

Flood Risk Assessment

Land off Stephenson Avenue Pinchbeck Spalding PE11 3SW

Tawny Homes Ltd | H14-1286-25 | Eleven industrial units

13 October 2026 | Common finished floor level 3.70 m OD

Prepared by TAC Architects for consideration by South Holland District Council

Executive assessment

TAC Architects recommends that SHDC consider and agree a common minimum finished floor level of 3.70 m OD for the two approved blocks through the mitigation package in this assessment. The request retains resilience to at least 4.50 m OD and measured access evidence. Harry Brown, owner of Tawny Homes, will retain the freehold and remain responsible for site management and coordinated flood-warning, closure and reopening arrangements. Deputy cover and occupier duties will be secured before occupation. [S15]

3.70 m OD is the lowest tested level that provides at least 300 mm clearance over every recorded ordinary ground observation inside the registered building footprints. At the controlling eight-unit point of 3.39 m OD the nominal clearance is 310 mm; at the three-unit maximum recorded point of 3.28 m OD it is 420 mm. These measured-ground comparisons do not establish flood-water freeboard or the highest height anywhere on an unsampled surface. [S03–S06; Appendix B]

The EA's October 2026 Product 4 records no impact on the site from its defended modelled extents and identifies no tidal risk at this site. Historic SFRA residual maps still warrant resilience and people-safety measures. Relevant commercial approvals support a practicable floor and recovery/management package; each decision is used only for its recorded proposition. [S01; Appendices D and E]

The proposal is suitable for a reasoned Council determination. A positive lifetime-safety conclusion depends on acceptance of the residual-risk and emergency strategy, including warning/route suitability and response failure, and a viable drainage/no-increase case.

1 Purpose scope and planning position

This is a site-wide Flood Risk Assessment for the eleven-unit development at land off Stephenson Avenue, Pinchbeck, Spalding PE11 3SW, permission H14-1286-25 granted on 16 July 2026. It replaces the flood-risk justification for the proposed floor datum while considering rivers, residual defence failure, surface water, drainage, groundwater, sewers, reservoirs, effects elsewhere, construction and the safety of all site users. The proposal remains within the approved light-industrial/storage use classes B8 and E(g).

Condition 7 requires minimum 4.00 m OD floors and resilience to 4.50 m OD unless otherwise agreed in writing by the LPA. It expressly reserves detailed site/floor levels. This report supports that written-agreement route. Condition 2 still binds the drawings and condition 8 requires approved surface-water details before work beyond oversite; agreement of a floor datum does not discharge either condition. [S02, Appendix I]

The accompanying request also seeks approval of surface-water details under condition 8. The indicative drawing identifies the proposed arrangement for consideration; the Council must separately be satisfied that full disposal details meet that condition. Written agreement to the floor level and drainage approval are distinct determinations. [S02 S14]

The existing development principle and approved layout provide the planning starting point. The present request does not use commercial vulnerability to bypass residual-safety requirements or claim an exemption from the Sequential Test for eleven new units. The Council must consider the change in the context of the permission and current policy. The original scheme's accepted principle is not a certification of the changed mitigation. [W10 W14 W15]

Assessment basis

The existing 75-year commercial assessment lifetime is retained. Occupation beginning in 2026 or 2027 would extend to approximately 2101 or 2102. Permitted operating hours are 07:30 to 18:00 Monday to Saturday, with no Sunday/bank-holiday operation. Those hours include winter darkness. No sleeping use is proposed; mobility, visitors, delivery drivers, lone workers and future tenant changes remain material to people safety.

Verified evidence means an accessible original or official record. Calculations are transparent operations on recorded geometry or declared design levels. Interpretations are conclusions drawn from those sources. Assumptions are proposed or unverified inputs and are identified where used. Technical detail deferred to design is distinguished from evidence needed to accept the principle. [Appendices A B F G]

2 Site and measured level evidence

The site is undeveloped land within the commercial estate and comprises the approved three-unit and eight-unit blocks, circulation, parking, pedestrian links and boundary access. Native DPR GPS survey, native V17 CAD layout and the complete overlay were accessible and examined through AutoCAD. The GPS survey is accepted as measured evidence. No accuracy value, terrain interpolation, area mean or existing-ground gradient has been invented. [S03–S08]

Observed reference	Existing OD	Clearance to 3.70
Three-unit footprint highest recorded ordinary point A4445	3.28 m	420 mm
Eight-unit footprint controlling point A442D; DPR handle 1CA	3.39 m	310 mm
Opposite D–D observed point A4430	3.12 m	580 mm
Outside footprint point A442A	3.52 m	180 mm; not used as an interior datum
Observed street/channel and path points	2.86 / 2.96 / 3.00 m	Measured discrete points; no inferred continuous profile

The 3.39 m point is at E525243.934 N324391.547 and lies just within the registered eight-unit outline. Its opposing 3.12 m observation is separated by a measured horizontal distance of 9.658 m. The drawing records both observations without an assumed ground line or gradient between them. The three-unit maximum recorded ground point is 3.28 m OD. [Appendices B C]

The 3.52 m external point is retained on the key plan. It cannot be projected into a building footprint, and it is not silently excluded from the overall site-level review. Council agreement should establish the relevant existing-ground reference for the E4 criterion, including any adjacent threshold/apron reference it considers material. The footprint comparison is a defensible recorded-ground screen, not a declaration that 3.70 is 300 mm above every external area.

The approximately 10 mm residual from matching CAD control positions describes the drawing registration, not GPS vertical accuracy or a construction allowance. Ordinary Spot Level records are distinguished from kerbs, manholes and specialist features. The tight 10 mm nominal margin at the controlling point makes reliable setting out and a minimum floor specification essential. No tolerance may consume the agreed minimum.

3 Policy and floor level approach

Current NPPF Chapter 18 requires a proportionate FRA and a safe lifetime outcome with residual risk managed, suitable access/escape, recovery and no increased risk elsewhere. Local Plan Policies 3 and 4 require a supported design and mitigation response. These are outcome tests; a comparison of floor numbers at other sites is insufficient. [W10 W14]

The current officer record refers the scheme to commercial standing-advice cell E4. It requires floors raised as high as practicable, with a minimum 300 mm above existing ground, and appropriate resistance/resilience measures. For single-storey premises it refers to the future flood-depth maps; where the higher-floor approach is impracticable, safe refuge or an appropriate warning and evacuation plan must address the risk. The LPA determines the plan's adequacy. This assessment seeks agreement to that combined mitigation approach for the approved commercial scheme. [W06; PR2026]

Christopher Hill's EA email of 10 September 2026, EIR2026-41701, quotes cell G9 for the proposed residential development at Rutland Gardens, Gosberton, in Flood Zone 3 outside hazard mapping. It confirms the regional use of ground raising with resilient construction. It is contextual advice for a different site and vulnerability class, not consultation approval or hydraulic evidence for Stephenson Avenue. E4 is the recorded commercial assessment route here. [C01; Appendix J]

National EA FRA guidance generally seeks 600 mm over the highest relevant site-average, adjacent-road or estimated river/sea flood reference; reduction to 300 mm depends on certainty about the flood level. It also addresses extra resilience and safe refuge for single-storey or ground-floor accommodation without upper access. This assessment does not claim blanket compliance with the generic 600 mm approach, or that GPS ground accuracy supplies certainty about a flood-water surface. It seeks consideration of a practical commercial mitigation package within the recorded local E4 approach. [W01]

The E4 minimum rise is measured from existing ground. DCLG 2007 separately illustrates freeboard above a predicted river flood level including climate change (printed p44). These reference surfaces must remain distinct. The 310/420 mm recorded-footprint clearances establish the ground comparison; they do not demonstrate flood-water freeboard. Section 2 identifies the external 3.52 m observation and the ground reference requiring Council agreement. [W06 W29; Appendix B]

The required judgement is whether the combined physical and operational measures demonstrate safe use despite residual inundation. Ground raising limits exposure, resilient construction supports recovery and controlled early closure seeks to prevent people being exposed. The response to a late or absent warning must be accepted on evidence. Practical access and loading are assessed in section 7; the construction specification is set out in section 9. [W01 W06 W29]

A dedicated additional refuge is not assumed mandatory solely from an historic commercial precedent, nor is it assumed unnecessary because workers can normally leave. The approved Unit 8 mezzanine remains part of the scheme, but no shared-refuge credit is taken: its level, capacity, accessible approach, structural adequacy and guaranteed availability have not been verified for all tenants. [W01 W13; Appendix E]

4 River flooding and residual scenarios

Current EA evidence

Product 4 EIR2026/44912 dated 5 October 2026 identifies the local defended context. Section 4.3 states that the defended modelled extents do not impact this site; section 5 identifies no tidal risk at this site. Section 4.4 confirms the EA has no site hazard mapping and directs the assessment to the 2017 South Holland SFRA. These are verified statements with their stated scope. They do not give a complete event list, local water surface, onset or duration. [S01, Appendix H]

The Welland Glen 2016 data show 4.52 m OD in-channel for the 1% event and 4.68 m OD with 20% flow increase. These are channel values, not a water surface on this defended site. The coincident 3.70 m channel value for a different event is not a recommendation for the proposed floor. Earth-bank protection described as a 1% standard and fair condition reduces defended probability but is not a breach probability or a guarantee of performance for the full life.

Strategic residual mapping

Detailed 2017 Spalding SFRA maps identify present and future 2115 residual scenarios for the 1% fluvial and 0.5% tidal events. Future mapped depths include 0-0.25 m and 0.25-0.50 m, with mainly 0-0.3 m/s velocity. Hazard includes Low and Danger for Some within the site, including part of the eight-unit footprint. These are strategic band interpretations, not precise unit-specific water levels. [M10-M18; Appendix D]

The detailed Spalding sheets are used for site interpretation, in place of enlarged district-wide maps. The registered site follows Stephenson Avenue with both blocks inside the plot. Road junctions and neighbouring buildings were checked against the survey and EA location map on 12 October 2026. Export sampling is approximately 1.09-1.16 m per pixel; that is not model-cell accuracy. Blank areas do not establish zero risk, and map depths are not added to GPS ground heights to invent water elevations.

Defence breach, overtopping and exceedance of the design event remain relevant. Strategic maps do not establish matched site terrain/water surfaces, arrival times or duration, or certify a dry escape route or warning period. Appropriate rare-event and response-failure assessment remains necessary alongside passive recovery and precautionary closure.

5 Climate change and the development lifetime

The assessment retains the 75-year commercial life rather than adopting the shorter 30- or 50-year lives used in some comparators. A future map horizon beyond that life is useful strategic evidence, but its calendar date alone does not establish that its allowance, defence assumptions and event coverage match current guidance. [S09 W02 W05]

Allowance reference	Benchmark used for review
Welland river flows for the 2080s	Central 17%; higher central 28%; upper end 53%
River evidence in Product 4	2016 model with 20% flow increase; full scenario/epoch coverage not specified
Welland peak rainfall 2070s 3.3% event	Central 25%; upper end 35%
Welland peak rainfall 2070s 1% event	Central 25%; upper end 40%

For this less-vulnerable commercial development, the applicable central river-flow benchmark is identified for its lifetime, with appropriate sensitivity according to the decision-maker's requirements. Although 20% is numerically greater than 17%, that arithmetic is not proof that the defended extent or residual model covers all relevant future scenarios. Product 4 itself advises checking current allowances. [W02 W11; S01 §4.2]

Historic statements that flood levels will be capped by remote bank overtopping or that defences and pumps will necessarily be upgraded have not been adopted. Such measures may be part of authority programmes, but no funded site-specific adaptation programme has been supplied as a lifetime-safety dependency.

The earlier drainage calculation includes a rainfall uplift, but a single selected storm is not a complete climate-adjusted design. Detailed drainage must test the relevant current allowances, critical durations, receiving flood levels, blockage and exceedance. Existing strategic/authority modelling may provide the necessary answer; obtaining Products 5 or 6 or commissioning a fresh model is not an automatic precondition merely because this is a lower-floor request. Further analysis is needed if the available information cannot support acceptance of the residual safety or drainage case. [W08 W09 W12]

6 Surface water drainage and other flood sources

The assessment treats local rainfall, drainage failure and receiving-water constraints separately from the favourable defended river extent. The new roofs and paving increase runoff from currently undeveloped ground, so a controlled, maintainable disposal system is required. The original drawing references to soakaways and the later hybrid attenuation/infiltration description are not treated as one verified network. [S05 S08 S10]

Source	Evidence and response
Rainfall and overland flow	Current and 2040–2060 public surface-water mapping shows local susceptibility in surrounding estate/road areas. Provide positive falls, threshold protection and safe exceedance; no precise site depth is inferred. [W24]
IDB drains and pumps	A receiving system, rate and level relationship must be established. Pump maintenance or a nominal discharge consent does not guarantee discharge during a flood.
Groundwater	No site monitoring or validated infiltration evidence is supplied. Check seasonal levels, soakaway separation, slab uplift and storage flotation.
Foul sewers and backflow	Confirm the lawful connection, capacity and surcharged operation; include suitable non-return protection. No history in EA records does not exclude sewer flooding.
Reservoirs and artificial sources	Public EA wet- and dry-day extents retrieved 6 October do not intersect the registered site. This is extent screening, not a depth, timing or zero-risk finding. [W21–W23]
Historic flooding	Product 4 records no known site-specific events in its records. Other sources, unrecorded events and future conditions remain possible.

The officer record contains an Anglian Water hierarchy objection. The IDB's principle of a 3 l/s rate is conditional, including its contribution/consent requirements; no payment or final lawful outfall is represented here.

Condition 8 requires full surface-water disposal details approved before work beyond oversite. The floor-level request also needs an acceptable outline viability and exceedance case. Appendix G audits two different historic storage bases; neither is a verified drainage design. An indicative layout or assumed discharge is not proof of capacity, performance or a lawful outfall.

Drawing 26/714/PA/001, dated 8 October 2026, shows the indicative RWP/inspection-chamber network and proposes central-soakaway disposal, separately from the dashed foul-drainage arrangement and labelled existing mains connection. The ground-level assessment uses the complete DPR survey and registered plan in Appendix C; this indicative plan is not a complete survey reproduction. Surveyed labels represent existing ground, not finished yard levels or the proposed 3.30 m circulation node. The plan does not establish storage capacity, infiltration, seasonal groundwater, pipe inverts or a lawful outfall. [S14; Appendix K]

Infiltration remains a proposed option pending BRE Digest 365 testing and seasonal groundwater checks. Detailed design must reconcile contributing areas and Appendix G storage bases, verify usable capacity, treatment, maintenance, traffic loading, foundation separation and safe exceedance at agreed floor/yard levels. If infiltration is unsuitable, establish an alternative lawful outfall and consents. The indicative plan alone does not demonstrate condition 8 compliance; full approval is required before development beyond oversite.

7 Finished floors and operational practicability

The proposed common minimum floor is 3.70 m OD. It improves flood protection above observed building ground while reducing the approach rise by 300 mm compared with condition 7's 4.00 m. Industrial access combines forklift and vehicle loading, pedestrian movement, deliveries, trolley/pallet handling, disabled access and doors that must open onto usable level areas. The effect of the floor is therefore assessed across the available approach length, not just at a threshold. [S05–S08; Appendix C]

Representative measured geometry	3.70 floor with proposed 3.30 node	4.00 floor with same node
C–V 8.031 m graded run after 1.5 m top landing	0.400 m rise; 4.981%; about 1:20.08	0.700 m rise; 8.716%; about 1:11.47
C–P 8.422 m graded run after three 1.5 m level areas	0.400 m rise; 4.750%; about 1:21.05	0.700 m rise; 8.312%; about 1:12.03

The proposed 3.30 m circulation node and landing arrangements are declared design inputs, not surveyed existing levels. However, the relative benefit of the 300 mm reduction is independent of the chosen lower-node level for fixed runs: the vehicle grade reduces by 3.74 percentage points and the personnel grade by 3.56 points. At a 1:20 graded approach, a 300 mm reduction saves 6.00 m of graded length, excluding landings. [Appendix B]

This materially reduces the effort and rollback risk of pushing loaded trolleys or manual pallet equipment; improves traction and control during forklift loading; eases low-clearance vehicle transitions; and preserves usable level space for load transfers, door operation, accessible turning and separate pedestrian movement. These are design benefits, not certification of any particular forklift fleet or manual-handling task. HSE guidance requires an operation-specific risk assessment. Its general gradient advice is not a universal forklift limit. [W17–W19]

Approved Document M favours a shallow approach where achievable and limits ramp flights, landings, clear width and turning. The measured personnel example supports a shallow approach but does not yet verify every route, parking link or 1.5 m square turning area. The final design must protect threshold/landing drainage and segregate vehicles from pedestrians. [W07]

DCLG Chapter 4 and Figure 4.2 recognise practical floor levels, access and cost while retaining flood-consequence and evacuation tests. The measured comparisons above provide evidence for the E4 practicability judgement. A 4.00 m floor could require higher external levels, longer ramps or more extensive raising, with consequences for loading space, drainage and flow paths. The requested 3.70 m datum balances those constraints with the specified mitigation; the sections do not establish that it is the highest achievable floor under every alternative layout. [W06 W29]

8 Flood risk elsewhere and construction

Lowering the building datum can reduce the need for high approach ramps and widespread yard raising, making the retained external flow and drainage relationships easier to coordinate. The building footprint and access layout remain those of the approved development. That favourable design direction is not, by itself, proof that no floodwater will be displaced. The complete proposed surface and obstructions must be assessed against the accepted flood scenario. [S05–S08 W01 W08]

The two principal CAD footprint polygons total approximately 933.34 m². The application's 936 m² figure appears to use a different definition or rounding; this is not evidence of a physical set-out discrepancy. A 300 mm datum reduction multiplied by 933.34 m² gives approximately 280.00 m³ of geometric platform prism. It is not an earthworks quantity, usable flood storage or a compensatory-storage design. No benefit of 280 m³ flood storage is claimed.

Final civil information should show level landings at shutters, accessible doors, external crossfalls, gullies, exceedance routes, road tie-in and boundary levels. It should identify whether building/slab raising obstructs a conveyance route or loses storage and, where relevant, provide a supported no-increase or compensation solution. Less-vulnerable use and a water-entry construction strategy do not automatically eliminate this requirement.

Surface-water treatment must address industrial yards and potential pollutants as well as roofs. Harry Brown, as retained freeholder and site-management lead, will remain responsible for common areas, the shared roadway, drainage, gates, lighting and estate flood-management arrangements. Occupier cooperation, maintenance funding and change-of-tenant duties must be secured through leases or equivalent binding arrangements. Any IDB or sewer consent remains separate from planning agreement. [S15]

During construction, maintain existing drainage paths or provide a lawful temporary replacement, keep material and waste outside critical flow routes, protect excavations and control sediment/contaminated water. Check forecasts before opening substantial excavations. Construction staff need their own weather closure and emergency instructions; the future tenant plan does not cover an unattended open excavation. The permission's ecological and biodiversity requirements also remain effective.

9 Resistance resilience and recovery

The proposal retains the conditioned resilience datum of at least 4.50 m OD. At a 3.70 m floor that provides 800 mm of specified vertical recovery provision above floor. It is not an 800 mm dry-proofing guarantee or certified freeboard above the design flood. Review the specification against the residual/design information accepted by SHDC; a higher required recovery extent must be incorporated if that review identifies it. [S02 W01 W29]

DCLG's depth bands of 0.3 m and 0.6 m guide selection of water exclusion or water entry; exclusion at higher depths requires structural assessment. They are not verified flood depths for this site. The industrial frame, cladding, slab and openings must be checked for the accepted pressures, inundation duration and recovery strategy. [W29, Chapter 4]

Element	Required design response
Floors and walls	Concrete slab and insulation/finishes selected for limited water absorption and recovery. Maintain continuous floor/wall membranes and durable joints; provide access to clean and dry wetted materials. Specify recovery performance for the actual wall and cladding assembly.
Services	Electrical distribution, sensitive controls, data and other vulnerable equipment above the accepted inundation/recovery extent, coordinated with electrical and accessibility requirements. Specify service-entry seals and replaceable vulnerable components; confirm installed levels before occupation.
Shutters and entrances	Provide passive threshold/drainage detailing. Ordinary roller shutters are not assumed watertight; confirm actual openings, weather seals, operating space and structural pressure effects.
Water entry and structure	Check hydrostatic/dynamic loads, frame/cladding and wall stability, slab uplift and storage-tank flotation. Allow controlled water entry where required for structural safety and provide drainage/recovery access. Temporary or demountable barriers are not the safety basis for these new units.
Drainage and recovery	Suitable backflow protection, inspection/cleaning access and a lawful means of removing water after inundation. Commission and maintain the system, with recovery instructions and access to spaces where water or silt could remain.
Materials and contents	Tenant storage/racking controls for floatable loads, oils and chemicals; secure containers and protect vulnerable stock without delaying evacuation.

For each block, the detailed specification must identify recoverable materials to at least 4.50 m OD, vulnerable-service levels, opening and penetration details, structural pressure limits and cleaning/drying access. The architect, structural engineer and services designer must coordinate these provisions with the approved fabric and confirm installed compliance before occupation. A greater recovery extent must be provided if the accepted flood information requires it. These provisions apply the DCLG construction principles alongside current EA guidance. [W01 W29; Appendix J]

The native shutter geometry and nominal approved door schedule are not identical in all dimensions. Final opening/clear-width coordination is required alongside landings and manoeuvring. These measured sections inform that coordination and are not construction release drawings.

