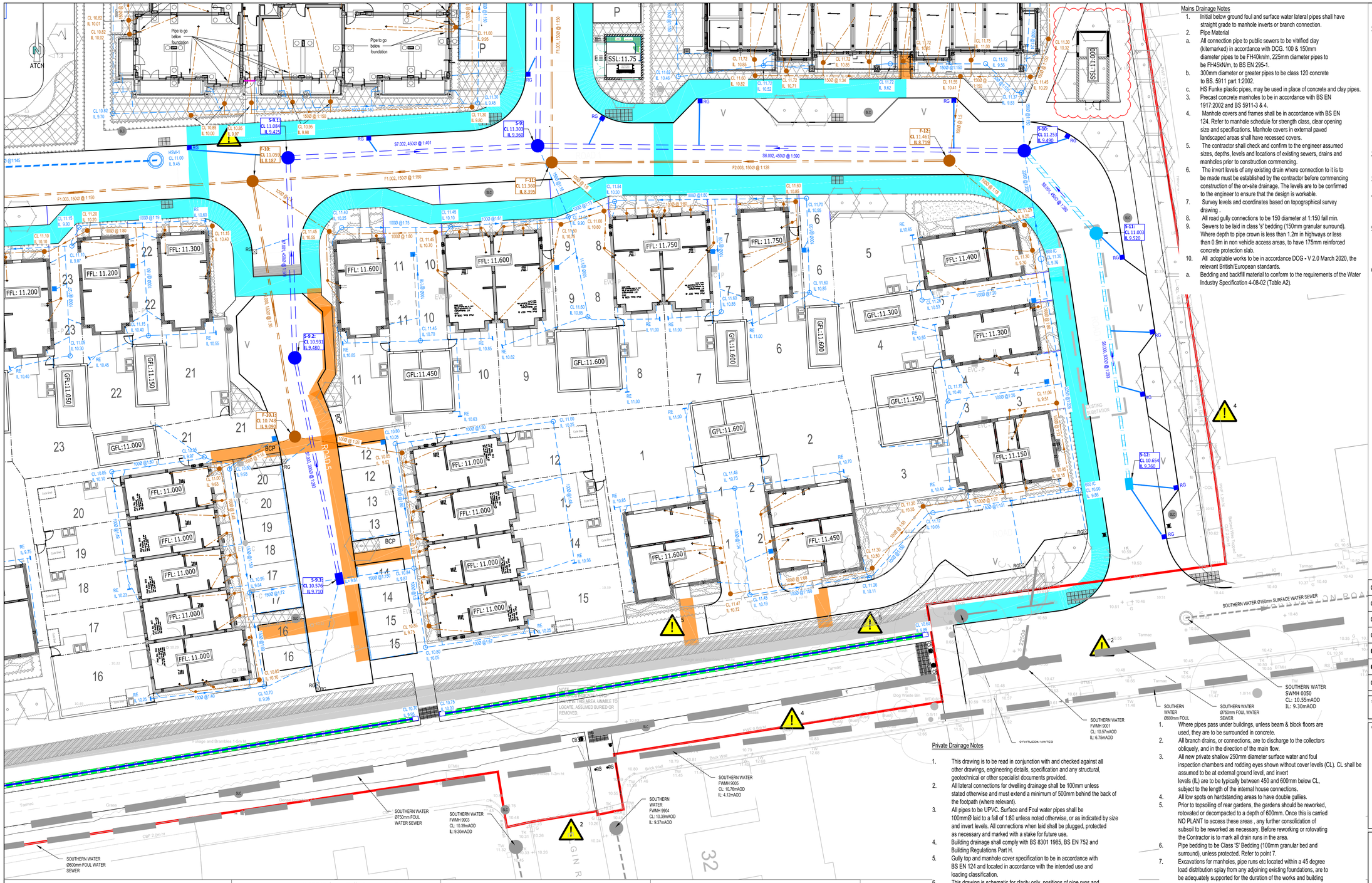


Mains Drainage Notes

1. Initial below ground foul and surface water lateral pipes shall have straight grade to manhole inverts or branch connection.
2. Pipe Material
   a. All connection pipe to public sewers to be vitrified clay (kitemarked) in accordance with DCG. 100 & 150mm diameter pipes to be FH40kn/m, 225mm diameter pipes to be FH45kN/m, to BS EN 295-1.
   b. 300mm diameter or greater pipes to be class 120 concrete to BS. 5911 part 1:2002.
   c. HS Funke plastic pipes, may be used in place of concrete and clay pipes.
3. Precast concrete manholes to be in accordance with BS EN 1917:2002 and BS 5911-3 & 4.
4. Manhole covers and frames shall be in accordance with BS EN 124. Refer to manhole schedule for strength class, clear opening size and specifications, Manhole covers in external paved landscaped areas shall have recessed covers.
5. The contractor shall check and confirm to the engineer assumed sizes, depths, levels and locations of existing sewers, drains and manholes prior to construction commencing.
6. The invert levels of any existing drain where connection to it is to be made must be established by the contractor before commencing construction of the on-site drainage. The levels are to be confirmed to the engineer to ensure that the design is workable.
7. Survey levels and coordinates based on topographical survey drawing .
8. All road gully connections to be 150 diameter at 1:150 fall min.
9. Sewers to be laid in class 's' bedding (150mm granular surround). Where depth to pipe crown is less than 1.2m in highways or less than 0.9m in non vehicle access areas, to have 175mm reinforced concrete protection slab.
10. All adoptable works to be in accordance DCG - V 2.0 March 2020, the relevant British/European standards.
    a. Bedding and backfill material to conform to the requirements of the Water Industry Specification 4-08-02 (Table A2).

Private Drainage Notes

1. This drawing is to be read in conjunction with and checked against all other drawings, engineering details, specification and any structural, geotechnical or other specialist documents provided.
2. All lateral connections for dwelling drainage shall be 100mm unless stated otherwise and must extend a minimum of 500mm behind the back of the footpath (where relevant).
3. All pipes to be UPVC. Surface and Foul water pipes shall be 100mmØ laid to a fall of 1:80 unless noted otherwise, or as indicated by size and invert levels. All connections when laid shall be plugged, protected as necessary and marked with a stake for future use.
4. Building drainage shall comply with BS 8301 1985, BS EN 752 and Building Regulations Part H.
5. Gully top and manhole cover specification to be in accordance with BS EN 124 and located in accordance with the intended use and loading classification.
6. This drawing is schematic for clarity only, positions of pipe runs and manholes may vary on site due to site conditions.
7. Cover and invert levels are indicative and may vary on site. Any irregularities to be communicated with the engineer immediately. In any case the following minimum cover to depth of cover to the crown of pipes without protection shall be as follows:
   a. Domestic gardens and pathways without any possibility of vehicular access - 0.35m
   b. Domestic driveways, parking areas and yards with height restrictions to prevent entry by vehicles with a gross weight in excess of 7.5 tonnes - 0.5m
