

13 April 2022

Report to:

South Cambridgeshire District
Council Planning Committee

Lead Officer:

Joint Director of Planning and Economic Development

S/2553/16/CONDO – Ward Linton / Parish Linton (Land Off Horseheath Road)

Proposal: Submission of details required by condition 11 (surface water drainage) of planning permission S/2553/16/OL for outline planning application with all matters reserved for up to 42 dwellings and allotments (not less than 0.45 hectares)

Applicant: Croudace Homes

Key material considerations: Surface Water Drainage and Flood Risk

Date of Member site visit: NA

Is it a Departure Application?: No

Decision due by: May 2021

Application brought to Committee because: The application is one that in the opinion of officers, in consultation with the Chair and Vice-Chair, should be determined by Committee because of the complexity of the application arising from the specific circumstances surrounding the site and its history.

Presenting officer: Stephen Kelly

Executive Summary

1. The application seeks to agree the surface water drainage details in relation to condition 11 of planning consent S/2553/16/OL for the erection of up to 42 dwellings on the site and allotments.

2. The application was deferred by members at the planning committee meeting on 9 March 2022 for the following reasons: -
 - i) To allow for publication by the Lead Local Flood Authority of the Flood Investigation Report in relation to the flood event on 20 July 2021 in Linton.
 - ii) To provide for further details to be provided of the drainage solution particularly details of the exceedance flows from the infiltration basin.
 - iii) To provide for clarification of the applicant's land ownership and the ability to deliver elements of the proposed drainage strategy.
3. Since the meeting, the Lead Local Flood Authority has published its Flood Investigation Report in relation to the flood event on 20 July 2021 in Linton and further information has been received from the applicants with regards to the exceedance flows and land ownership.
4. The surface water drainage system will consist of sustainable drainage methods in the form of an infiltration basin to the south of the public open space, bunds along the southern and western boundaries of the site, piped highway drainage, permeable paving to tanks, banks within the landscape buffers along the northern and eastern boundaries, and the access road to be constructed to prevent on street water flows to enter the site at its junction with Horseheath Road.
5. The application submission has been subject to significant scrutiny and engagement as a result of a surface water flooding event in July 2021. Following that event, the Lead Local Flood Authority (LLFA) initiated a peer review of the surface water drainage proposals which culminated in a revised drainage submissions in November 2021, December 2021 and a further revised submission in January 2022. Following deferral of the item by the Planning Committee, further details have been received from the applicants clarifying the exceedance flow route, and providing further calculations outlining the design performance of the scheme in relation to rainfall events.
6. The concerns from the Parish Council and local residents in relation to the method of surface water drainage and the impacts upon flood risk have been subject to discussion and review. This engagement has led to additional information, revision and clarification of the proposals.
7. Council officers and the statutory consultee consider the surface water drainage scheme reflects the principles set out in the surface water drainage strategy prepared by Thomas Consulting as contained in the appellant's Proof of Evidence (Ref: 4760) referenced in the appeal decision. The peer review of the technical details for the LLFA supports the LLFA conclusions that the proposed surface water drainage scheme is acceptable. This view has not changed following publication of the Flood Investigation report or the submission of the additional material. Given the status of development on the site, the proposals include provision for phased implementation/completion of

the measures in accordance with a clear timetable (starting on approval of the application) and for post implementation monitoring and maintenance. For these reasons, and noting the continued and ongoing concerns of local residents and the Parish Council, the proposals are considered to accord with the policies of the Local Plan and would not result in a significant risk of flooding to the site and surrounding area.

Relevant Planning History

8. **S/2553/16/CONDI** - Submission of details required by condition 11 (Surface water drainage) of planning permission S/2553/16/OL – Refused

The proposed surface water drainage strategy, in terms of insufficient information in relation to the volume, depth and route of the flood exceedance flows on the site would result in an increase in the risk of flooding to the site and surrounding area. The proposal is therefore contrary to Policies CC/8 and CC/9 of the South Cambridgeshire Local Plan 2018 and the Cambridgeshire Flood and Water Supplementary Planning Document 2016 that require the provision of sustainable surface water drainage systems (SuDS) appropriate to the nature of the site to demonstrate that the development would not result in an increase in the risk of flooding to the site and surrounding area or pose an unacceptable risk to water quality.

9. **S/4418/19/RM** - Approval of matters reserved for access appearance landscaping layout and scale following outline planning permission S/2553/16/OL for the erection of 42 dwellings including the provision of 0.45ha for allotments - Approved
10. **S/2553/16/OL** - Outline planning application with all matters reserved for up to 42 dwellings and allotments (not less than 0.45 hectares) - Appeal Allowed

Planning Policies

11. **South Cambridgeshire Local Plan 2018 Policies**
 - CC/7 Water Quality
 - CC/8 Sustainable Drainage Systems
 - CC/9 Managing Flood Risk
 - HQ/1 Design Principles
12. **Supplementary Planning Documents (SPD's)**
 - Cambridgeshire Flood and Water - Adopted November 2016
13. **National Policy**
 - National Planning Policy Framework (NPPF) 2021
 - National Planning Practice Guidance (NPPG)
 - National Design Guide 2021

Consultation

14. **Lead Local Flood Authority** – The Lead Local Flood Authority (LLFA) are the statutory authority responsible for reviewing surface water drainage proposals for major developments in the district. The LLFA originally raised an objection to the proposals. That objection related to the following matters.