10 Flood warning closure and people safety

Harry Brown, owner of Tawny Homes, will retain the freehold and is the designated site-management and flood-warning lead for all eleven units and common areas. He will receive warnings, coordinate non-attendance and early closure, and authorise reopening. Before occupation he must appoint a deputy with authority to act during absence or loss of contact and secure each occupier's response duties. Tenants must maintain staff/visitor and delivery contacts; arrangements must cover out-of-hours monitoring and tenant changes. [S15; Appendix F]

Before occupation, Harry Brown must register the site with the Environment Agency's free flood warning service, formerly Floodline Warnings Direct. The appointed deputy and each occupier's nominated manager must also register and maintain tested contacts, including out-of-hours receipt. Registration supports prompt precautionary departure on an applicable alert or earlier instruction while the accepted route remains safe. These are duties to implement before occupation, not registrations recorded as completed. [S15 W30; Appendix F]

Public EA area polygons retrieved on 7 October 2026 cover both the registered site boundary and its representative point within warning area 055FWTWELL4A, Pinchbeck and the West of Spalding, and alert area 055WAF135TLW, Lower Welland. The catalogue names the Welland/Glen context. The broader tidal-alert polygon also overlaps; this is a notification geography, not proof of tidal hazard at this site and does not override Product 4. [W26–W28]

Trigger	Estate action proposed for approval
Forecast concern before attendance	Remote manager checks relevant flood and severe-weather information; stop attendance where a credible risk could affect the estate or the intended route.
Applicable flood alert or authority instruction	Precautionary close/no new attendance. If occupied, organise prompt departure while the checked route is safe; manager may act earlier. Notify every tenant and delivery contact.
Flood warning or escalating local evidence	Site to remain closed. Do not wait for a severe warning or visible floodwater to begin the planned response.
Route unsafe or warning/communications failure	Do not walk or drive through water or default to an unverified mezzanine. Follow the accepted failure procedure. Current evidence does not verify a safe shared refuge or rescue response.
Reopening	Manager verifies route/site safety, authorities' advice, drainage, electrics and structural condition as relevant; a warning ending alone is not a reopening certificate.

Published coverage proves that a warning service is geographically available, not that every breach or local drainage failure will be warned in time. No two-hour minimum or slow-onset assumption is adopted. Warning modes, onset relative to the route, notification/decision time, clearance time for the slowest user and a margin must support the accepted strategy. The EA service does not provide surface-water flood warnings; Harry Brown or his deputy must also monitor weather, local conditions and drainage concerns, and act on earlier triggers. [W01 W13 W15 W30]

11 Relevant commercial planning evidence

The comparative review uses primary Council permissions, operative FRA revisions and officer records. It covers 26 approved commercial comparator applications, including older relevant decisions, with 19 FRA-containing records examined. The purpose is to identify accepted mitigation approaches; the cases are not hydraulically equivalent and provide no approval probability. Appendix E gives the material source and condition links.

County Interiors H14-0836-25, decided 31 October 2025, binds its October amended FRA and requires the new storage floor 300 mm above existing ground. Its FRA combines that raising with warning, water-entry recovery and raised services, explaining impracticality of a higher floor. The revised submission matters: the superseded July report did not specify the raising. This supports the current measured-ground and practical-access argument without importing a different site's OD level.

H14-1252-18, decided 2 July 2019, binds the final March RSK FRA, requires 300 mm floor raising and an approved warning/evacuation plan before first occupation. H02-0493-19, decided 5 September 2019, expressly binds the August amended FRA that describes constrained ramps, retained floor in one phase and no feasible safe refuge in single-storey units, with an operational plan. Crowland H02-0925-24 records withdrawal of an EA objection following a revised commercial operational response and secures evacuation measures before use.

These decisions support Council consideration of an adequate management alternative where higher raising/refuge is impracticable; they do not supply an adequate plan for Stephenson Avenue automatically. Their unverified warning times and generic routes are not copied. Freshline and Bars Bridge include first-floor fallback; Fleet uses a different Low Hazard matrix cell. Those limits are retained rather than hidden.

The same-site 2020 three-unit permission H14-0402-20 used a 3.50 m OD floor in its bound April 2020 FRA and approved site plan. It provides useful planning history but is a different layout, date and mitigation package. No lawful fallback or current floor entitlement is asserted. The operative current minimum remains 4.00 m until SHDC agrees otherwise in writing.

12 Recommended agreement and delivery requirements

The requested decision is written agreement to a common minimum 3.70 m OD floor in both blocks, retaining at least 4.50 m OD resilience, through condition 7 if SHDC accepts that mechanism. The Council should also identify how revised datum/absolute roof and access information is reconciled with condition 2. A Section 73 route is appropriate only if the Council concludes it is needed for the actual changes; this assessment does not declare a material change non-material. [S02 W03]

Measure	Required provision
Finished floors	Minimum 3.70 m OD in both blocks, with datum/threshold verification and no construction tolerance that reduces the agreed minimum clearance.
Passive recovery	Retain resilience to at least 4.50 m OD through the coordinated fabric, services, structural and recovery specification in section 9. Confirm the extent against the accepted design/residual information before implementation.
Access and drainage	Coordinated external levels, level loading/door landings, segregated accessible approaches, maintained drainage and safe exceedance. Condition 8 remains effective.
People safety	Harry Brown as retained freeholder and designated warning/site-management lead, with deputy cover, binding duties for all eleven occupiers, early closure/access control and an LPA-accepted route and response-failure strategy.
Planning coordination	Written agreement under condition 7 and confirmation of the means to reconcile condition 2 drawings before implementation.

The structural envelopes on the approved unit drawings have relative eaves and ridge heights of approximately 5.00 m and 6.41 m. With 3.70 floors their corresponding absolute levels are approximately 8.70 m and 10.11 m OD. Revised drawings must state the intended relative and absolute relationships and avoid incompatible level notes. Those relationships are calculations from the submitted dimensions, not a revised approved elevation.

13 Assessment conclusion

3.70 m OD has a coherent, evidence-led justification: it exceeds the local 300 mm criterion at every recorded ordinary footprint ground point, substantially reduces the approach rise, preserves the 4.50 m OD recovery provision and can be paired with one enforceable site-management regime. The October EA evidence and relevant commercial permissions justify reassessing 4.00 m on those grounds.

The recommendation is to consider and agree that package where SHDC is satisfied about the ground reference, residual safety and drainage viability. It is not a claim that the nominal floor alone proves lifetime safety, that all required evidence has already been supplied or that approval follows from precedent. An unresolved route/warning-failure case or lawful outfall remains material to determination. No other floor datum is proposed.

This document and its appendices set out the assessment, mitigation case and remaining evidence and implementation requirements. They support a precise request for Council agreement. Construction to 3.70 m must await the required written agreement and coordinated approvals; the construction and operational measures must be secured and implemented at the stages identified above.

Appendix	Supporting evidence bound into this document
A	Primary source and evidence-status register
B	Observed footprint points and measured calculations
C	Five measured AutoCAD sections and key plan
D	Registered SFRA evidence and other public-map screening
E	Relevant operative SHDC permissions and FRA evidence digest
F	Verified warning-area coverage and estate management requirements
G	Drainage arithmetic and design/assumption controls
H	EA Product 4 dated 5 October 2026 reproduced in full
I	Current permission relevant pages 1 to 3 and current Flood Map for Planning
J	Construction-guidance references and the regional EA correspondence digest
K	Indicative surface-water plan 8 October 2026 and its assessment limits

Appendix A Primary source and evidence register

Identifier	Evidence and role
S01	EA EIR2026/44912 5 October 2026, 11 pages. Defence/channel context and expressly scoped defended-extent and tidal statements.
S02	SHDC permission H14-1286-25 16 July 2026, 9 pages. Conditions 2 7 and 8; extracts reproduced in Appendix I.
S03	DPR-09/26/103 GPS survey 16 September 2026, native DWG and PDF. Observed HEIGHT values in OD; native coordinate evidence.
S04	Complete native overlay DXF and 260919 OVERLAY PDF. Registration and observation matching.
S05 S06	V17 native proposed layout and approved site PDF; three-unit V9.6 and eight-unit V3.8 sheets. Drawing title blocks control revision identity.
S07 S08	Access V5.3 and drainage whose title block is V4.6 despite V9.6 filename. Geometry and earlier drainage intentions.
S09 S10	Applicant April 2026 FRA and drainage statements v6.6. Prior assessment and calculation inputs; not new hydraulic evidence.
S11 S12	Applicant design/access and transport statements, including development operation.
S13	EA Flood Map for Planning 2 September 2026, Flood Zone 3; Appendix I.
M01 to M18	M01-M09 district context; M10-M18 detailed Spalding SFRA maps, February 2017, accessed 12 October 2026. Registered extracts and linked sources in Appendix D.
PR2026	Official current officer record pp3–4 gives the recorded E4 consultation route. Original standalone bespoke EA consultation letters for H14-1286-25 were not available; C01 relates to a separate Gosberton enquiry.
Public comparators	Official SHDC decision/FRA/plan records identified in Appendix E; no unverified research approval rankings used.
W21 to W24	EA public reservoir extent and surface-water map screening 6 October 2026; captured source/session records retained.
W26 to W28	EA published area descriptions/catalogue/polygons and boundary containment checked 7 October 2026. No subscription or contact made.
W29	DCLG 2007 Improving the flood performance of new buildings. Chapter 4 and Figure 4.2; Chapter 6 construction principles. Technical guidance used alongside W01 and W06; Appendix J.
C01	Christopher Hill, EA, 10 September 2026, EIR2026-41701. Full original email thread retrieved 8 October 2026. Gosberton residential/G9 advice; regional context only, not Stephenson Avenue approval or hydraulic data. Appendix J.
S14	TAC indicative surface-water plan 26/714/PA/001, 8 October 2026. Existing survey retained; disposal option subject to testing and detailed approval. Appendix K reproduces the plan.
S15	Client confirmation: Harry Brown retains the freehold, manages the site and is the designated warning lead; registration, deputy cover and occupier arrangements to be implemented.

Original project documents and native CAD were examined; their unchanged source hashes are retained in `Original_Source_Inventory.csv`. The recommendations rely on verified primary records cited here.

Appendix B Observations and calculation audit

Ordinary Spot Level records inside the registered principal block polygons are listed below. The record is discrete: there is no interpolation between observations and no surveyed-area average. Clearance is $1000 \times (3.700 - \text{recorded OD})$. Overlay handles provide source traceability; the key plan in Appendix C shows the point locations.

Block	Overlay handle	Easting and northing	OD	Rise mm
Three	A43F7	525235.996 324418.820	3.15	550
Three	A43FA	525230.618 324410.381	3.19	510
Three	A4421	525233.911 324418.675	3.22	480
Three	A4424	525226.427 324412.146	3.17	530
Three	A443F	525223.113 324411.683	3.23	470
Three	A4442	525214.826 324407.508	3.23	470
Three	A4445	525219.032 324400.538	3.28	420
Eight	A440F	525249.951 324396.937	3.18	520
Eight	A4412	525249.236 324395.129	3.28	420
Eight	A4415	525256.775 324394.629	3.11	590
Eight	A4418	525257.000 324391.020	3.13	570
Eight	A441B	525251.323 324395.970	3.23	470
Eight	A442D	525243.934 324391.547	3.39	310
Eight	A4430	525250.366 324384.342	3.12	580
Eight	A4433	525243.310 324377.646	3.04	660
Eight	A4436	525236.880 324386.095	3.28	420
Eight	A444E	525231.358 324375.592	3.15	550
Eight	A4451	525234.408 324369.261	2.98	720
Eight	A45E8	525264.564 324403.910	3.07	630
Eight	A45EB	525258.774 324399.541	2.97	730

The native 3.39 m DPR observation, handle 1CA, corresponds to overlay A442D. Special feature records and invalid proposed-CAD Z values are not used as existing-ground observations. See the unchanged trace-bend and measured schedule files for the complete drawing audit.

Appendix B Calculations continued

Tested datum	Rise over 3.39 point	Ground criterion at recorded point
3.60 m OD	210 mm	Below 300 mm
3.70 m OD	310 mm	Exceeds by 10 mm nominal
3.80 m OD	410 mm	Exceeds by 110 mm nominal
4.00 m OD	610 mm	Exceeds by 310 mm nominal

This is a ground-reference screen of the four tested floor levels. It is not a hydraulic pass/fail assessment and does not offer the other values as applications. Only 3.70 m OD is requested. The available data do not prove flood-water freeboard for any of these floors.

Calculation	Inputs and result
Vehicle approach	9.531 m total – 1.500 m top landing = 8.031 m run. $(3.70-3.30)/8.031 \times 100 = 4.981\%$. $(4.00-3.30)/8.031 \times 100 = 8.716\%$.
Personnel approach	12.921839 m total – 4.500 m for lower turn and top level areas = 8.421839 m run. $0.400/8.421839 \times 100 = 4.750\%$; $0.700/8.421839 \times 100 = 8.312\%$.
Relative grade benefit	300 mm reduction over fixed 8.031/8.421839 m runs = 3.74/3.56 percentage points, independent of lower-node datum.
Run length benefit	0.300 m $\times 20 = 6.00$ m less graded run at 1:20. Excludes all landings and turning space.
A–A developed approach	Observed path 3.00 m. Proposed 3.00→3.10 over 4.945 m =2.02%; proposed 3.10→3.30 over 11.668 m =1.71%. Design inputs expressly labelled.
Footprint comparison	$933.34165 \text{ m}^2 \times 0.300 \text{ m} = 280.00 \text{ m}^3$ geometric prism. No inferred earthwork or flood-storage benefit.
Building height coordination	$3.70+5.00 = 8.70$ m OD eaves; $3.70+6.41 = 10.11$ m OD ridge, subject to revised approved drawing coordination.

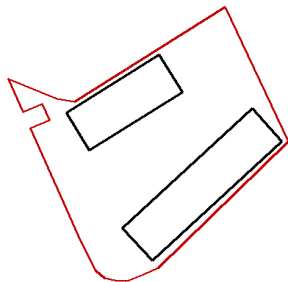
B–B is a 45.7 m true cut with measured block widths approximately 12.196 m and 11.993 m. The 18.301 m interval is not a carriageway width. A–A is a 65.038 m developed route through bends, not a straight terrain transect. P–P is 26.228 m within/beside the site and does not prove the full off-site escape. Final widths, turns, drainage and threshold opening coordination remain required.

Appendix D Other public map screening

The registered historic SFRA map audit is reproduced with the source sheets at the end of this assessment. The following current public-map screening is separate evidence and does not replace the SFRA residual scenarios. Reservoir wet- and dry-day layers retrieved 6 October 2026 do not intersect the registered boundary. The source requests and layer capabilities are retained; the approximately 0.20 m export pixel spacing is not model accuracy.

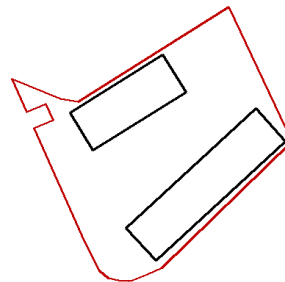
Reservoir flood extent screening

Dry day
N



20 m

Wet day
N



20 m

Red site boundary Black approved footprints Shaded mapped extent

Red site boundary Black approved footprints Shaded mapped extent

No mapped extent intersects the registered site boundary in either extract.

EA public WMS retrieved 6 October 2026. Extent screening only; no depth or arrival-time conclusion.

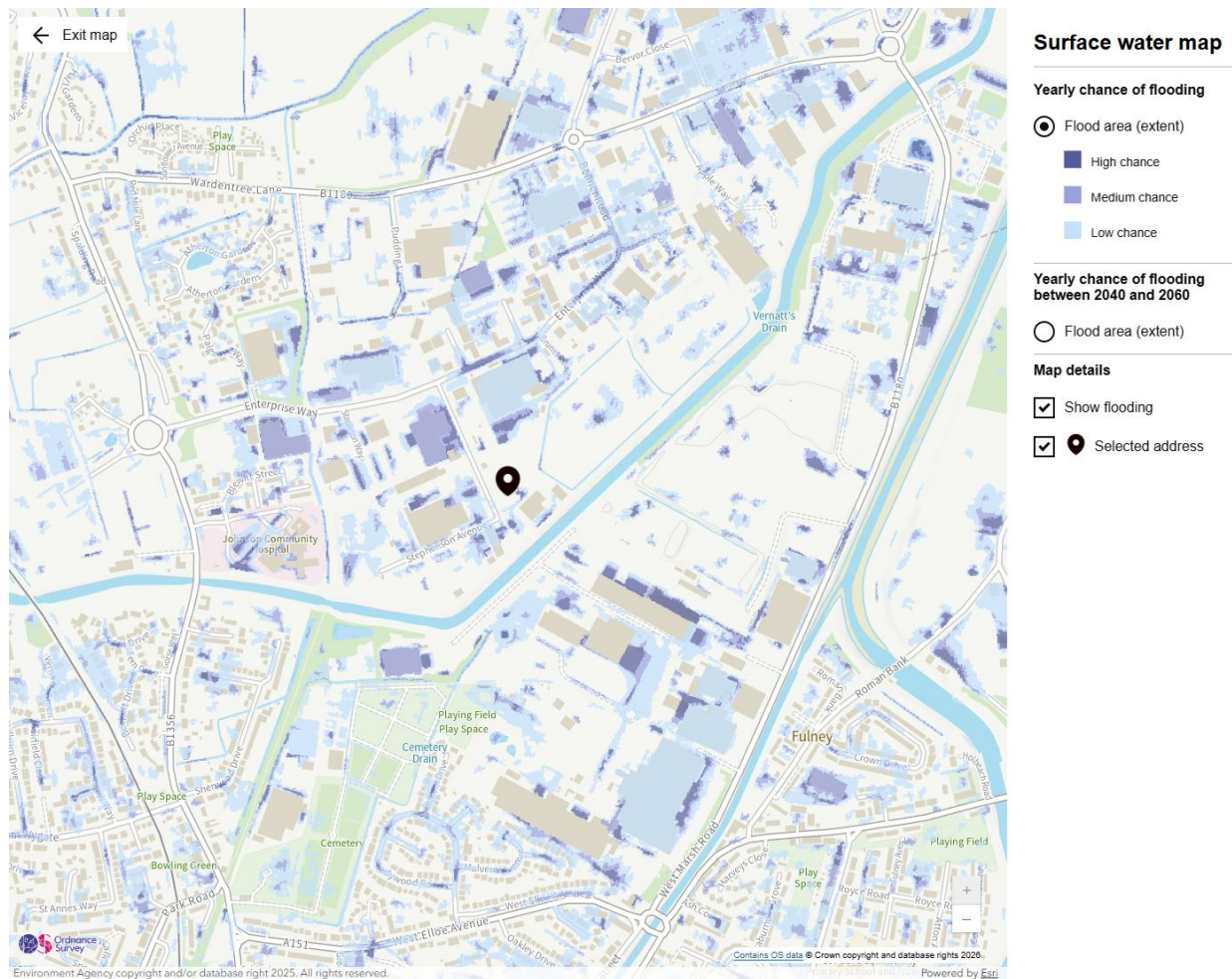
BNG window E525150–525310 / N324300–324470. Contains Environment Agency data under OGL.

EA reservoir extent screening with registered boundary and footprints. Graphic retained from the verified mapping audit; no ground or flood-water interpolation is introduced.



Appendix D Surface water screening

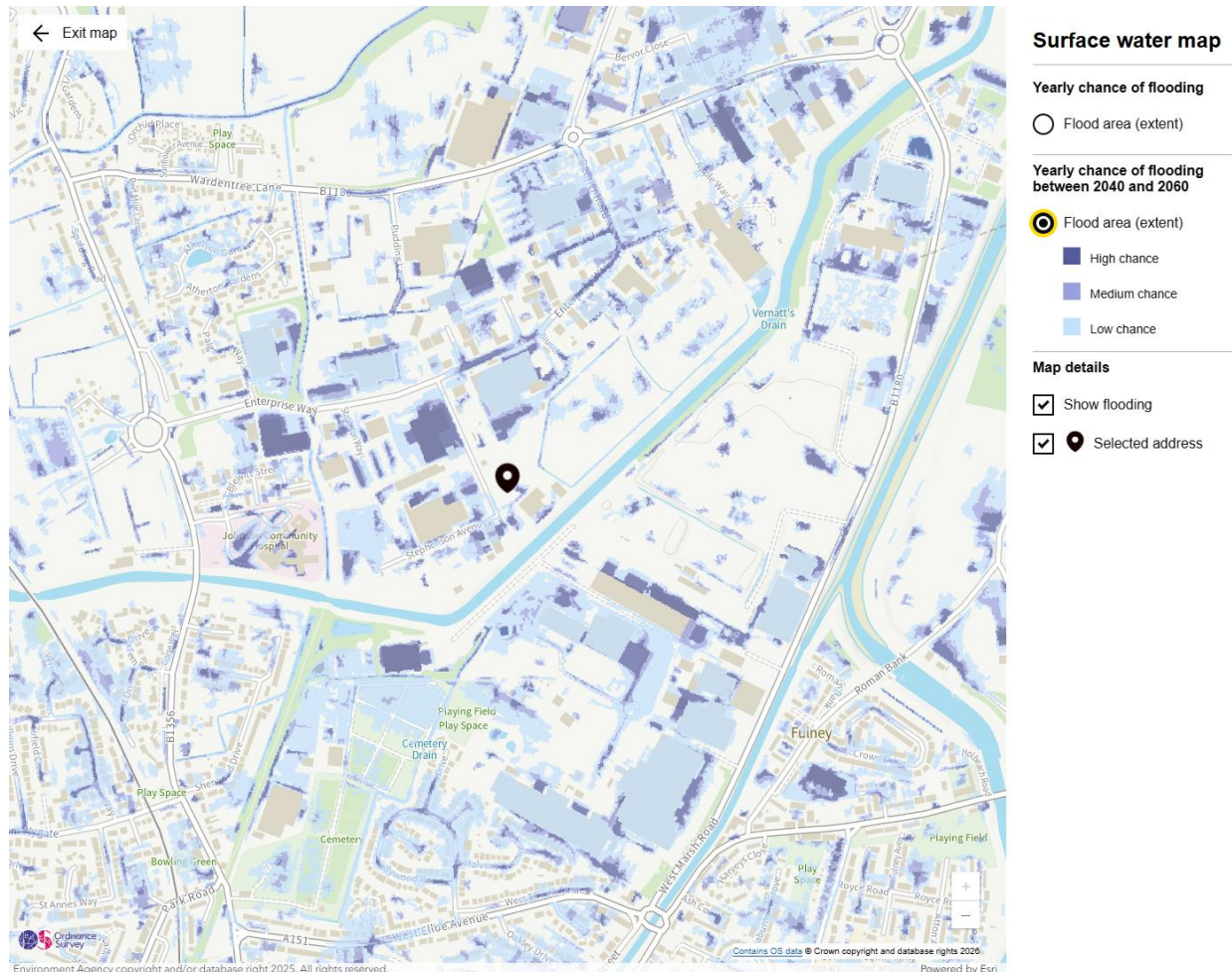
Current public EA surface-water map captured at the registered site and surrounding estate. This is an extent/likelihood screening image; no numerical site depth is extracted. Local pockets and road susceptibility require the drainage and exceedance controls in section 6.