   c. Domestic driveways, parking areas and narrow streets without footways (e.g Mews developments) with limited access for vehicles with a gross weight in excess of 7.5 tonnes - 0.9m
   d. Agricultural land and public open space - 0.9m
   e. Other highways and parking areas with unrestricted access to vehicles with a gross weight in excess of 7.5 tonnes - 1.2m
8. Note: any protection required where drainage does not comply with a-e above shall be as follows:-
   i) Vitrified clay pipes - provide a 100 mm min. thick concrete bed and surround (instead of class 'S' bedding) and a 13 mm thick compressible filler at each joint.
   ii) UPVC pipes - provide a concrete bridging (in addition to class 'S' bedding) in accordance with appendix A15, Building Regulations part 'H'.
   Note: in-situ concrete used in connection with a) and b) above shall be standard mix GEN3 in accordance with BS 5328.
9. Where pipes pass under buildings, unless beam & block floors are used, they are to be surrounded in concrete.
10. All branch drains, or connections, are to discharge to the collectors obliquely, and in the direction of the main flow.
11. All new private shallow 250mm diameter surface water and foul inspection chambers and rodding eyes shown without cover levels (CL). CL shall be assumed to be at external ground level, and invert levels (IL) are to be typically between 450 and 600mm below CL, subject to the length of the internal house connections.
12. All low spots on hardstanding areas to have double gullies.
13. Prior to topsoiling of rear gardens, the gardens should be reworked, rotovated or decompacted to a depth of 600mm. Once this is carried NO PLANT to access these areas , any further consolidation of subsoil to be reworked as necessary. Before reworking or rotovating the Contractor is to mark all drain runs in the area.
14. Pipe bedding to be Class 'S' Bedding (100mm granular bed and surround), unless protected. Refer to point 7.
15. Excavations for manholes, pipe runs etc located within a 45 degree load distribution splay from any adjoining existing foundations, are to be adequately supported for the duration of the works and building drainage protected.
16. Foundations adjacent to pipe runs or manholes are to have their formation level set above the invert level no higher than the equivalent of the horizontal distance between the pipe/excavation trench and the foundation, minus 500 mm.
17. Where excavations for pipe runs are parallel and in close proximity to each other and/or other service trenches, the contractor shall ensure that adequate safety measures, including temporary shoring, are provided in line with current Health & Safety Legislation and good practice. Particular attention is to be paid to adjacent trenches of differing invert levels.
18. All existing drainage found on site during the works shall be investigated, its operational status confirmed, and the following applied:-
    a. Inoperative drainage shall be cut back and pipe runs filled with concrete grout.
    b. 'Live' drainage shall be temporarily re-routed to allow the new drainage to be constructed.
19. Where existing drainage is to be re-used including road, building and external drainage systems, the contractor shall ensure that all chambers and drainage runs are cleaned, de-silted and made good. Covers to existing chambers to be re-used shall be replaced where necessary to suit proposed development loading class, see note 5. Chamber covers shall also be adjusted to suit final ground levels as necessary.
20. Where necessary, existing chambers shall be re-benched to suit new pipework arrangement.

