



11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE
Tel: 0161 799 2720 Fax: 0161 790 3474
Email: mail@carleydaines.co.uk Web: www.carleydaines.co.uk

Reference: Brigham Street, Openshaw. Planning Reference CDN/23/0591.
RE comments received 21/02/2024 (& further comments on 16/04/2024)

Carley Daines and Partners Ltd (CDP) are the consulting drainage engineers working on behalf of John Southworth Construction for the One Manchester development of 22 new residential dwellings at Brigham Street, Openshaw.

This letter is a response to the latest comments from the MCC planners department, particularly the drainage related queries within condition 17. Please find below our responses to the planners' latest queries received on 21/02/2024 (plus additional comments received on 16/04/2024) in red, with a pack of supplementary drawings and documents also provided with this submission.

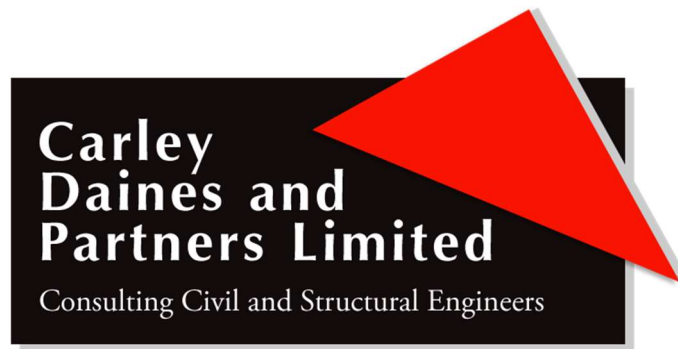
iv. **Condition 17 (Drainage)** – *The Flood Risk Management Team have confirmed that the following additional information is required prior to the discharge of condition 17:*

o The LLFA require a finalised drainage layout showing all components, outfalls, levels and connectivity. Outfall IL not provided (south of site)

The finalised drainage layout showing all main drainage, the approved S185 combined sewer diversion, the to-be-adopted (under S38 agreement) highway drainage, the 2 x foul points of connection to the public sewer and the private drainage attenuation crates with points of connection to the public sewer are shown are CDP drawing **21.B.13127-11 Rev H – Engineering Layout.**

The propose private plot drainage consisting of peripheral foul and surface water drainage leading up to the points of connection to the public sewer are found on CDP drawing **21.B.13127-20 Rev D – Private Drainage Layout.**

All discharge invert levels are shown within manhole C7 and are as follows: SW (both highway drainage and plot drainage): 66.024m; Foul drag out chamber: 66.024m; S185 diversion combined and existing combined sewers: 64.235m. This is the point whereby the new and proposed S185 sewers re-connect with the existing combined sewer, and thus no IL further south of this point is necessary nor relevant to the design.



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o Please provide details of S106. The LLFA require an agreement in principle from United Utilities for the connection to the south. An email of acceptance of proposed flows and/or new connection will suffice.

*Please see email from United Utilities dated 05/12/2023 in PDF document “**S106 Approval Pending Planning Sign Off**” which states that UU cannot give the formal TA for the S106 approval until the planning conditions are signed off. However, a second email in document “**S106 SW Flow Rates Confirmation**” from UU confirms that they accept the 2l/s and 3l/s SW connections into the combined sewer.*

*o Where a public sewer diversion is required, an agreement in principle from United Utilities is required. S185 approvals including easement approval. An email of acceptance will suffice. Please see attached PDF document “**S185 Approval Email**” which confirms the approval of the S185 diversion works.*

o Please provide details of S38 approval.

*S38 is still ongoing with MCC, however MCC have confirmed that they will commit to adopting the SW highway drain, and discussions within the LLFA are ongoing, which we are not party to. PDF document “**S38 Drainage Correspondence**” gives evidence that highways have confirmed they will adopt this, and are discussing internally.*

o Please provide dimensions from tank to plot. The LLFA require SW features to be 5m of a building or highways and 2.5m of a boundary. We need to ensure; the tank does not clash with the foundations and has suitable access and the ability to be maintained through its lifetime.

(Further comments received on 16/04/2024 following CDP querying the requirement of the above):

- If the inability to maintain a 5m easement from the property and 2.5m easement from the existing highway, the developer is required to provide the LLFA with the following information:

- A detailed methodology outlining the installation of the proposed tank in the event of a failure or replacement of tank requirement. This methodology should adhere to engineering standards, and environmental considerations to ensure a robust and viable arrangement.

- Provide a site specific cross-section demonstrating that the property foundations will remain unaffected by the attenuation tank and are positioned safely beyond the zone of influence. This section should detail the proximity of the attenuation tank to property/highway.

