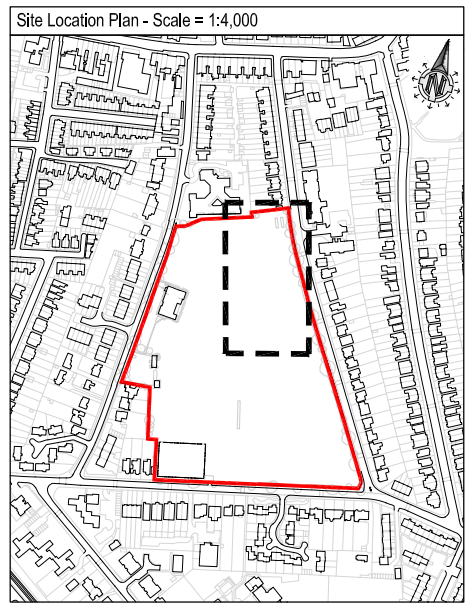
0m 5m 10m 15m

Scale = 1:200

Notes:

1. This drawing is to be read in conjunction with all relevant architects, engineers and specialist sub-contractors drawings and the specification.
2. All setting out to be in accordance with the schedules. any discrepancies between the engineers and the architects drawings to be referred to the architect before proceeding. Dimensions must not be scaled.
3. Refer to drawing JB-3336-007 or 008 for the full list of drainage notes.

Site Location Plan - Scale = 1:4,000



Drainage Legend

- Existing Private Surface Water Sewer (& Manhole)
- Existing Private Foul Water Sewer (& Manhole)
- Existing Public Surface Water Sewer (& Manhole)
- Existing Public Foul Water Sewer (& Manhole)
- Existing Public Combined Sewer (& Manhole)
- Proposed Surface Water Sewer (& Manhole)
- Proposed Foul Water Sewer (& Manhole)
- Proposed Adoptable FW Demarcation Chamber
- Proposed Adoptable SW Demarcation Chamber
- Proposed Adoptable Foul Water Lateral
- Proposed Adoptable Surface Water Lateral
- Proposed Suspended Surface Water Drain
- RE Proposed Suspended SW Rodding Eye
- RWP Rainwater Collection Pipe at High Level
- Proposed Suspended Foul Water Drain
- RE Proposed Suspended FW Rodding Eye
- SVP Soil & Vent Pipe at High Level
- RG 450Ø P.C.C. Road Gully
- YG Square Trapped V.C. Yard Gully c/w Shallow Bucket
- G(1,2,3) Gully / Outlet Serving the Podium Slab
- RE Rodding Eye (Refer to plan for invert level)
- RWP Rainwater Collection Pipe
- SU Drainage Channel (with Sump Unit)
- SVP Soil & Vent Pipe
- SS Stub Stack
- Rising Main - Surface Water
- Rising Main - Foul Water
- Pipeline with Concrete Surround
- XXXXXXX Pipeline to be Removed / Abandoned

Any outlets marked with an (A) reference required rodding access.
Refer to architects / M&E drawings for exact positions of internal connections and RWP'S.

Note:
- This is an initial drainage scheme only and is subject to detailed design and development.
- All foul and surface water outlets positions have been assumed.
- The proposed drainage and infiltration measures have been sized for a peak 1:100 yr (+ 40% for climate change) storm event.

Tree Protection Legend

- Construction Exclusion Zone Protected by Fencing
- Precautionary Areas Hand Digging Only

Attenuation Tank 1
Tank Size = 29.0 x 5.0 x 2.0m deep
Unit Size = 1.0 x 0.5 x 0.4m deep
Unit Types = Wavin Aquacell 'Eco, Prime and Plus'
CL 9.050
Top of tank = 8.600
IL 6.600 ≈
Sized for a peak 1:30 year (+20%) Storm

SW-PS
Pump Station
Chamber Size: TBC
Model: TBC
Max Flow: 4.5 l/s
CL 9.080
IL 6.550 ≈

Rev.	Date	Description	Issued By
P2	14.07.17	Issued for Planning Approval	GEB
P1	12.06.17	Drawn	GEB

Planning

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Client: Quantum Land and Property Limited

Project Title: Former ICL Private Ground

Drawing Title: Proposed Drainage Plan
Area 1 - Plot A and GP Surgery
Sheet 1 of 3 - Lower Ground Floor

Drawn by	GEB	Project No.	Drwg No. [Rev]
Scale	1:200	3336	005 P2
Date	Jun' 17		

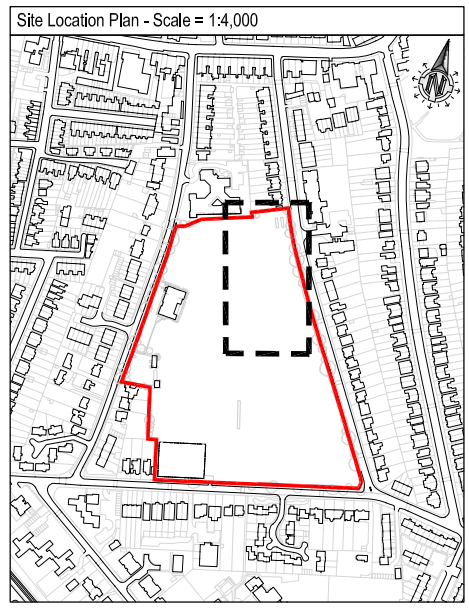
0m 5m 10m 15m

Scale = 1:200

Notes:

1. This drawing is to be read in conjunction with all relevant architects, engineers and specialist sub-contractors drawings and the specification.
2. All setting out to be in accordance with the schedules. any discrepancies between the engineers and the architects drawings to be referred to the architect before proceeding. Dimensions must not be scaled.
3. Refer to drawing JB-3336-007 or 008 for the full list of drainage notes.

Site Location Plan - Scale = 1:4,000



EX-SWMH
Ref: 4907
CL 10.360
IL 8.340

EX-FWMH
Ref: 4905
CL 10,360
IL 7.950

Ex 225Ø Pub FWS
Ex 225Ø Pub SWS

Permeable Paving
System B/C, subject to on site infiltration tests and detailed design. See note 32.

Possible hydrobrake manhole

FWMH
CL 8.920
IL 7.370

Ground Floor
FFL = 9.400

Podium Slab
FFL = 8.925

SW Ditch / Swale - Area 1
Size and profile of ditch subject to detailed design. Approximate grade 1:400.
The ditch will need to provide a minimum of 190.0m³ of storage for the additional flows generated by a peak 1:100 yr +40% storm

FWMH
CL 9.030
IL 6.765

Possible hydrobrake manhole

Aco S200

HDPE SW Rising Main

HDPE FW Rising Main

Drainage Legend

- Existing Private Surface Water Sewer (& Manhole)
- Existing Private Foul Water Sewer (& Manhole)
- Existing Public Surface Water Sewer (& Manhole)
- Existing Public Foul Water Sewer (& Manhole)
- Existing Public Combined Sewer (& Manhole)
- Proposed Surface Water Sewer (& Manhole)
- Proposed Foul Water Sewer (& Manhole)
- Proposed Adoptable FW Demarcation Chamber
- Proposed Adoptable SW Demarcation Chamber
- Proposed Adoptable Foul Water Lateral
- Proposed Adoptable Surface Water Lateral
- Proposed Suspended Surface Water Drain
- RE Proposed Suspended SW Rodding Eye
- RWP Rainwater Collection Pipe at High Level
- Proposed Suspended Foul Water Drain
- RE Proposed Suspended FW Rodding Eye
- SVP Soil & Vent Pipe at High Level
- RG 450Ø P.C.C. Road Gully
- YG Square Trapped V.C. Yard Gully c/w Shallow Bucket
- G(1,2,3) Gully / Outlet Serving the Podium Slab
- RE Rodding Eye (Refer to plan for invert level)
- RWP Rainwater Collection Pipe
- SU Drainage Channel (with Sump Unit)
- SVP Soil & Vent Pipe
- SS Stub Stack
- Rising Main - Surface Water
- Rising Main - Foul Water
- PIpeline with Concrete Surround
- XXXXXXX Pipeline to be Removed / Abandoned

Any outlets marked with an (A) reference required rodding access.
Refer to architects / M&E drawings for exact positions of internal connections and RWP'S.

Note:
- This is an initial drainage scheme only and is subject to detailed design and development.
- All foul and surface water outlets positions have been assumed.
- The proposed drainage and infiltration measures have been sized for a peak 1:100 yr (+ 40% for climate change) storm event.

Tree Protection Legend

- Construction Exclusion Zone Protected by Fencing
- Precautionary Areas Hand Digging Only

Attenuation Tank 1
Tank Size = 29.0 x 5.0 x 2.0m deep
Unit Size = 1.0 x 0.5 x 0.4m deep
Unit Types = Wavin Aquacell 'Eco, Prime and Plus'
CL 9.050
Top of tank = 8.600
IL 6.600 ≈
Sized for a peak 1:30 year (+20%) Storm

SW-PS
Pump Station
Chamber Size: TBC
Model: TBC
Max Flow: 4.5 l/s
CL 9.080
IL 6.550 ≈

Rev.	Date	Description	Issued By
P2	14.07.17	Issued for Planning Approval	GEB
P1	12.06.17	Drawn	GEB