- i) I would like to echo the Drainage Officer's comments on the safety factor. This should be 10 given that the consequences of infiltration basin failure would be significant as the primary infiltration feature for the site, particularly as the basin is located adjacent to existing homes.*
- ii) Further information should be provided on how basin exceedance flows will be contained within the site. The infiltration basin plan on PDF page 5 of the report suggests that the basin edge will have a slight gradient to the east of the site (54.00 metres AOD at the basin edge to 53.48 metres AOD at the site boundary). This would not appear to correlate with the note on the Exceedance Flow Plan that states 'LANDSCAPED AREA BETWEEN BASIN AND SITE BOUNDARY TO BE GRADED TO DIRECT ANY EXCEEDANCE FLOWS AWAY FROM SITE BOUNDARY AND INTO INFILTRATION BASIN'. The applicant should provide a more detailed cross section plan of this area to provide further information on the landscaped area and how it will enable exceedance flows to be contained within the site boundary.*
- iii) Whilst flood volumes during the 1 in 100 year event plus 40% climate change have been labelled on the exceedance flow plan, the associated flood depths are also required.*

Following the submission of further information, the LLFA indicated on 1 June 2021 that they were satisfied with the revised drainage proposals. On 20 July 2021 a flooding event locally prompted the LLFA to issue a follow up letter on 27 July 2021 asking the LPA to pause its consideration of the applications whilst the cause of the flooding event was investigated.

Following further engagement between the LLFA and applicants, additional details have been submitted including three revised Surface Water Drainage Statements, in November 2021, December 2021 and January 2022.

In response to the most recent surface water statement the LLFA revised response on 24 February 2022 is as follows: -

As you will be aware, this application has been subject to consultation since March 2021. A brief history of the LLFA involvement is summarised below:

- i) 19 March 2021 – LLFA requested additional information on 3 points: safety factor of the basin; exceedance flows; depths of exceedance flows.*
- ii) 1 June 2021 – Following submission of additional information, the LLFA removed the objection.*
- iii) 27 July 2021 – LLFA wrote to SCDC advising that whilst we had previously recommended approval of the surface water drainage scheme, significant flooding occurred in Linton on 20 July 2021 and as such we requested any applications in the area were paused until we concluded our formal flood*

investigation. As part of this we requested some additional information from the developer.

iv) 9 September 2021 – LLFA wrote to SCDC following extensive discussions with the developer, SCDC, Linton Parish Council, local residents and the local MP. We advised that whilst some of our points had been addressed we still required clarification of water levels during the flood.

Given the significance of the flood event that occurred and the potential relationship to the development the LLFA appointed Capita (a national civil engineering and environmental consultancy) to undertake an independent review of the application submission with a view to ultimately providing reassurance that flood risk matters had been adequately addressed.

Upon appointment of Capita, a number of meetings with SCDC, Croudace and local residents have taken place, and this has resulted in several further iterations of the drainage strategy being produced.

Both the LLFA and Capita are now of the view that the design of the surface water drainage scheme is sufficient to meet local and national policy and that additional elements have been added to the scheme since it was originally submitted by Croudace in March 2021 to accord with the principles of the original Thomas Consulting report.

In summary, the system has been designed to cater for events up to and including the 1 in 100 year plus 40% allowance for climate change. Surface water will be disposed of by an infiltration basin, the size of which has been determined by the results of on-site infiltration testing. In order to treat the surface water and remove as much silt as possible features such as sumps and permeable paving have been included throughout the site. A sediment forebay has been included at the entrance to the basin to provide a final means of treatment and will allow sediments to settle out before water enters the basin. The level of treatment is in accordance with the CIRIA SuDS Manual which presents best practice.

A management company will be employed to maintain the drainage features and a table of requirements for regular, occasional and remedial maintenance actions for most features has been included within the strategy. Given the topography of the land, the applicant proposes to reinforce the banks of the infiltration basin with concrete and a freeboard of 300 mm will be maintained above the maximum water level within the basin.

We have requested the applicant to definitively include all drainage features within their maintenance plan including the bund/ditch arrangement and the bund along the western boundary of the site and around the basin.

A factor of safety of 10 has been used in the design calculations which represents a greater value than we would typically expect to see for a residential site. A safety factor effectively reduces the infiltration rate during the analysis to account for silting up or poor maintenance.

No flooding of the drainage system is expected in the 1 in 30 year event, but some flooding is expected during a 1 in 100 year plus climate change event. The applicant has provided a plan of the volumes of water expected during such an event and has confirmed that any water would be contained within the road and would flow towards the infiltration basin. During the events in which exceedance is expected, the applicant has demonstrated there would be sufficient capacity within the basin to cater for these volumes.

During the consultation process and following the flooding in July 2021, concerns were raised around the potential for overland flows emanating from off-site to flow through and across the site towards existing properties. In order to mitigate this, the applicant proposes to install a bund/swale arrangement along the eastern boundary, and this will be reinforced by a concrete plug. The applicant anticipates the swale will provide approximately 360 m³ of storage and water will infiltrate through the swale. Additionally, a bund will be provided along the western and southern boundaries to reduce the risk of water flowing into Lonsdale. This bund will also contain a concrete plug.

Upon receipt of a satisfactory updated maintenance plan including all aspects of the drainage scheme (including the bund/ditch arrangement and the bund along the western boundary of the site and around the basin) the LLFA will be in a position to recommend the approval of Condition 11.

Please note: We are aware that significant parts of the site have already been built out including some drainage features. We are not able to comment on whether what has been built so far accords with the information contained within the aforementioned drainage strategy. Checks by the Local Planning Authority or Building Control should be undertaken to ensure the scheme is built in accordance with the approved details.