Source W24 viewed 6 October 2026. Official map interface and key are retained. Site selection and view audit are in the supporting source records.

Appendix D Future surface water screening

EA public 2040–2060 surface-water view captured 6 October 2026. Its horizon is shorter than the adopted commercial lifetime and does not demonstrate lifetime drainage adequacy. The detailed design must apply the appropriate rainfall allowances and test critical events and exceedance.



The source image is used as current public screening evidence, with no interpolation or conversion to an absolute flood-water level.

Appendix E Operative SHDC evidence digest

The following primary decisions and bound FRA revisions support the propositions used in section 11. Source-page references use PDF pages. Official document links are retained with hashes in the source register; the Council application link gives the complete public document list. Other applicants' model datasets and complete proprietary FRAs are not redistributed.

H14-0836-25

Decision pp1–2 conditions 2 and 4; officer p7; October FRA p11. New storage floor 300 mm above existing ground, with raised services, warning and water-entry recovery. Superseded July FRA did not include that floor measure. A current local relative-level comparator; no absolute OD imported.

H14-0836-25 Council application and document register

H14-1252-18

Decision condition 11 requires an approved warning/evacuation plan before first occupation; condition 12 requires 300 mm raising. Final RSK FRA dated 28 March 2019 pp42–44 discusses practicality and combined mitigation. This confirms the condition structure; its unverified warning periods are not adopted.

H14-1252-18 Council application and document register

H02-0493-19

Decision conditions 2 and 3 bind RAB2271L version 1.0 dated 14 August 2019. FRA pp12–14 retains phase 2 ground-level floor because of constrained ramps, raises phase 3 by 300 mm and explains no feasible safe refuge in proposed single-storey units; Appendix B gives a warning/evacuation plan. No timing or ground-raising waiver transferred.

H02-0493-19 Council application and document register

Appendix E Evidence digest continued

H02-0925-24

Officer pp3 and 7 records EA objection withdrawal after January 2025 amended section 8.6. Decision condition 5 secures evacuation before first use; approved plans show nine ground-floor units without an additional dedicated upper refuge. The decision supports an accepted operational alternative, subject to independent site safety evidence.

H02-0925-24 Council application and document register

H14-0957-22

Decision condition 6 requires 3.15 m AOD. Operative DB418F v2 includes forklift/pallet-access and impaired-mobility considerations, recovery materials and raised services. Its conflicting existing-floor/ground descriptions are not used to claim a verified 100 mm ground rise.

H14-0957-22 Council application and document register

H14-0391-21

2021 Freshline permission/report requires 3.15 m AOD. Operational discussion compares the proposal with an existing floor; the FRA has a first-floor fallback. It is not a verified 250 mm above-ground or refuge-free precedent.

H14-0391-21 Council application and document register

Appendix E Evidence digest continued

H05-0844-22

Decision conditions 7 and 8 require minimum 3.35 m ODN unless otherwise agreed and reserve detailed levels/sections. FRA June 2022 proposes about 150 mm raising under Low Hazard F4. Different cell and reserved levels prevent transfer to the current E4 criterion.

H05-0844-22 Council application and document register

H14-0243-23

Decision pp2–3 condition 8 secures 150 mm above external ground and reserves final levels. March 2023 FRA p4 specifies first-floor/mezzanine refuge and an additional stair. Its smaller floor rise accompanies a different safety package.

H14-0243-23 Council application and document register

H14-0402-20

Decision condition 2 binds April 2020 EWE Revision A and drawing 272-W-5a at the same site; the earlier three-unit scheme used 3.50 m OD. Historic contextual evidence only: different layout/data, no asserted lawful fallback, and the 2026 condition remains operative.

H14-0402-20 Council application and document register

Appendix F Warning coverage and management parameters

The 7 October 2026 EA public catalogue was queried at E525235 N324398, converted to longitude -0.143764956 and latitude 52.802607871. Published GeoJSON polygons were tested against both that point and the registered site boundary. The warning area and Lower Welland alert area both cover the whole site; the broad tidal-alert area is retained as notification context. This is geographic coverage evidence, not a timing or hydraulic analysis.

Area	Published role	Coverage
055FWTWELL4A Pinchbeck and the West of Spalding	Warning area; catalogue river label Welland/Glen	Point and whole registered boundary
055WAF135TLW Lower Welland	Flood alert area	Point and whole registered boundary
055WAT602WTE Far extent of Tidal Flooding from the Wash and Tidal Estuaries	Broad alert area; notification context only	Point and whole registered boundary

Official warning area 055FWTWELL4A

Official alert area 055WAF135TLW

Public EA flood-area catalogue and polygons

Harry Brown is the nominated site flood-warning lead and retained freeholder. Before occupation he must register the site with the EA's free warning service, formerly Floodline Warnings Direct, appoint/register deputy cover and confirm occupier-manager registration and contacts. He must confirm event relevance, out-of-hours receipt, a tested tenant contact chain and review after personnel/tenancy changes. No registration is recorded as completed by this assessment. Follow section 10's early-closure response. Register at <https://www.gov.uk/get-flood-warnings> or contact Floodline on 0345 988 1188. Published coverage is not a lead-time guarantee. [S15 W30]

Response test

For the relevant residual event, compare available time before the first route segment becomes unsafe with warning delivery plus decision, notification, mobilisation and route-clearance time for the slowest expected user, with an accepted contingency margin. The inequality must be supported by suitable evidence; no invented number is inserted. Test a warning that arrives late or not at all, power/phone loss, out-of-hours arrival and an already affected route.

Record each unit's route to the estate exit, the off-site destination outside the relevant flood risk, the access permission and alternative arrangements. A general road arrow or a regional Flood Zone 1 destination without the connecting route is insufficient. Where the failure case cannot be demonstrated safely, provide a verified accessible refuge or redesign the safety strategy before relying on it.

Appendix F Estate implementation schedule

Responsibility	Required record before occupation
Harry Brown as retained freeholder	Retained responsibility for shared roadway, common areas, drainage/lighting maintenance and estate flood management; binding occupier duties, funding, deputy appointment and review records.
Harry Brown as designated warning lead	EA site registration and an accepted plan with route/destination, early triggers and failure arrangements; named authorised deputy, out-of-hours monitoring and tested communications.
Every tenant	Named primary/deputy contacts, warning-registration evidence, staff/visitor and delivery procedure, accessibility needs and assistance arrangements; no sleeping use; acknowledgement of estate instructions in lease/licence.
Civil and services team	As-built floors/thresholds, drainage commissioning, maintained safe approaches, emergency lighting/communications provision and recoverable services.
Review	Realistic drill after occupancy arrangements are known; annual and change-triggered review, including new tenant, layout or flood evidence; corrective actions recorded.

Emergency closure takes priority over stock movement, vehicles, data recovery and switching services unless those tasks are safe and do not delay departure. Goods must not block escape or become floatable hazards. No reliance is placed on a normal fire assembly point in a potentially flooded yard, driving through water, an unverified shared mezzanine or guaranteed emergency-service rescue.

Appendix G Drainage and design input audit

Earlier stated input or calculation	Status
S09 FRA Appendix E pp18–22: effective area 1,594.68 m ² ; rainfall 79.7 mm over 240 minutes	Applicant selected inputs; critical duration and rainfall basis not independently verified.
S09 runoff $1,594.68 \times 0.0797 = 127.10 \text{ m}^3$	Arithmetic calculation from the original FRA appendix, not drainage statement S10.
Discharge $0.003 \text{ m}^3/\text{s} \times 14,400 \text{ s} = 43.20 \text{ m}^3$	Assumes 3 l/s is continuously achievable throughout the event.
S09 net $127.10 - 43.20 = 83.90 \text{ m}^3$; with 10% uplift 92.29 m ³	Appendix rounds its uplifted target to about 93 m ³ .
S10 drainage statement §5.13 p12: $147.50 - 43.20 = 104.30 \text{ m}^3$	Different inflow basis, while retaining 105 m ³ effective storage. The two bases require reconciliation.
105 m ³ effective storage at 95% void ratio = 110.53 m ³ gross	Confirm effective capacity, installation dimensions, available head and sediment/maintenance allowance.
Infiltration or restricted alternative outfall	Testing, groundwater and lawful receiving-level/outfall evidence outstanding; drawings and narrative require reconciliation.

A simple zero-discharge sensitivity over the same 240 minutes would require 127.10 m³ on the S09 basis or 147.50 m³ on the S10 basis, exceeding 105 m³ by 22.10 or 42.50 m³ respectively. This is a volume illustration of flood-locking sensitivity, not a network simulation. A receiving-level and critical-storm design must establish the actual operating case.

Final drawings must show pipe and storage inverts, levels, overflow, shut-off/backflow arrangements where relevant, pollution treatment, maintenance access and safe surface exceedance. Verify the network against the accepted floor/yard levels and 1% rainfall event with applicable allowance, critical durations and appropriate blockage/flood-locking cases. Flood-storage displacement is a separate river/residual analysis from runoff attenuation. The original calculation appendix and drainage statement page are reproduced with the bound sources.

References

Source identifiers S01 to S15, M01 to M18 and contextual correspondence C01 are defined in Appendix A. Web guidance was checked during 5 to 8 October 2026. Published records retain their own issue dates. DCLG 2007 supplies construction principles alongside current policy and EA guidance; historic planning references within it are not used as current policy. Links below open the original source.

- W01 Environment Agency Flood risk assessment Flood Zones 1 2 3 and 3b Floor levels and access and escape
- W02 Environment Agency Climate change allowances Current allowance method
- W03 Planning practice guidance Flexible options for planning permissions Condition amendments and Section 73
- W05 South East Lincolnshire SFRA 2017 version 6 Commercial life and mitigation
- W06 SFRA Appendix C Standing Advice Commercial row 4 and E4
- W07 Approved Document M Volume 2 Approaches and ramp flights
- W08 National standards for sustainable drainage systems 2025 standards
- W09 Environment Agency Using modelling for flood risk assessments Suitability of available modelling
- W10 National Planning Policy Framework Chapter 18 Policies F4 F7 and F8; published 29 September 2026
- W11 Environment Agency Peak river flow allowances Welland catchment official data
- W12 Environment Agency Peak rainfall allowances Welland catchment official data
- W13 ADEPT and Environment Agency Flood risk emergency plans September 2019 guidance
- W14 Adopted South East Lincolnshire Local Plan March 2019 Policies 3 and 4
- W15 Planning practice guidance Flood risk and coastal change Residual risk and emergency plans
- W17 Health and Safety Executive Traffic routes Workplace gradients
- W18 Health and Safety Executive Workplace transport safety HSG136 Slopes and loading operations
- W19 Health and Safety Executive Pushing and pulling INDG478 Route and handling assessment
- W21 Environment Agency Reservoir dry day extents Public service retrieved 6 October 2026
- W22 Environment Agency Reservoir wet day extents Public service retrieved 6 October 2026
- W23 Environment Agency Reservoir mapping guidance Scenario interpretation
- W24 Environment Agency Long term flood risk map Surface water site and surrounding roads; current and 2040 to 2060 views
- W26 Environment Agency Pinchbeck and the West of Spalding Published warning area 055FWTWELL4A
- W27 Environment Agency Lower Welland Published alert area 055WAF135TLW
- W28 Environment Agency Flood monitoring area catalogue Public polygons checked against registered site boundary 7 October 2026
- W29 DCLG 2007 Improving the flood performance of new buildings Chapter 4 printed pp43–50 and Chapter 6
- W30 Environment Agency Get flood warnings Registration by text phone or email and Floodline contact details
- C01 Christopher Hill EA email 10 September 2026 EIR2026-41701 Gosberton G9 regional context; digest in Appendix J

Appendix J Construction guidance and regional EA advice

Construction guidance W29

DCLG 2007, printed p44 and Figures 4.2–4.4 (pp48–50), distinguish flood-water freeboard, practical floor levels and the construction response. Chapter 6 addresses materials, openings, fittings and services. Sections 3, 7 and 9 explain their application to the requested 3.70 m OD floors. The current EA guidance W01 and commercial matrix cell E4 in W06 remain part of the assessment.

Regional correspondence C01

Christopher Hill, FCRM Officer, EA Partnerships and Strategic Overview (Welland and Nene), emailed TAC Architects on 10 September 2026 at 10:36 BST under reference EIR2026-41701. The reply followed an enquiry about proposed homes east of Rutland Gardens, Gosberton. It identifies major more-vulnerable development in Flood Zone 3 outside hazard mapping and quotes standing-advice cell G9.

The floor-level sentence reads: “Finished floor levels (FFL) should be set 300mm above ground level.” The same passage calls for resilient construction with reference to DCLG 2007, surface-water drainage arrangements and evidence of no increased flood risk elsewhere.

This correspondence confirms the EA’s use of the regional matrix for that enquiry in September 2026. It contains no hydraulic results or approval of a 3.70 m OD floor at Stephenson Avenue. The approved industrial use and recorded E4 route are assessed independently here. The email supplies regional advisory context; the 26 approved commercial comparators are considered separately in section 11 and Appendix E.

Application to the mitigation package

The proposed floors are supported by measured ground comparisons and the access assessment, with retained recovery provision to at least 4.50 m OD. Section 9 requires a coordinated construction specification. Section 10 and Appendix F require warning registration, early closure and an accepted evacuation/failure strategy. The ground reference, residual safety and lawful drainage approach remain matters for Council acceptance. The correspondence and construction guidance do not supply missing site flood-water levels or warning times.

Bound source reproductions

Appendices C G H I and K reproduce complete or selected source evidence pages. Appendix D presents registered extracts from the detailed Spalding SFRA sheets with an EA location inset. Word images are scaled to fit; the submission PDF retains the drawing and map sheets at their original output sizes. Measured-section geometry and source dates are preserved.

Registered measured section key plan

TAC Architects | Tawny Homes Ltd | Stephenson Avenue Pinchbeck | H14-1286-25



Source and trace basis

- Native approved positions registered rigidly to BNG.
- Survey and level attributes checked against DPR DWG.
- Ch 0 marks start; large circles mark trace endpoints.
- A-A developed vehicle alignment; actual bends shown.
- B-B straight section through both main footprints.
- C-V and C-P are separate shutter and personnel traces.
- P-P is a candidate boundary connection only.
- No off site safe escape route is claimed.

- Proposed common floor: 3.70 m OD.
- Proposed circulation node: 3.30 m OD.
- Site floodwater level not yet established.
- Profile markers are measured on-cut observations.
- No existing ground line or surface is interpolated.
- Plan labels show ordinary Spot Level observations.

Trace endpoints and developed lengths

- A-A L 65.038 m
O E 525211.189 N 324372.544
end E 525257.077 N 324417.512
- B-B L 45.700 m
O E 525223.561 N 324416.984
end E 525254.538 N 324383.384
- C-V L 9.531 m
O E 525222.283 N 324385.651
end E 525228.744 N 324378.644
- C-P L 12.922 m
O E 525221.488 N 324382.511
end E 525230.543 N 324380.303
- P-P L 26.228 m
O E 525213.052 N 324377.780
end E 525230.543 N 324380.303
- D-D L 9.658 m
O E 525243.934 N 324391.547
end E 525250.366 N 324384.342

Measured access and building cross section

TAC Architects | Tawny Homes Ltd | Stephenson Avenue Pinchbeck | H14-1286-25

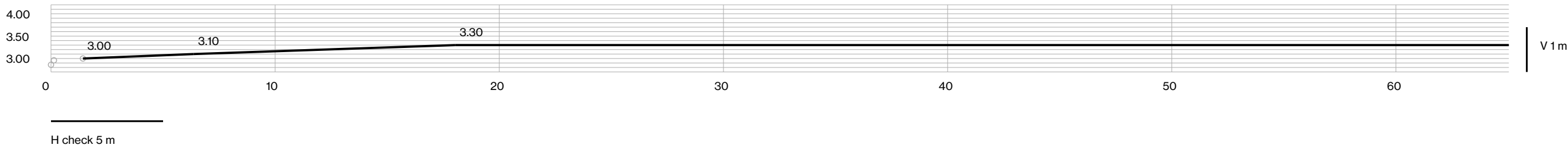


A-A: measured highway levels retained; public crossing design is held.

Observed channel 2.86 / kerb top 2.96 / path 3.00 m OD. Markers retain surveyed heights; nearby spots show offsets.

Path to entry 4.945 m / 100 mm = 2.02%; entry to circulation 11.668 m / 200 mm = 1.71%.

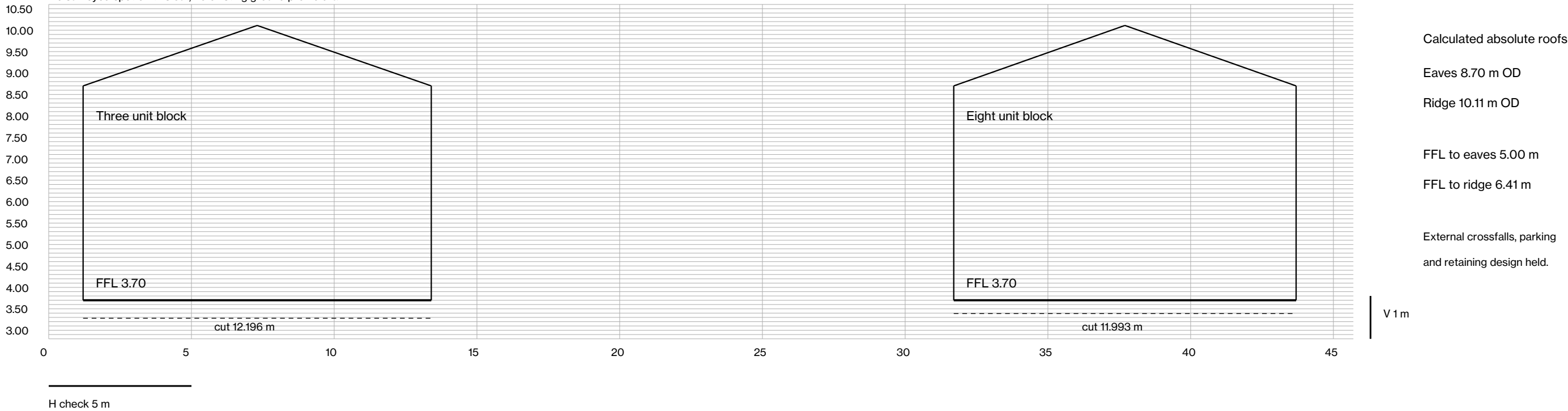
A-A H 1:200 / V 1:100 VE 2



B-B: genuine straight cut; approved relative roof heights retained.

B-B H 1:150 / V 1:100 VE 1.5

No surveyed spot on this cut; no existing ground profile drawn.



Dashed references are recorded footprint spot maxima, not on-cut terrain: three-unit 3.28 / 420 mm; eight-unit 3.39 / 310 mm raising.

Block interval 18.301 m along B-B; this is not the access road width. Roofs require condition 2 coordination.

Measured shutter and personnel approaches

TAC Architects | Tawny Homes Ltd | Stephenson Avenue Pinchbeck | H14-1286-25

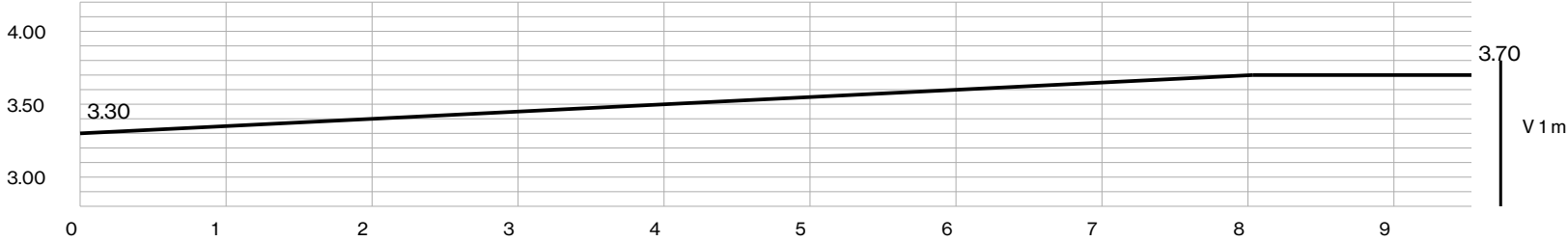


Southern shutter – proposed floor 3.70 / circulation 3.30 m OD

Measured total 9.531 m; graded run 8.031 m; rise 0.400 m; grade 4.981% / 1:20.08.

C-V H 1:50 / V 1:50 VE 1

No surveyed spot on this cut; no existing ground profile drawn.



H check 5 m

Bend chainages m: 0.000, 9.531

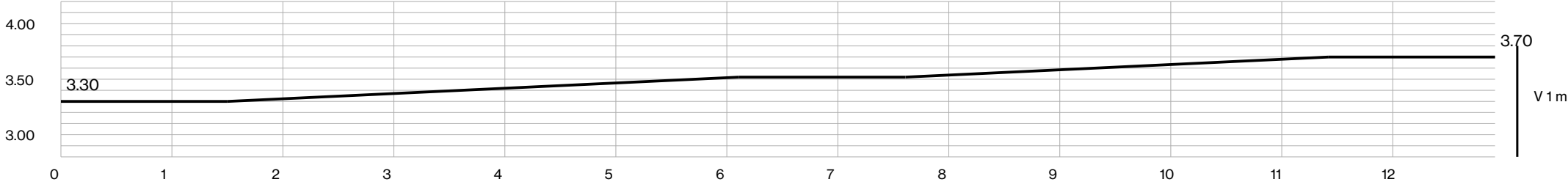
Fleet/loading suitability and shutter-position/opening dimensions require detailed coordination; no actual vehicle pass claimed.

Separate personnel door – proposed floor 3.70 / circulation 3.30 m OD

Measured total 12.922 m; graded run 8.422 m; rise 0.400 m; grade 4.750% / 1:21.05.

C-P H 1:50 / V 1:50 VE 1

No surveyed spot on this cut; no existing ground profile drawn.



H check 5 m

Bend chainages m: 0.000, 6.860, 12.021, 12.922

Includes level turning length; 1:21.05 grade. Clear landing width, door manoeuvring and parking links require design coordination.

Design profiles use measured runs. Provide level operating pads, positive drainage and coordinated threshold / outfall details.

Landing assumptions

Top 1.50 m level

Bottom at circulation

Level loading area to detail

Widths / door swings to detail.