Planning

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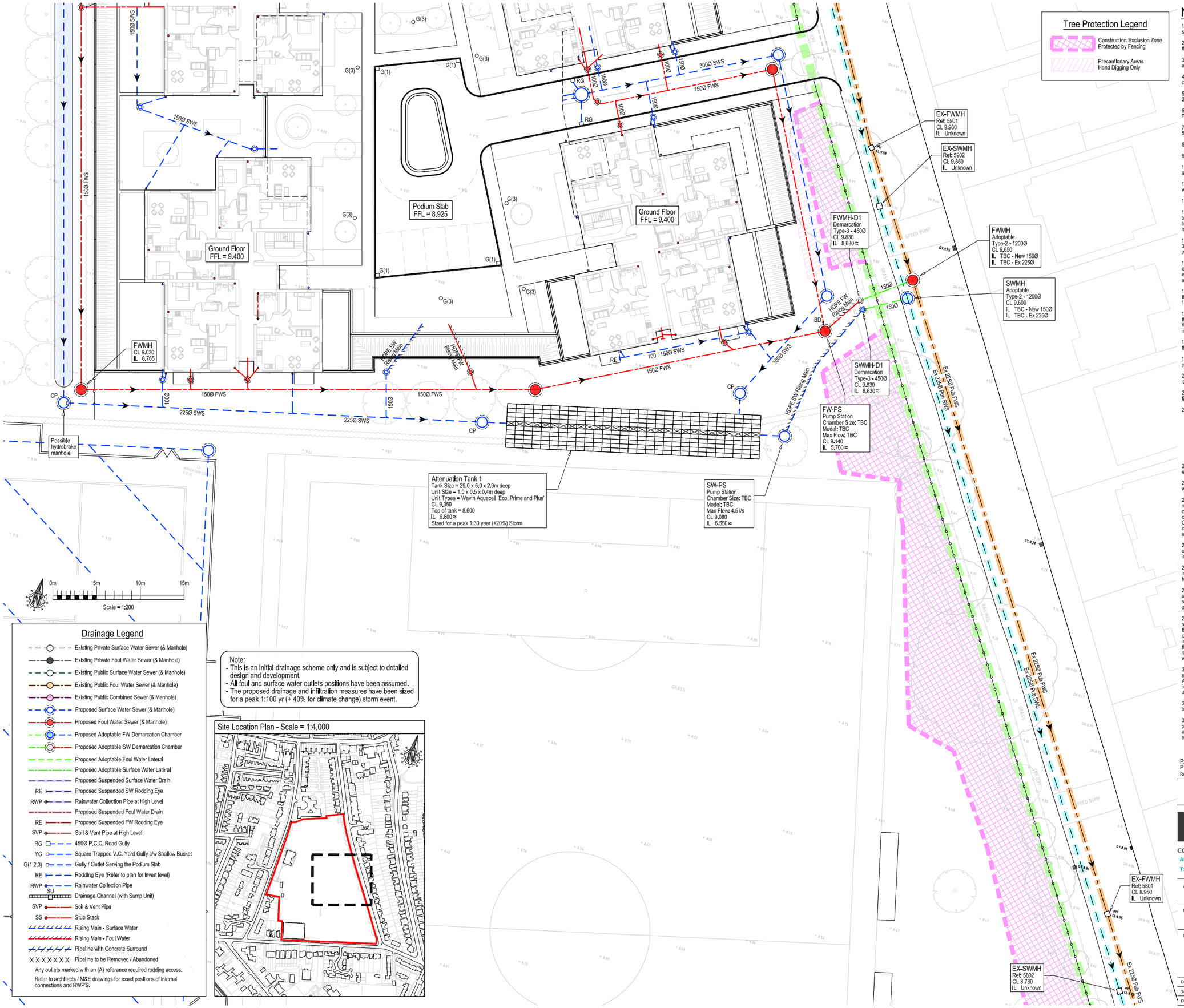
Client. Quantum Land and Property Limited

Project Title. Former ICL Private Ground

Drawing Title. **Proposed Drainage Plan Area 1 - Plot A and GP Surgery Sheet 2 of 3 - Ground Floor**

Drawn by	GEB	Project No.	Drwg No. [Rev]
Scale	1:200	3336	006 P2
Date	Jun' 17		



Tree Protection Legend

- Construction Exclusion Zone Protected by Fencing
- Precautionary Areas Hand Digging Only

Drainage Legend

- Exlstlng Private Surface Water Sewer (& Manhole)
- Exlstlng Private Foul Water Sewer (& Manhole)
- Existing Public Surface Water Sewer (& Manhole)
- Existing Public Foul Water Sewer (& Manhole)
- Existing Public Combined Sewer (& Manhole)
- Proposed Surface Water Sewer (& Manhole)
- Proposed Foul Water Sewer (& Manhole)
- Proposed Adoptable FW Demarcation Chamber
- Proposed Adoptable SW Demarcation Chamber
- Proposed Adoptable Foul Water Lateral
- Proposed Adoptable Surface Water Lateral
- Proposed Suspended Surface Water Drain
- RE — Proposed Suspended SW Rodding Eye
- RWP — Rainwater Collection Pipe at High Level
- Proposed Suspended Foul Water Drain
- RE — Proposed Suspended FW Rodding Eye
- SVP — Soil & Vent Pipe at High Level
- RG — 450Ø P.C.C. Road Gully
- YG — Square Trapped V.C. Yard Gully c/w Shallow Bucket
- G(1,2,3) — Gully / Outlet Serving the Podium Slab
- RE — Roddlng Eye (Refer to plan for Invert level)
- RWP — Rainwater Collection Pipe
- SU — Drainage Channel (with Sump Unit)
- SVP — Soil & Vent Pipe
- SS — Stub Stack
- Rising Main - Surface Water
- RIsing Main - Foul Water
- Pipeline with Concrete Surround
- XXXXXX Pipeline to be Removed / Abandoned

Any outlets marked with an (A) referance required rodding access.
Refer to archltects / M&E drawlngs for exact posltlons of Internal connections and RWP'S.

Note:
- This is an initial drainage scheme only and is subject to detailed design and development.
- All foul and surface water outlets positions have been assumed.
- The proposed drainage and infiltration measures have been sized for a peak 1:100 yr (+ 40% for climate change) storm event.

Site Location Plan - Scale = 1:4,000

Notes:

1. This drawing is to be read in conjunction with all relevant architects, engineers and specialist sub-contractors drawings and the specification.
2. All setting out to be in accordance with the schedules, any discrepancies between the engineers and the architects drawings to be referred to the architect before proceeding. Dimensions must not be scaled.
3. All private drainage is to be in accordance with BS EN 752-1-2-3-4, BS EN 1295-1, BS EN 1610 and all relevant sections of approved document H of the building regulations (2002 Edition).
4. All adoptable drainage is to be in accordance with 'Sewers for Adoption 7th Edition' - a design and construction guide for developers and the local highway authority requirements where appropriate.
5. Where drainage pipework is to be flexibly jointed extra strength vitrified clay it should be to BS EN 295-1, Hepworth 'Supersleve' or equivalent.
6. Where drainage pipework is plastic i.e. PVC-U it shall be to BS EN 1401-1 Osma or equivalent. Private pipework to be type SN4 and all adoptable pipework to be type SN8.
7. All concrete pipework, shall be to BS EN 1916 and BS 5911-1. Manholes and fittings shall be to BS 5911 parts 3 and 4 and BS EN 1917.
8. All materials for adoptable drainage are to be Kitemarked as appropriate.
9. All adoptable manhole covers are to be badged as appropriate i.e. 'FW' or 'SW'.
10. Rising main trench to have warning tape fitted. Allow for 1.0m of tape coiled inside the pump chamber at the upstream end of the rising main.
11. Where drains pass through foundations or connect to manholes, flexible pipe joints are to be provided within 150mm of the face of the structure and within a further 600mm to form a rocker pipe.
12. Where pipes pass through screen walls, footings or retaining walls, lintels are to be provided.
13. Where pipelines pass within 1.0m of buildings or walls the foundations are to be taken down below the bottom of the trench. Where pipelines are more than 1.0m away from foundations the trench shall be backfilled with concrete up to a point that meets a 45° angle line taken from the bottom corner of the nearest foundation.
14. Where depth to Invert does not exceed 600mm and the pipe size does not exceed 100mm diameter, 300mm dia. polypropylene access chambers may be used. Elsewhere, proprietary polypropylene or precast concrete manholes are to be used,
15. Where connections are to be made to existing manholes / sewers, invert levels, pipe sizes and orientation should be checked prior to the commencement of the works and any variance reported to the engineer immediately. Where connections are to be made on or off site the contractor is to check the line and level of any services / mains, to ensure that no clashes exist prior to works commencing.
16. Where pipelines cross, each is to be surrounded with grade ST4 mass concrete for a distance not less than 1.0m centred on the crossing point. Length of surround to be extended as necessary to within 150mm of the next nearest flexible joints.
17. For adoptable drainage, a reinforced concrete cover slab is to be provided where the effective cover to the crown of the adopted pipe(s) is less than 0.9m in verges or 1.2m in carriageways and / or footpaths. Where effective cover is 1.0m or less in carriageways and / or footpaths, pipework will need to be ductile iron (ie, Stanton Pam St, Gobain type "Integral").
18. For private drainage, concrete protection is to be provided where the effective cover to the crown of the pipe(s) is less than 1.2m in trafficked areas and 0.6m in soft landscaped or pedestrianised areas.
19. 'Effective cover' is the minimum depth of cover over the pipe crown at any time during the construction process.
20. All adopted foul drainage to be located a minimum of 1.2m finished depth to soffit. Unless specifically identified as otherwise with relevant protective measures.
21. The contractor is to ensure that protective measures are taken to ensure that drainage pipework and fittings are not damaged by site traffic prior to oversite filling operations being completed around buildings.
22. Chamber annotation references are as follows:
    - AC - Denotes a polypropylene or vitrified clay access chamber, depth not exceeding 600mm, diameter not exceeding 300mm.
    - IC - Denotes a polypropylene Inspection chamber, depth not exceeding 3.0m, diameter not exceeding 600mm, Standard diameter 450mm unless specified otherwise.
    - MH - Denotes a manholes constructed from either brick, polypropylene or P.C.C. sections. Chamber depth to be in excess of 1.2m.
    - CP - Denotes a catchpit chamber.