15. **Drainage Officer** – The LPA initially consulted the Councils drainage officer on the original application proposals. The drainage team at the authority are not however the appropriate statutory consultee for surface water drainage schemes relating to major developments that responsibility rests with the LLFA) and following the flooding event in July 2021, and detailed engagement arising from the consideration of the surface water drainage proposals by the LLFA, no further consultation with the drainage officer has been undertaken. The initial response of the drainage officer (from March 2021) is nevertheless included in this report for completeness.

A number of our comments previously made have now been addressed however our team still have the following outstanding matters which need further clarification.

We understand given underlying ground conditions the infiltration basin sides will need to be lined. From the latest micro drainage calcs it confirms that only the base of the basin (190m²) has been allowed to infiltrate, does this correspond with the construction details or rather the area that will remain unlined?

Additionally, there had been an earlier point raised regarding the factor of safety used on the calculations, it is usual that for features solely relying on infiltration that a factor of safety of 10 is required as there is an expectation that the infiltration rates will decrease over a longer period of time. I am still not satisfied that the calculations are robust enough in this area. The reason given for the value used in the last response was not adequate.

16. **Anglian Water** – Has no objections. Comments that the applicant has indicated on the application form that their method of surface water drainage is via SuDS. If the developer wished Anglian Water to be the adopting body for all or part of the SuDS scheme the Design and Construction Guidance must be followed.
17. **Linton Parish Council** – The Parish Council has commented on the proposals throughout the consideration by the LPA. It has also commented on each revision of the surface water drainage scheme, re-stating an objection to the proposals contained in the January 2022 submission for the following reasons:

31 January 2022

Linton Parish Council (LPC) have not received formal notification from SCDC of the most recent documents added on the 18 January 2022 to the planning portal for S/2553/16/CONDO.

As a statutory consultee LPC re-iterate the previous comments sent to SCDC on the 10 and 14 January 2022 as these have not been addressed.

14 January 2022

To date the results of the full inquiry into the flood event of 20th July 2021 have not been provided. The terms of reference for this enquiry have not been provided either. The Environment Agency (EA) does not even have a formal record of the overflow of sewage from approx. 1000 homes and water from the Horseheath Road development (evident from its very distinctive colour) from the foul sewer manhole on Horn Lane into the river Granta for this event, despite the photographic/video evidence sent to all parties AND representatives being present at the formal meeting between LPC, Lead Local Flood Authority (LLFA), EA and LPA on 26th July. This is unacceptable.

It is also unacceptable that Croudace have allowed occupation of homes on this site while the pre-commencement conditions for surface and foul water have not been discharged.

The recent submissions for the surface water condition show plans that conflict with landscape plans that have already been approved. They also change the contouring at the site entrance – this should be reassessed by highways.

Questions raised by LPC regarding the scientific rigour to justify infiltration rates, bund heights, gradients etc. remain unanswered.

The development of this site has seen the removal of roadside grips/rills that previously channelled surface water from the Horseheath Road into a ditch that ran inside the hedge-line at the top of the field. The ditch and hedgerow have also been removed across the front of the site. There is nothing in this scheme that acknowledges or compensates for the loss of this important protection (to the remainder of the village) from flooding.

How does the scheme perform in an event like that of 20th July 2021? Or 18/19th July 2017 (Approx. 125mm rain in 120 minutes for the former and approx. 75mm rain in under 60 mins for the latter?) None of the storm events modelled have figures anything like this – even the 1 in 100 yr plus climate change is only half this amount. Which areas of the site will flood in these events?

Given rain events occur in excess of the 1 in 100 yr events (plus climate change) that are modelled, where is the exceedance route from this proposal? The lowest point of the bank around the infiltration pond appears to be at 54.02m AOD – this is the height recorded between the site and the existing Lonsdale homes – is the exceedance route therefore via the properties in Lonsdale?

The modelling shows long term rainfall events with negative rainfall in Appendix D – surely something is wrong here?

Infiltration rate from the basin is still calculated from the original 2020 test result during which the pit collapse prevented a reading according to BRE Digest 365. Half-drain times calculated from this infiltration rate are therefore optimistic at best. The village has no confidence in the times presented. The infiltration rate achieved is also not consistent with TP2 in approx. the same location from the tests in 2018. It is therefore clear that the infiltration performance of the pond will (unsurprisingly) depend on the ground conditions at any given time. Calculations are not based on a “worst case scenario” which they should be.

The 10cm drop from the site to HH road is not evidently over a 4m length for the whole entrance as stated. It looks from the contours on the road as though the water from Horseheath Road could potentially be channelled straight down to the western dropped kerb to the footpath, overflowing into the development.

The bund to the western edge of the site seems to include the 1m strip of SCDC owned land. The gardens in the already occupied properties along this boundary also conflict with the bund. How will the property boundaries be altered to ensure that the bunds are maintained in perpetuity?

The bund and ditch to the eastern edge of the site and to the north of the area with the allotments is not a consistent 6m width as detailed in the approved OL. This bund and ditch system conflicts with the 6m landscaping buffer. How

has the landscaping been checked to ensure that the planting is suitable for the altered water conditions that will result from the contouring? Part of the reason for the insistence of the planning inspector that construction should not be allowed to start prior to the approval of this condition was to ensure that the conflict in land use was properly accounted for and any layout alterations could be accommodated.

The bund and ditch system will alter how the water in the remaining area of the field will behave, specifically, there is the potential for a large pool of water to build up in a severe weather event. Has the farmer been notified? Are they aware of the implications to their crops of this pooling?