Landing assumptions

Top 1.50 m level

Bottom 1.50 m

Turn 1.50 m (C-P)

Widths / door swings to detail.

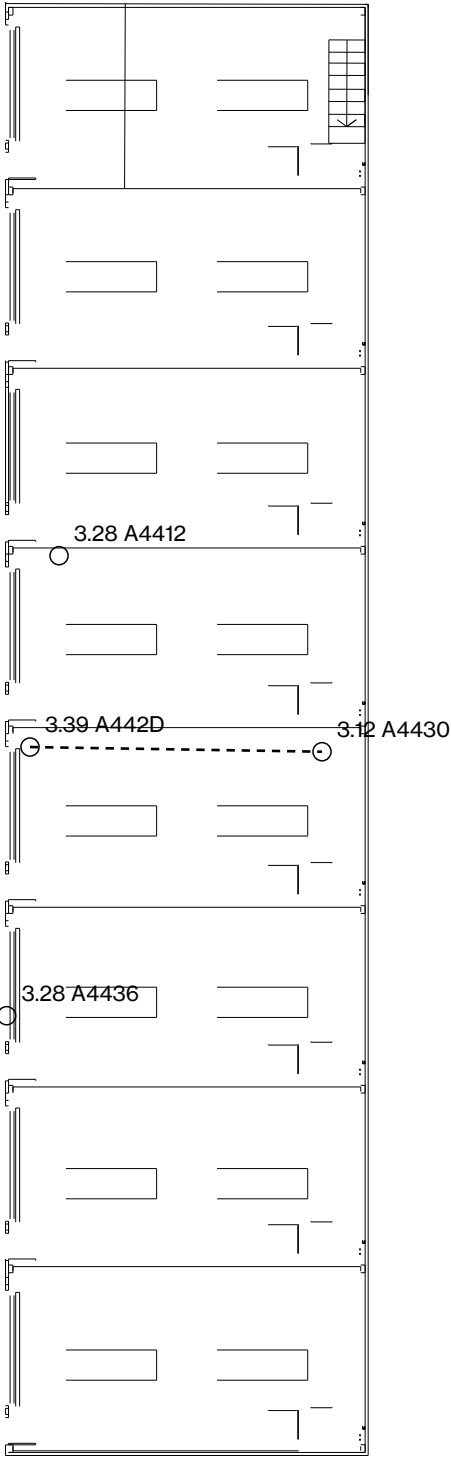
Measured floor and ground comparison

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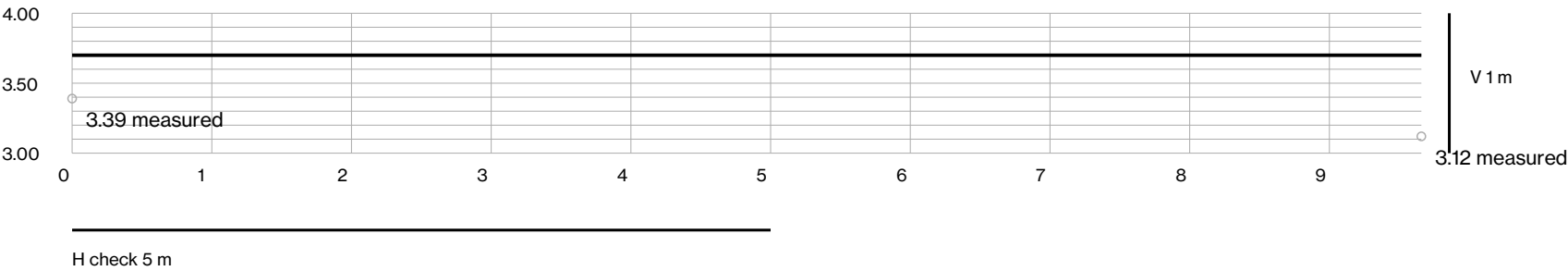
Verified survey observations

- Front point A442D / native DPR handle 1CA: 3.39 m OD.
- E525243.934 / N324391.547, inside the eight-unit footprint.
- Opposite point A4430: 3.12 m OD, at its actual survey position.
- D-D is the direct measured cut between the two observations.
- No ground line or rate of fall between points is inferred.
- FFL 3.70 minus measured 3.39 = 0.31 m / 310 mm.
- Nominal 10 mm above the local 300 mm ground minimum.
- This is a ground comparison, not hydraulic freeboard.



Direct section between recorded point centres

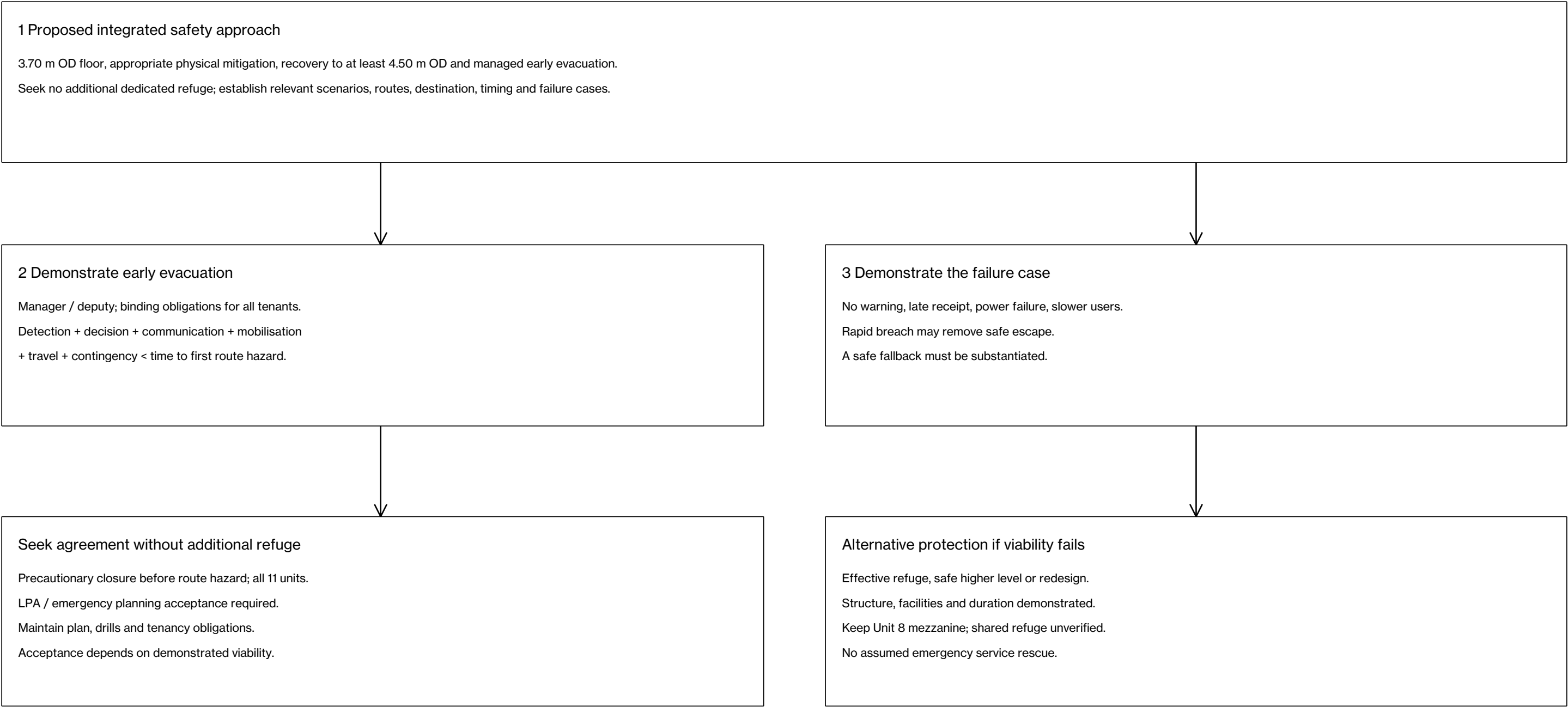
D-D H 1:50 / V 1:50 VE 1
Measured horizontal span 9.658 m; proposed floor 3.70 m OD.



- Three-unit highest recorded footprint observation: 3.28 m OD.
- 3.70 minus 3.28 = 0.42 m / 420 mm raising.
- No whole-site area average or unsurveyed ground maximum is claimed.
- Specify 3.70 m as the minimum completed floor; verify datum and slabs.
- Recorded-point maxima do not certify every unsurveyed patch.

Proposed managed evacuation and refuge decision

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Verified Crowland 2025 RF01–RF05 supports consideration of this industrial approach; its hydraulics and warning times do not transfer.

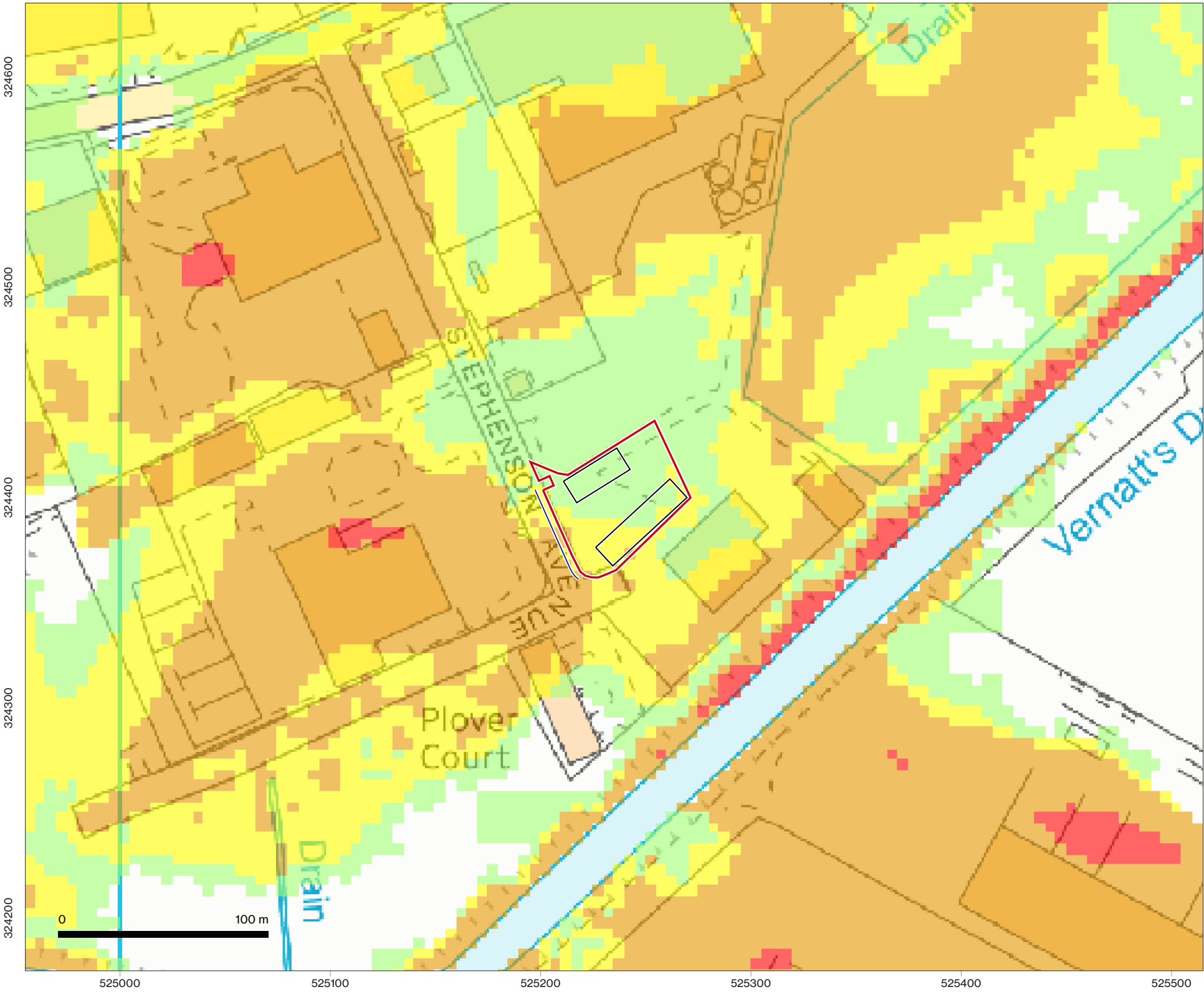
Justify E4 alongside the broader national FRA guidance. Closure and departure must occur before required routes become hazardous.

ER signs identify an onward network; they do not prove local breach timing or route safety. See Flood Risk Assessment.

Residual flood hazard Future 2115

Stephenson Avenue Pinchbeck | H14-1286-25 | Detailed Spalding SFRA February 2017 | Map 1 of 9

Red site boundary | Black proposed footprints | Navy surveyed kerbs | 1% fluvial and 0.5% tidal residual scenarios

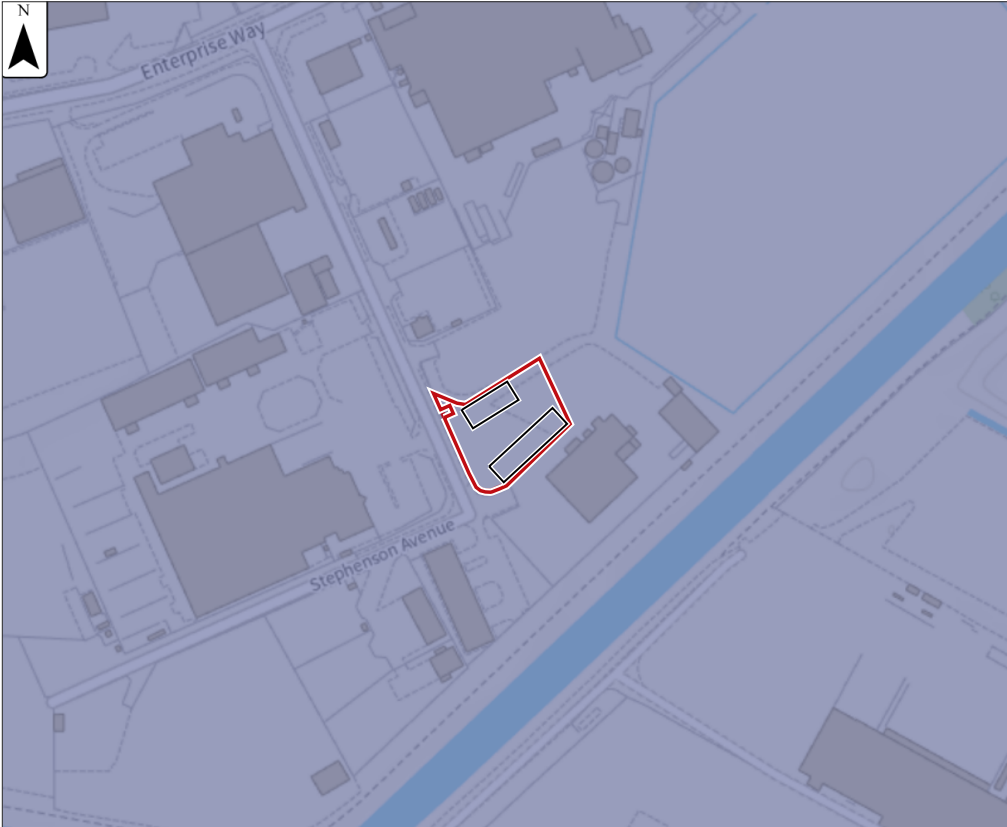


British National Grid metres | N up

Detailed Spalding SFRA overlays checked against surveyed road boundaries and the EA location map on 12 October 2026.
Detailed settlement mapping is used for site location. Printed source scale 1:15,000; velocity captions 1:16,000 at A1.
Export sampling about 1.09 m for depth/hazard/extends and 1.16 m for velocity is not model-cell accuracy. Depth bands are not water elevations.
Site and building coordinates are retained from the survey registration. No ground levels are interpolated. Blank pixels do not prove no risk.

M10 Source Residual_Flood_Hazard_Map__Spalding_2115__1__fluvial_0.5__tidal_event_probability.pdf
Official source link embedded above. SHDC and Royal HaskoningDHV February 2017 Revision 2. Source colours retained.
SFRA basemap: Crown Copyright, Licence No 100018215, 2009. EA locator: Environment Agency and Crown Copyright 2026, OS AC0000807064.

Road location check



EA map 2 September 2026 same grid extent
Location context only not an SFRA hazard layer

Site north of Stephenson Avenue and west of A16

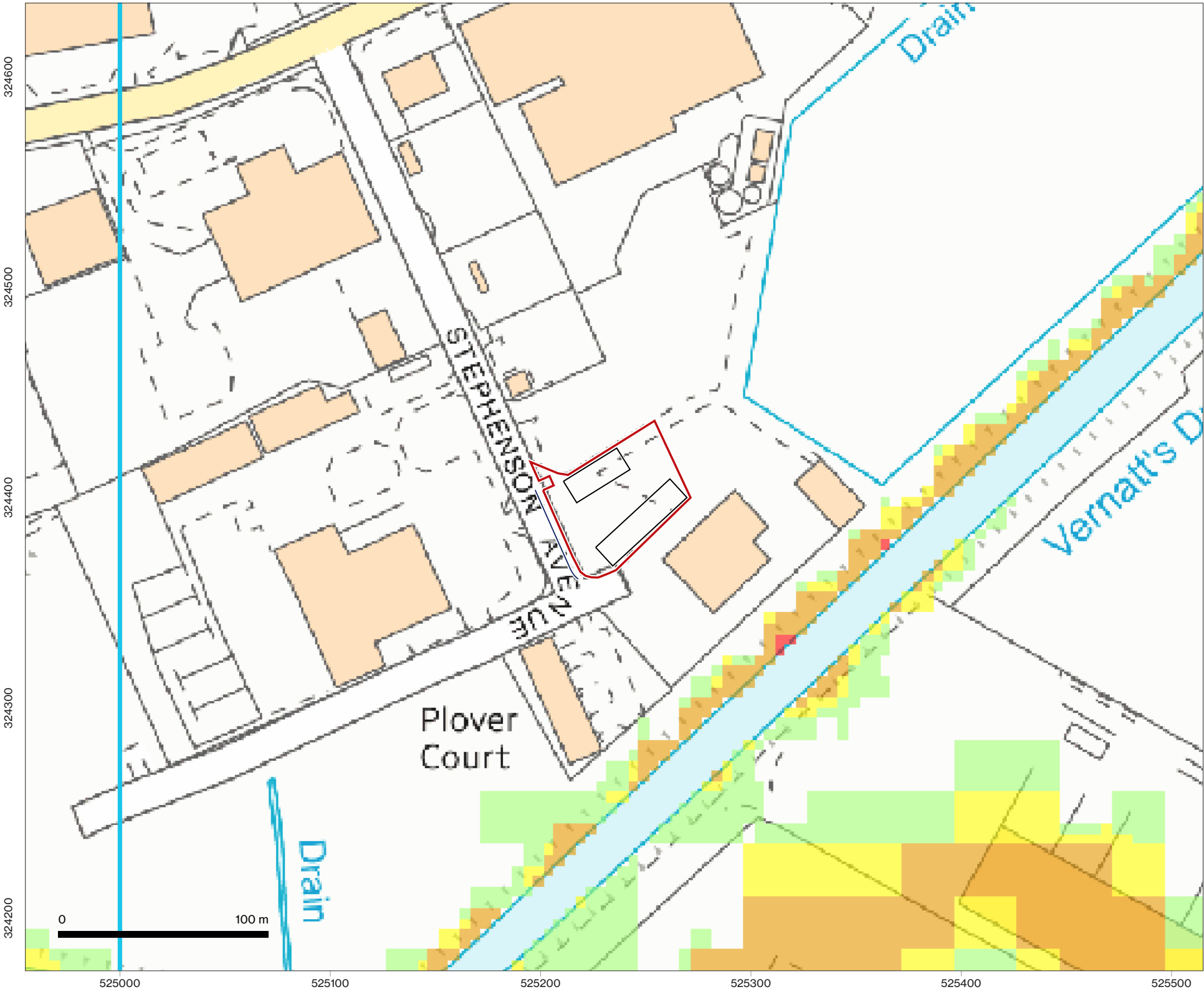
Original SFRA legend

Map Legend	
Max Hazard (Flood Risk to People : FD2320)	
Less than 0.75 (Low Hazard)	
Between 0.75 and 1.25 (Danger for Some)	
Between 1.25 and 2.0 (Danger for Most)	
Greater than 2.0 (Danger for All)	
Functional Floodplain	
South Holland District Boundary	

Residual flood hazard Present day

Stephenson Avenue Pinchbeck | H14-1286-25 | Detailed Spalding SFRA February 2017 | Map 2 of 9

Red site boundary | Black proposed footprints | Navy surveyed kerbs | 1% fluvial and 0.5% tidal residual scenarios



British National Grid metres | N up

Detailed Spalding SFRA overlays checked against surveyed road boundaries and the EA location map on 12 October 2026.
Detailed settlement mapping is used for site location. Printed source scale 1:15,000; velocity captions 1:16,000 at A1.
Export sampling about 1.09 m for depth/hazard/extends and 1.16 m for velocity is not model-cell accuracy. Depth bands are not water elevations.
Site and building coordinates are retained from the survey registration. No ground levels are interpolated. Blank pixels do not prove no risk.

M11 Source Residual_Flood_Hazard_Map__Spalding_present_day_1_fluvial_0.5_tidal_event_probability.pdf
Official source link embedded above. SHDC and Royal HaskoningDHV February 2017 Revision 2. Source colours retained.
SFRA basemap: Crown Copyright, Licence No 100018215, 2009. EA locator: Environment Agency and Crown Copyright 2026, OS AC0000807064.