    Annotations are indicative only and final depths are to be checked on site prior to Installation.
23. The top run of each private foul drainage network is to be laid to falls no slacker than 1:40, the head of each run is to be vented to atmosphere in accordance with approved document H.
24. All surface water drainage to be min 100mm dia. laid at a gradient no slacker than 1/80. And all foul water drainage to be min 100mm dia. unless stated otherwise.
25. The contractor is to ensure that all pipework connections are arranged to direct flows down or into the main channel in the direction of the main flow. Where necessary 3/4 bends are to be used on oblique connections inside the manhole benching where sufficient room exists or the pipelines on oblique connections are arranged outside the chamber to be able to divert flows down the main channel. Connections brought in perpendicular to the main channel are not acceptable. Where possible the main channel flow shall be from any connections with WC's to ensure a flush through the main channel is achieved.
26. The contractor is to ensure that when preformed polypropylene manhole bases are used that they are orientated such that the main flow is through the main channel of the base, this should be achieved by incorporating long radius bends outside of the manhole.
27. Any connection into a public sewer is to be inspected by the local water authority and carried out fully in accordance with their requirements. The contractor is to allow for obtaining the appropriate 'connection to a public sewer' forms and paying all necessary fees.
28. The contractor is to allow for obtaining the appropriate road opening licences from the local highway authority and paying all necessary fees for any works associated with off-site sewer connections. All reinstatement works within the public highway are to be carried out in accordance with the requirements of the local highway authority.
29. Package pumping station(s) to be 'a specialist design element' or equivalent. For installation guidance refer to manufacturer's specification. Any vent pipe to be taken to a position agreed with the architect. A three phase electricity supply is required to provide power to the control panel of the pumping station. The control panel, if external, is to be located inside a kiosk within close proximity of the pumping station. If internally located within a building, the control panel may be positioned on a wall. Localised re-grading of the ground around the pumping station may be required to accommodate new levels. An informative notice plaque should be located on or near the control panel stating 'In the event of the alarm sounding or warning light flashing please contact the number below 'insert contact telephone number'.
30. Drainage channel(s) to be 'Aco' or equivalent. For installation guidance refer to the manufacturer's specification. Refer to landscape architects details for surfacing treatments around units where applicable. All drainage channels are to be constructed with in-built falls where possible. Relevant units are to be incorporated to provide the necessary length of channel gradient from the head of the run to the sump unit.
31. Modular crate attenuation tank system(s) to be 'Wavin Aquacell'. Size, unit types and arrangement to be confirmed.
32. Permeable paving to be to 'The architects specification'. It is intended to use the permeable paved parking areas as either a Type B or a Type C system, A 'Type B' system provide collection, attenuation and partial infiltration while a 'Type C' system will provide collection and attenuation only. This will be subject to detailed design and on-site infiltration testing.

Rev.	Date	Description	Issued By
P2	14.07.17	Issued for Planning Approval	GEB
P1	15.06.17	Drawn	GEB

Planning

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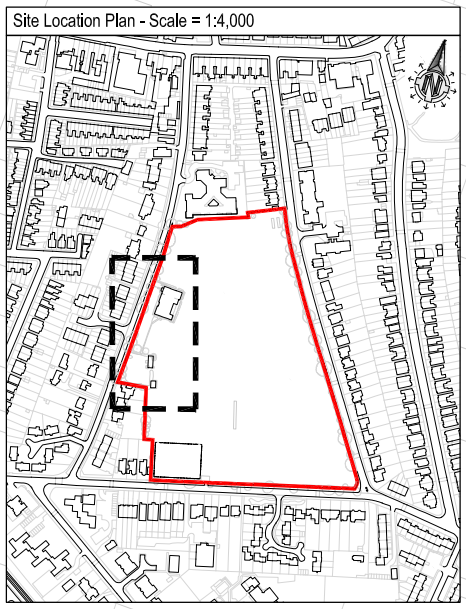
Client: **Quantum Land and Property Limited**

Project Title: **Former ICL Private Ground**

Drawing Title: **Proposed Drainage Plan**
Area 1 - Plot A and GP Surgery
Sheet 3 of 3 - Off Site Connections

Drawn by	GEB	Project No.	Drwg No. [Rev]
Scale	1:200	3336	007 P2
Date	May' 17		



EX-FWMH
Ref: 3904
CL 8.800
IL 6.280

Permeable Paving
System B/C, subject to on site infiltration tests and detailed design. See note 32.

100Ø SWS

CP

EX-FWMH
CL 9.270
IL 7.730

Ground Floor
FFL = 9.600

EX-SWMH
Ref: 3803
CL 8.830
IL 5.730

EX-SWMH
CL 9.240
IL 8.070

100Ø FWS

Possible hydrobrake manhole

EX-FWMH
Ref: 3805
CL Unknown
IL Unknown

SW Ditch / Swale - Area 2
Size and profile of ditch subject to detailed design. Approximate grade 1:400.
both ditches in this area will need to provide a minimum of 31.4m³ of combined storage for the additional flows generated by a peak 1:100 yr +40% storm

150Ø FWS

150Ø SWS

SWMH
Hydrobrake
Chamber Size: TBC
Model: TBC
Max Flow: 3.0 l/s
CL 9.300
IL 7.750

Attenuation Tank 2
Tank Size = 10.0 x 6.0 x 0.8m deep
Unit Size = 1.0 x 0.5 x 0.4m deep
Unit Types = Wavin Aquacell 'Eco, and Plus'
CL 9.300
Top of tank = 8.600
IL 7.800
Sized for a peak 1:30 year (+20%) Storm

New 150Ø FW Lateral

New 150Ø SW Lateral

EX-SWMH
Ref: 3801
CL Unknown
IL Unknown

SWMH-D2
Demarcation
Type-3 - 450Ø
CL 9.400
IL 7.500≈

FWMH-D2
Demarcation
Type-3 - 450Ø
CL 9.400
IL TBC

Ex 300Ø Pub SWS

Ex 225Ø Pub FWS

Ex 300Ø Pub SWS

Ex 225Ø Pub FWS

0m 5m 10m 15m
Scale = 1:200

Notes:

1. This drawing is to be read in conjunction with all relevant architects, engineers and specialist sub-contractors drawings and the specification.

2. All setting out to be in accordance with the schedules. any discrepancies between the engineers and the architects drawings to be referred to the architect before proceeding. Dimensions must not be scaled.

3. All private drainage is to be in accordance with BS EN 752-1-2-3-4, BS EN 1295-1, BS EN 1610 and all relevant sections of approved document H of the building regulations (2002 Edition).

4. All adoptable drainage is to be in accordance with 'Sewers for Adoption 7th Edition' - a design and construction guide for developers and the local highway authority requirements where appropriate.

5. Where drainage pipework is to be flexibly jointed extra strength vitrified clay it should be to BS EN 295-1, Hepworth 'Supersleve' or equivalent.

6. Where drainage pipework is plastic i.e. PVC-U it shall be to BS EN 1401-1 Osma or equivalent. Private pipework to be type SN4 and all adoptable pipework to be type SN8.

7. All concrete pipework, shall be to BS EN 1916 and BS 5911-1. Manholes and fittings shall be to BS 5911 parts 3 and 4 and BS EN 1917.

8. All materials for adoptable drainage are to be Kitemarked as appropriate.

9. All adoptable manhole covers are to be badged as appropriate i.e. 'FW' or 'SW'.

10. Rising main trench to have warning tape fitted. Allow for 1.0m of tape coiled inside the pump chamber at the upstream end of the rising main.

11. Where drains pass through foundations or connect to manholes, flexible pipe joints are to be provided within 150mm of the face of the structure and within a further 600mm to form a rocker pipe.

12. Where pipes pass through screen walls, footings or retaining walls, lintels are to be provided.

13. Where pipelines pass within 1.0m of buildings or walls the foundations are to be taken down below the bottom of the trench. Where pipelines are more than 1.0m away from foundations the trench shall be backfilled with concrete up to a point that meets a 45° angle line taken from the bottom corner of the nearest foundation.

14. Where depth to invert does not exceed 600mm and the pipe size does not exceed 100mm diameter, 300mm dia. polypropylene access chambers may be used. Elsewhere, proprietary polypropylene or precast concrete manholes are to be used.

15. Where connections are to be made to existing manholes / sewers, invert levels, pipe sizes and orientation should be checked prior to the commencement of the works and any variance reported to the engineer immediately. Where connections are to be made on or off site the contractor is to check the line and level of any services / mains, to ensure that no clashes exist prior to works commencing.

16. Where pipelines cross, each is to be surrounded with grade ST4 mass concrete for a distance not less than 1.0m centred on the crossing point. Length of surround to be extended as necessary to within 150mm of the next nearest flexible joints.

17. For adoptable drainage, a reinforced concrete cover slab is to be provided where the effective cover to the crown of the adopted pipe(s) is less than 0.9m in verges or 1.2m in carriageways and / or footpaths. Where effective cover is 1.0m or less in carriageways and / or footpaths, pipework will need to be ductile iron (ie. Stanton Pam St. Gobain type "Integral").

18. For private drainage, concrete protection is to be provided where the effective cover to the crown of the pipe(s) is less than 1.2m in trafficked areas and 0.6m in soft landscaped or pedestrianised areas.

19. 'Effective cover' is the minimum depth of cover over the pipe crown at any time during the construction process.

20. All adopted foul drainage to be located a minimum of 1.2m finished depth to soffit. Unless specifically identified as otherwise with relevant protective measures.

21. The contractor is to ensure that protective measures are taken to ensure that drainage pipework and fittings are not damaged by site traffic prior to oversite filling operations being completed around buildings.

22. Chamber annotation references are as follows:
- AC - Denotes a polypropylene or vitrified clay access chamber, depth not exceeding 600mm, diameter not exceeding 300mm.
- IC - Denotes a polypropylene inspection chamber, depth not exceeding 3.0m, diameter not exceeding 600mm. Standard diameter 450mm unless specified otherwise.
- MH - Denotes a manholes constructed from either brick, polypropylene or P.C.C. sections. Chamber depth to be in excess of 1.2m.
- CP - Denotes a catchpit chamber.

Annotations are indicative only and final depths are to be checked on site prior to installation.

23. The top run of each private foul drainage network is to be laid to falls no slacker than 1:40, the head of each run is to be vented to atmosphere in accordance with approved document H.

24. All surface water drainage to be min 100mm dia, laid at a gradient no slacker than 1/80. And all foul water drainage to be min 100mm dia, unless stated otherwise.

25. The contractor is to ensure that all pipework connections are arranged to direct flows down or into the main channel in the direction of the main flow. Where necessary 3/4 bends are to be used on oblique connections inside the manhole benching where sufficient room exists or the pipelines on oblique connections are arranged outside the chamber to be able to divert flows down the main channel. Connections brought in perpendicular to the main channel are not acceptable. Where possible the main channel flow shall be from any connections with WC's to ensure a flush through the main channel is achieved.