The eastern boundary of the site along the allotments is still not visible in the plans presented.

The concrete plug in the bund between the infiltration pond and Lonsdale, along with the landscaping around this feature are likely to seriously damage the hedge between the sites – the roots of the hedge will be damaged or suffocated resulting in a loss of amenity for the existing residents.

LPC Decision: **Object** and do refer this to the District Council Full Planning Committee

10 January 2022

How does the scheme perform in an event like that of 20th July 2021? Or 18/19th July 2017 (Approx. 125mm rain in 120 minutes for the former and approx. 75mm rain in under 60 mins for the latter?) None of the storm events modelled have figures anything like this – even the 1 in 100 yr. plus climate change is only half this amount. Which areas of the site will flood in these events? And where is the exceedance route?

The model shows rainfall events with negative rainfall in Appendix D – surely something is wrong here?

Infiltration rate from the basin is still calculated from the original 2020 test result during which the pit collapse prevented a reading according to BRE Digest 365. Half-drain times calculated from this infiltration rate are therefore optimistic. The infiltration rate achieved is also not consistent with TP2 in approx. the same location from the tests in 2018. It is therefore clear that the infiltration performance of the pond will (unsurprisingly) depend on the ground conditions at any given time. Calculations are not based on a “worst case scenario” which they should be.

The 10cm drop from the site to HH road is not evidently over a 4m length of the whole entrance as stated. It looks from the contours on the road as though the water could potentially be channelled down the western dropped kerb to the footpath.

The bund and ditch to the eastern edge of the site and to the north of the area with the allotments is not a consistent 6m width as detailed in the approved OL.

This bund and ditch system conflicts with the 6m landscaping buffer. How has the landscaping been checked to ensure that the planting is suitable for the altered water conditions that will result from the contouring?

The bund and ditch system will alter how the water in the remaining area of the field will behave, specifically, there is the potential for a large pool of water to build up in a severe weather event. Has the farmer been notified? Are they aware of the implications to their crops of this pooling?

The eastern boundary of the site along the allotments is still not visible in the plans presented.

Representations

18. Six specific representations have been received from local residents at Nos. 11, 31 and 36 Lonsdale, 2 and 8 Bakers Lane, and No. 8 Horn Lane who all object to the application. However substantial additional correspondence between the LLFA, LPA and local residents since the flood event in 2021 has also taken place. This has resulted in a number of additional submissions raising continued objections and concern on a number of technical aspects of the submission and seeking clarification on the technical/modelling elements of the submissions.

A summary of the concerns contained in the correspondence is set out below. Copies of the representations raising matters arising from the application can be viewed on the Council's website:

- a. Flood event on 20 July 2021 flooded properties in Lonsdale, Bakers Lane and Bartlow Road.
- b. Torrents of water flooded down through the site and overwhelmed the infiltration basin until it overflowed. The infiltration basin overflowed into gardens on Lonsdale and resulted in the very rapid flooding of local properties and gardens.
- c. This event caused damage to properties, inconvenience/stress to owners, and raised considerable concerns around future threat of flooding to these properties from the site.
- d. Effect on insurance and value of properties.
- e. Need to consider risk from development, higher surrounding land, land levels, and Horseheath Road.
- f. Need to consider fully the risks arising during construction and when complete.
- g. Concern that the proposals follow from a lack of understanding of the Thomas Consulting FRA principles as required by the planning condition and Planning Inspector.
- h. The proposals do not satisfactorily respond to the geology of area and its impact upon infiltration rates.
- i. Poor layout of the site and drainage solution where road cuts across site contours increases flood risk.

- j. An investigation into the material facts of the flood event needs to be carried out.
 - k. Extension to public consultation required for the implication of the facts in relation to the submitted information.
 - l. Seek clarification of the process which you will be following in deciding this matter, including gathering of evidence (through the LLFA investigation and otherwise), assessment of impact and requirements to be placed on the developer.
 - m. Question the calculations, methodology and assumptions underpinning the design of the drainage system, including the size and performance of the infiltration basin and raise concerns around the potential implications for the basins performance once the development is completed.
 - n. Raise concerns about the ability of the developer to fully implement the proposed drainage scheme in line with the Thomas Consulting Principles because of limits to land ownership, the carrying out of landscape works and the recent occupation of dwellings.
 - o. Concern/objection to the continuing implementation of the development without approval of the drainage solution.
 - p. Current plan is inadequate and may be based upon incorrect or out of date computer modelling of rainfall as events are more common now.
 - q. Concern that the proposed new hump on the site access road will direct more water along Horseheath Road towards Lonsdale.
 - r. Removal of topsoil does not help drainage.
 - s. Only viable solution is the land returned to its previous state.
 - t. The Lead Local Flood Authority has not published its report into the investigation of the flood event to date.
 - u. The proposals do not fully detail where any exceedance flows from the basin would be directed contrary to the CCC SPD.
 - v. Question whether the plans can be implemented in full due to occupation of dwellings and the position of the current eastern boundary fence.
 - w. What checks have taken place on what has been constructed to date.
 - x. Concerns that another flood event may occur in the future.
19. A letter was received from Lucy Frazer MP prior to the March committee meeting which was circulated to members and raised the following concerns: -
- a. Very significant flooding which took place at the location of this development in July 2021. A number of my constituents' homes were flooded and at least one family remains in temporary accommodation.
 - b. Ongoing concerns raised by the Parish Council and local residents in respect of the exceedance flow plan, the infiltration rate of the basin and the bund and ditch on the eastern boundary.
 - c. The Lead Local Flood Authority's (LLFA) Section 19c Flood Report into the events of the 20 July 2021 has not been completed and published.
 - d. Asks the Committee to consider delaying a decision until the Section 19 Report is publicly available.
 - e. Very short notice given to the decision to hear these applications at Planning Committee.
20. A number of further representations with photographs and videos have been received in relation to the flood event on 20 July 2021.