General Notes

1. Where this drawing has been issued in electronic .dwg format it has been done so in good faith. ATCN Consulting LTD do not take any responsibility for any inaccuracies in the electronic data, which should be checked against the paper (or .pdf) drawing issue. Any apparent discrepancies should be immediately reported to ATCN Consulting LTD. The electronic .dwg file should not be assumed to be to scale and should not be used for 'overlaying', setting out or checking of any third party information. All dimensions should be taken from the paper (or .pdf) version of the drawing. Electronic drawings may contain third party information. ATCN Consulting LTD take no responsibility for this information, which should be checked against the originators paper drawing(s).
2. All dimensions to be checked on site prior to construction/fabrication.
3. Do not scale from this drawing.
4. Any discrepancies between drawings of different scales, and between drawings and specification where appropriate to be notified to ATCN Consulting LTD for decision.
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Health & Safety Note

The details on this drawing have been prepared on the assumption that a competent contractor will be carrying out the works. If the contractor(s) considers that there is insufficient Health and Safety information on this drawing, this should immediately be brought to the attention of the designer.

HAZARD IDENTIFICATION BOX

This table is provided to assist the Principal Contractor to fulfil their obligations under the CDM Regulations 2015

Hazard Ref	Hazard Type (Construction/Maintenance/ Cleaning/Demolition/Adaptation)	Hazard Description	Mitigation Measures/ Residual Risk
1	ALL	Working adjacent to live carriageway	Contractor to install necessary traffic management.
2	ALL	Working with deep excavation	Safety MS. fencing/shoring, correct shoring & propping of excavation
3	ALL	Working near by steep banking	Contractors Safety method statement, Fencing, guarding and signage.
4	ALL	Live utilities including GAS/ELEC/WATER	Contractors Safety Method Statement, Scan / Locate and mark all services prior to commencing work. Hand dig to locate services
Site Wide	ALL	Potential ground gases and elevated arsenic	Contractor to provide relevant PPE to workers, and hotspots marked out onsite.

Rev	Date	Description	Drn / Chk'd / App'd
C18	06/02/25	New RMU Instaled as Clouded	MSK/MAT
C17	11/12/24	Update Road Gully As Per Bellway Homes Comments, as Clouded	MSK/MAT
C16	10/12/24	Update Road Gully As Per Bellway Homes Comments, as Clouded	MSK/MAT
C15	13/11/24	Update Road Gully As Clouded	MSK/MAT
C14	12/01/24	Update Private FW Drainage For Apartment Block A1&B as Clouded	MS/AAA/AA
C13	21/12/23	Approved for Construction	SMK/AA
C12	10/11/23	Flat block C FW reviewed and updated, as clouded	KA/MS/AA