26. The contractor is to ensure that when preformed polypropylene manhole bases are used that they are orientated such that the main flow is through the main channel of the base. this should be achieved by incorporating long radius bends outside of the manhole.

27. Any connection into a public sewer is to be inspected by the local water authority and carried out fully in accordance with their requirements. The contractor is to allow for obtaining the appropriate 'connection to a public sewer' forms and paying all necessary fees.

28. The contractor is to allow for obtaining the appropriate road opening licences from the local highway authority and paying all necessary fees for any works associated with off-site sewer connections. All reinstatement works within the public highway are to be carried out in accordance with the requirements of the local highway authority.

29. Package pumping station(s) to be 'a specialist design element' or equivalent. For installation guidance refer to manufacturer's specification. Any vent pipe to be taken to a position agreed with the architect. A three phase electricity supply is required to provide power to the control panel of the pumping station. The control panel, if external, is to be located inside a kiosk within close proximity of the pumping station. If internally located within a building, the control panel may be positioned on a wall. Localised re-grading of the ground around the pumping station may be required to accommodate new levels. An informative notice plaque should be located on or near the control panel stating 'in the event of the alarm sounding or warning light flashing please contact the number below 'Insert contact telephone number'.

30. Drainage channel(s) to be 'Aco' or equivalent. For installation guidance refer to the manufacturer's specification. Refer to landscape architects details for surfacing treatments around units where applicable. All drainage channels are to be constructed with in-built falls where possible. Relevant units are to be incorporated to provide the necessary length of channel gradient from the head of the run to the sump unit.

31. Modular crate attenuation tank system(s) to be 'Wavin Aquacell', Size, unit types and arrangement to be confirmed.

32. Permeable paving to be to 'The architects specification'. It is intended to use the permeable paved parking areas as either a Type B or a Type C system. A 'Type B' system provide collection, attenuation and partial infiltration while a 'Type C' system will provide collection and attenuation only. This will be subject to detailed design and on-site infiltration testing.

Note:
- This is an initial drainage scheme only and is subject to detailed design and development.
- All foul and surface water outlets positions have been assumed.
- The proposed drainage and infiltration measures have been sized for a peak 1:100 yr (+ 40% for climate change) storm event.

Tree Protection Legend

Construction Exclusion Zone Protected by Fencing

Precautionary Areas Hand Digging Only

Drainage Legend

- Existing Private Surface Water Sewer (& Manhole)
- Existing Private Foul Water Sewer (& Manhole)
- Existing Public Surface Water Sewer (& Manhole)
- Existing Public Foul Water Sewer (& Manhole)
- Existing Public Combined Sewer (& Manhole)
- Proposed Surface Water Sewer (& Manhole)
- Proposed Foul Water Sewer (& Manhole)
- Proposed Adoptable FW Demarcation Chamber
- Proposed Adoptable SW Demarcation Chamber
- Proposed Adoptable Foul Water Lateral
- Proposed Adoptable Surface Water Lateral
- Proposed Suspended Surface Water Drain
- RE Proposed Suspended SW Rodding Eye
- RWP Rainwater Collection Pipe at High Level
- Proposed Suspended Foul Water Drain
- RE Proposed Suspended FW Rodding Eye
- SVP Soil & Vent Pipe at High Level
- RG 450Ø P.C.C. Road Gully
- YG Square Trapped V.C. Yard Gully c/w Shallow Bucket
- G(1,2,3) Gully / Outlet Serving the Podium Slab
- RE Rodding Eye (Refer to plan for invert level)
- RWP Rainwater Collection Pipe
- SU Drainage Channel (with Sump Unit)
- SVP Soil & Vent Pipe
- SS Stub Stack
- Rising Main - Surface Water
- Rising Main - Foul Water
- Pipeline with Concrete Surround
- XXXXXX Pipeline to be Removed / Abandoned

Any outlets marked with an (A) reference required rodding access.
Refer to architects / M&E drawings for exact positions of internal connections and RWP'S.

Rev.	Date	Description	Issued By
P2	14.07.17	Issued for Planning Approval	GEB
P1	15.06.17	Drawn	GEB

Planning

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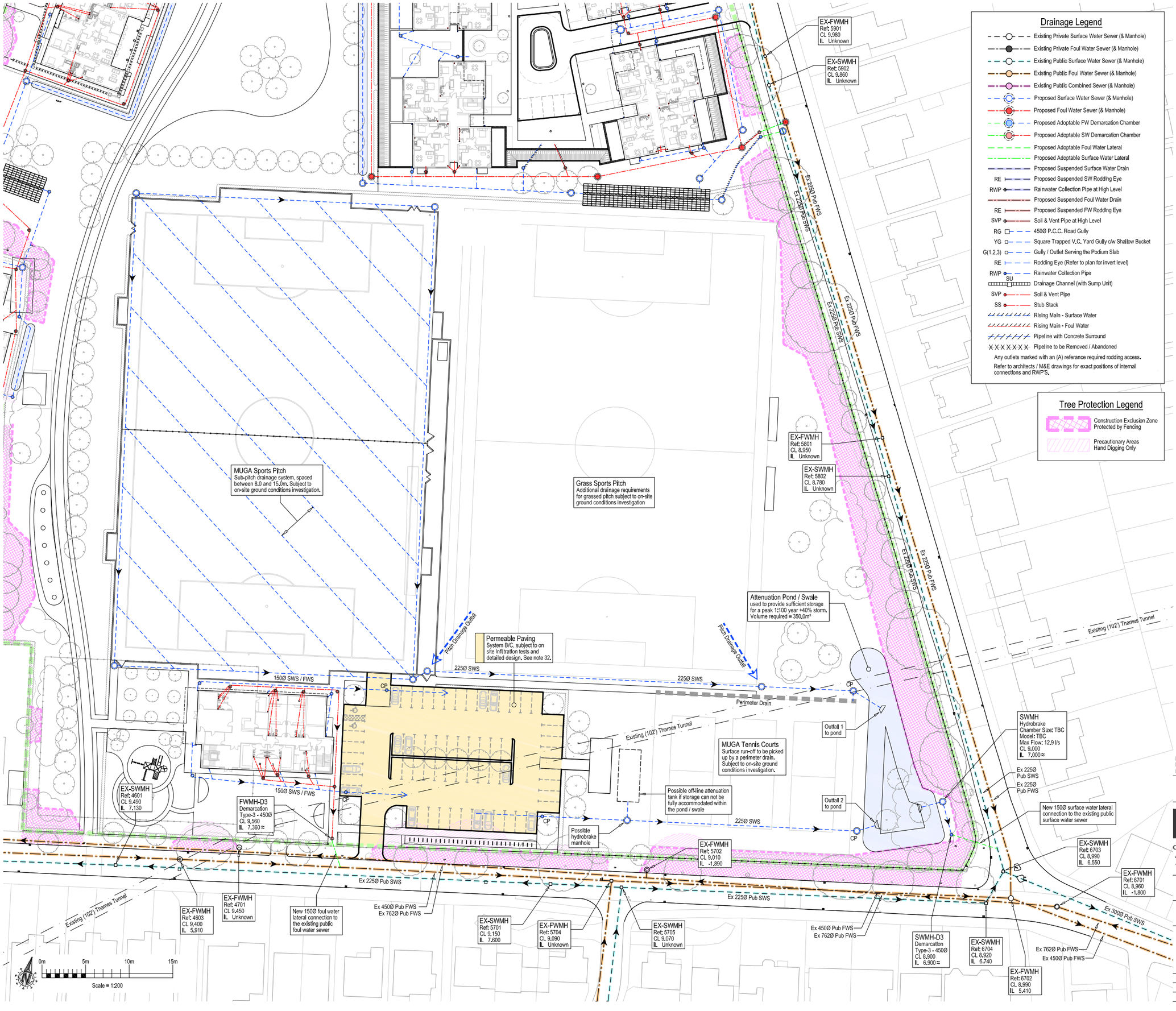
Client.
Quantum Land and Property Limited

Project Title.
Former ICL Private Ground

Drawing Title.
Proposed Drainage Plan
Area 2 - Plots B and C

Drawn by	GEB	Project No.	Drwg No. [Rev]
Scale	1:200	3336	008 P2
Date	Jun' 17		



Drainage Legend

- Existing Private Surface Water Sewer (& Manhole)
- Existing Private Foul Water Sewer (& Manhole)
- Existing Public Surface Water Sewer (& Manhole)
- Existing Public Foul Water Sewer (& Manhole)
- Existing Public Combined Sewer (& Manhole)
- Proposed Surface Water Sewer (& Manhole)
- Proposed Foul Water Sewer (& Manhole)
- Proposed Adoptable FW Demarcation Chamber
- Proposed Adoptable SW Demarcation Chamber
- Proposed Adoptable Foul Water Lateral
- Proposed Adoptable Surface Water Lateral
- Proposed Suspended Surface Water Drain
- RE — Proposed Suspended SW Rodding Eye
- RWP — Rainwater Collection Pipe at High Level
- Proposed Suspended Foul Water Drain
- RE — Proposed Suspended FW Rodding Eye
- SVP — Soil & Vent Pipe at High Level
- RG — 450Ø P.C.C. Road Gully
- YG — Square Trapped V.C. Yard Gully c/w Shallow Bucket
- G(1,2,3) — Gully / Outlet Serving the Podium Slab
- RE — Rodding Eye (Refer to plan for invert level)
- RWP — Rainwater Collection Pipe
- SU — Drainage Channel (with Sump Unit)
- SVP — Soil & Vent Pipe
- SS — Stub Stack
- Rising Main - Surface Water
- Rising Main - Foul Water
- Pipeline with Concrete Surround
- Pipeline to be Removed / Abandoned

Any outlets marked with an (A) reference required rodding access.
Refer to architects / M&E drawings for exact positions of internal connections and RWP's.