Road location check



EA map 2 September 2026 same grid extent
Location context only not an SFRA hazard layer

Site north of Stephenson Avenue and west of A16

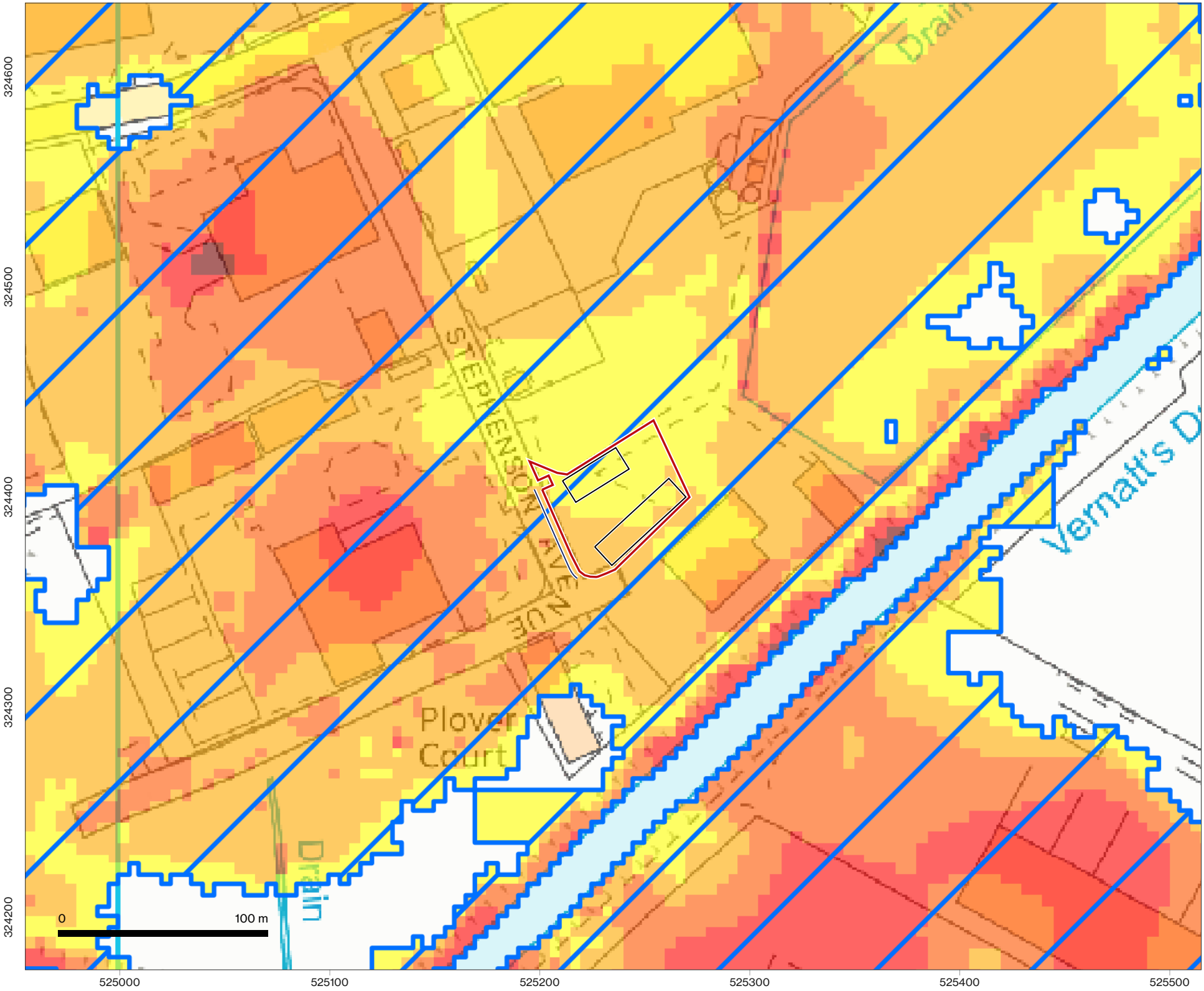
Original SFRA legend

Map Legend	
Max Hazard (Flood Risk to People : FD2320)	
Less than 0.75 (Low Hazard)	
Between 0.75 and 1.25 (Danger for Some)	
Between 1.25 and 2.0 (Danger for Most)	
Greater than 2.0 (Danger for All)	
Functional Floodplain	
South Holland District Boundary	

Residual flood depth and source dominance Future 2115

Stephenson Avenue Pinchbeck | H14-1286-25 | Detailed Spalding SFRA February 2017 | Map 3 of 9

Red site boundary | Black proposed footprints | Navy surveyed kerbs | 1% fluvial and 0.5% tidal residual scenarios

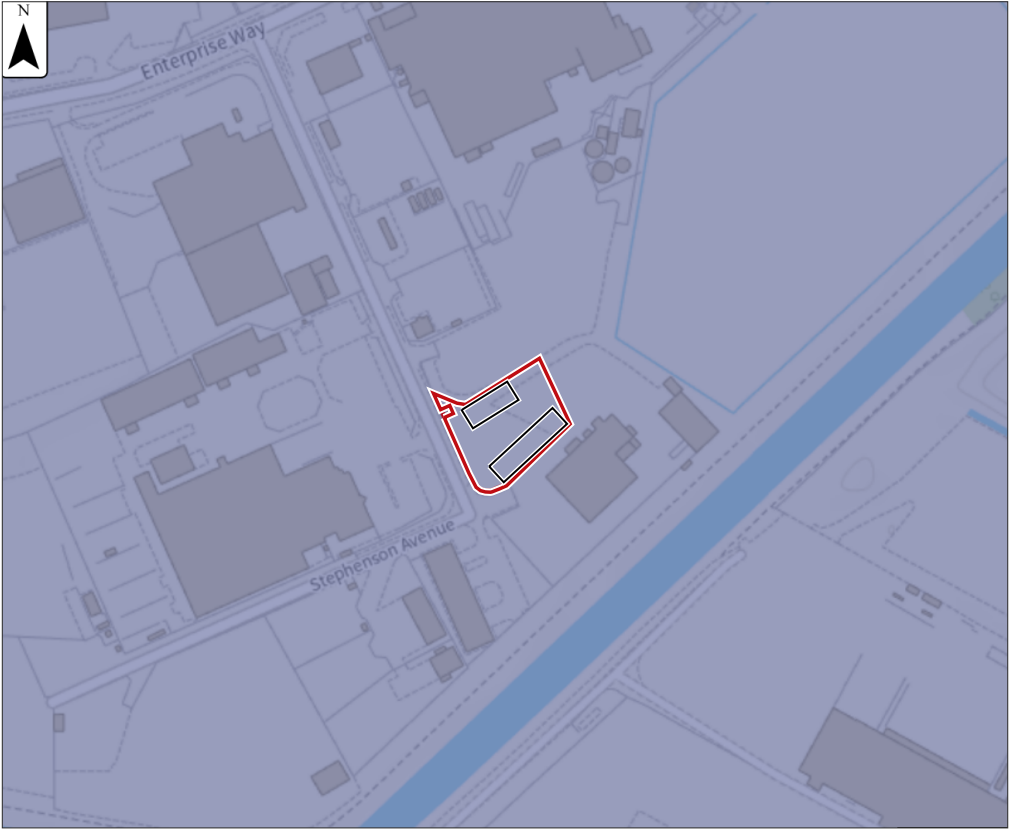


British National Grid metres | N up

Detailed Spalding SFRA overlays checked against surveyed road boundaries and the EA location map on 12 October 2026.
Detailed settlement mapping is used for site location. Printed source scale 1:15,000; velocity captions 1:16,000 at A1.
Export sampling about 1.09 m for depth/hazard/extents and 1.16 m for velocity is not model-cell accuracy. Depth bands are not water elevations.
Site and building coordinates are retained from the survey registration. No ground levels are interpolated. Blank pixels do not prove no risk.

M12 Source Residual_Peak_Depth_Extent_of_Fluvial__Tidal_Domination__Spalding_2115.pdf
Official source link embedded above. SHDC and Royal HaskoningDHV February 2017 Revision 2. Source colours retained.
SFRA basemap: Crown Copyright, Licence No 100018215, 2009. EA locator: Environment Agency and Crown Copyright 2026, OS AC0000807064.

Road location check



EA map 2 September 2026 same grid extent
Location context only not an SFRA hazard layer

Site north of Stephenson Avenue and west of A16

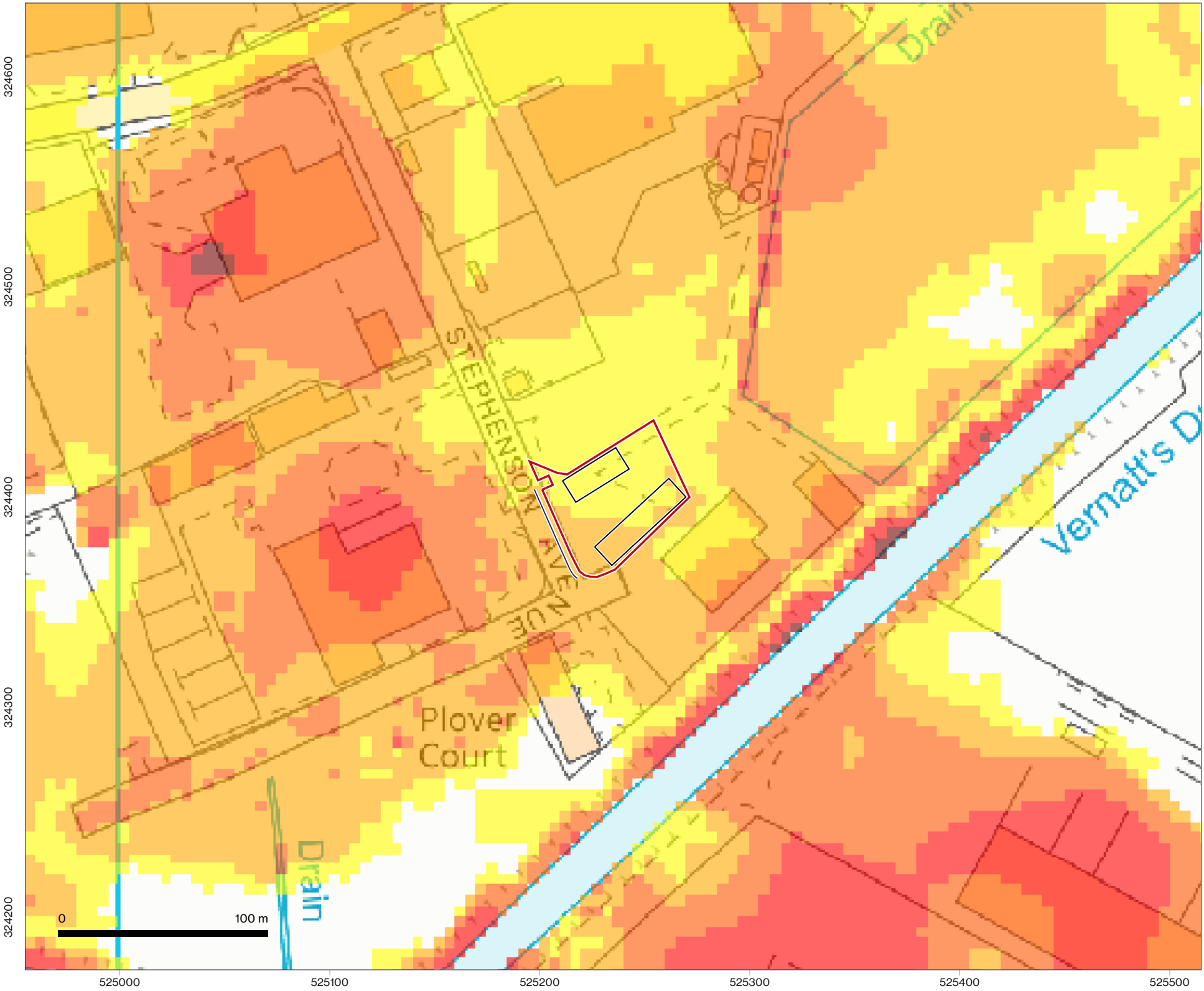
Original SFRA legend

Map Legend	
Peak Depth	
0m - 0.25m	
0.25m - 0.5m	
0.5m - 1m	
1m - 2m	
2m +	
Fluvially dominated extent	
Tidally dominated extent	
Functional Floodplain	
South Holland District Boundary	

Residual flood depth Future 2115

Stephenson Avenue Pinchbeck | H14-1286-25 | Detailed Spalding SFRA February 2017 | Map 4 of 9

Red site boundary | Black proposed footprints | Navy surveyed kerbs | 1% fluvial and 0.5% tidal residual scenarios

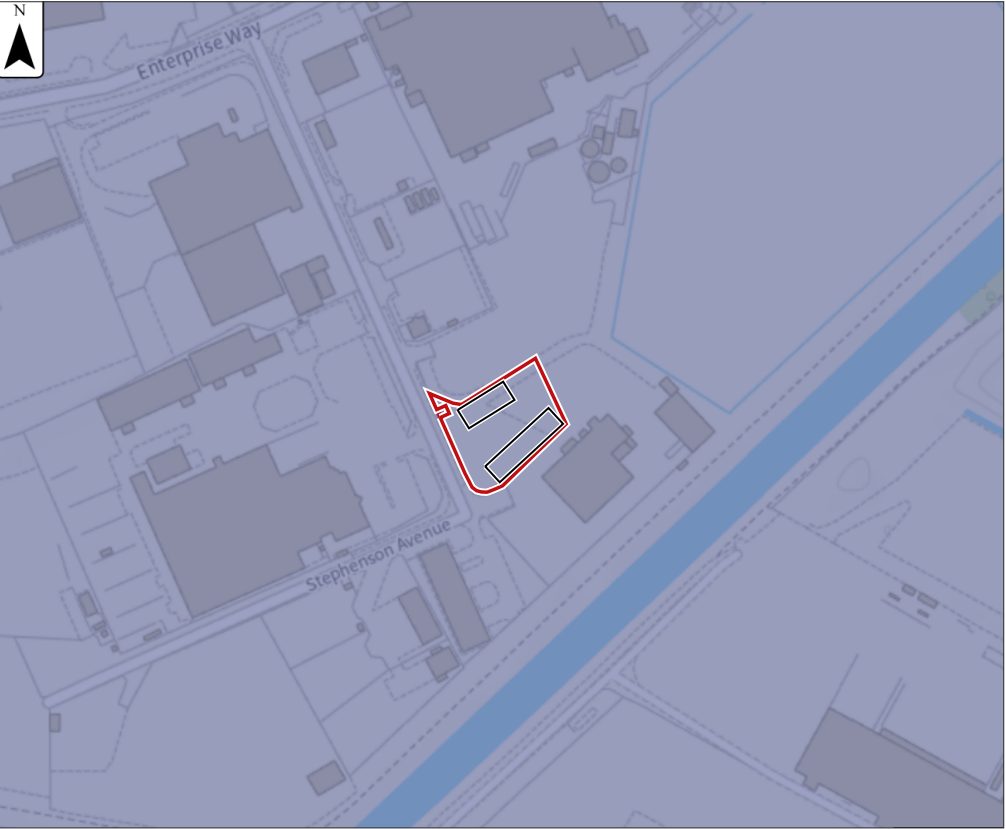


British National Grid metres | N up

Detailed Spalding SFRA overlays checked against surveyed road boundaries and the EA location map on 12 October 2026.
Detailed settlement mapping is used for site location. Printed source scale 1:15,000; velocity captions 1:16,000 at A1.
Export sampling about 1.09 m for depth/hazard/extends and 1.16 m for velocity is not model-cell accuracy. Depth bands are not water elevations.
Site and building coordinates are retained from the survey registration. No ground levels are interpolated. Blank pixels do not prove no risk.

M13 Source Residual_Peak_Depth_Map__Spalding_2115_1_fluvial_0.5_tidal_event_probability.pdf
Official source link embedded above. SHDC and Royal HaskoningDHV February 2017 Revision 2. Source colours retained.
SFRA basemap: Crown Copyright, Licence No 100018215, 2009. EA locator: Environment Agency and Crown Copyright 2026, OS AC0000807064.

Road location check



EA map 2 September 2026 same grid extent
Location context only not an SFRA hazard layer

Site north of Stephenson Avenue and west of A16

Original SFRA legend

Map Legend		
Peak Depth	0m - 0.25m	
	0.25m - 0.5m	
	0.5m - 1m	
	1m - 2m	
	2m +	
Functional Floodplain		
South Holland District Boundary		

Residual flood depth Present day

Stephenson Avenue Pinchbeck | H14-1286-25 | Detailed Spalding SFRA February 2017 | Map 5 of 9

Red site boundary | Black proposed footprints | Navy surveyed kerbs | 1% fluvial and 0.5% tidal residual scenarios

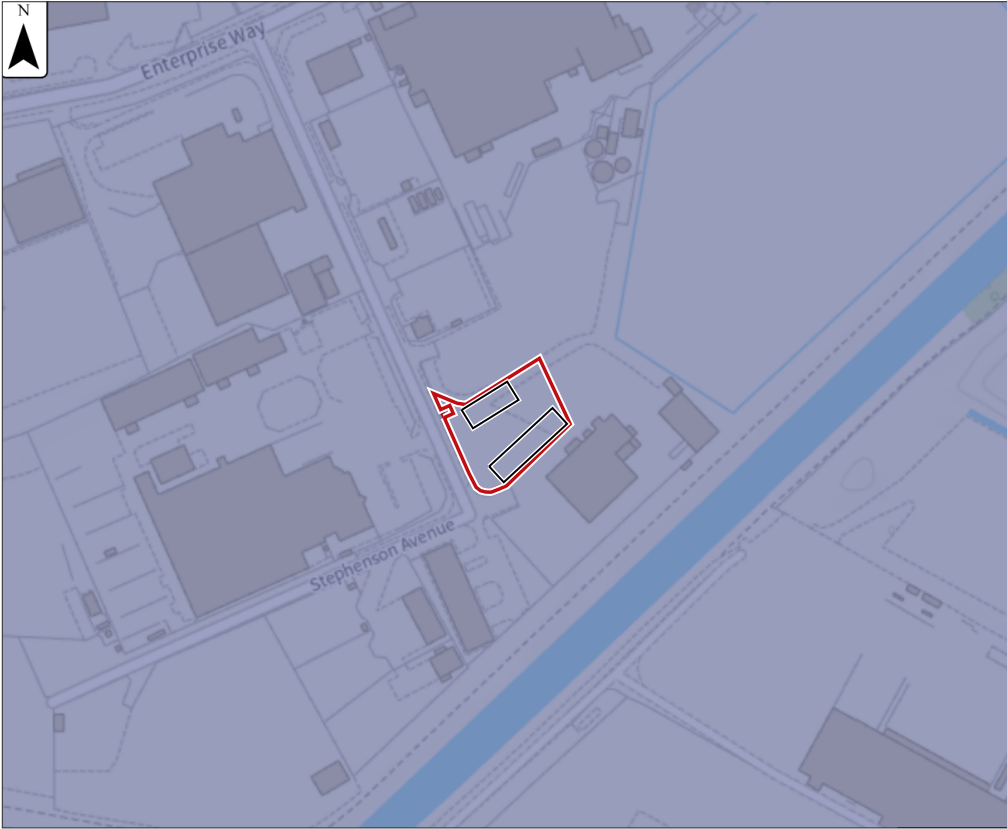


British National Grid metres | N up

Detailed Spalding SFRA overlays checked against surveyed road boundaries and the EA location map on 12 October 2026.
Detailed settlement mapping is used for site location. Printed source scale 1:15,000; velocity captions 1:16,000 at A1.
Export sampling about 1.09 m for depth/hazard/extents and 1.16 m for velocity is not model-cell accuracy. Depth bands are not water elevations.
Site and building coordinates are retained from the survey registration. No ground levels are interpolated. Blank pixels do not prove no risk.

M14 Source Residual_Peak_Depth_Map__Spalding_present_day_1_fluvial_0.5_tidal_event_probability.pdf
Official source link embedded above. SHDC and Royal HaskoningDHV February 2017 Revision 2. Source colours retained.
SFRA basemap: Crown Copyright, Licence No 100018215, 2009. EA locator: Environment Agency and Crown Copyright 2026, OS AC0000807064.