Suitability: A1 - Approved/Stage Complete

Client Logo: Bellway

ATCN CONSULTING
Surbiton | Slough
Web: www.atcnconsulting.com
Tel: 01753 708949

Client: Bellway Homes Limited

Job: Barrington Road, Durrington

Title: Drainage Design Plan Sheet 6 of 6

Classification: FI_60_20

Scale @ A1: 1:200

Certified ISO 14001:2015 Environmental Management

Certified ISO 9001:2015 Quality Management

Project - Originator - Volume/System - Level/Location - Type - Discipline - Number: K43058-ATCN-92-ZZ-DR-C-2106 (Document/Drawing Number)

Revision: C18

LEGEND

- Site Boundary
- Care Home Boundary
- Foul Water Mains Drainage, to be built in accordance with DCG March 2020.
- Private Foul Water Inspection Chamber, 250mm dia. polypropelene up to 600mm deep. Max. pipe diameter 100mm.
- Private Foul Water Inspection Chamber, 450mm dia. polypropelene up to 3000mm deep. Max. pipe diameter 150mm.
- Surface Water Mains Drainage, to be built in accordance with DCG March 2020
- Private Surface Water Inspection Chamber, 450mm dia. polypropelene up to 3000mm deep. Max. pipe diameter 150mm.
- WSCC Highway Gully Connection Drainage
- WSCC Highway Mains Drainage
- Mains Drainage to have concrete surround.
- ⊠RG Adoptable Road Gully, 180m² max catchment as per WSCC standard.
- ⊠RG Private Road Gully
- ⊠ Private Yard Gully
- ■NRV Non Return Valve
- RE Private Rodding Eye
- Land Drains
- Private Channel Drain
- Perforated Pipe
- Private Rising Main
- Adoptable Permeable Paving
- Private Permeable Paving
- Cellular Crate Storage
- Aquacell Plus Inspection cellular crate
- Existing Surface Water Drainage
- Existing Foul Water Drainage
- 2m Wide Site Services Corridor
- 1.5m Wide Site Services Corridor
- Existing Services Corridor
- Filter Drain
- Inspection Chamber
- Tree Pit Extent

Appendix D Response by Ardent Engineers to Drainage Officer Comments

ARDENT
CONSULTING ENGINEERS

FAO Laura Gibbons
Adur & Worthing Councils

Ref: JM/2103241/Drainage Response 3_v1

Facilities & Technical Services,
Worthing Town Hall,
Chapel Road, Worthing,
West Sussex, BN11 1HA

25/08/2022
Issued by E-mail to:
lucy.wilford@dhaplanning.co.uk

Dear Laura,

Former HMRC site, Barrington Road, Durrington – Additional response to drainage officer comments

Please see comments below to your latest response. As a general note, we are not ignoring the comments made on the strategy, rather justifying why the strategy is compliant with the policies you are quoting and explaining how we arrived at the current strategy.

We have made changes to the drainage layout and architectural layout since your previous response to try and improve the overall strategy. The key changes are as followed and included on the revised drainage layout submitted to the case officer.

1. The massing of the flat blocks has changed which has introduced a landscaped footway through to the central green. We are allowing for a ditch/swale along the footway but given it's a shallow linear feature it will be used for local runoff only and unlikely to convey highway runoff.
2. Due to the layout changes to the flat blocks in the east of the site, we have been able to increase the below ground attenuation significantly in this part of the site and added permeable paving to maximise storage to the east of the basin. This has dramatically reduced the catchment going to the private pump in the northeast. Over 95% of the site now drains by gravity to the central basin. Nonetheless there is still a requirement for a small package pump for the lowest area of the site even with the car park being permeable paving to minimise pipework and keep drainage shallow. The pump will be designed with appropriate telemetry and alarms and emergency storage provided to protect the site in the event of failure. Should the emergency storage be breached for any reason, excess surface water would be contained in external parking areas with levels falling away from buildings.
3. The central basins have been combined into one basin to maximise storage and maintain the usable open space. All runoff from site still passes through this basin as with the previous strategy.

Key

WBC TS comments 28.04.22
Ardent response 17.06.22
WBC TS response 04.07.22
Ardent response 21.07.22 not submitted due to updating of strategies
WBC TS comments 16.08.22
Ardent Response 25.08.22

1. The drainage strategy references "the approved FRA" - the decision notice does not list the outline FRA as approved, furthermore our comments made it clear that we had numerous issues with the previously submitted strategy due to its lack of compliance with adopted WSCC policy for the management of surface water. The currently proposed strategy continues to fail to comply with WSCC LLFA policy for the management of surface water and draft local plan policy DM20.

