



Channel View, Cardiff

Drainage Strategy Report

Client: Cardiff City Council

Project Ref: CC2083

Report status: S1

CAMBRIA

Report Control Sheet

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1 Introduction

- 1.1.1 Cambria Consulting Ltd have been appointed by Powell Dobson Architects on behalf of Cardiff City Council to develop a Drainage Strategy Report in support of a planning and SAB application for the redevelopment of the Channel View area in Grangetown, Cardiff.
- 1.1.2 As a result of the enactment of Schedule 3 of the Flood Management Act 2010 by Welsh Government, the development will require Sustainable Urban Drainage (SuDS) approval as well as planning approval in order to be constructed.
- 1.1.3 The objectives of this report are:
- ▶ Identify suitable outfall locations for the Surface Water and Foul Water from the proposed development
 - ▶ Undertake hydraulic calculations to identify peak design flows or restrictions to the development and any subsequent attenuation requirements.
 - ▶ Consult with the SAB and Dwr Cymru Welsh Water regarding the proposals.
 - ▶ Provide a schematic layout of the proposed foul and surface water drainage proposals.
 - ▶ Demonstrate compliance with the National SuDS standards.

2 Site Description

2.1 Site Location

2.1.1 The development is located predominantly on a brownfield site, currently occupied by 188 dwellings, accessed off Channel View Road in Grangetown Cardiff. The site is bounded by the Marl to north, the Taff Trail & Cardiff Bay to the east, residential properties fronting Channel View road to the west and residential dwellings to the south fronting Constant Close, Seager Drive and Chetterton Square. The site boundary extends to South Clive Street to the south west and Ferry Road Park and Beecher Avenue to the north west. The site is centered around OS coordinates E:317994 N:173973 with a post code of CF11 7HY.