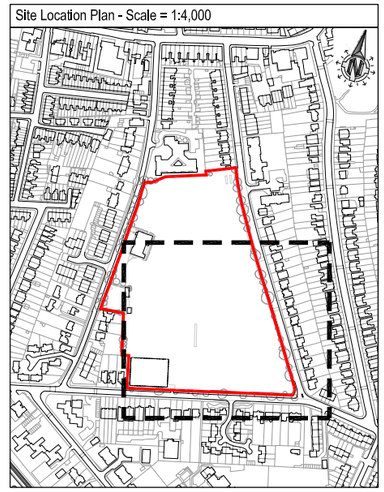
Tree Protection Legend

- Construction Exclusion Zone Protected by Fencing
- Precautionary Areas Hand Digging Only

Notes:

1. This drawing is to be read in conjunction with all relevant architects, engineers and specialist sub-contractors drawings and the specification.
2. All setting out to be in accordance with the schedules. any discrepancies between the engineers and the architects drawings to be referred to the architect before proceeding. Dimensions must not be scaled.
3. Refer to drawing JB-3336-007 or 008 for the full list of drainage notes.

Site Location Plan - Scale = 1:4,000



Note:
- This is an initial drainage scheme only and is subject to detailed design and development.
- All foul and surface water outlets positions have been assumed.
- The proposed drainage and infiltration measures have been sized for a peak 1:100 yr (+ 40% for climate change) storm event.

Rev.	Date	Description	Issued By
P2	14.07.17	Issued for Planning Approval	GEB
P1	15.06.17	Drawn	GEB

Planning

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Client.
Quantum Land and Property Limited

Project Title.
Former ICL Private Ground

Drawing Title.
Proposed Drainage Plan Area 3 - Sports Pitches and Leisure Facility

Drawn by	GEB	Project No.	Drwg No. [Rev]
Scale	1:400	3336	009 P2
Date	May' 17		

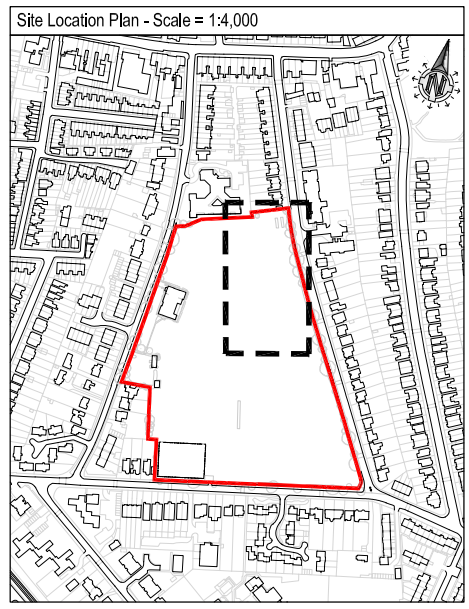
0m 5m 10m 15m

Scale = 1:200

Notes:

1. This drawing is to be read in conjunction with all relevant architects, engineers and specialist sub-contractors drawings and the specification.
2. All setting out to be in accordance with the schedules. any discrepancies between the engineers and the architects drawings to be referred to the architect before proceeding. Dimensions must not be scaled.
3. Refer to drawing JB-3336-007 or 008 for the full list of drainage notes.

Site Location Plan - Scale = 1:4,000



Permeable Paving
Premeable paved parking spaces. System Type B or Type C to be used, subject to on-site Infiltration tests and detailed design.

Ground Floor FFL = 9.400

New access road to be suitably spanned over the established tree protection - precautionary areas. Refer to drawing JB-3336-055 for sections and details.

Podium Slab FFL = 8.925

Levels Legend

10.000 - Existing Ground Levels

10.000 - Proposed Ground Levels

Tree Protection Legend

Construction Exclusion Zone Protected by Fendng

Precautionary Areas Hand Digging Only

Rev.	Date	Description	Issued By
P2	14.07.17	Issued for Planning Approval	GEB
P1	19.06.17	Drawn	GEB

Planning

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Client.
Quantum Land and Property Limited

Project Title.
Former ICL Private Ground

Drawing Title.
Proposed External Levels Plan Area 1 - Plot A and GP Surgery

Drawn by	GEB	Project No.	Drwg No. [Rev]
Scale	1:200	3336	015 P2
Date	Jun' 17		

Appendix F

Microdrainage Calculations for Surface Water

Summary of Results for 30 year Return Period (+20%)

Half Drain Time : 679 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	7.449	0.849	0.0	2.0	2.0	116.9	O K
30 min Summer	7.688	1.088	0.0	2.6	2.6	149.9	O K
60 min Summer	7.924	1.324	0.0	3.1	3.1	182.3	O K
120 min Summer	8.140	1.540	0.0	3.6	3.6	212.2	O K
180 min Summer	8.246	1.646	0.0	3.8	3.8	226.8	O K
240 min Summer	8.304	1.704	0.0	3.9	3.9	234.7	O K
360 min Summer	8.353	1.753	0.0	4.1	4.1	241.5	O K
480 min Summer	8.366	1.766	0.0	4.1	4.1	243.3	O K
600 min Summer	8.374	1.774	0.0	4.1	4.1	244.3	O K
720 min Summer	8.377	1.777	0.0	4.1	4.1	244.8	O K
960 min Summer	8.374	1.774	0.0	4.1	4.1	244.4	O K
1440 min Summer	8.341	1.741	0.0	4.0	4.0	239.8	O K
2160 min Summer	8.265	1.665	0.0	3.9	3.9	229.3	O K
2880 min Summer	8.182	1.582	0.0	3.7	3.7	217.9	O K
4320 min Summer	8.027	1.427	0.0	3.3	3.3	196.6	O K
5760 min Summer	7.897	1.297	0.0	3.0	3.0	178.6	O K
7200 min Summer	7.789	1.189	0.0	2.8	2.8	163.8	O K
8640 min Summer	7.700	1.100	0.0	2.6	2.6	151.5	O K
10080 min Summer	7.623	1.023	0.0	2.4	2.4	141.0	O K
15 min Winter	7.551	0.951	0.0	2.3	2.3	131.0	O K
30 min Winter	7.820	1.220	0.0	2.9	2.9	168.0	O K
60 min Winter	8.084	1.484	0.0	3.5	3.5	204.5	O K
120 min Winter	8.330	1.730	0.0	4.0	4.0	238.3	O K
180 min Winter	8.451	1.851	0.0	4.3	4.3	254.9	O K
240 min Winter	8.517	1.917	0.0	4.4	4.4	264.1	O K
360 min Winter	8.580	1.980	0.0	4.5	4.5	272.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	93.738	0.0	94.7	26
30 min Summer	60.530	0.0	120.5	41
60 min Summer	37.349	0.0	184.2	70
120 min Summer	22.370	0.0	219.0	126
180 min Summer	16.404	0.0	239.7	184
240 min Summer	13.109	0.0	254.5	242
360 min Summer	9.533	0.0	275.8	360
480 min Summer	7.603	0.0	291.5	426
600 min Summer	6.375	0.0	303.7	484
720 min Summer	5.519	0.0	313.5	544
960 min Summer	4.393	0.0	328.3	674
1440 min Summer	3.182	0.0	345.2	952
2160 min Summer	2.302	0.0	420.2	1364
2880 min Summer	1.829	0.0	444.5	1760
4320 min Summer	1.321	0.0	469.3	2552
5760 min Summer	1.048	0.0	510.2	3336
7200 min Summer	0.876	0.0	532.7	4104
8640 min Summer	0.756	0.0	551.8	4840
10080 min Summer	0.667	0.0	568.4	5552
15 min Winter	93.738	0.0	105.5	26
30 min Winter	60.530	0.0	134.4	40
60 min Winter	37.349	0.0	205.5	68
120 min Winter	22.370	0.0	244.4	124
180 min Winter	16.404	0.0	267.7	180
240 min Winter	13.109	0.0	284.2	238
360 min Winter	9.533	0.0	308.1	350

Summary of Results for 30 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	8.598	1.998	0.0	4.5	4.5	275.2	O K
600 min Winter	8.594	1.994	0.0	4.5	4.5	274.6	O K
720 min Winter	8.594	1.994	0.0	4.5	4.5	274.7	O K
960 min Winter	8.577	1.977	0.0	4.5	4.5	272.4	O K
1440 min Winter	8.508	1.908	0.0	4.4	4.4	262.8	O K
2160 min Winter	8.380	1.780	0.0	4.1	4.1	245.2	O K
2880 min Winter	8.255	1.655	0.0	3.8	3.8	227.9	O K
4320 min Winter	8.039	1.439	0.0	3.3	3.3	198.2	O K
5760 min Winter	7.868	1.268	0.0	3.0	3.0	174.7	O K
7200 min Winter	7.733	1.133	0.0	2.7	2.7	156.1	O K
8640 min Winter	7.624	1.024	0.0	2.4	2.4	141.0	O K
10080 min Winter	7.533	0.933	0.0	2.2	2.2	128.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	7.603	0.0	325.6	456
600 min Winter	6.375	0.0	339.2	506
720 min Winter	5.519	0.0	350.2	568
960 min Winter	4.393	0.0	366.8	720
1440 min Winter	3.182	0.0	385.7	1022
2160 min Winter	2.302	0.0	470.6	1456
2880 min Winter	1.829	0.0	496.9	1876
4320 min Winter	1.321	0.0	524.7	2684
5760 min Winter	1.048	0.0	571.4	3464
7200 min Winter	0.876	0.0	596.7	4256
8640 min Winter	0.756	0.0	618.1	5016
10080 min Winter	0.667	0.0	636.7	5752

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.200	Shortest Storm (mins)	15
Ratio R	0.420	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.676

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.420	4	8	0.093	8	12	0.163

Model Details

Storage is Online Cover Level (m) 9.080

Cellular Storage Structure

Invert Level (m) 6.600 Safety Factor 5.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	145.0	140.0	2.000	145.0	234.7	2.001	0.0	234.7