The term 'approved' was in the context of a document that was submitted for planning, the local authority consulted on the documents and planning approval was subsequently granted. As demonstrated in this document and the submitted drainage report, national and local planning policy has been complied with, including Adur-Worthings "Submission Draft Worthing Local Plan (SDWLP)" Policy DM20. *As stated previously, the outline and reserved matters strategies do not comply with policy. We maintained numerous concerns about the outline strategy. We therefore recommend that reliance is not placed upon the outline strategy. The drainage strategy references "the approved FRA" - the decision notice does not list the outline FRA as approved, furthermore our comments made it clear that we had numerous issues with the previously submitted strategy due to its lack of compliance with adopted WSCC policy for the management of surface water. The currently proposed strategy continues to fail to comply with WSCC LLFA policy for the management of surface water and draft local plan policy DM20. The outline and reserved matters strategies do not comply with policy. We maintained numerous concerns about the outline strategy. We therefore recommend that reliance is not placed upon the outline strategy.* Noted however, outline strategy aside, based on the site constraints and information we have available, we maintain that the current drainage strategy is policy compliant. Our previous response dated 17.06.22 referenced every policy clause quoted and provided justification of why the strategy should be acceptable for each item.

2. The drainage strategy states that infiltration is not possible. Until further information pursuant to condition 26 is provided it has not been sufficiently evidenced infiltration is not suitable throughout the site. The suitability of infiltration depends upon the degree and type of contamination identified by further on-site investigations and any mitigation measures proposed. Currently the strategy fails to comply with WSCC LLFA policy for the management of surface water policy 1.

Permeability was tested in some external locations, and indicates the site (or part of the site) could be favourable for an infiltration based strategy - from a soakage perspective. However the contamination study results and consultation received from the Environment Agency (EA) suggested infiltration was not feasible based on the available information, due to risk of introducing contaminant pathways to the underlying receptor. Based on the response from the EA and lack of site investigation proving infiltration is viable, policy 1 (drainage hierarchy) has been followed as outlined in this document. On this basis, a deliverable solution has been presented to secure reserved matters approval based on the information available.

The Environment Agency did not state that infiltration must not occur, but that further testing and remediation proposals are required. "Additional site investigation, remedial works to remove the contaminated soils and robust validation testing would be required for us to consider the use of surface

water infiltration from sustainable drainage systems (SuDS) and demonstrate the risks to controlled waters have been removed" We stand by our comments of the 28th April. We expect further on site testing to be completed to examine the extent of contamination and if and what remediation may be required to facilitate infiltration. The proposed layout precludes the use of infiltration, rather than the ground conditions. This does not meet policy requirements. The drainage strategy states that infiltration is not possible. Until further information pursuant to condition 26 is provided it has not been sufficiently evidenced infiltration is not suitable throughout the site. The suitability of infiltration depends upon the degree and type of contamination identified by further on-site investigations and any mitigation measures proposed. Currently the strategy fails to comply with WSCC LLFA policy for the management of surface water policy 1. The Environment Agency state that further testing and remediation proposals are required. "Additional site investigation, remedial works to remove the contaminated soils and robust validation testing would be required for us to consider the use of surface water infiltration from sustainable drainage systems (SuDS) and demonstrate the risks to controlled waters have been removed" We stand by our comments of the 28th April. We expect further on site testing to be completed to examine the extent of contamination and if and what remediation may be required to facilitate infiltration. The proposed layout precludes the use of infiltration, rather than the ground conditions. This does not meet policy requirements. We did not state infiltration "must not occur" but based on the investigation undertaken we concurred with the EA that infiltration systems introduced a risk of contaminating the aquifer. On that basis we proceeded to develop a viable alternative for the planning application. As stated previously additional testing cannot be undertaken until the site is cleared and demolished, the site cannot be demolished until planning is granted. Any resultant remediation works that may arise will be covered under the appropriate remediation conditions. We consider this strategy to be policy compliant for the purposes of granting planning approval. Should further testing show contamination to not be a risk, the strategy can be adapted to suit which may reduce runoff to existing sewers.