Road location check



EA map 2 September 2026 same grid extent
Location context only not an SFRA hazard layer
Site north of Stephenson Avenue and west of A16

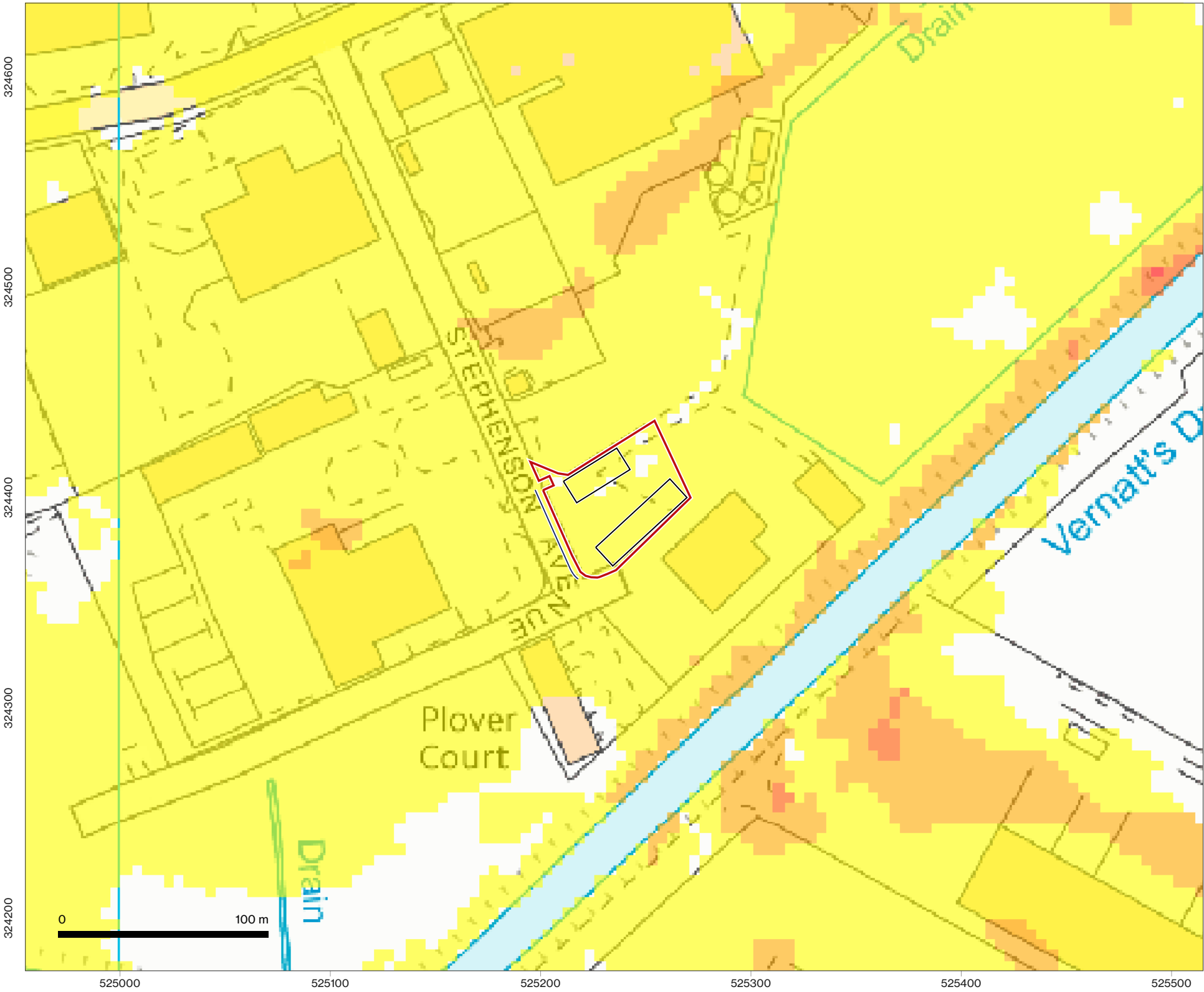
Original SFRA legend

Map Legend		
Peak Depth		
0m - 0.25m		
0.25m - 0.5m		
0.5m - 1m		
1m - 2m		
2m +		
Functional Floodplain		
South Holland District Boundary		

Residual flood velocity Future 2115

Stephenson Avenue Pinchbeck | H14-1286-25 | Detailed Spalding SFRA February 2017 | Map 6 of 9

Red site boundary | Black proposed footprints | Navy surveyed kerbs | 1% fluvial and 0.5% tidal residual scenarios

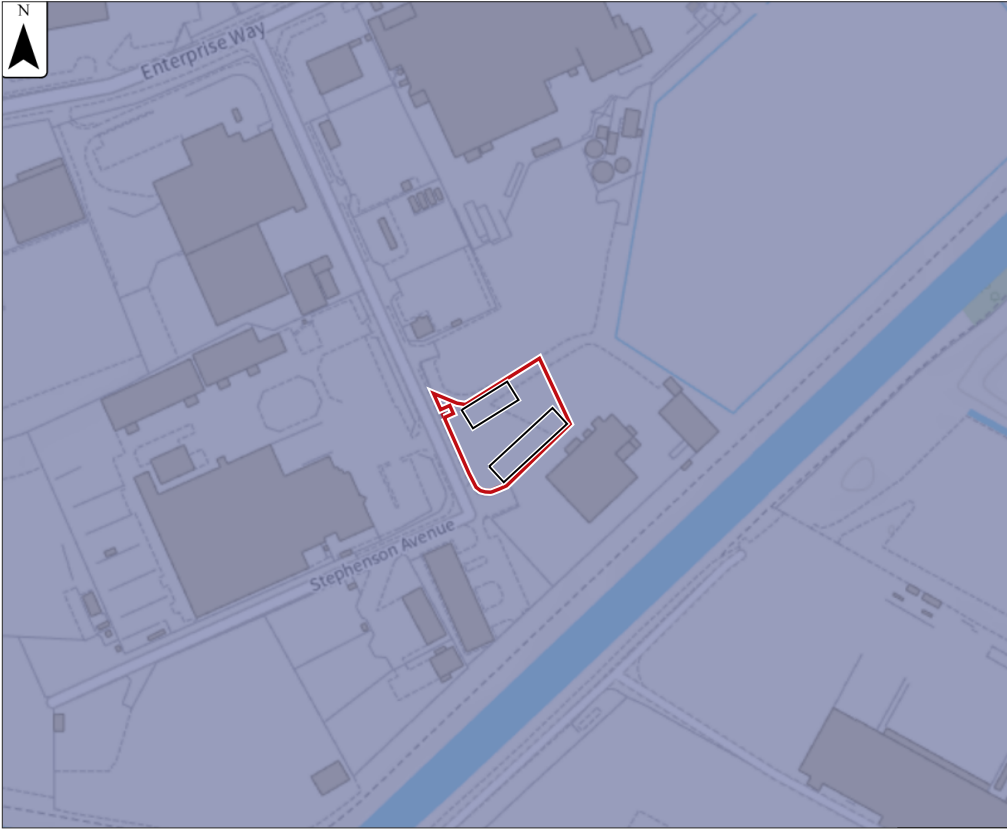


British National Grid metres | N up

Detailed Spalding SFRA overlays checked against surveyed road boundaries and the EA location map on 12 October 2026.
Detailed settlement mapping is used for site location. Printed source scale 1:15,000; velocity captions 1:16,000 at A1.
Export sampling about 1.09 m for depth/hazard/extents and 1.16 m for velocity is not model-cell accuracy. Depth bands are not water elevations.
Site and building coordinates are retained from the survey registration. No ground levels are interpolated. Blank pixels do not prove no risk.

M15 Source Residual_Peak_Velocity_Map__Spalding_2115__1__fluvial_0.5__tidal_event_probability.pdf
Official source link embedded above. SHDC and Royal HaskoningDHV February 2017 Revision 2. Source colours retained.
SFRA basemap: Crown Copyright, Licence No 100018215, 2009. EA locator: Environment Agency and Crown Copyright 2026, OS AC0000807064.

Road location check



EA map 2 September 2026 same grid extent
Location context only not an SFRA hazard layer
Site north of Stephenson Avenue and west of A16

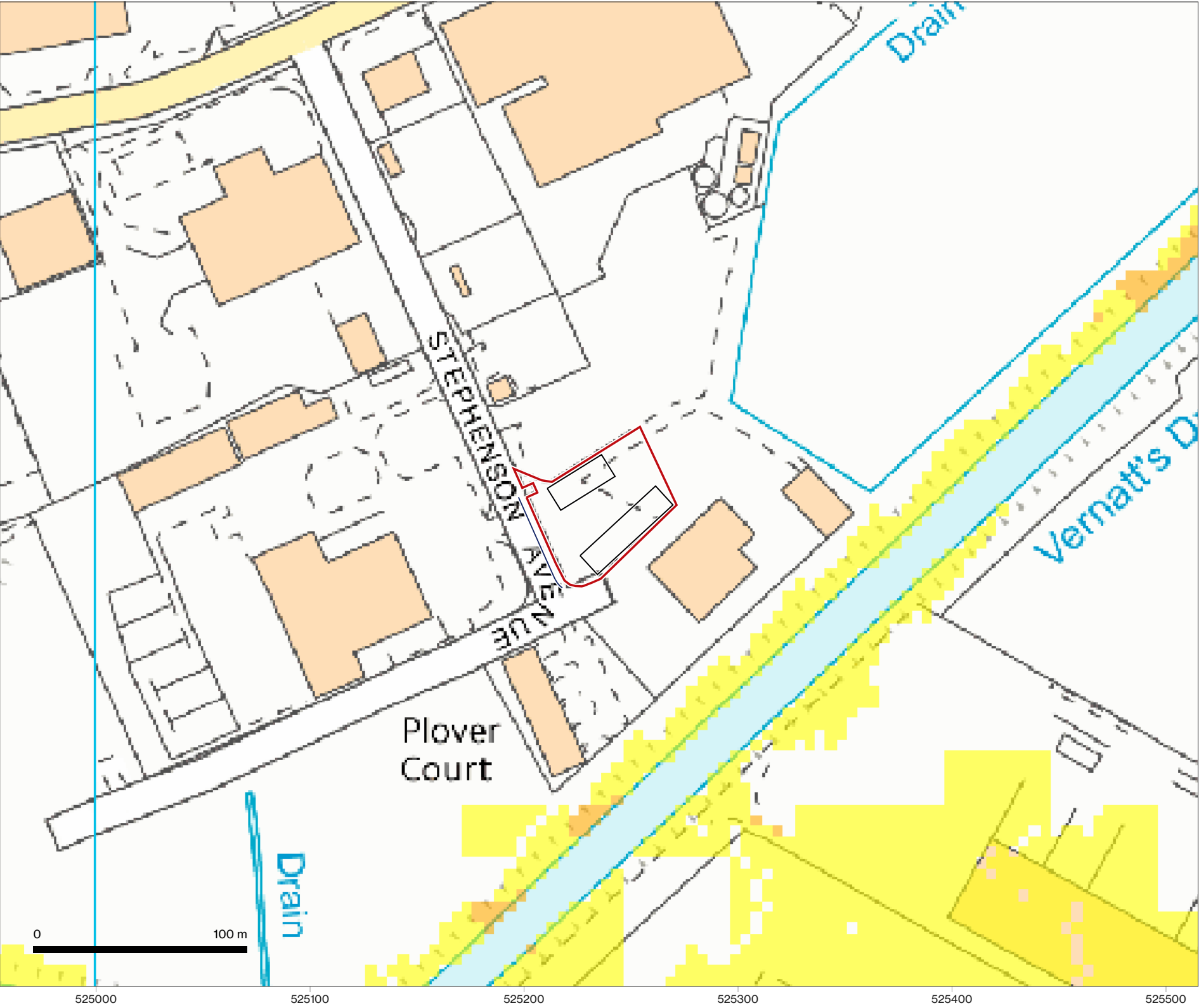
Original SFRA legend

Map Legend	
Peak Velocity (metres per second)	
0 - 0.3	
0.3 - 1	
1 - 1.5	
1.5 - 2.5	
2.5 +	
Functional Floodplain	
South Holland District Boundary	

Residual flood velocity Present day

Stephenson Avenue Pinchbeck | H14-1286-25 | Detailed Spalding SFRA February 2017 | Map 7 of 9

Red site boundary | Black proposed footprints | Navy surveyed kerbs | 1% fluvial and 0.5% tidal residual scenarios

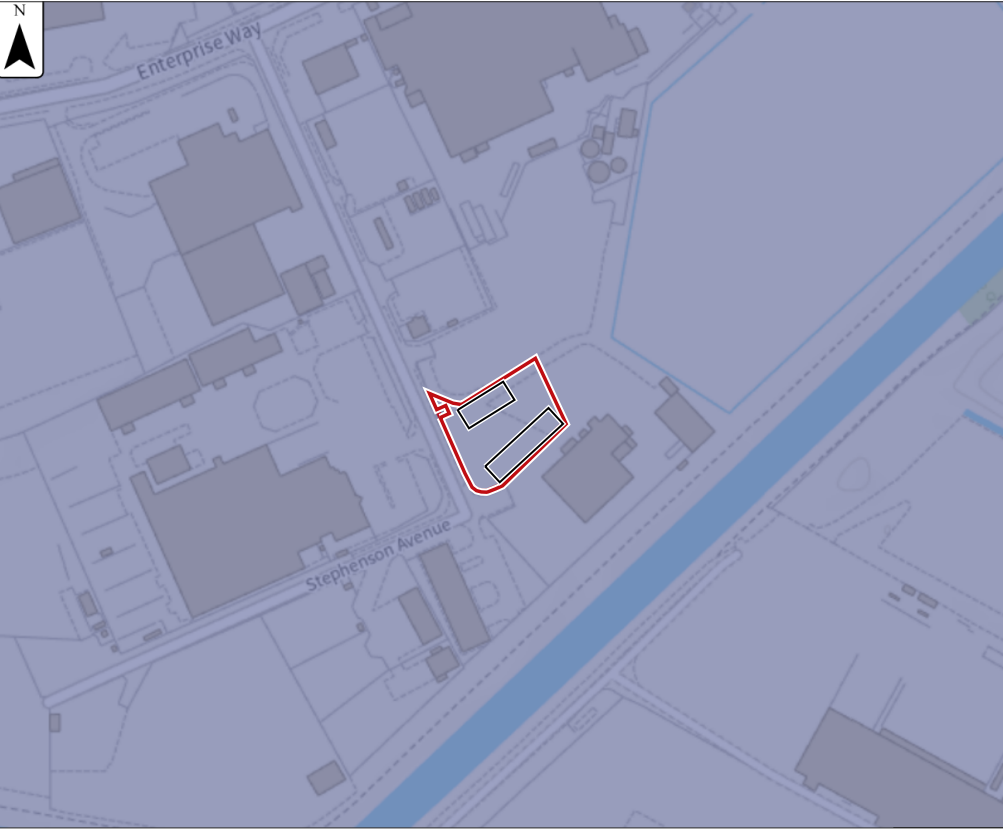


British National Grid metres | N up

Detailed Spalding SFRA overlays checked against surveyed road boundaries and the EA location map on 12 October 2026.
Detailed settlement mapping is used for site location. Printed source scale 1:15,000; velocity captions 1:16,000 at A1.
Export sampling about 1.09 m for depth/hazard/extents and 1.16 m for velocity is not model-cell accuracy. Depth bands are not water elevations.
Site and building coordinates are retained from the survey registration. No ground levels are interpolated. Blank pixels do not prove no risk.

M16 Source Residual_Peak_Velocity_Map__Spalding_present_day_1_fluvial_0.5_tidal_event_probability.pdf
Official source link embedded above. SHDC and Royal HaskoningDHV February 2017 Revision 2. Source colours retained.
SFRA basemap: Crown Copyright, Licence No 100018215, 2009. EA locator: Environment Agency and Crown Copyright 2026, OS AC0000807064.

Road location check



EA map 2 September 2026 same grid extent
Location context only not an SFRA hazard layer
Site north of Stephenson Avenue and west of A16

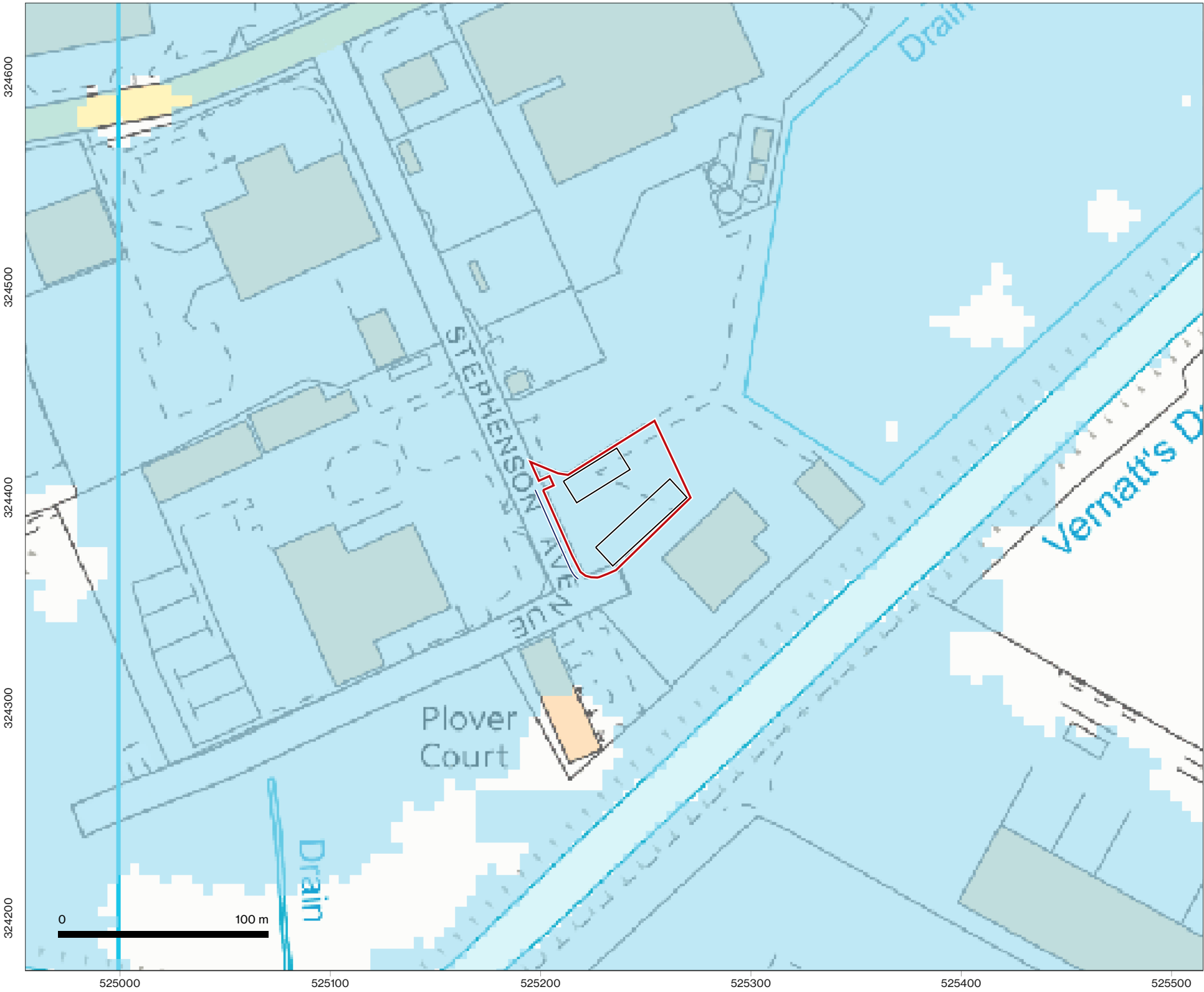
Original SFRA legend

Map Legend	
Peak Velocity (metres per second)	
0 - 0.3	
0.3 - 1	
1 - 1.5	
1.5 - 2.5	
2.5 +	
Functional Floodplain	
South Holland District Boundary	

Residual flood extent Future 2115

Stephenson Avenue Pinchbeck | H14-1286-25 | Detailed Spalding SFRA February 2017 | Map 8 of 9

Red site boundary | Black proposed footprints | Navy surveyed kerbs | 1% fluvial and 0.5% tidal residual scenarios

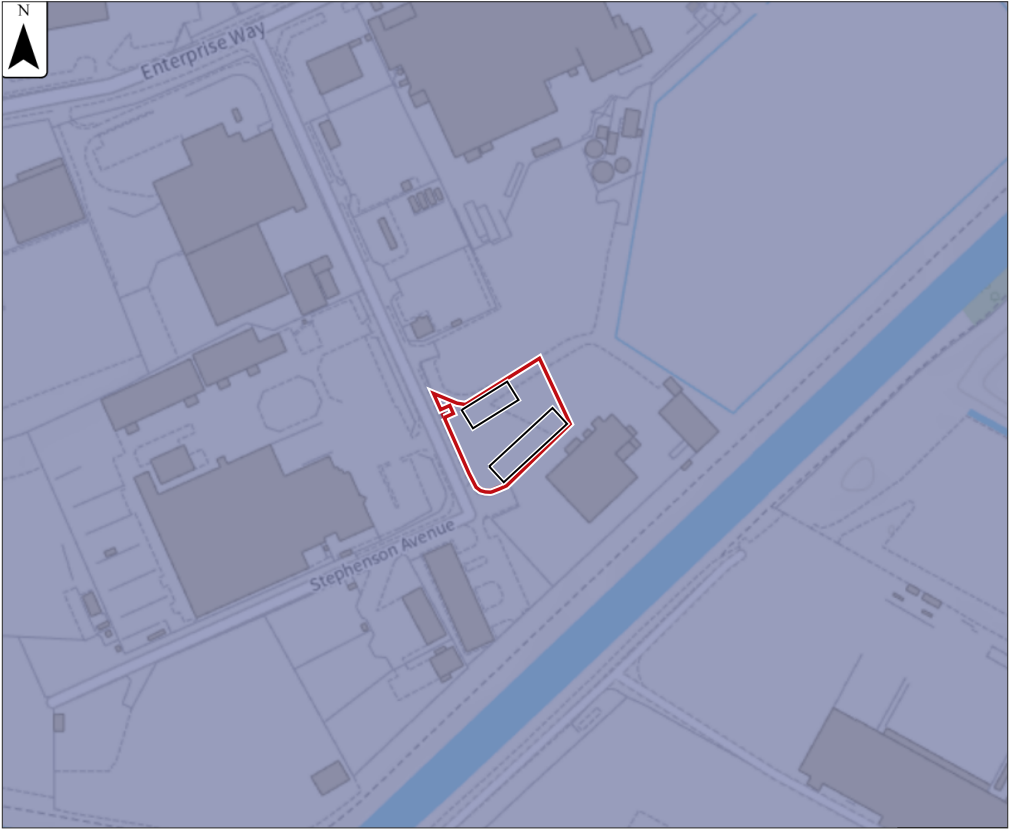


British National Grid metres | N up

Detailed Spalding SFRA overlays checked against surveyed road boundaries and the EA location map on 12 October 2026.
Detailed settlement mapping is used for site location. Printed source scale 1:15,000; velocity captions 1:16,000 at A1.
Export sampling about 1.09 m for depth/hazard/extents and 1.16 m for velocity is not model-cell accuracy. Depth bands are not water elevations.
Site and building coordinates are retained from the survey registration. No ground levels are interpolated. Blank pixels do not prove no risk.

M17 Source Residual_Risk_Extent_Map__Spalding_2115_1_fluvial_0.5_tidal_event_probability.pdf
Official source link embedded above. SHDC and Royal HaskoningDHV February 2017 Revision 2. Source colours retained.
SFRA basemap: Crown Copyright, Licence No 100018215, 2009. EA locator: Environment Agency and Crown Copyright 2026, OS AC0000807064.