2.1.2 The site location is shown in Figure 1 below, a more detailed site location plan is included in *Appendix A*.

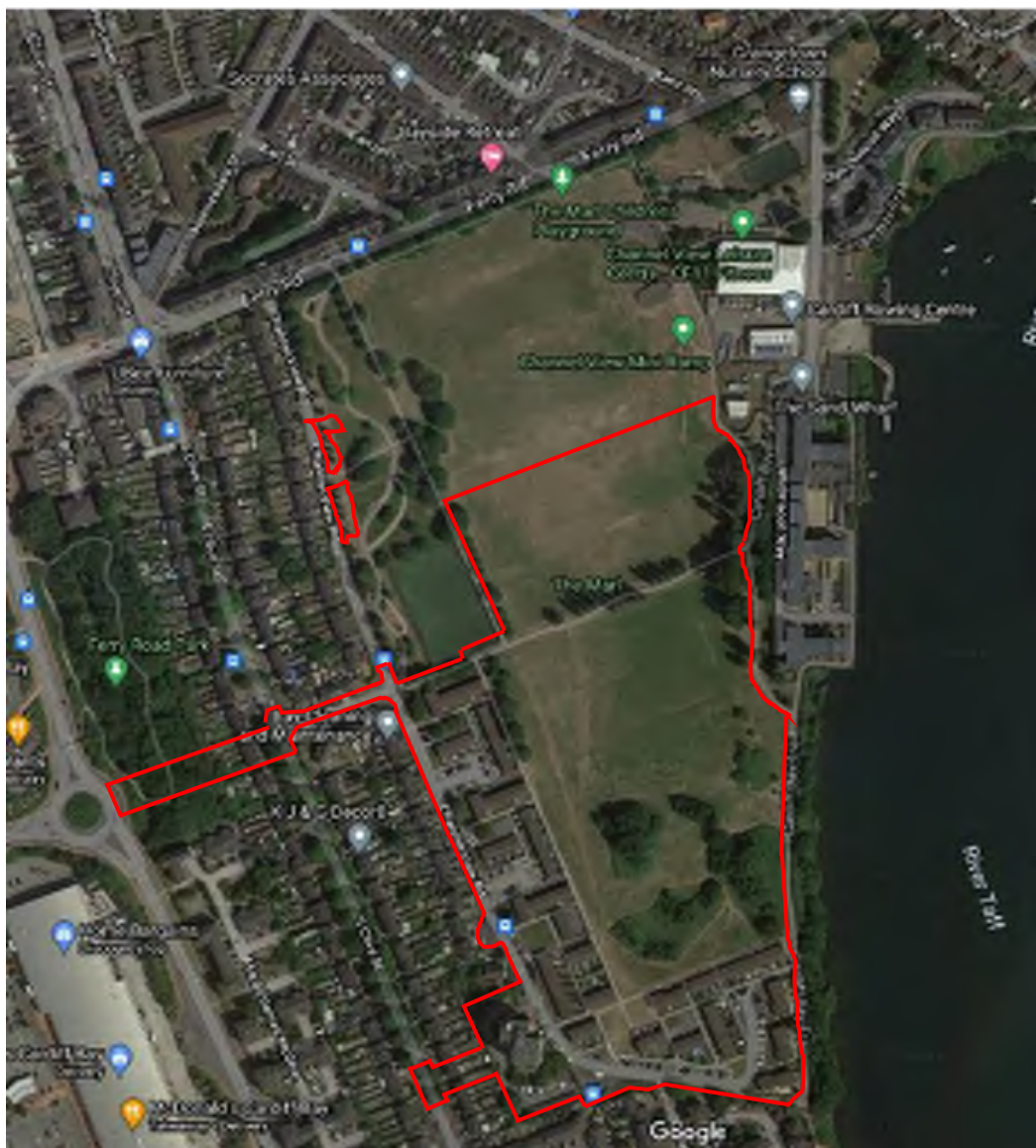


Figure 1 - Site location map (Google Earth)

2.2 Topography

- 2.2.1 A topographical survey of the site has been undertaken by 3 Point Surveys in June 2020, this extended to incorporate portions of Ferry Road and neighbouring properties along the site boundary. Due to the COVID-19 restrictions private enclosed gardens were not captured as part of the survey. A copy of the topographical survey is included in *Appendix B*.
- 2.2.2 The survey indicates the Marl falls gently from west to east from approximately 9.5mAOD to 7.8m AOD at the north section of the Taff Trail route. The northern and central sections of Channel View Road are relatively flat and are between 9.5m AOD – 9.8m AOD. Channel View Road levels then fall gradually to approximately 8.5mAOD to the south eastern corner of the site. The access road to the rear of existing 14 storey tower block and existing garages drops to around 7.9m AOD – 8m AOD.
- 2.2.3 Finished floor levels of the properties within the northern and central parts of the site area are generally elevated at around 9.5mAOD to 10m AOD. Properties within the south eastern corner of the site are set down lower, with finished floor levels ranging between 8.7mAOD to 9.3mAOD.

2.3 Ground Conditions

- 2.3.1 An intrusive site investigation was undertaken by Terra Firma in April 2020 and a Geotechnical and Geo-Environmental Report was issued in July 2020.
- 2.3.2 The report identifies that a portion of the site, The Marl, was used as landfill between 1936 to 1945. Investigation results show the site is generally underlain by **Made Ground**. Typically the ground conditions comprised of Grass over firm brown slightly gravelly CLAY to maximum depth of 0.45m over MADE GROUND: medium dense black gravelly SAND to maximum depth of 5.3m over, soft laminated silty CLAY with occasional cobble to maximum depth of 11.80m over Loose grey clayey sandy GRAVEL to a maximum depth of 12.5m over, Medium dense to dense becoming very dense brown sandy GRAVEL with medium cobble content to a maximum depth of 19.60m over, Hard weathered brown occasionally mottled grey sandy MUDSTONE proved to a depth of 28m.
- 2.3.3 Multiple contaminants were identified within the Made Ground and a capping system has been recommended with a 600mm imported clean soil capping layer provided across landscaped areas.
- 2.3.4 Groundwater strikes were relatively deep and typically between 5m – 11m below ground level.
- 2.3.5 Due to the level of contaminants found within the site, no infiltration testing was carried out during the investigation works and infiltration solutions have been discounted within the development proposals. All SuDs features will be lined to avoid mobilising contaminants into the groundwater table and / or Cardiff Bay to the east of the site.