3. Full winter groundwater monitoring must be completed on site even if infiltration is not proposed. This will be required to support a future application to discharge the surface water drainage conditions. 'Policy for the management of surface water' clause 5.2.3 requires ground water monitoring to be carried between October and March. Testing was undertaken in October and November which can be considered representative of the wettest months of the year. Furthermore, on the basis that infiltration is not currently a feasible strategy, high ground water levels can be managed by detailed design of the storage structures and so further testing would not be required.

Policy requires winter groundwater monitoring to be completed October to March inclusive. Monitoring in October and November is unlikely to have obtained the seasonal peak. Even if attenuation is eventually justified we will expect this to be supported by full winter groundwater monitoring to demonstrate that design adequately accounts for flotation. Full winter groundwater monitoring must be completed on site even if infiltration is not proposed. This will be required to support a future application to discharge the surface water drainage conditions. Policy requires winter groundwater monitoring to be completed October to March inclusive. Monitoring in October and November is unlikely to have obtained the seasonal peak. Even if attenuation is eventually justified we will expect this to be supported by full winter groundwater monitoring to demonstrate that design adequately accounts for flotation. As above, the current testing is policy compliant. If planning is granted promptly there may be opportunity to do further monitoring in Jan/Feb post demolition to confirm the current findings.

4. The SuDS hierarchy site assessment in Table 1 is flawed. As stated above infiltration should be fully investigated. Permeable paving is suitable within private areas. Permeable paving is adopted by WSCC. As above, infiltration has been investigated and

is not feasible based on the evidence provided. The lack of permeable paving was to avoid water discharging into the contaminated made ground, as an alternative a lined permeable paving system could be considered in some areas to aid water quality but would still contribute to runoff volume. Swales not being used due to a lack space is insufficient justification. The use of attenuation basins being restricted by available space is also insufficient justification it implies overdevelopment. We suggest that the developer gives due consideration to the appropriate location and design of surface water drainage features to achieve necessary capacity, water quality (via the SuDS management/treatment train), as well as ease of on-going maintenance. Please refer to the Planning Context section above. As this site benefits from outline planning for 287 new homes, the drainage has been designed to suit the masterplan and known constraints. The drainage strategy provides significant benefits both in terms of water quality and water quantity, and biodiversity and amenity compared to the existing site. Surface water drainage features should also be designed in a manner that positively affects the amenity of the site. We would like to remind the developer that, open features, such as swales, basins and ponds, when designed correctly, can satisfy all the above aspirations in addition to; being easier to maintain, having longer lifespans and offering ecological advantages over subterranean features such as "plastic crate systems". Currently the proposals fail to comply with WSCC LLFA policy for the management of surface water polices 8-10. We agree with this principal and this is why we tried to incorporate as much suds into the central open space as possible, inc a boardwalk over one of the permanently wetted landscaped basins. The central play space has been maintained and SuDS incorporated to suit. We have only provided below ground storage to supplement the above ground system. Given the site benefits from outline planning the drainage design could not influence the masterplan as a whole from the outset, but where possible the drainage design has considered opportunities for inclusion of amenity and biodiversity by providing multifunctional use of open space. This has also been considered in the landscape proposals and adequate planting will be provided in the basins. There is no known connectivity to water bodies or natural habitats on this site.

We stand by our comments of the 28th April 2022. The granting of outline planning does not overrule policy requirements. A development does not have consent until conditions are discharged. Please re-consider proposals to achieve a policy compliant surface water drainage strategy. The SuDS hierarchy site assessment in Table 1 is flawed. As stated above infiltration should be fully investigated. Permeable paving is suitable within private areas. We stand by our comments of the 28th April 2022. The granting of outline planning does not overrule policy requirements. A development does not have consent until conditions are discharged. Please re-consider proposals to achieve a policy compliant surface water drainage strategy. The granting of outline does not overrule policy but outline planning is in place to consider whether the site parameters are viable. We are providing a policy compliant strategy based on the constraints on site. That being said, as mentioned above we have worked with the architect to take on board your comments and improve the strategy by adding a swale, introducing lined permeable paving and significantly reducing the catchment to the pump as demonstrated on the latest drainage layout.