21. A representation has been received from Bedfordshire Pilgrims Housing Association who question whether approval of the conditions applications would allow the affordable properties to be handed over and occupied.
22. A representation has been received from a future owner of a property on the development site who advises that because of the delay to the determination of the application, they have had to move into temporary accommodation.

Site and Surroundings

23. The site is located outside the Linton development framework and in the countryside. It is situated to the south of Horseheath Road, east of Lonsdale and north of Martins Lane, Harefield Rise and Kenwood Gardens.
24. The site formerly comprised open agricultural land. The land falls north to south and east to west. Construction on the approved development of 42 dwellings and allotments has commenced and a number of the properties constructed were recently occupied.
25. The site is located in Flood Zone 1 (low risk). The land within the south western corner of the site and some properties in Lonsdale to the south west of the site are nevertheless identified on the Environment Agency maps for long term flood risk from surface water flooding.

Proposal

26. The proposal seeks to discharge condition 11 of planning consent reference S/2553/16/OL dated 14 March 2018 in relation to surface water drainage of the site.
27. The full wording of the condition is set out below.

11. No development shall take place until details of a scheme for surface water drainage have been submitted to and been approved in writing by the Local Planning Authority and including arrangements for subsequent management. The scheme shall reflect the principles set out in the surface water drainage strategy prepared by Thomas Consulting as contained in the appellant's Proof of Evidence (Ref: 4760). The scheme shall include appropriate flood mitigation measures and shall be implemented in accordance with the approved details, and in accordance with an agreed programme.

28. The proposed surface water strategy for the site is through sustainable drainage measures relying on infiltration. The main components are an infiltration basin, permeable paving, and drains/private sewers to the infiltration basin. Banks would be formed along boundaries to manage overland flows of excess surface water from surrounding land to the site, and from the site to surrounding properties. The proposals have been designed to meet or exceed

the Council and County Councils design requirements for all drainage systems to accommodate a 1:100 year rainfall event plus 40% allowance for climate change effects. This is a county wide design standard applied by the Lead Local Flood Authority to all surface water drainage proposals.

Flooding Event 2021

29. On 20 July 2021, Linton experienced a significant rainfall event. Based on rain gauge data from 4.5km away, the LLFA Flood investigation report indicates that 109% of the average monthly rainfall occurred in this location in just 3 hours. Based on rainfall radar data this increases to 180%. According to the Flood Estimation Handbook (FEH20133), the Flood Investigation report suggests this rainfall event has a return period of between 1 in 211 years and 1 in 659 years depending on the rainfall data used (i.e., gauge or radar).
30. The S19 report published on 1 April 2022 records flooding events in three broad locations in Linton as a result of this rainfall - High Street, Balsham Road/Lamb Fair Court and Lonsdale/ Bakers Lane/ Bartlow Road/Finchams Close. Photographs and video footage from residents record how surface water flowed down Horseheath Road and into the construction site temporary access before flowing overland across the construction site towards and into the partially constructed infiltration basin. The LLFA S19 report describes the event as follows:
- *“There is a large surface water catchment area above Horseheath Road, consisting of arable fields and carriageway area, all of which contribute to surface water flowing towards the village. The surface water flows were exacerbated by the absence of crops along with dry compacted ground causing additional runoff from the fields. This, combined with minimal highway drainage along Horseheath Road resulted in a large volume of surface water flowing westerly down Horseheath Road. Due to the topography 11 along the road and the presence of multiple access points leading off Horseheath Road, a large amount of surface water entered the construction site immediately to the south of Horseheath Road through the temporary site entrance. Some surface water continued along the road entering the development site by the main entrance, and the remainder made its way further along the road where it entered and flowed down Lonsdale. Most of the surface water that initially entered Lonsdale was captured by the highway drainage system (apart from an initial report of minor flooding at the bottom of Lonsdale where water entered a garage).*
 - *The surface water that entered the development site combined with the surface water that fell on the site itself and followed the topography to flow in a south westerly direction. The flow picked up debris, earth, sand, and silt and ultimately filled the partially constructed infiltration basin. It is likely that the debris and sediment that settled in the basin reduced its infiltration capacity. It should be noted that as this development site was still under construction, the surface water drainage network was incomplete.*
 - *The infiltration basin overtopped which caused the banks to fail, sending a large amount of surface water into Lonsdale. Due to the nature of the flooding the properties at the bottom of Lonsdale were impacted by this water very*

quickly. The water from the overtopped basin combined with water flowing down Lonsdale from Horseheath Road to exacerbate the flooding. It is understood that the retaining wall situated between Lonsdale and Bakers Lane initially acted like a dam holding back this in rush of water until this wall then also overtopped, flooding several properties below. The depth of flooding in Lonsdale before the wall overtopped is understood to have been between 15cm and 45cm deep.