Pump Outflow Control

Invert Level (m) 6.550

Depth (m)	Flow (l/s)
2.000	4.5000

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 1122 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	7.366	0.766	0.0	1.8	1.8	178.3	O K
30 min Summer	7.593	0.993	0.0	2.3	2.3	231.2	O K
60 min Summer	7.820	1.220	0.0	2.9	2.9	283.9	O K
120 min Summer	8.035	1.435	0.0	3.3	3.3	333.9	O K
180 min Summer	8.146	1.546	0.0	3.6	3.6	359.8	O K
240 min Summer	8.213	1.613	0.0	3.7	3.7	375.3	O K
360 min Summer	8.289	1.689	0.0	3.9	3.9	393.1	O K
480 min Summer	8.327	1.727	0.0	4.0	4.0	402.1	O K
600 min Summer	8.343	1.743	0.0	4.0	4.0	405.7	O K
720 min Summer	8.346	1.746	0.0	4.0	4.0	406.3	O K
960 min Summer	8.347	1.747	0.0	4.0	4.0	406.5	O K
1440 min Summer	8.337	1.737	0.0	4.0	4.0	404.3	O K
2160 min Summer	8.301	1.701	0.0	3.9	3.9	396.0	O K
2880 min Summer	8.253	1.653	0.0	3.8	3.8	384.6	O K
4320 min Summer	8.145	1.545	0.0	3.6	3.6	359.7	O K
5760 min Summer	8.043	1.443	0.0	3.4	3.4	335.9	O K
7200 min Summer	7.951	1.351	0.0	3.2	3.2	314.3	O K
8640 min Summer	7.869	1.269	0.0	3.0	3.0	295.3	O K
10080 min Summer	7.796	1.196	0.0	2.8	2.8	278.3	O K
15 min Winter	7.458	0.858	0.0	2.0	2.0	199.8	O K
30 min Winter	7.713	1.113	0.0	2.6	2.6	259.0	O K
60 min Winter	7.967	1.367	0.0	3.2	3.2	318.2	O K
120 min Winter	8.209	1.609	0.0	3.7	3.7	374.6	O K
180 min Winter	8.335	1.735	0.0	4.0	4.0	403.9	O K
240 min Winter	8.411	1.811	0.0	4.2	4.2	421.5	O K
360 min Winter	8.499	1.899	0.0	4.4	4.4	442.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	142.068	0.0	108.0	27
30 min Summer	92.480	0.0	138.2	41
60 min Summer	57.296	0.0	244.2	70
120 min Summer	34.294	0.0	289.3	128
180 min Summer	25.069	0.0	315.0	186
240 min Summer	19.959	0.0	332.4	244
360 min Summer	14.431	0.0	356.5	362
480 min Summer	11.466	0.0	373.6	482
600 min Summer	9.585	0.0	386.1	600
720 min Summer	8.276	0.0	395.6	686
960 min Summer	6.561	0.0	408.3	790
1440 min Summer	4.722	0.0	417.4	1038
2160 min Summer	3.393	0.0	588.3	1448
2880 min Summer	2.682	0.0	607.8	1852
4320 min Summer	1.923	0.0	615.3	2680
5760 min Summer	1.517	0.0	738.2	3464
7200 min Summer	1.261	0.0	767.4	4256
8640 min Summer	1.085	0.0	784.0	5024
10080 min Summer	0.954	0.0	788.6	5760
15 min Winter	142.068	0.0	120.2	26
30 min Winter	92.480	0.0	154.0	41
60 min Winter	57.296	0.0	272.4	70
120 min Winter	34.294	0.0	322.9	126
180 min Winter	25.069	0.0	351.7	182
240 min Winter	19.959	0.0	371.1	240
360 min Winter	14.431	0.0	398.1	356

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	8.545	1.945	0.0	4.5	4.5	452.8	O K
600 min Winter	8.568	1.968	0.0	4.5	4.5	458.0	O K
720 min Winter	8.575	1.975	0.0	4.5	4.5	459.7	O K
960 min Winter	8.564	1.964	0.0	4.5	4.5	457.2	O K
1440 min Winter	8.542	1.942	0.0	4.5	4.5	451.9	O K
2160 min Winter	8.475	1.875	0.0	4.3	4.3	436.5	O K
2880 min Winter	8.394	1.794	0.0	4.1	4.1	417.6	O K
4320 min Winter	8.232	1.632	0.0	3.8	3.8	379.9	O K
5760 min Winter	8.088	1.488	0.0	3.5	3.5	346.3	O K
7200 min Winter	7.964	1.364	0.0	3.2	3.2	317.4	O K
8640 min Winter	7.857	1.257	0.0	2.9	2.9	292.6	O K
10080 min Winter	7.765	1.165	0.0	2.7	2.7	271.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	11.466	0.0	417.3	470
600 min Winter	9.585	0.0	431.3	580
720 min Winter	8.276	0.0	441.9	688
960 min Winter	6.561	0.0	456.1	876
1440 min Winter	4.722	0.0	466.3	1094
2160 min Winter	3.393	0.0	657.5	1556
2880 min Winter	2.682	0.0	679.2	1992
4320 min Winter	1.923	0.0	687.4	2856
5760 min Winter	1.517	0.0	826.8	3688
7200 min Winter	1.261	0.0	859.0	4472
8640 min Winter	1.085	0.0	876.6	5280
10080 min Winter	0.954	0.0	881.8	6056

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.200	Shortest Storm (mins)	15
Ratio R	0.420	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.676

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.420	4	8	0.093	8	12	0.163

Model Details

Storage is Online Cover Level (m) 9.080

Cellular Storage Structure

Invert Level (m) 6.600 Safety Factor 5.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	245.0	240.0	2.000	245.0	363.9	2.001	0.0	364.0

Pump Outflow Control

Invert Level (m) 6.550

Depth (m)	Flow (l/s)
2.000	4.5000

Summary of Results for 30 year Return Period (+20%)

Half Drain Time : 131 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.257	0.457	0.0	3.0	3.0	26.0	O K
30 min Summer	8.366	0.566	0.0	3.0	3.0	32.3	O K
60 min Summer	8.439	0.639	0.0	3.0	3.0	36.4	O K
120 min Summer	8.448	0.648	0.0	3.0	3.0	36.9	O K
180 min Summer	8.424	0.624	0.0	3.0	3.0	35.6	O K
240 min Summer	8.396	0.596	0.0	3.0	3.0	34.0	O K
360 min Summer	8.341	0.541	0.0	3.0	3.0	30.8	O K
480 min Summer	8.283	0.483	0.0	3.0	3.0	27.5	O K
600 min Summer	8.223	0.423	0.0	3.0	3.0	24.1	O K
720 min Summer	8.170	0.370	0.0	3.0	3.0	21.1	O K
960 min Summer	8.079	0.279	0.0	3.0	3.0	15.9	O K
1440 min Summer	7.955	0.155	0.0	3.0	3.0	8.8	O K
2160 min Summer	7.869	0.069	0.0	2.7	2.7	3.9	O K
2880 min Summer	7.842	0.042	0.0	2.4	2.4	2.4	O K
4320 min Summer	7.820	0.020	0.0	1.8	1.8	1.1	O K
5760 min Summer	7.810	0.010	0.0	1.4	1.4	0.5	O K
7200 min Summer	7.803	0.003	0.0	1.2	1.2	0.2	O K
8640 min Summer	7.800	0.000	0.0	1.0	1.0	0.0	O K
10080 min Summer	7.800	0.000	0.0	0.9	0.9	0.0	O K
15 min Winter	8.318	0.518	0.0	3.0	3.0	29.5	O K
30 min Winter	8.444	0.644	0.0	3.0	3.0	36.7	O K
60 min Winter	8.534	0.734	0.0	3.0	3.0	41.8	O K
120 min Winter	8.557	0.757	0.0	3.0	3.0	43.2	O K
180 min Winter	8.525	0.725	0.0	3.0	3.0	41.3	O K
240 min Winter	8.490	0.690	0.0	3.0	3.0	39.3	O K
360 min Winter	8.413	0.613	0.0	3.0	3.0	35.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	93.738	0.0	28.6	18
30 min Summer	60.530	0.0	37.0	32
60 min Summer	37.349	0.0	45.6	62
120 min Summer	22.370	0.0	54.7	112
180 min Summer	16.404	0.0	60.2	142
240 min Summer	13.109	0.0	64.1	174
360 min Summer	9.533	0.0	69.9	244
480 min Summer	7.603	0.0	74.3	314
600 min Summer	6.375	0.0	78.0	374
720 min Summer	5.519	0.0	81.0	436
960 min Summer	4.393	0.0	85.9	558
1440 min Summer	3.182	0.0	93.3	782
2160 min Summer	2.302	0.0	101.3	1124
2880 min Summer	1.829	0.0	107.3	1468
4320 min Summer	1.321	0.0	116.3	2200
5760 min Summer	1.048	0.0	123.0	2912
7200 min Summer	0.876	0.0	128.5	3672
8640 min Summer	0.756	0.0	133.1	0
10080 min Summer	0.667	0.0	137.1	0
15 min Winter	93.738	0.0	32.1	18
30 min Winter	60.530	0.0	41.4	32
60 min Winter	37.349	0.0	51.0	60
120 min Winter	22.370	0.0	61.2	116
180 min Winter	16.404	0.0	67.4	148
240 min Winter	13.109	0.0	71.8	186
360 min Winter	9.533	0.0	78.3	264

Summary of Results for 30 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	8.333	0.533	0.0	3.0	3.0	30.4	O K
600 min Winter	8.238	0.438	0.0	3.0	3.0	24.9	O K
720 min Winter	8.154	0.354	0.0	3.0	3.0	20.2	O K
960 min Winter	8.022	0.222	0.0	3.0	3.0	12.7	O K
1440 min Winter	7.882	0.082	0.0	2.8	2.8	4.7	O K
2160 min Winter	7.835	0.035	0.0	2.2	2.2	2.0	O K
2880 min Winter	7.820	0.020	0.0	1.8	1.8	1.1	O K
4320 min Winter	7.806	0.006	0.0	1.3	1.3	0.3	O K
5760 min Winter	7.800	0.000	0.0	1.0	1.0	0.0	O K
7200 min Winter	7.800	0.000	0.0	0.8	0.8	0.0	O K
8640 min Winter	7.800	0.000	0.0	0.7	0.7	0.0	O K
10080 min Winter	7.800	0.000	0.0	0.6	0.6	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	7.603	0.0	83.2	340
600 min Winter	6.375	0.0	87.2	408
720 min Winter	5.519	0.0	90.7	468
960 min Winter	4.393	0.0	96.2	580
1440 min Winter	3.182	0.0	104.5	792
2160 min Winter	2.302	0.0	113.5	1120
2880 min Winter	1.829	0.0	120.2	1468
4320 min Winter	1.321	0.0	130.2	2148
5760 min Winter	1.048	0.0	137.8	0
7200 min Winter	0.876	0.0	143.9	0
8640 min Winter	0.756	0.0	149.0	0
10080 min Winter	0.667	0.0	153.5	0