5. The surface water drainage strategy states that surface water pumping is proposed. This is wholly unsupported by ourselves as pumping is not a robust sustainable means of surface water disposal. Currently the proposals fail to comply with WSCC LLFA policy for the management of surface water policy 3. Policy 3 states: "*Drainage schemes should be designed to match greenfield discharge rates and follow natural drainage routes as far as possible; pumps should therefore not form part of drainage schemes*". The natural/pre-developed greenfield drainage route of our site would be to the northeast corner which is the lowest part of the site. We have taken as much of the catchment to the central suds feature via gravity as possible with the level constraints of the site. To avoid pumping proposed levels

would need to be raised in the NE part of the site by circa 2m, which would involve retaining walls on the northern network rail boundary and retaining the eastern boundary potentially affecting the pedestrian accessibility/connectivity. Furthermore, clause 5.4.3 states: "*Working with existing **natural** gradients also avoids any reliance on pumped drainage*". This is true for many greenfield sites but for this brownfield site, the gradients fall away from the outfall resulting in pumping. We agree that pumping should be a last resort but the strategy is not to have everything pumped all the way back to the outfall, the intention is to only pump the low part of the site back to the central suds feature to ensure all runoff from the site passes through the basins before leaving the site.

As per policy, we do not support any drainage strategy which includes pumping. Please consider the use of swales and permeable paving for conveyance at shallow gradients. The surface water drainage strategy states that surface water pumping is proposed. This is wholly unsupported by ourselves as pumping is not a robust sustainable means of surface water disposal. Currently the proposals fail to comply with WSCC LLFA policy for the management of surface water policy 3. As per policy, we do not support any drainage strategy which includes pumping. Please consider the use of swales and permeable paving for conveyance at shallow gradient. The area reliant upon pumping has been reduced and very minor lengths of swales included within rev c of the drainage technical note. The strategy still fails to comply with WSCC LLFA policy for the management of surface water policy 3, pumping of surface water is not supported.

We consider pumping to be a last resort but as explained in our previous response, pumping is unavoidable due to the levels of the site falling away from the outfall and central suds feature. As such we consider the strategy to be policy compliant based on site constraints. As above the pump is not an outfall and should not be considered as such. It's a means of transporting water from the low part of the site back into the SuDS system. The private pump will have alarms, telemetry, emergency storage and designed to service the area required in line with industry standards.

6. If attenuation is accepted we first will require evidence of the minimum achievable discharge rate. If the currently high proposed discharge rate is to be taken forward we will require further discussions around this. The rate is calculated assuming no water except from the site is flowing into this manhole, conclusive evidence of this has NOT been supplied. Currently the proposals fail to comply with WSCC LLFA policy for the management of surface water policy 3. The strategy demonstrates that greenfield rates have been used as a target but where that wasn't feasible, we have shown at least a 50% betterment for the lower events, and 86% for the larger storm events. From SW records, manhole ref 8952 is the only manhole terminating at the site boundary (and is a 375mm sewer) indicating this is the only positive outfall from the existing site. This is in line with policy 3 as far as possible.

The strategy acknowledges that some of the existing site drains to soakaways, the area draining to these soakaways has been assumed. The area positively drained to surface water sewer has not been clearly defined and evidenced. Rates have been based upon the capacity of the sewer, assuming that water from no other source enters the sewer here. We will require conclusive evidence of the above points, i.e. area currently positively draining to surface water sewer, and lack of other connections to surface water sewer.

Furthermore, as per policy we require justification as to why a lower discharge rate, closer to QBar, cannot be achieved. If attenuation is accepted we first will require evidence of the minimum achievable discharge rate. If the currently high proposed discharge rate is to be taken forward we will require further discussions around this. The rate is calculated assuming no water except from the site is flowing into this manhole, conclusive evidence of this has NOT been supplied. Currently the proposals fail to comply with WSCC LLFA policy for the

management of surface water policy 3. The strategy acknowledges that some of the existing site drains to soakaways, the area draining to these soakaways has been assumed. The area positively drained to surface water sewer has not been clearly defined and evidenced. Rates have been based upon the capacity of the sewer, assuming that water from no other source enters the sewer here. We will require conclusive evidence of the above points, i.e. area currently positively draining to surface water sewer, and lack of other connections to surface water sewer. Furthermore, as per policy we require justification as to why a lower discharge rate, closer to QBar, cannot be achieved. Rates have not been based on the sewer capacity, they have been based on what we have estimated to be discharging from site and additional betterment provided where the rates exceeded the capacity of the sewer. Whether additional sources are connecting to the existing sewer or not, Southern Water have consulted on multiple occasions to confirm they have capacity for the intended rate and no objections. Qbar rates would result in a significant increase in below ground attenuation which is not achievable given the density required to deliver number of units required.