2.4 Flood Risk

2.4.1 The majority of the new development is sited in Flood Zone B which areas known to have flood in the past evidenced by sedimentary deposits. There are small pockets of proposed development in Flood Zone C1 along the south eastern boundary of the site and the northern section of phase 1. There is also a portion of the marl park development that is situated in Flood Zone C1 however there is no proposal to change the existing recreational function of this area, only regenerate and improve the existing green space. These are areas of the floodplain which are developed and served by significant infrastructure, including flood defences. The risk of flooding to the development, from all sources, are further explored in the Flood Consequences Assessment (FCA) report which is submitted as part of the planning and SUDS applications.

2.5 Proposed Development

- 2.5.1 Hybrid planning application for mixed-use development. Outline planning permission is sought for: The redevelopment and extension of part of the existing Channel View Estate to provide up to 321 residential apartments and houses (Use Class C3), up to 285 sq.m of retail floorspace (Use Class A1), communal gardens incorporating allotments and picnic areas, formal and informal children's play space, landscaping, cyclepaths/footpaths, drainage infrastructure, roads and parking; The regeneration of the Marl public open space to include new/improved sports pitches, children's play space, a new 'beach', water features, landscaping, and cyclepaths/footpaths; The provision of a new bus/cycle/pedestrian link between Channel View Road and South Clive Street and a new cycle/pedestrian link between South Clive Street and Ferry Road; The provision of a new parking area; Together with associated works (all matters reserved for future consideration).
- 2.5.2 Full planning permission is sought for a first phase of development comprising of a tower block (8-12 storeys) providing 79 elderly-persons (over 55s) accommodation units, a 115sq.m community cafe, communal gardens incorporating allotments and picnic areas, landscaping, drainage infrastructure, footpaths, roads, parking, and associated works.
- 2.5.3 The proposed masterplan has been produced by Powell Dobson Architects, an extract of the layout is shown in Figure 2 overleaf and included in *Appendix C*.



Figure 2 – Proposed Masterplan (Powell Dobson Architect)

3 Existing Drainage

- 3.1.1 Welsh Water records show the Channel view estate is predominantly served by a 225mm diameter Public Combined Sewer which runs south to north, within the western portion of the Marl at a depth to invert of between 3 – 4.5m. Properties to the north west of Channel View Road are served by a separate 225mm diameter Public Combined sewer which runs within the front gardens of the properties and heads west along Beecher Avenue.
- 3.1.2 A single surface water Public Sewer, 450mm in diameter runs north to south, east of the Channel View Road kerbline, this moves into the road near the Tower Block and outfalls into Cardiff Bay in the south eastern corner of the site.