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.200	Shortest Storm (mins)	15
Ratio R	0.420	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.163

Time (mins) From:	To:	Area (ha)
0	4	0.163

Model Details

Storage is Online Cover Level (m) 9.300

Cellular Storage Structure

Invert Level (m) 7.800 Safety Factor 5.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	60.0	100.0	0.800	60.0	132.0	0.801	0.0	132.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0085-3000-0850-3000
Design Head (m)	0.850
Design Flow (l/s)	3.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	85
Invert Level (m)	7.750
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.850	3.0	Kick-Flo®	0.541	2.4
Flush-Flo™	0.251	3.0	Mean Flow over Head Range	-	2.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	0.800	2.9	2.000	4.5	4.000	6.2	7.000	8.0
0.200	3.0	1.000	3.2	2.200	4.7	4.500	6.5	7.500	8.3
0.300	3.0	1.200	3.5	2.400	4.8	5.000	6.8	8.000	8.6
0.400	2.9	1.400	3.8	2.600	5.0	5.500	7.2	8.500	8.8
0.500	2.6	1.600	4.0	3.000	5.4	6.000	7.5	9.000	9.0
0.600	2.6	1.800	4.2	3.500	5.8	6.500	7.7	9.500	9.3

Summary of Results for 30 year Return Period (+20%)

Half Drain Time : 131 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.257	0.457	0.0	3.0	3.0	26.0	O K
30 min Summer	8.366	0.566	0.0	3.0	3.0	32.3	O K
60 min Summer	8.439	0.639	0.0	3.0	3.0	36.4	O K
120 min Summer	8.448	0.648	0.0	3.0	3.0	36.9	O K
180 min Summer	8.424	0.624	0.0	3.0	3.0	35.6	O K
240 min Summer	8.396	0.596	0.0	3.0	3.0	34.0	O K
360 min Summer	8.341	0.541	0.0	3.0	3.0	30.8	O K
480 min Summer	8.283	0.483	0.0	3.0	3.0	27.5	O K
600 min Summer	8.223	0.423	0.0	3.0	3.0	24.1	O K
720 min Summer	8.170	0.370	0.0	3.0	3.0	21.1	O K
960 min Summer	8.079	0.279	0.0	3.0	3.0	15.9	O K
1440 min Summer	7.955	0.155	0.0	3.0	3.0	8.8	O K
2160 min Summer	7.869	0.069	0.0	2.7	2.7	3.9	O K
2880 min Summer	7.842	0.042	0.0	2.4	2.4	2.4	O K
4320 min Summer	7.820	0.020	0.0	1.8	1.8	1.1	O K
5760 min Summer	7.810	0.010	0.0	1.4	1.4	0.5	O K
7200 min Summer	7.803	0.003	0.0	1.2	1.2	0.2	O K
8640 min Summer	7.800	0.000	0.0	1.0	1.0	0.0	O K
10080 min Summer	7.800	0.000	0.0	0.9	0.9	0.0	O K
15 min Winter	8.318	0.518	0.0	3.0	3.0	29.5	O K
30 min Winter	8.444	0.644	0.0	3.0	3.0	36.7	O K
60 min Winter	8.534	0.734	0.0	3.0	3.0	41.8	O K
120 min Winter	8.557	0.757	0.0	3.0	3.0	43.2	O K
180 min Winter	8.525	0.725	0.0	3.0	3.0	41.3	O K
240 min Winter	8.490	0.690	0.0	3.0	3.0	39.3	O K
360 min Winter	8.413	0.613	0.0	3.0	3.0	35.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	93.738	0.0	28.6	18
30 min Summer	60.530	0.0	37.0	32
60 min Summer	37.349	0.0	45.6	62
120 min Summer	22.370	0.0	54.7	112
180 min Summer	16.404	0.0	60.2	142
240 min Summer	13.109	0.0	64.1	174
360 min Summer	9.533	0.0	69.9	244
480 min Summer	7.603	0.0	74.3	314
600 min Summer	6.375	0.0	78.0	374
720 min Summer	5.519	0.0	81.0	436
960 min Summer	4.393	0.0	85.9	558
1440 min Summer	3.182	0.0	93.3	782
2160 min Summer	2.302	0.0	101.3	1124
2880 min Summer	1.829	0.0	107.3	1468
4320 min Summer	1.321	0.0	116.3	2200
5760 min Summer	1.048	0.0	123.0	2912
7200 min Summer	0.876	0.0	128.5	3672
8640 min Summer	0.756	0.0	133.1	0
10080 min Summer	0.667	0.0	137.1	0
15 min Winter	93.738	0.0	32.1	18
30 min Winter	60.530	0.0	41.4	32
60 min Winter	37.349	0.0	51.0	60
120 min Winter	22.370	0.0	61.2	116
180 min Winter	16.404	0.0	67.4	148
240 min Winter	13.109	0.0	71.8	186
360 min Winter	9.533	0.0	78.3	264

Summary of Results for 30 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	8.333	0.533	0.0	3.0	3.0	30.4	O K
600 min Winter	8.238	0.438	0.0	3.0	3.0	24.9	O K
720 min Winter	8.154	0.354	0.0	3.0	3.0	20.2	O K
960 min Winter	8.022	0.222	0.0	3.0	3.0	12.7	O K
1440 min Winter	7.882	0.082	0.0	2.8	2.8	4.7	O K
2160 min Winter	7.835	0.035	0.0	2.2	2.2	2.0	O K
2880 min Winter	7.820	0.020	0.0	1.8	1.8	1.1	O K
4320 min Winter	7.806	0.006	0.0	1.3	1.3	0.3	O K
5760 min Winter	7.800	0.000	0.0	1.0	1.0	0.0	O K
7200 min Winter	7.800	0.000	0.0	0.8	0.8	0.0	O K
8640 min Winter	7.800	0.000	0.0	0.7	0.7	0.0	O K
10080 min Winter	7.800	0.000	0.0	0.6	0.6	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	7.603	0.0	83.2	340
600 min Winter	6.375	0.0	87.2	408
720 min Winter	5.519	0.0	90.7	468
960 min Winter	4.393	0.0	96.2	580
1440 min Winter	3.182	0.0	104.5	792
2160 min Winter	2.302	0.0	113.5	1120
2880 min Winter	1.829	0.0	120.2	1468
4320 min Winter	1.321	0.0	130.2	2148
5760 min Winter	1.048	0.0	137.8	0
7200 min Winter	0.876	0.0	143.9	0
8640 min Winter	0.756	0.0	149.0	0
10080 min Winter	0.667	0.0	153.5	0

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.200	Shortest Storm (mins)	15
Ratio R	0.420	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.163

Time (mins) From:	To:	Area (ha)
0	4	0.163

Model Details

Storage is Online Cover Level (m) 9.300

Cellular Storage Structure

Invert Level (m) 7.800 Safety Factor 5.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	60.0	100.0	0.800	60.0	132.0	0.801	0.0	132.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0085-3000-0850-3000
Design Head (m)	0.850
Design Flow (l/s)	3.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	85
Invert Level (m)	7.750
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.850	3.0	Kick-Flo®	0.541	2.4
Flush-Flo™	0.251	3.0	Mean Flow over Head Range	-	2.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	0.800	2.9	2.000	4.5	4.000	6.2	7.000	8.0
0.200	3.0	1.000	3.2	2.200	4.7	4.500	6.5	7.500	8.3
0.300	3.0	1.200	3.5	2.400	4.8	5.000	6.8	8.000	8.6
0.400	2.9	1.400	3.8	2.600	5.0	5.500	7.2	8.500	8.8
0.500	2.6	1.600	4.0	3.000	5.4	6.000	7.5	9.000	9.0
0.600	2.6	1.800	4.2	3.500	5.8	6.500	7.7	9.500	9.3

Summary of Results for 30 year Return Period (+20%)