- *The water that overtopped the retaining wall then flowed towards and into properties in Bakers Lane and Bartlow Road to a reported depth of 15cm to 20cm. Water continued towards Finchams Close leading to some external flooding around properties. It is understood that some flooding of the foul drainage network occurred in Finchams Close due to the ingress of surface water to the foul water system.”*

31. As a result of the flood event, 17 properties (across Linton) were reported to have flooded internally and 6 externally in three main areas in the village of the High Street, Balsham Road/Lamb Fair Court and Lonsdale/ Bakers Lane/ Bartlow Road/Finchams Close. At least 5 properties are likely to be uninhabitable for 1-12 months.
32. Following the event, the Lead Local Flood Authority has undertaken walkovers of the areas that flooded and inspected the general topography and relevant features in the areas. It has also met with residents who experienced flooding and with a representative of the Local Highways Authority to establish the state of the highway drains.
33. The S19 report then details a range of actions undertaken or proposed for the LLFA, Highways Authority, Anglian Water, Environment Agency, local landowners, Local Planning Authority, developers, and the Parish Council. This includes engaging with the LPA on the discharge of condition for the drainage proposals and in future, consultation with the LLFA on all Construction Environment Management Plans (CEMPs) for major development to ensure surface water is managed and phased appropriately during construction.

Planning Assessment

34. The key issue to consider in the determination of this application relates to the appropriateness of the proposed SUDS drainage solution outlined having regard to the planning condition, the sites characteristics, the development plan polices and the particular concerns of the Parish Council and local residents following the recent flooding event in July 2021.
35. The site is located in Flood Zone 1 (low risk land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)) but it is recognised that part of the site is identified as an area of flood risk from surface water on the Environment Agency’s flood risk maps.

36. The nearest watercourse is the drainage ditch to the south of Finchams Close 250 metres to the south. The River Granta is 300 metres to the south. The land levels fall from the site towards the river.
37. The site falls to the south and west. Properties to the south in Harefield Rise, and Bakers Lane, and to the west in Lonsdale, are at lower land levels than the site.
38. The soils on the site are of chalk strata.
39. The Proof of Evidence in relation to the Surface Water Drainage Strategy referenced in condition 11 of S/2553/16/OL advises that the development should be able to deal successfully with its own surface water runoff, but will also reduce the flood risk for the Lonsdale and Martins Lane properties which already flood.
40. It suggested the following sustainable drainage measures to mitigate the flood risk:-
 - i) to address overland flow from north and east: banking inside landscape buffer zone and the first 4m of the new access will slope at 1 in 40 towards Horseheath Road.
 - ii) to address surface water flooding to properties to the south: bank along the western and southern boundaries of the site.
 - iii) For highway drainage: pipe to a soakaway at the northern end of the public open space.
 - iv) For house drainage: infiltration trench to southern end of public open space.
41. The submitted Surface Water Drainage Strategy, as amended, comprises a range of sustainable drainage methods to address the risk of surface water flooding from the development and to reduce flood risk to the surrounding area. The proposals have been developed (and further evolved) so as to make clear how, as required by condition 11, they have been based upon the principles set out in the surface water drainage strategy prepared by Thomas Consulting at the time of the outline planning permission appeal. This includes not only addressing and holding water captured by the development on the site for infiltration, but also addressing the risks of overland flows onto and from the site from both the new site entrance on Horseheath Road but also flows from the adjoining agricultural land to the east. These overland flows onto the site partly conveyed into the site by the temporary site access road and exacerbated by the sites partially developed status, are believed to have been a significant contributory factor leading to the flooding of properties in the adjoining Lonsdale development and beyond in July last year.
42. The measures are set out below: -
 - i) Overland flow from the north and east.
 - a) A landscape buffer would be provided along the eastern boundary and the Horseheath Road boundary as per the layout approved under reserved

matters application ref. S/4418/19/RM. The inside edge of the landscape buffer would have a shallow bank, generally 0.5m high and rising to 0.75m high. The contour plan shows the land levels and that the highest point of the bank would be in the north eastern corner. The cross section drawing shows the profile of the banks. The section of the bank adjacent to plots 9 and 10 would be reinforced with a concrete plug.

b) The first 4m of the access road would slope towards Horseheath Road at a gradient of 1:40 (effectively 0.1m above the existing channel level). The contour plan shows the levels.

ii) Surface water flooding to properties to the south.

A shallow bank would be provided along the southern and western boundaries of the site. The bank would measure not more than 0.5 metres high. The contour plan shows the land levels. The cross section drawing shows the profile of the banks. The drawings show that parts of these banks would be reinforced with a concrete plug.

iii) Highway drainage

The adopted road would have standard piped drainage which discharges to the infiltration basin. There would be tanked permeable paving to provide additional storage which will be privately managed.

iv) House drainage

An infiltration basin would be provided within the southern part of the open space to the south west of the site. It has been designed with a volume to accommodate the 1 in 100 year storm allowance plus 40% climate change from impermeable surfaces within the site along with rainfall falling directly onto the basin. In addition, a 300mm freeboard has been incorporated within the basin. Tanked permeable paving would provide additional storage. The system has been checked with a factor of safety of 10. Any storm durations over and above the required volume, would drain via overland flood routes as shown on the drainage plan.

43. Infiltration tests have been carried out on the site to demonstrate that these methods of drainage are suitable. The observed performance of the infiltration tests has been carefully considered by the LLFA and their consultants following concerns raised by the Parish Council and local residents. These suggest that the assumptions on infiltration associated with the proposed SUDS scheme are acceptable. However, their response notes that further verification tests to the infiltration basin will be required if approved to ensure that the scheme functions as designed.
44. The micro drainage calculations were originally modelled on Flood Studies Report (FSR) rainfall data. The calculations have now been updated and are now based on Flood Estimation Handbook (FEH) rainfall data. This increases the capacity required by 41 cubic metres or 60mm.