Road location check



EA map 2 September 2026 same grid extent
Location context only not an SFRA hazard layer

Site north of Stephenson Avenue and west of A16

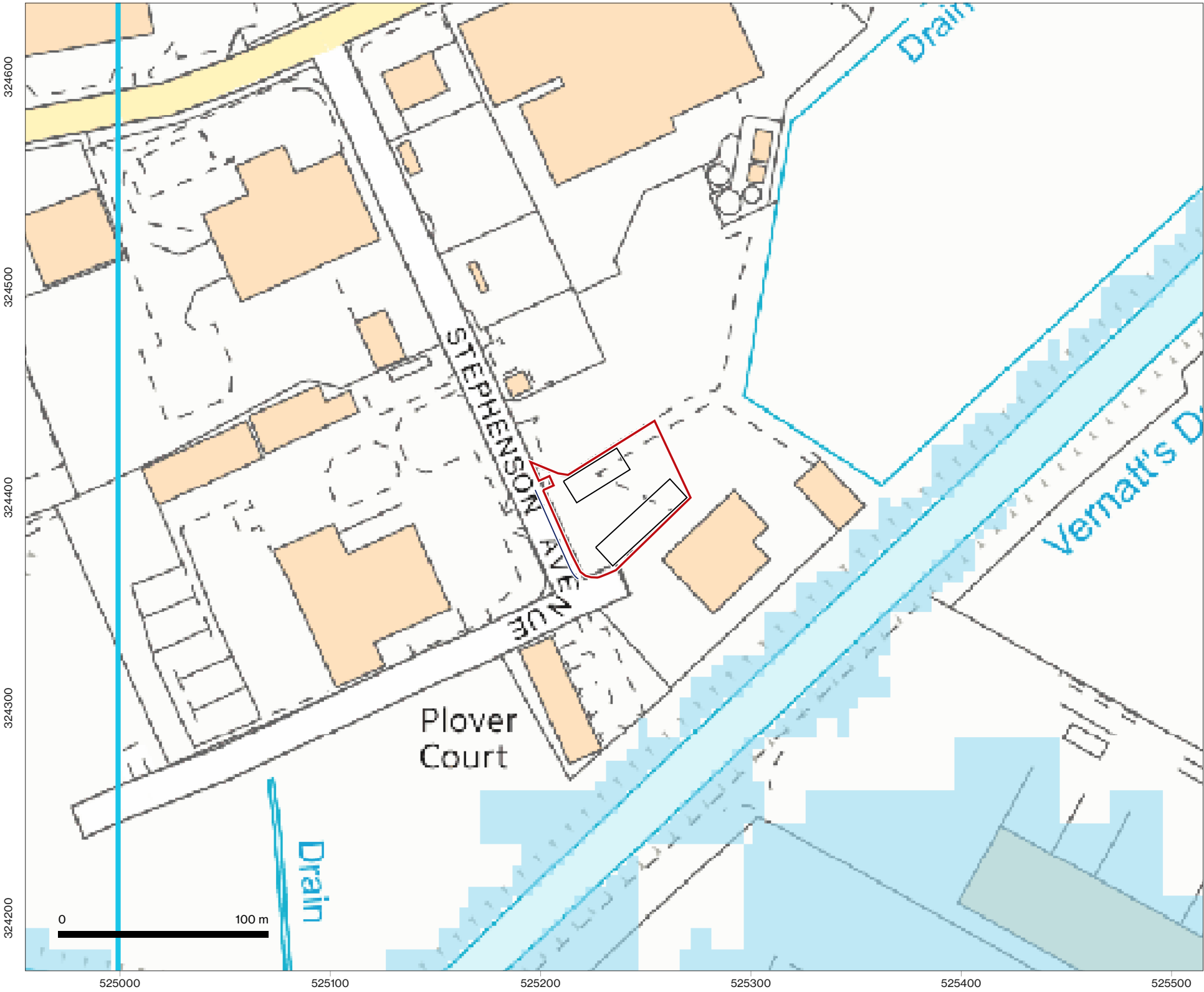
Original SFRA legend

Map Legend	
Flooding Probability bands :	
High	
Low or medium, but reliant on protection by flood defences for this standard	
Functional Floodplain	
South Holland District Boundary	

Residual flood extent Present day

Stephenson Avenue Pinchbeck | H14-1286-25 | Detailed Spalding SFRA February 2017 | Map 9 of 9

Red site boundary | Black proposed footprints | Navy surveyed kerbs | 1% fluvial and 0.5% tidal residual scenarios

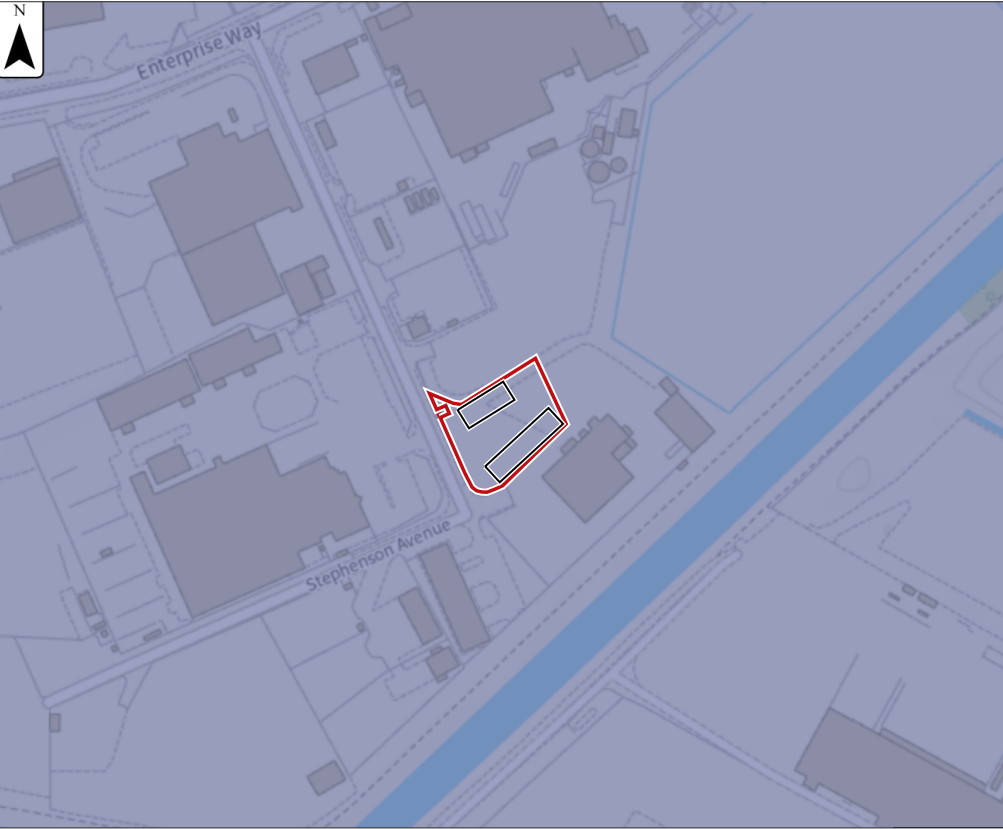


British National Grid metres | N up

Detailed Spalding SFRA overlays checked against surveyed road boundaries and the EA location map on 12 October 2026.
Detailed settlement mapping is used for site location. Printed source scale 1:15,000; velocity captions 1:16,000 at A1.
Export sampling about 1.09 m for depth/hazard/extends and 1.16 m for velocity is not model-cell accuracy. Depth bands are not water elevations.
Site and building coordinates are retained from the survey registration. No ground levels are interpolated. Blank pixels do not prove no risk.

M18 Source Residual_Risk_Extent_Map__Spalding_present_day_1_fluvial_0.5_tidal_event_probability.pdf
Official source link embedded above. SHDC and Royal HaskoningDHV February 2017 Revision 2. Source colours retained.
SFRA basemap: Crown Copyright, Licence No 100018215, 2009. EA locator: Environment Agency and Crown Copyright 2026, OS AC0000807064.

Road location check



EA map 2 September 2026 same grid extent
Location context only not an SFRA hazard layer
Site north of Stephenson Avenue and west of A16

Original SFRA legend

Map Legend	
Flooding Probability bands :	
High	
Low or medium, but reliant on protection by flood defences for this standard	
Functional Floodplain	
South Holland District Boundary	

E1. INTRODUCTION

This appendix presents the revised surface water drainage calculations for the proposed development at Stephenson Avenue, Pinchbeck, Spalding.

The calculations have been updated to reflect the confirmed development parameters and site areas, ensuring consistency with the drainage strategy and Flood Risk Assessment.

The development comprises:

- **Total site area:** 2,960 m²
- **Building footprint:** 936 m²
- **Hard landscaping:** 1,824.79 m²
 - 1,690.62 m² permeable tarmac/asphalt
 - 134.17 m² gravel surfacing
- **Soft landscaping:** 200 m²

The drainage design has been undertaken in accordance with:

- CIRIA SuDS Manual (C753)
- FEH rainfall methodology
- National Standards for Sustainable Drainage Systems (DEFRA, 2025)

E2. DESIGN CRITERIA

The surface water drainage system has been designed using the following parameters:

- **Design event:** 1 in 100 year rainfall event
- **Climate change allowance:** +40% (Higher Central)
- **Design life:** 75 years
- **Critical storm duration:** assessed across multiple durations
- **Permitted discharge rate:** 3.0 litres/second (subject to Anglian Water approval)

The objective of the drainage design is to ensure that post-development runoff is controlled to a rate equivalent to, or better than, the existing brownfield condition and that no increase in flood risk occurs elsewhere.

E3. SITE RUNOFF PARAMETERS

E3.1 Existing Site Conditions

The existing site is brownfield in nature, comprising largely permeable surfaces. For the purposes of calculation, a runoff coefficient of **0.30** has been applied.

Parameter	Value
Site area	2,960 m ²
Runoff coefficient	0.30
Effective contributing area	888.00 m²

E3.2 Proposed Development

The proposed development introduces a combination of impermeable and permeable surfaces.

Runoff coefficients have been applied as follows:

- Roof areas: **1.00**
- Permeable hardstanding: **0.35**

- Soft landscaping: **0.10**

Surface Type	Area (m ²)	Runoff Coefficient	Contributing Area (m ²)
Buildings (roofs)	936.00	1.00	936.00
Hard landscaping (permeable)	1,824.79	0.35	638.68
Soft landscaping	200.00	0.10	20.00
Total	2,960.79*		1,594.68

*Minor rounding difference due to detailed area schedule.

E3.3 Comparison of Existing and Proposed Runoff

Parameter	Existing	Proposed
Effective contributing area	888.00 m ²	1,594.68 m ²

The proposed development results in an increase in effective contributing area of approximately 706.68 m², representing a 79.6% increase relative to the existing condition. This increase necessitates attenuation storage to manage peak runoff rates.

E4. RAINFALL DATA

Rainfall depths have been derived from FEH data for the site location and adjusted to include a 40% climate change allowance.

Duration (minutes)	Rainfall Depth (mm)
15	25.9
30	37.5
60	49.3
120	63.1
180	72.5
240	79.7
360	90.7
480	99.5
600	107.0

E5. RUNOFF VOLUME CALCULATIONS

Runoff volumes have been calculated using the equation:

$$\text{Volume (m}^3\text{)} = \text{Rainfall depth (m)} \times \text{Effective contributing area (m}^2\text{)}$$

Based on an effective contributing area of **1,594.68 m²**, the following runoff volumes are obtained:

Duration (minutes)	Rainfall Depth (mm)	Inflow Volume (m ³)
15	25.9	41.30
30	37.5	59.80
60	49.3	78.62
120	63.1	100.62
180	72.5	115.61
240	79.7	127.10
360	90.7	144.64
480	99.5	158.67
600	107.0	170.63

E6. ATTENUATION STORAGE ASSESSMENT

The drainage system incorporates a flow control device limiting discharge to **3.0 litres/second**. Outflow volumes are calculated as:

$$\text{Outflow (m}^3\text{)} = 3.0 \times \text{duration (seconds)} / 1000$$

Duration (minutes)	Inflow (m ³)	Outflow (m ³)	Storage Required (m ³)
60	78.62	10.80	67.82
120	100.62	21.60	79.02
180	115.61	32.40	83.21
240	127.10	43.20	83.90
360	144.64	64.80	79.84
480	158.67	86.40	72.27
600	170.63	108.00	62.63

E6.1 Critical Storm Duration

The critical storm duration is identified as **240 minutes**, at which point the maximum storage requirement occurs.

E6.2 Required Storage Volume

The calculated storage requirement is:

- **Minimum effective storage:** 83.90 m³ (≈ 84 m³)

Allowing for design tolerance and long-term performance:

- **Recommended design storage (10% allowance):** 93 m³

E6.3 Proposed Storage Provision

The proposed drainage design includes:

- **Underground geocellular attenuation storage:** 105 m³ (effective volume)

This exceeds the calculated requirement and provides:

- Additional resilience to climate variability
- Operational tolerance for system performance
- Allowance for potential long-term reduction in permeable paving efficiency

E7. STORAGE SYSTEM VOLUME CHECK

Assuming a typical geocellular storage void ratio of **95%**, the required gross storage volume is:

Gross volume for 105 m³ effective storage:

≈ 110 m³

This aligns with the proposed attenuation system design.

E8. DISCHARGE RATE AND BETTERMENT

The proposed discharge rate of **3.0 l/s** is considered appropriate for the site and broadly reflects existing brownfield runoff conditions.

This ensures:

- No increase in peak runoff rates
- Protection of downstream infrastructure
- Compliance with sustainable drainage principles

Final discharge rates will be subject to agreement with Anglian Water.

E9. SUMMARY

The revised calculations demonstrate that:

- The corrected development generates an effective impermeable area of **1,594.68 m²**
- The critical storm duration is **240 minutes**
- The required attenuation storage is approximately **84 m³**

- The proposed system provides **105 m³ storage**, exceeding requirements

The drainage strategy is therefore:

- Robust and policy compliant
- Designed for climate change resilience
- Capable of preventing increased flood risk off-site

impermeable area of the site. The planting will be selected to be tolerant of occasional inundation and to provide good ground cover, thereby minimising soil erosion and reducing the potential for sediment to enter the surface water drainage system. The soft landscaping also contributes to wider environmental objectives including biodiversity enhancement, visual amenity, and urban cooling through provision of vegetation.

5.13 Drainage Calculations and Storage Requirements

Detailed hydraulic calculations have been undertaken to determine the required attenuation storage volume, taking account of the site area, the proportion of impermeable surfaces, the runoff coefficients applicable to each surface type, design rainfall intensities for the critical storm duration, and the permitted discharge rate. The calculations follow the methodology set out in the CIRIA SuDS Manual and industry standard practice, using rainfall data derived from the Flood Estimation Handbook for the site location. The design storm event is the 1 in 100 year rainfall event with the addition of a 40% climate change allowance, applied over a range of storm durations to identify the critical duration that generates the maximum storage requirement.

The critical storm duration has been identified as 240 minutes, which represents the storm duration at which the difference between the total inflow volume to the attenuation system and the total outflow volume via the flow control device is maximised. For this critical duration, the cumulative inflow volume accounting for the contributing impermeable area and climate-adjusted rainfall depth is approximately 147.5 cubic metres, whilst the cumulative outflow volume over the same duration at the restricted discharge rate of 3.0 litres per second is 43.2 cubic metres, giving a net storage requirement of 104.3 cubic metres. With appropriate allowances for sediment accumulation and design tolerance, a design storage volume of 105 cubic metres has been specified, which provides adequate capacity to accommodate the design storm whilst maintaining a modest freeboard for additional resilience.

The storage system has been sized conservatively with runoff coefficients selected to represent realistic long-term performance accounting for potential deterioration of permeable paving performance if maintenance is inadequate. Sensitivity analysis has been conducted to assess the impact of variations in key parameters, confirming that the proposed storage volume of 105 cubic metres remains adequate across a reasonable range of assumptions. The most sensitive parameter is the discharge rate, and it is therefore critical that the flow control device is maintained properly and that the 3.0 litres per second discharge limitation is not exceeded.

6.0 CONSTRUCTION STANDARDS AND SPECIFICATIONS

6.1 Drainage Pipe Materials and Standards

All drainage pipework will be manufactured from materials appropriate to their intended use and will conform to relevant British Standards and European Standards as specified. Foul drainage pipes will be manufactured from uPVC conforming to BS EN 1401-1 or vitrified clay conforming to BS EN 295-1, with all pipes being of appropriate thickness and strength to withstand the anticipated loading conditions

Alasdair McFarlane
Alasdair@tacarchitects.co.uk

Our ref: EIR2026/44912

Date: 05/10/2026

Dear Alasdair,

Flood Risk Information for Stephenson Avenue, Pinchbeck

The flood risk information for the above site is set out below and attached. It is important you read any contextual notes on the maps provided.

If you are preparing a Flood Risk Assessment (FRA) for this site, please note this information may not be sufficient by itself to produce an adequate FRA to demonstrate the development is safe over its lifetime. Additional information may be required to carry out an appropriate assessment of all risks, such as the consequences of a breach in the flood defences.

We aim to review our information on a regular basis, so if you are using this data more than twelve months from the date of this letter, please contact us again to check it is still valid.

Please read the letter in full as the information covered has been updated in **September 2026**.

1. Flood Map for Planning

The attached map includes the current Flood Map for Planning for your area. The map indicates the Area at Risk of Flooding (Flood Zone 3) and the Extreme Flood Outline (Flood Zone 2) **assuming no flood defences exist.**

The Area at Risk of Flooding shows the land that could be impacted from a flood with a 0.5% or greater chance of occurring in any year for flooding from the sea, or a 1% or greater chance of occurring in any year for fluvial (river) flooding.

The Extreme Flood Outline shows the land that could be impacted from a flood which has between a 1% and 0.1% chance of occurring in any year for fluvial (river) flooding, or between a 0.5% and 0.1% annual probability of sea flooding, or the highest recorded historic extent if greater.

In some locations, such as around the fens and the large coastal floodplains, showing the area at risk of flooding assuming no defences may give a slightly misleading picture in that if there were no flood defences, water would spread out across these large floodplains. This flooding could cover large areas of land but to relatively shallow depths and could leave pockets of locally slightly higher land as isolated dry islands. It is important to understand the actual risk of the flooding to these dry islands, particularly in the event of defence failure.

The Flood Map for Planning also shows the location of formal raised flood defences and flood storage reservoirs. It represents areas at risk of flooding for present day only and does not take account of climate change.

The Flood Map for Planning only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered flooding may occur from other sources such as surface water sewers, road drainage, etc.

2. Recorded Flood Outlines

With regards to the history of flooding I can advise we do not have any records of flooding in this area. It is possible recent flooding may have occurred which we are currently investigating, therefore this information may be subject to change.

It is possible other flooding may have occurred which other risk management authorities, such as the Lead Local Flood Authority (i.e. top tier council) or Internal Drainage Board (where they exist) have responsibility.

3. Schemes in the area

There are no ongoing capital projects to reduce or sustain the current flood risk to this area.

4. Fluvial Flood Risk Information

The site may be at risk from main rivers in the form of residual risk due to the failure of flood management infrastructure such as a breach of a raised flood defence. You may need to undertake further assessment of this residual risk using the data provided.

The site may also be at risk from local ordinary watercourses for which other risk management authorities, such as the Lead Local Flood Authority (i.e. top tier council) or Internal Drainage Board (where they exist) have responsibility.

4.1 Fluvial Defence Information

The existing fluvial defences reducing the risk of flooding from main river to this site consist of earth embankments. They are in fair condition and reduce the risk of flooding (at the defence) to a 1% (1 in 100) chance of occurring in any year. We inspect these defences routinely to ensure potential defects are identified.

4.2 Fluvial Modelled Levels and Flows

Available modelled fluvial flood levels and flows for the model nodes shown on the attached map are set out in the data table attached. This data is taken from the model named on the data table, which is the most up-to-date model currently available.

Please note these levels are “in-channel” levels and therefore may not represent the flood level on the floodplain, particularly where the channel is embanked or has raised defences.

Our models may not have the most up to date climate change allowances. In time we will update our models for the latest allowances. You should refer to ['Flood risk assessments: climate change allowances'](#) to check if the allowances modelled are appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

4.3 Fluvial Modelled Flood Extents

Our modelled flood extents, which take into account flood defences, do not impact this site.

There may still be a residual risk of fluvial flooding to your site due to the failure of flood management infrastructure such as a breach of a raised flood defence. You may need to undertake further assessment of this residual risk using the data provided.

4.4 Fluvial Hazard Mapping

For certain locations we have carried out modelling to map the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from overtopping and / or breaching of defences at specific locations for a number of scenarios.

At present this information is available for fluvial flood risk in Northampton, Lincoln, Wainfleet and some isolated rural locations.

The number of locations we have this information for is expected to increase in time.

At present this site is not covered by any Environment Agency hazard mapping.

Detailed Hazard Mapping is available within the 2017 Update of South Holland Strategic Flood Risk Assessment. This can be downloaded via the following link:

<http://www.southeastlincslocalplan.org/water/>

5. Tidal Flood Risk Information

This site is not considered to be at risk from tidal flooding.

6. Development Planning

If you would like local guidance on preparing a flood risk assessment for a planning application, please contact our Sustainable Places team at LNplanning@environment-agency.gov.uk. It will help if you mention this data request and attach your site location plan.

We offer free preliminary advice. More detailed support—including review of draft Flood Risk Assessments (FRAs) and meetings—is available on a chargeable basis. Our current rate is £119.37 per hour (plus VAT), which covers staff time. Further details can be found on our website: <https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals>

General advice on flood risk assessment for planning applications can be found on GOV.UK at <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

We have provided information on risk of breach where it is available. If you are intending on using this information to prepare a Flood Risk Assessment you will need to check if the data meets your requirements. You may need to carry out further assessment (or modelling) for sites that are at residual risk (including from breach of defences), or additional locations or scenarios.

Climate change will increase flood risk due to overtopping of defences. Please note, unless specified otherwise, the climate change data included has an allowance for 20% increase in flow. Updated guidance on how climate change could affect flood risk to new development - 'Flood risk assessments: climate change allowances' was published on GOV.UK in **July 2021**. The appropriate updated climate change allowance should be applied in a Flood Risk Assessment.

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

7. Permitting Information

Under the Environmental Permitting (England and Wales) Regulations 2016, permission must be obtained from the Environment Agency for any proposed activities which will take place:

- in, over, under or within 8 metres of a main river (16 metres if tidal)
- on or within 8 metres of a flood defence structure or culvert (16 metres if tidal)
- on or within 16 metres of a sea defence
- within 16 metres of any main river, flood defence (including a remote defence) or culvert for quarrying or excavation
- in a flood plain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if tidal) if planning permission has not already been granted for the works

For further guidance and advice please visit our website: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> or contact our local Partnerships and Strategic Overview team by email at

psown@environment-agency.gov.uk. The team will be able to advise if an environmental permit or exemption registration is required and the fee applicable.

Please note that a permit is separate to and in addition to any planning permission granted. The applicant should not assume that such a permit will automatically be forthcoming once planning permission has been granted, and we would advise them to consult with us at the earliest opportunity.

8. Data Licence and Other Supporting Information

We respond to requests for recorded information we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

This information is provided in accordance with the Open Government Licence which can be found here: <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Further information on flood risk can be found on the GOV.UK website at: <https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>

Rights of appeal

If you are not satisfied with our decision, you can contact us within two calendar months to ask for the decision to be reviewed. We will then conduct an internal review of our response to your request and give you our decision in writing within 40 working days.

If you are not satisfied with the outcome of the internal review, you can then make an appeal to the Information Commissioner Office, the statutory regulator for EIR and the

Freedom of Information Act 2002. The address is: Information Commissioner's Office, Wycliffe House, Water Lane, Wilmslow, Cheshire. SK9 5AF.