Principal: **D.J. Middleton BEng(Hons) CEng MStructE**

Company Number: **11006567** Address **11 Bridgewater Road, Worsley, Manchester, M28 3JE**

VAT Number: **285 0439 91**



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The site drainage design includes the highways drainage which is to be adopted by MCC under the S38 (ongoing approvals) which discharges by a 3l/s flow control, and the plot drainage which discharges at 2l/s. The attenuation required to store the water from the plot drainage is stored in underground attenuation tanks below the rear gardens of apartment blocks 13-16. Due to the tight site constraints, this attenuation tank is closer to the buildings than 5m, however this has not been an issue in the past with attenuation tanks below gardens within close proximity of buildings and even in some cases, below structures themselves (such as garages).

CDP contacted the planners on 07/03/24 to seek clarity on this point, as we do not see the attenuation tank as a risk to the foundations as it is a sealed tank, not an open infiltration tank or soakaway. The plots foundations are also pre cast concrete piles, therefore neither the tank nor the foundations have any risk of surcharging the other. The manhole access for regular cleaning and maintenance is in a convenient and accessible location.

Following this correspondence, the planners submitted two further requirements in the event that the tank is closer to the buildings, which CDP have answered as below:

The attached drawing **13127-24 Storage Tank Section** demonstrates the relationship between the piled foundations and the sealed attenuation tank, and as ratified by our chartered structural engineer, will not pose any risk of surcharging.

An methodology statement is also submitted by our contractor, which confirms the above point raised of the installation of the proposed tank in the event of a replacement being necessary. All of these have been deemed both structurally and civilly as feasible and low risk.

o Construction details of SuDS elements not provided. (Stormcells Geo Cellular).

Please see attached Hydro International brochure in PDF document titles "**Stormcells Geo Cellular**" which shows the manufacturers specification of the 520mm deep crates as specified in the drainage drawings. Construction and installation as per manufacturer guidelines, and as demonstrated in CDP drawing **13127-24 Storage Tank Section**.

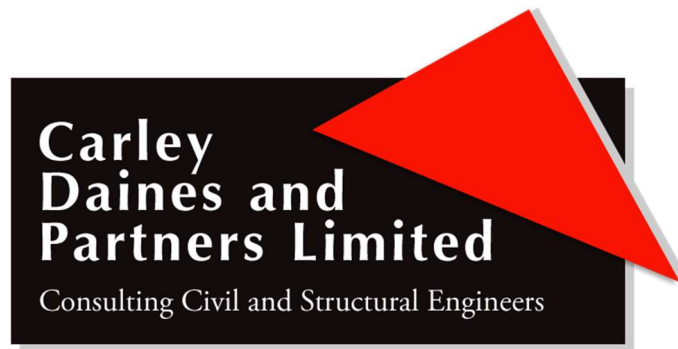
o Overland flow routes not provided.

As demonstrated in the MicroDrainage calculations, there is no flooding proposed in storms up to and including the 1 in 100 year event + 45% climate change. Therefore it is not anticipated for any flooding to occur on site or for any flood water to exist. The blockage risks have also been discussed, and the HydroBrake chambers are fitted with emergency overflow and penstock bypass pipes to prevent any flooding in the event of blockage. Mitigating measures have been taken to ensure that all plot FFLs are minimum of 150mm above ground levels to lift them out of any potential flood plains. Therefore, the risk of

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flooding (as discussed in further detail in CDPs FRA) is negligible, and no overland flood routes are deemed to be required to exist.

o A blockage risk assessment is to be undertaken as part of the drainage strategy to support proposed flows less than 5 l/s (2 Separate flow controls)

The design drawing of the HydroBrake flow control units are provided in the resubmission. The orifice plates are 57mm for the 2l/s HydroBrake (private plot drainage) and 71mm for the 3l/s HydroBrake from the highway drainage system. These orifice sizes can be protected against blockage by installing sumps within the HB chambers, mesh grates (mesh guards) over and around the orifice, and having an overflow with a penstock in the chamber. All of these features are present in Hydro International HydroBrake models, and when installed as per manufacturers guidance reduce the risk of blockages. Flow rates of as low as 2l/s are commonly used and preferred by local authorities who seek for flow rates as low as possible in order to create as environmentally and ecologically friendly drainage systems and possible with minimal impact of surface water run off. Therefore the risk of blockages from these HydroBrakes can be mitigated with suitable measures to low risk.

The manufacturer of these HydroBrakes, Hydro International, has been consulted and have confirmed that they consider the risk of blockage from their product is low.

"In our opinion yes we would say it [blockage risk] would be low, as preventative measures have been accounted for given the low flow rates which are to be achieved. The mesh guards are very popular for this type of design with low flows, and to date we've not had any problems"

Please see email responses from the manufacturer in PDF documents "**Hydro International response 1**" and "**Hydro International response 2**", along with their technical information included within the resubmission pack.

Andrew Mulligan.

A handwritten signature in black ink that reads 'A. Mulligan'.

Civil Engineer.

Carley Daines and Partners Ltd.

Andrew.mulligan@carleydaines.co.uk

0161 799 2720.

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