45. The system will have a range of treatment measures prior to entering the system to filter out debris and ensure that there would not be any pollution to groundwaters. These will include a catch pit with a sump for positive outfalls, a catch pit, block bedding course and geotextile separation membrane for the permeable paving, and sediment forebay for the infiltration basin. The basin would have a dense vegetation layer and 300mm depth soils.
46. As a result of the exchanges between the LLFA, LPA and Locla residents around the design performance of the basin, additional information has been submitted by the applicants over the course of the application in relation to the modelled performance of the drainage system. Following the recent committee deferral, additional information has also been submitted in relation to exceedance flows in addition to the information set out in Section 2.2.16 and Appendix K of the Drainage Strategy.
47. The Cambridgeshire Flood and Water SPD requires a plan if any above ground flooding is expected in the 1% AEP (1 in 100 Year) rainfall event including any allowance for climate change. Limited surface water flooding is expected during this event which would be restricted to the area of permeable paving within the site to the east of the infiltration basin. The maximum volume of overland flow is approximately 22m³, which would flow westwards along the pavement and into the infiltration basin. The applicants advise that the infiltration basin would only be around half full during these short duration storms so there is at least 450m³ of spare capacity to accommodate the overland flow.
48. The applicants modelling, assessed by the LLFA and peer reviewed by their retained consultants indicates that all the surface water runoff for all the 1 in 100 year plus 40% climate change storm durations will be contained within the infiltration basin with at least 300mm freeboard above the maximum water level to the top of the infiltration basin. This is the reason why there are no exceedance flows shown from the infiltration basin.
49. Further modelling with Flood Estimation Handbook data with regards to more extreme events estimates that the infiltration basin will also be able to contain the surface water runoff for all storms up to and including the 0.33% AEP (1 in 300 year) + 40% climate change events. The applicants most recent submission contains further analysis including a series of modelling runs for longer return periods up to 1 in 1000. Their assessment includes a table of the maximum water level in the infiltration basins. They conclude:

“By comparing the rainfall intensities and water levels for the different events we can estimate that the 0.1% AEP (1 in 100 year) + 40% climate change design rainfall event is approximately equivalent to between the current 1 in 300 to 1 in 400 year event.

The results show that the surface water runoff would be contained within the infiltration basin for all of these events and with at least 100mm freeboard in

the 1 in 1000 year event. This is a significant and high level of protection that goes well beyond the requirements of planning policy and is also well beyond the severity of the July 2021 event. It also represents an increased level of protection to the surrounding area than the pre-development situation.”

50. The scheme will be regularly maintained for the lifetime of the development and a revised schedule (February 2022) has been submitted to outline how such maintenance will be addressed. A management company would regularly maintain the majority of the drainage components such as private sewers, the infiltration basin and permeable paving. The surface water sewers within the main access road to the forebay would be offered to Anglian Water for adoption.
51. Surface water will not be directed to Anglian Water main surface water or foul water system.
52. Following the recent flood event and through engagement with the LPA, a series of measures, reflected in the recommendations in the Flood Investigation report were implemented by the applicants through a revised construction management plan. These measures comprise: -
 - i) The temporary site entrance has been altered in terms of its levels and a drainage channel provided along the edge so that potential surface water flooding from Horseheath Road would be redirected into the field.
 - ii) A trench has been dug at the end of the new drainage channel to create a soakaway and encourage the surface water onto the soft landscape of the field. In addition, a temporary bund has been constructed along the edge of the temporary access road to prevent overland flow from the field onto the construction site.
 - iii) Materials have been moved away from water channels to mitigate the risk of any silt and sand being washed into the infiltration basin.
 - iv) The LEAP will be landscaped as soon as possible (Note: this has now been substantially completed) to help mitigate / reduce surface water run off which was one of the main routes for the recent flood waters.
 - v) All new gullies have been cleared from site debris and checked to be clean. They have been relined to reduce the silt and sand build up. This will be monitored during construction.
 - vi) Emergency sand bags have been filled and stored onsite.
 - vii) A number of French drains around the construction compound to stop any surface water running off the fields into the site compound.
 - viii) The levels have been increased around the boundary of the infiltration basin to mitigate the risk of any overflow.

ix) Along the road boundary of the infiltration basin a course of concrete blocks (bedded on mortar) has been installed to form a barrier to catch any silt and sand that may flow in the surface water before it reaches the basin.

x) Post Construction, the temporary construction access and site compound will be removed and the field access and verge will be restored to its previous state.