7. Insufficient calculation detail has been provided to demonstrate that proposals work. Catchment area plans should be clearly defined and tally with area within calculations, all structures should be accurately modelled, etc. We have drawn the catchment areas on the layout and summarised in a table on the layout, which should corelate with the calcs for runoff rates and volumes in the report. We have modelled the impermeable area to determine the required attenuation. If specific information on this is required to demonstrate the correct level of attenuation has been provided for each sub-catchment, we would be happy to supplement the report. *Please provide the information referred to.* The calculations show no flooding for 100yr+cc based on 2100m3 of storage and the measured catchments.

8. It appears that trees are proposed over drainage features. This is not appropriate, tree root potential areas should not conflict with drainage infrastructure. Agreed, planting will be closely coordinated with drainage pipes at detailed design to ensure no clashes. Trees in close proximity to drainage may be subject to root barrier (depending on species and distance) to protect infrastructure in the long term. The level of detail at this stage shows the intended routes and locations of manholes but will be refined at detailed design in conjunction with other disciplines. The accurate setting out of drainage features and planting is not considered critical to the drainage strategy at this stage of the project but will be considered. *Please confirm if landscaping is proposed to be approved as part of this reserved matters application. Furthermore, please note we do not support the use of root barriers, but require offset distances consistent with those required by Southern Water. Noted regarding root barrier.* As above drainage shall be set out at detailed design to adequate offsets for each species type. Specialist Tree pit systems may be specified adjacent to storage crates.

Given the above points we OBJECT to this application and REQUEST FURTHER INFORMATION IS SUPPLIED. Insufficient evidence has been submitted to demonstrate that a policy compliant design can be achieved. Further information is required prior to determination as it is not clear that drainage can fit within the proposed layout and be secured via conditions.

To overcome this objection the applicant should:
1. Submit results of winter infiltration testing and winter groundwater monitoring.
2. Submit a revised drainage strategy which fully complies with policy, i.e. demonstrates the hierarchy will be followed, demonstrates pumping will not be

utilised, demonstrates minimum achievable discharge rate will be adhered to, and demonstrates a SuDS approach is followed.

The submission of further groundwater monitoring should not constitute a reason for objection unless infiltration is proposed as a policy compliant testing has been presented. Pumping is of course a last resort but do not believe the inclusion of a pump should lead to an objection, particularly as the pump discharges to a suds feature. The alternative is to significantly alter the existing topography of the site and import a significant amount of fill material to get a gravity solution to work which is not a feasible or sustainable solution at this stage. This may also lead to concerns from Network Rail about retaining private land abutting a railway line and station. Based on the evidence provided the current strategy is policy compliant and should be granted permission on this basis.

The reserved matters application is requesting approval of a layout, approving a layout which does not support infiltration without full consideration of infiltration is not compliant with policy. Furthermore, a pumped solution fails to meet policy requirements, layout should be reconsidered to provide conveyance through swales and permeable paving sub-bases. We maintain our objection to this application. Please supply a revised surface water drainage strategy which is policy compliant, it is expected that this will require alterations to the proposed layout.
As above the layout needs to be approved based on a viable solution to allow demolition to take place. Infiltration shall be incorporated if deemed viable during investigation works post demolition. The layout has been adapted to minimise reliance on pumping and permeable paving added to keep drainage shallow (in the sub-base) but the pump cannot be omitted due to level differences and existing topograpy.

We request that a policy compliant surface water drainage strategy is submitted. The provision of rebuttals of our comments, with no change to the strategy will gain a recommendation for refusal as the strategy remains noncompliant with policy. We consider the strategy to be compliant but have improved the strategy in the latest submission to address the comments raised.

Please note this stance will not alter with a meeting. Please re-consult us once a revised surface water drainage strategy is supplied. A revised strategy was submitted in lieu of a meeting as requested.

Kind Regards,

Jay Moriarty

Jay Moriarty
Principal Engineer