Tel: 0303 123 1113 (local rate) or 01625 545 745 (national rate) | Fax: 01625 524 510

Email: casework@ico.org.uk | Website: www.ico.org.uk

9. Other Flood Risk Management Authorities

The information provided with this letter relates to flood risk from main river or the sea. The Flood Map for Surface Water can be viewed at <https://www.gov.uk/check-long-term-flood-risk>

Additional information may be available from other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist).

I hope we have correctly interpreted your request. If you have any queries or would like to discuss the content of this letter further please contact Christopher using the email address below and quoting our EIR reference number above.

Yours sincerely,

Christopher Hill
FCRM Officer

for John O'Neill

Welland and Nene Partnerships and Strategic Overview Team Leader

e-mail PSOWN@environment-agency.gov.uk

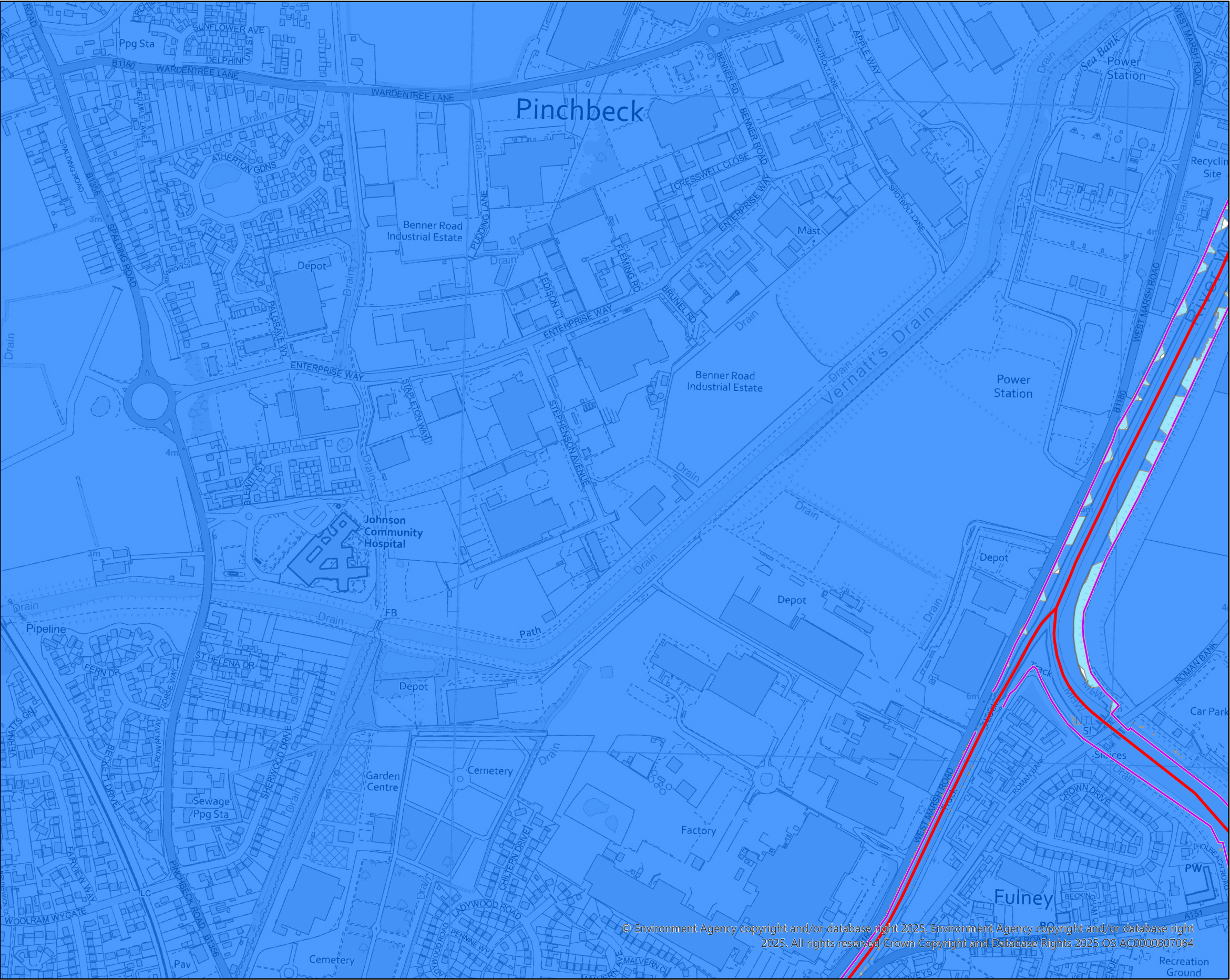
Enc.

Flood Map for Planning

Modelled Node Points Map

Modelled Fluvial Levels and Flows Data Sheet

Flood Map centred on TF25233 24398 - created October 2026 [Ref: EIR2026-44912]



Scale 1:10,000



Legend

- Statutory Main Rivers
- Raised Defences
- Flood Storage Areas

Flood Zones 2 and 3 Rivers and Sea

- Flood Zone 2
- Flood Zone 3

Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

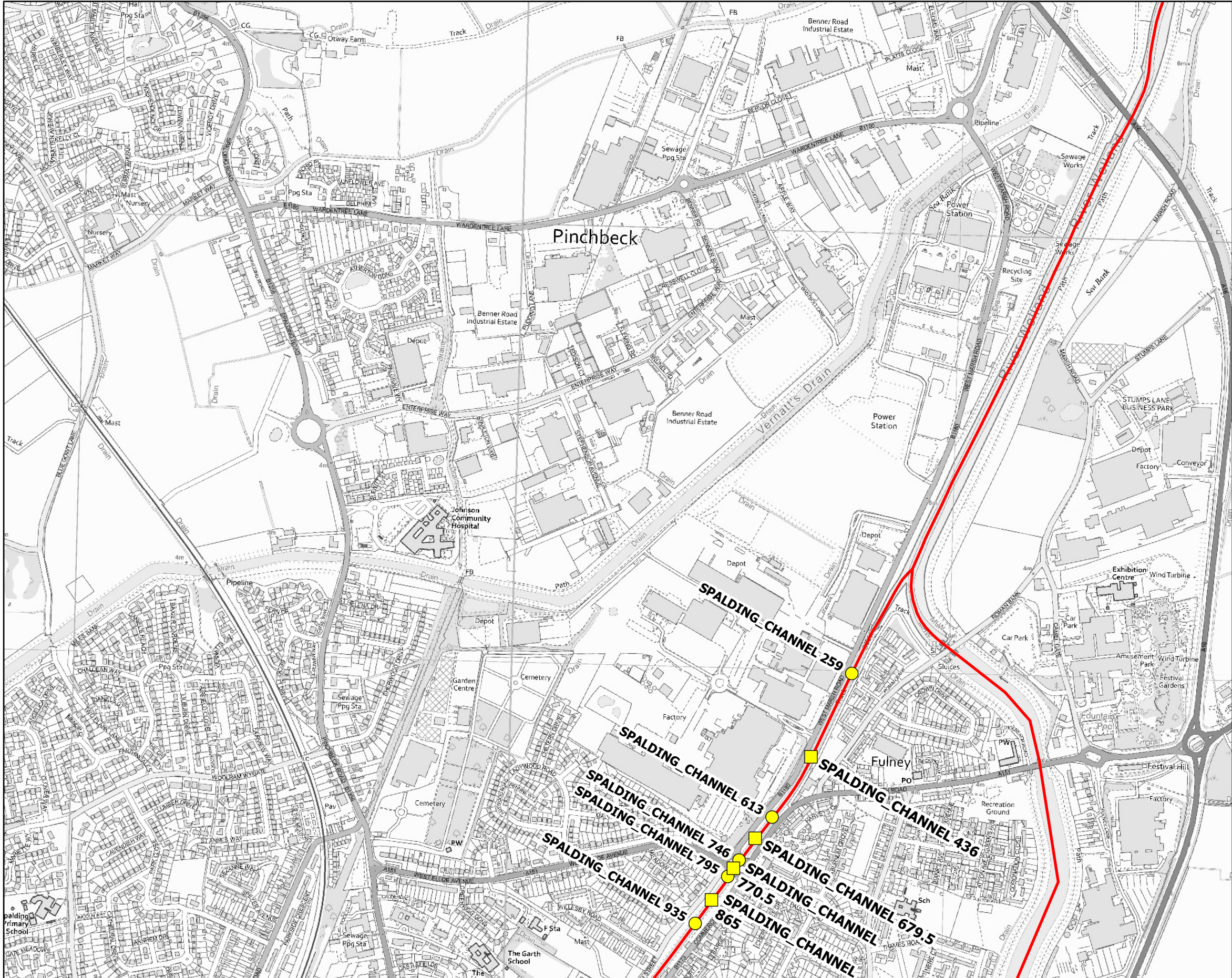
- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year.
- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue shows the extent of the Extreme Flood Outline, which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Sites outside the two extents, but behind raised defences, may be affected by flooding if the defences are overtopped or fail.

Created by the Partnerships and Strategic Overview Team, Kettering

Modelled Levels and Flows Model: Welland Glen (2016)
centred on TF 25233 24398 - created October 2026 [Ref: EIR2026-44912]



Scale 1:15,000



Legend

-  Welland Glen - Flows
 Welland Glen - Levels
 Statutory Main Rivers

Created by the Partnerships and Strategic Overview Team,
Kettering

Datasheet [Ref: EIR2026-44912]
Model Name: Welland Glen
Model Date: 2016

Fluvial Flood Levels (mODN)

The fluvial flood levels for the model nodes shown on the attached map are set out in the table below. They are measured in metres above Ordnance Datum Newlyn (mODN).

Node Label	Easting	Northing	Annual Exceedance Probability - Maximum Water Levels (mODN)											
			50% (1 in 2)	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	3.33% (1 in 30)	2% (1 in 50)	1.33% (1 in 75)	1% (1 in 100)	1% (1 in 100) inc 20% Climate Change	0.5% (1 in 200)	0.1% (1 in 1000)	0.1% (1 in 1000) inc 20% Climate Change
SPALDING_CHANNEL 259	525779	323995	3.70	4.00	4.17	4.45	4.50	4.51	4.52	4.52	4.68	4.53	4.56	4.68
SPALDING_CHANNEL 613	525605	323662	3.70	4.00	4.17	4.45	4.50	4.51	4.52	4.52	4.68	4.53	4.55	4.68
SPALDING_CHANNEL 746	525532	323562	3.70	4.00	4.17	4.45	4.50	4.51	4.52	4.52	4.68	4.53	4.55	4.68
SPALDING_CHANNEL 795	525507	323524	3.70	4.00	4.17	4.45	4.50	4.51	4.52	4.52	4.68	4.53	4.55	4.68
SPALDING_CHANNEL 935	525435	323416	3.70	4.00	4.17	4.45	4.50	4.51	4.52	4.52	4.68	4.53	4.55	4.68

Fluvial Flood Flows (m³/s)

The fluvial flood flows for the model nodes shown on the attached map are set out in the table below. They are measured in metres cubed per second (m³/s).

Node Label	Easting	Northing	Annual Exceedance Probability - Maximum Flows (m³/s)											
			50% (1 in 2)	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	3.33% (1 in 30)	2% (1 in 50)	1.33% (1 in 75)	1% (1 in 100)	1% (1 in 100) inc 20% Climate Change	0.5% (1 in 200)	0.1% (1 in 1000)	0.1% (1 in 1000) inc 20% Climate Change
SPALDING_CHANNEL 436	525690	323802	0.71	1.06	0.91	1.06	1.02	1.03	1.15	1.17	1.65	1.10	1.07	1.93
SPALDING_CHANNEL 679.5	525567	323613	1.30	1.99	1.77	2.06	2.01	1.93	2.24	2.31	3.19	2.18	2.06	3.61
SPALDING_CHANNEL 770.5	525519	323543	1.48	2.26	2.04	2.37	2.31	2.21	2.56	2.65	3.65	2.50	2.35	4.07
SPALDING_CHANNEL 865	525471	323470	1.75	2.69	2.48	2.87	2.86	2.70	3.13	3.25	4.56	3.10	2.86	5.02

Sphnyx Ltd
12 Bakers Way
Morton
Bourne
Lincolnshire
PE10 0XW

Council Offices
Priory Road
Spalding
Lincolnshire
PE11 2XE
Admin 01775 764725
DC Officers 01775 764703

planningadvice@sholland.gov.uk
www.sholland.gov.uk

TOWN AND COUNTRY PLANNING ACT 1990

FULL

Reference: H14-1286-25 **Date of Decision:** 16th July 2026
Applicant: Tawny Homes Ltd
1-4 London Road
Spalding
Lincolnshire
PE112TA
Location: Land Off Stephenson Avenue Pinchbeck Spalding Lincolnshire
Description: Erection of a mixed use commercial site for 11 industrial units

South Holland District Council, in pursuance of the provisions of the Town and Country Planning Act 1990 (as amended), hereby give notice that permission has been GRANTED (or equivalent) for the development referred to above, subject to the following condition(s):

- 1 The development must be begun not later than the expiration of three years beginning with the date of this permission.

Reason: As required by Section 91 of the Town and Country Planning Act 1990 as amended by the Planning and Compulsory Purchase Act 2004.

- 2 The development hereby permitted shall be carried out in accordance with the following approved plans and/or documents:

- Location Plan
- Site Plan
- V17.0 - Site Outlay
- Rev V4.6 - Drainage Plan
- V5.3 - Access Plan
- V3.8 - Floor Plans & Elevations - 8 Units

- V9.6 - Floor Plans & Elevations 3 Units
- Covering Letter
- Transport & Traffic Statement, dated April 2026
- Drainage Assessment & Statement, dated April 2026
- Design & Access Statement, dated 2026

Reason: For the avoidance of doubt and in the interests of proper planning.

- 3 The materials of the external surfaces (including brickwork, finish, roof tiles and windows) of the development hereby permitted shall be carried out in accordance with the details outlined within the application form and approved plans.

Reason: In the interests of the architectural and visual integrity of the overall development and the visual amenity of the area in which it is set.

This Condition is imposed in accordance with Policies 2 and 3 of the South East Lincolnshire Local Plan, 2019.

- 4 No storage of materials, machinery, waste or other items shall take place outside the buildings(s) on the site.

Reason: In the interests of the appearance of the development and the visual amenity of the area in which it is set.

This Condition is imposed in accordance with Policies 2 and 3 of the South East Lincolnshire Local Plan, 2019.

- 5 The use and development hereby permitted shall not be open to customers or employees (workers), or be operated, except between the following hours, as specified within the Planning Application Form:

-07:30 - 18:00 Monday - Saturday

-Nor at any time on Sundays, Bank or Public Holidays.

Reason: In the interests of the amenity of local residents.

This Condition is imposed in accordance with Policies 2, 3 and 30 of the South East Lincolnshire Local Plan, 2019.

- 6 Notwithstanding the provisions of Schedule 2, Parts 3 and 4 of the Town & Country Planning (General Permitted Development Order) 2015 (as amended), the development hereby permitted, as identified on the approved plans, shall only be used for the following purposes unless express planning permission is granted by the Local Planning Authority for any other use:

- The development shall be limited to Use Classes B8 and/or E(g) only.

Reason: In order to ensure that the buildings are used for the purposes identified within the application and to enable the Local Planning Authority to regulate any changes, in the interest of the character and appearance of the development and the visual amenity of the area.

This Condition is imposed in accordance with Policies 2, 3 and 7 of the South East Lincolnshire Local Plan, 2019 and Section 12 of the National Planning Policy Framework,

December 2024.

- 7 The development hereby permitted shall be carried out in accordance with the measures set out in the Flood Risk Assessment (dated April 2026) forming part of this planning application, unless otherwise agreed in writing by the Local Planning Authority. In particular, the following measures shall be fully implemented before the buildings are first occupied:

-Ground floor levels to be set at minimum 4.0mOD with resilience to 4.5mOD

Note: The above approved plan does not constitute final approval of detailed site levels or finished floor levels.

Reason: To ensure that the development does not increase the risk of flooding or be at risk of flooding.

This Condition is imposed in accordance with Policies 3 and 4 of the South East Lincolnshire Local Plan, 2019 and Section 14 of the National Planning Policy Framework, December 2024.

- 8 Before any development beyond oversite is commenced, full details of the means of surface water disposal shall be submitted to and approved in writing by the Local Planning Authority. The details so approved shall be implemented in full before the development hereby permitted is first brought into use.

Reason: To ensure that the site is adequately drained, to avoid pollution, and to prevent increased risk of flooding.

This Condition is imposed in accordance with Policies 2, 3 and 30 of the South East Lincolnshire Local Plan, 2019 and Section 14 of the National Planning Policy Framework, December 2024.

- 9 Prior to any vegetation clearance (defined as the deliberate removal of any semi-natural vegetative habitat e.g., grassland, trees, and native shrubs); or prior to the commencement of any development hereby permitted (whichever comes first), a scheme of mitigation relating to nesting birds shall be submitted to, and approved in writing by, the Local Planning Authority; unless said works or clearances occur between 1st September and 28th February. Thereafter, the development shall be undertaken in accordance with the approved scheme.

Reason: In the interest of the protection of habitat and nesting birds

This condition is imposed in accordance with Policy 28 of the South East Lincolnshire Local Plan, 2019, and the Wildlife and Countryside Act 1981

- 10 The development hereby permitted shall not commence until a biodiversity gain plan has been submitted to and approved in writing, by the Local Planning Authority. This plan shall be accompanied by an updated and accurate metric showing existing habitat conditions on the site.

The development shall then be carried out in accordance with the details as approved.

Reason: To comply with Schedule 7A of the Town and Country Planning Act (1990, as

Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	525235/324398	2 September 2026 10:28

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see <https://www.gov.uk/guidance/flood-risk-assessment-standing-advice>)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2026 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

Unspecified

Location (easting/northing)

525235/324398

Scale

1:2,500

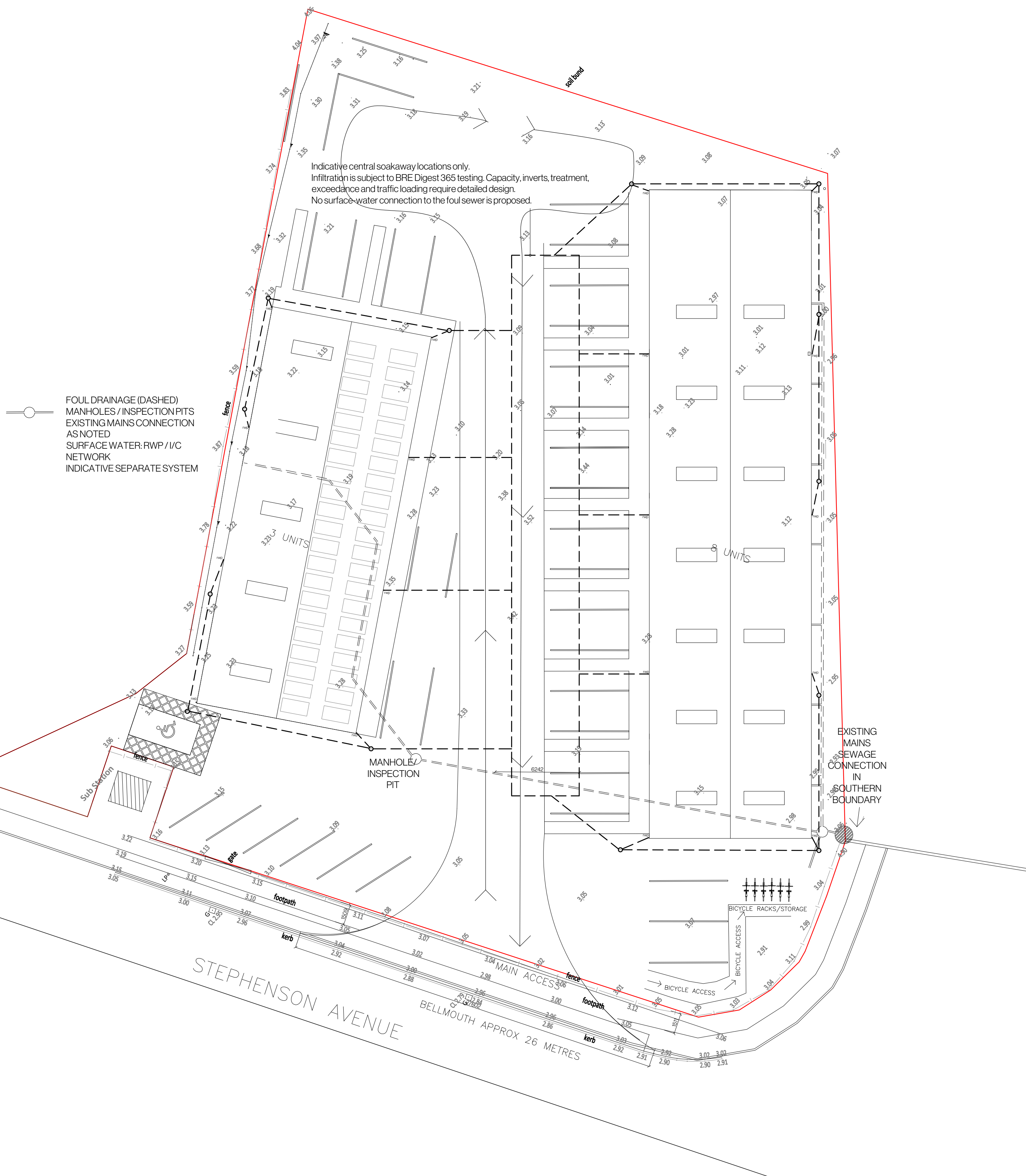
Created

2 Sep 2026 10:28

-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area



0 20 40 60m



Revision	Date	Drawn	Description
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Client Tawny Homes Ltd

Project Commercial Development @ Stephenson Avenue, Pinchbeck

Drawing Planning (Indicative Surface Water Plan)

Scale 1:200 @ A2

Drawn **AWM** Checked **TAC** Date **08/10/2026**

Drawing No. 26/714/PA/001

Trevor A Clay RIBA Ltd, 14 Old Fendike Road, Weston Hills, Spalding, Lincs. PE126DD
 alasdair@tacarchitects.co.uk www.tacarchitects.co.uk

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 alasdair@tacarchitects.co.uk www.tacarchitects.co.uk