Half Drain Time : 138 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.055	0.455	0.0	12.8	12.8	114.6	O K
30 min Summer	8.172	0.572	0.0	12.8	12.8	144.0	O K
60 min Summer	8.257	0.657	0.0	12.8	12.8	165.5	O K
120 min Summer	8.282	0.682	0.0	12.8	12.8	171.7	O K
180 min Summer	8.266	0.666	0.0	12.8	12.8	167.7	O K
240 min Summer	8.243	0.643	0.0	12.8	12.8	161.8	O K
360 min Summer	8.191	0.591	0.0	12.8	12.8	148.9	O K
480 min Summer	8.135	0.535	0.0	12.8	12.8	134.6	O K
600 min Summer	8.080	0.480	0.0	12.8	12.8	120.7	O K
720 min Summer	8.029	0.429	0.0	12.8	12.8	108.0	O K
960 min Summer	7.940	0.340	0.0	12.8	12.8	85.7	O K
1440 min Summer	7.813	0.213	0.0	12.8	12.8	53.6	O K
2160 min Summer	7.723	0.123	0.0	12.3	12.3	31.0	O K
2880 min Summer	7.696	0.096	0.0	10.2	10.2	24.1	O K
4320 min Summer	7.668	0.068	0.0	7.6	7.6	17.0	O K
5760 min Summer	7.652	0.052	0.0	6.1	6.1	13.1	O K
7200 min Summer	7.642	0.042	0.0	5.1	5.1	10.6	O K
8640 min Summer	7.635	0.035	0.0	4.5	4.5	8.7	O K
10080 min Summer	7.629	0.029	0.0	3.9	3.9	7.2	O K
15 min Winter	8.115	0.515	0.0	12.8	12.8	129.8	O K
30 min Winter	8.249	0.649	0.0	12.8	12.8	163.4	O K
60 min Winter	8.350	0.750	0.0	12.8	12.8	188.7	O K
120 min Winter	8.388	0.788	0.0	12.8	12.8	198.4	O K
180 min Winter	8.366	0.766	0.0	12.8	12.8	192.7	O K
240 min Winter	8.336	0.736	0.0	12.8	12.8	185.4	O K
360 min Winter	8.265	0.665	0.0	12.8	12.8	167.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	93.738	0.0	126.8	26
30 min Summer	60.530	0.0	163.8	40
60 min Summer	37.349	0.0	202.0	68
120 min Summer	22.370	0.0	242.2	120
180 min Summer	16.404	0.0	266.3	150
240 min Summer	13.109	0.0	283.7	182
360 min Summer	9.533	0.0	309.5	252
480 min Summer	7.603	0.0	329.1	318
600 min Summer	6.375	0.0	345.0	382
720 min Summer	5.519	0.0	358.4	446
960 min Summer	4.393	0.0	380.5	568
1440 min Summer	3.182	0.0	413.4	800
2160 min Summer	2.302	0.0	448.7	1128
2880 min Summer	1.829	0.0	475.2	1480
4320 min Summer	1.321	0.0	514.9	2208
5760 min Summer	1.048	0.0	544.8	2936
7200 min Summer	0.876	0.0	568.9	3672
8640 min Summer	0.756	0.0	589.3	4392
10080 min Summer	0.667	0.0	607.1	5136
15 min Winter	93.738	0.0	142.0	26
30 min Winter	60.530	0.0	183.5	40
60 min Winter	37.349	0.0	226.4	68
120 min Winter	22.370	0.0	271.2	122
180 min Winter	16.404	0.0	298.3	156
240 min Winter	13.109	0.0	317.9	192
360 min Winter	9.533	0.0	346.7	270

Summary of Results for 30 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	8.188	0.588	0.0	12.8	12.8	148.1	O K
600 min Winter	8.100	0.500	0.0	12.8	12.8	125.8	O K
720 min Winter	8.020	0.420	0.0	12.8	12.8	105.8	O K
960 min Winter	7.888	0.288	0.0	12.8	12.8	72.5	O K
1440 min Winter	7.736	0.136	0.0	12.5	12.5	34.4	O K
2160 min Winter	7.689	0.089	0.0	9.6	9.6	22.3	O K
2880 min Winter	7.668	0.068	0.0	7.7	7.7	17.2	O K
4320 min Winter	7.647	0.047	0.0	5.6	5.6	11.8	O K
5760 min Winter	7.635	0.035	0.0	4.5	4.5	8.7	O K
7200 min Winter	7.627	0.027	0.0	3.8	3.8	6.7	O K
8640 min Winter	7.621	0.021	0.0	3.2	3.2	5.2	O K
10080 min Winter	7.616	0.016	0.0	2.8	2.8	3.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	7.603	0.0	368.6	348
600 min Winter	6.375	0.0	386.6	414
720 min Winter	5.519	0.0	401.6	478
960 min Winter	4.393	0.0	426.2	594
1440 min Winter	3.182	0.0	463.0	790
2160 min Winter	2.302	0.0	502.5	1128
2880 min Winter	1.829	0.0	532.3	1480
4320 min Winter	1.321	0.0	576.7	2212
5760 min Winter	1.048	0.0	610.2	2936
7200 min Winter	0.876	0.0	637.2	3656
8640 min Winter	0.756	0.0	660.1	4400
10080 min Winter	0.667	0.0	679.9	5144

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.200	Shortest Storm (mins)	15
Ratio R	0.420	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.722

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.050	4	8	0.155	8	12	0.517

Model Details

Storage is Online Cover Level (m) 9.050

Cellular Storage Structure

Invert Level (m) 7.600 Safety Factor 5.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	265.0	265.0	0.800	265.0	317.1	0.801	0.0	317.1

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0165-1290-0850-1290
Design Head (m)	0.850
Design Flow (l/s)	12.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	165
Invert Level (m)	7.550
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.850	12.9	Kick-Flo®	0.608	11.0
Flush-Flo™	0.285	12.8	Mean Flow over Head Range	-	10.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.9	0.800	12.5	2.000	19.4	4.000	27.0	7.000	35.4
0.200	12.6	1.000	13.9	2.200	20.3	4.500	28.6	7.500	36.6
0.300	12.8	1.200	15.2	2.400	21.1	5.000	30.1	8.000	37.7
0.400	12.6	1.400	16.3	2.600	22.0	5.500	31.5	8.500	38.8
0.500	12.2	1.600	17.4	3.000	23.5	6.000	32.8	9.000	39.8
0.600	11.2	1.800	18.4	3.500	25.3	6.500	34.1	9.500	40.9

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 234 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.012	0.412	0.0	12.8	12.8	179.9	O K
30 min Summer	8.126	0.526	0.0	12.8	12.8	230.0	O K
60 min Summer	8.226	0.626	0.0	12.8	12.8	273.4	O K
120 min Summer	8.285	0.685	0.0	12.8	12.8	299.3	O K
180 min Summer	8.288	0.688	0.0	12.8	12.8	300.6	O K
240 min Summer	8.274	0.674	0.0	12.8	12.8	294.4	O K
360 min Summer	8.241	0.641	0.0	12.8	12.8	280.2	O K
480 min Summer	8.209	0.609	0.0	12.8	12.8	266.0	O K
600 min Summer	8.175	0.575	0.0	12.8	12.8	251.2	O K
720 min Summer	8.138	0.538	0.0	12.8	12.8	235.2	O K
960 min Summer	8.069	0.469	0.0	12.8	12.8	205.1	O K
1440 min Summer	7.953	0.353	0.0	12.8	12.8	154.5	O K
2160 min Summer	7.828	0.228	0.0	12.8	12.8	99.5	O K
2880 min Summer	7.754	0.154	0.0	12.6	12.6	67.2	O K
4320 min Summer	7.700	0.100	0.0	10.6	10.6	43.8	O K
5760 min Summer	7.678	0.078	0.0	8.6	8.6	34.0	O K
7200 min Summer	7.664	0.064	0.0	7.3	7.3	28.0	O K
8640 min Summer	7.654	0.054	0.0	6.3	6.3	23.7	O K
10080 min Summer	7.647	0.047	0.0	5.6	5.6	20.4	O K
15 min Winter	8.064	0.464	0.0	12.8	12.8	202.9	O K
30 min Winter	8.196	0.596	0.0	12.8	12.8	260.3	O K
60 min Winter	8.309	0.709	0.0	12.8	12.8	309.7	O K
120 min Winter	8.383	0.783	0.0	12.8	12.8	342.0	O K
180 min Winter	8.393	0.793	0.0	12.9	12.9	346.5	O K
240 min Winter	8.379	0.779	0.0	12.8	12.8	340.3	O K
360 min Winter	8.336	0.736	0.0	12.8	12.8	321.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	142.068	0.0	192.1	26
30 min Summer	92.480	0.0	250.2	41
60 min Summer	57.296	0.0	309.9	70
120 min Summer	34.294	0.0	371.1	128
180 min Summer	25.069	0.0	407.1	182
240 min Summer	19.959	0.0	432.0	214
360 min Summer	14.431	0.0	468.7	278
480 min Summer	11.466	0.0	496.4	344
600 min Summer	9.585	0.0	518.8	414
720 min Summer	8.276	0.0	537.5	480
960 min Summer	6.561	0.0	568.1	608
1440 min Summer	4.722	0.0	613.5	860
2160 min Summer	3.393	0.0	661.3	1200
2880 min Summer	2.682	0.0	696.9	1536
4320 min Summer	1.923	0.0	749.3	2216
5760 min Summer	1.517	0.0	788.3	2944
7200 min Summer	1.261	0.0	819.5	3680
8640 min Summer	1.085	0.0	845.5	4408
10080 min Summer	0.954	0.0	868.1	5144
15 min Winter	142.068	0.0	215.2	26
30 min Winter	92.480	0.0	280.2	40
60 min Winter	57.296	0.0	347.2	68
120 min Winter	34.294	0.0	415.8	126
180 min Winter	25.069	0.0	456.0	180
240 min Winter	19.959	0.0	483.9	234
360 min Winter	14.431	0.0	524.8	292

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	8.293	0.693	0.0	12.8	12.8	303.0	O K
600 min Winter	8.248	0.648	0.0	12.8	12.8	283.1	O K
720 min Winter	8.200	0.600	0.0	12.8	12.8	262.2	O K
960 min Winter	8.093	0.493	0.0	12.8	12.8	215.6	O K
1440 min Winter	7.917	0.317	0.0	12.8	12.8	138.4	O K
2160 min Winter	7.756	0.156	0.0	12.6	12.6	68.1	O K
2880 min Winter	7.706	0.106	0.0	11.0	11.0	46.3	O K
4320 min Winter	7.672	0.072	0.0	8.1	8.1	31.5	O K
5760 min Winter	7.655	0.055	0.0	6.4	6.4	24.1	O K
7200 min Winter	7.644	0.044	0.0	5.4	5.4	19.3	O K
8640 min Winter	7.636	0.036	0.0	4.6	4.6	15.9	O K
10080 min Winter	7.630	0.030	0.0	4.1	4.1	13.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	11.466	0.0	556.1	368
600 min Winter	9.585	0.0	581.1	446
720 min Winter	8.276	0.0	602.2	522
960 min Winter	6.561	0.0	636.3	662
1440 min Winter	4.722	0.0	687.2	904
2160 min Winter	3.393	0.0	740.6	1216
2880 min Winter	2.682	0.0	780.5	1528
4320 min Winter	1.923	0.0	839.3	2216
5760 min Winter	1.517	0.0	882.9	2944
7200 min Winter	1.261	0.0	917.8	3680
8640 min Winter	1.085	0.0	947.0	4416
10080 min Winter	0.954	0.0	972.2	5144

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.200	Shortest Storm (mins)	15
Ratio R	0.420	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.722

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.050	4	8	0.155	8	12	0.517