53. The County Council have also undertaken works adjacent to the highway to re-instate roadside rills to reduce surface water flows along Horseheath Road above the site. The above measures are considered appropriate for a temporary period during construction until the main drainage system is completed.
54. Policy CC7, CC8 and CC9 of the South Cambridgeshire Local Plan, address surface water drainage, water quality and flood risk matters arising from drainage schemes on new development. The NPPF seeks to ensure that when making planning decisions, flood risk is not increased elsewhere as a result of a development. The NPPF, echoes the adopted Cambridgeshire Flood and Water SPD and encourages the use of sustainable drainage systems unless there is clear evidence that this would be inappropriate.
55. The Parish Council and residents have raised a number of concerns and objections to the proposed surface water drainage solution. Residents' concerns echo the concerns of the Parish Council but also include detailed concerns arising from the design parameters and calculations, the systems modelled performance and the suitability of the ground for an infiltration-based SUDS solution together with concerns about the management of existing overland flows into and over the site and the management of exceedance flows from the basin itself in the event of extreme rainfall events. Their concern is heightened by the events in July 2021 which led to localised flooding in the adjoining housing areas and from the early submissions made by the applicants. As a result of these concerns, the LLFA have engaged third party consultants to "peer review" the proposed drainage solution.
56. Officers are however satisfied that the proposals engage with the principles contained in the Thomas Consulting water drainage strategy. Through engagement with the LLFA, the design parameters and calculations underpinning the design solution have been thoroughly reviewed by the LLFA and scrutinised/challenged by local residents and are considered to be appropriate and acceptable. This includes consideration of the proposals against the Local Plan policies and Cambridgeshire Flood and Water SPD.
57. In March 2022, the Committee deferred consideration of the application in order that the applicant provide evidence of the exceedance route for surface water in the event that the infiltration basin was overtopped. Alongside the further micro-drainage calculations to demonstrate the performance of the infiltration basin beyond the baseline design requirement of 1 in 100 year (plus 40% Climate change) return events, the applicants have also now provided an

exceedance flow plan which indicates that surface water overtopping the infiltration pond in extreme events would leave the site in the south western corner – reflecting that this point is the lowest point in the site – and follow the prevailing ground levels. This routing corresponds with the existing maps from the Environment Agency which also show overland flows across the site towards this point. A number of structures within the gardens of properties in Lonsdale (which are at a lower level to the site) may intercept or influence the flow of surface water beyond the site boundary in these exceedance events.

58. The applicants have satisfactorily demonstrated that the proposals would capture and manage surface water flows on the site to a level greater than if no development had taken place. Having regard to the principles explored in *Menston Action Group vs City of Bradford MDC and BDW Trading 2016* officers are of the view that Policy CC/9 - which requires applicants to explore and take opportunities to reduce flood risk elsewhere has therefore been satisfied.
59. During the consideration of this application, the applicant has continued to construct homes on the site. Some of these homes have been occupied. This does mean that as the scheme has been developed, concerns have also been raised about whether the proposed drainage strategy is capable of implementation in full, and whether the below ground (especially) drainage installed on the site, will perform in accordance with the calculations forming part of any agreed drainage details.
60. As the Parish Council comments also note, landscaping works have taken place in a way that do not reflect the details contained in the submitted proposals. Further works are also known to be required to replace the temporary bunds around the infiltration basin, to ensure that embankments/bunds required on the western, southern, and eastern site boundaries and forming part of the principles to the original FRA are incorporated into the finished scheme and that necessary changes to the site access road are carried out. The measured performance of the infiltration basin also requires validation. The applicants have therefore submitted a scheme for implementation of the proposals alongside a revised scheme for maintenance of the SUDS system. They have also committed to a post implementation assessment and monitoring of the scheme.
61. A further question has arisen surrounding the applicant's ability to implement the eastern site boundary works – comprising a bund. Third party representations suggest that the applicants do not control the land necessary to implement and maintain the bund proposed. The applicants however maintain that they control all of the land necessary. Based upon the submissions made, officers are satisfied with the applicants assertion that they are able to implement the proposals outlined. In the event that the proposed drainage scheme is not implemented in full, the LPA would be able to secure completion through enforcement action where appropriate.

Planning Balance and Conclusion

62. The concerns from the Parish Council and local residents in relation to the method of surface water drainage and the impacts upon flood risk have been carefully considered by the LPA and the LLFA and their consultants. noted.
63. Following the recent deferral of the application for further information, officers remain satisfied that the surface water drainage scheme reflects the principles set out in the surface water drainage strategy prepared by Thomas Consulting as contained in the appellant's Proof of Evidence (Ref: 4760) referenced in the appeal decision and required by condition 11. The role of planning conditions in addressing existing flood risk has also been considered by the courts previously and expectations that the development should remove all existing flood risk to surrounding properties cannot be reasonably achieved. Significant amount of technical work has been undertaken to seek to demonstrate that the drainage solution proposed is appropriate for the site and responds to observations and lessons learnt from the recent flood event.
64. The LLFA have now published their S19 report which outlines the exceptional nature of the rainfall conditions and the incomplete works on the application site at the time of the flood event. The conclusions of the S19 report do not change officers earlier conclusions on the acceptability of the proposals.
65. For these reasons whilst noting the continued objection and concern of the Parish Council and local residents and following the receipt of the information requested by members at the committee meeting on 9 March 2022, officers are nevertheless satisfied with the assessment of the LLFA that the surface water drainage scheme is consistent with the objectives of policies CC7, CC8 and CC9 of the adopted Local Plan, and the Cambridge Flood and Water SPD and can now be approved.

Recommendation

66. Officers recommend that the Planning Committee accept the following surface water drainage details but do not formally discharge the condition as the development has commenced.
 - Surface Water Drainage Statement reference DES/035/410 Revision G dated January 2022 by Croudace Homes
 - Construction Management Plan (CMP) Revision D dated September 2021 by Croudace Homes
 - SuDS Maintenance Requirements dated February 2022 by Croudace Homes
 - Drawing number 035/360 Scope of Drainage Works
 - E-mail and enclosures dated 25 March 2022 from Croudace to Planning Director
 - Email and Drwg No 035/361 dated 30 March 2022 from Croudace to Planning Director

Background Papers

Planning applications S/2553/16/CONDO, S/2553/16/CONDH, S/2553/16/OL, S/1969/15/OL, S/3405/17/OL and S/4418/19/RM.

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