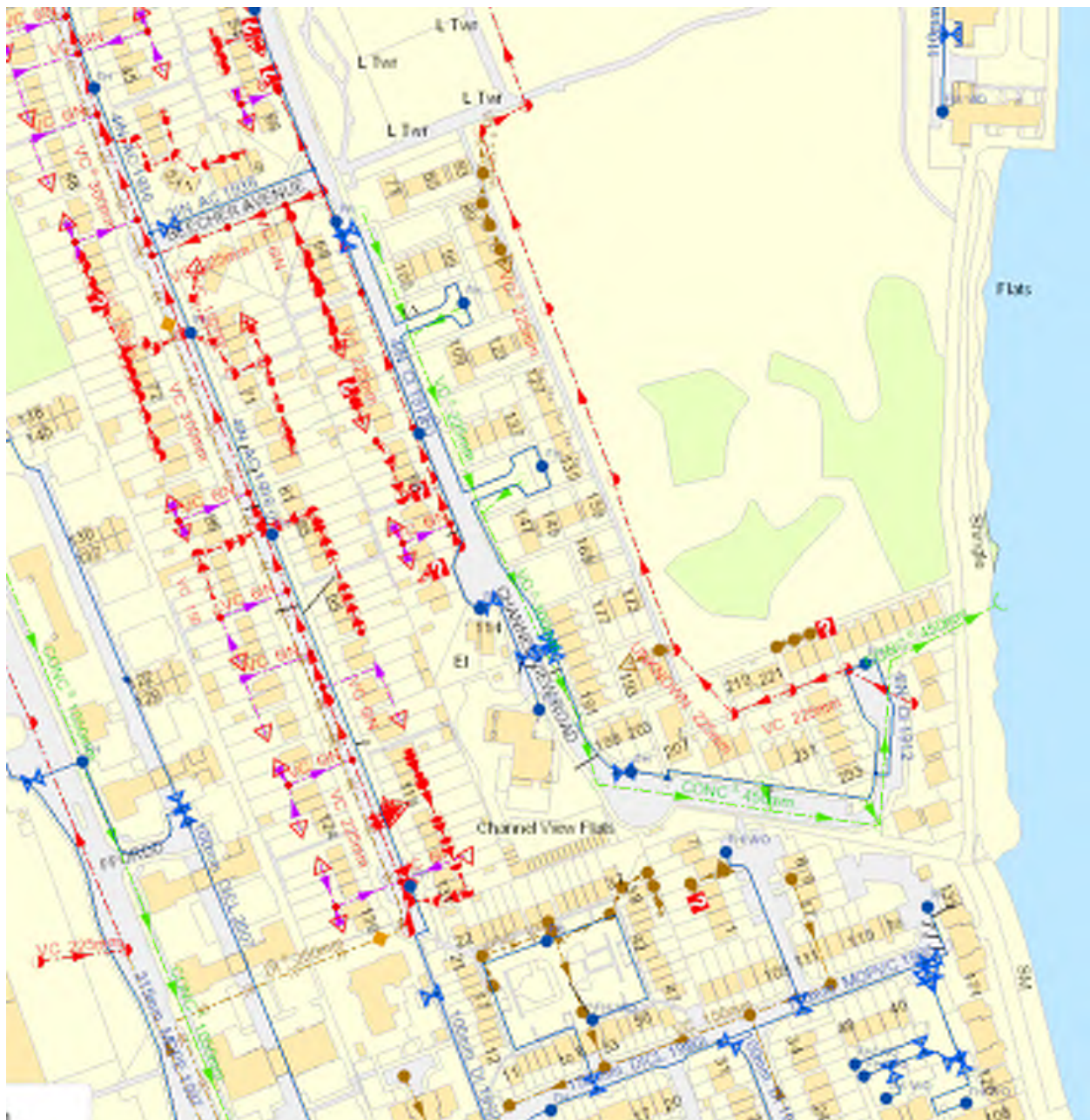


Figure 3 – Extract of Welsh Water Records

- 3.1.3 A manhole survey was undertaken as part of the topographical survey by 3 Point Surveys. Existing drainage plans have been produced, based on the manhole surveys. Drawings CC2083-CAM-ZZ-00-GA-52-103-105 are included in *Appendix D*.
- 3.1.4 Utility GPR Surveys and drainage CCTV surveys will be carried to confirm the accurate location and condition of the existing drainage network. The CCTV surveys will focus particularly on the main public sewers through the site which will be affected by the proposed development works.

4 Foul Drainage

- 4.1.1 The existing foul drainage from the site currently drains via gravity into the 225mm Public Combined Sewer in the Marl. The manhole survey around the existing tower block is currently inconclusive but invert levels suggests that the foul drainage from this site potentially connects to the Public Combined Sewer in South Clive Street, this will need to be confirmed by further survey works.
- 4.1.2 The existing peak foul flows from the existing 188 properties within the development area would be **8.7 l/s** using the 4,000 l/dwelling/day flow from Sewers for Adoption 7th edition.
- 4.1.3 The proposed peak foul development flows have been calculated and summarised in Table 1 below;

Table 1: Proposed Peak Foul Discharges

Development	No. of Units / Floor Area	Design Rate	Peak Discharge (l/s)
Residential	400	4,000 l/dwelling/day	18.52
Café / Enterprise Hub	Approx. 115m ²	15l/hd/day	0.14
Retail Shop	Approx. 285m ²	40l/hd/day	0.48
Total			19.14

- 4.1.4 The development proposals will therefore result in an increase of 10.44/s in peak foul discharge rates into the surrounding public sewerage network. The public sewer is identified as a combined sewer and therefore there is potential for surface water connections into the system to be present. Any surface water connections would be removed as part of the development works, this would likely offset any increase in foul flow generation. Further detailed drainage survey works would be required to identify surface water connections present into the Combined Sewer.
- 4.1.5 A pre planning enquiry has been made to Welsh Water and their response dated 13th October 2020 is included in *Appendix E*. The enquiry confirms there is sufficient capacity within the sewerage network to accommodate the additional foul flows from the development and a connection can be made at, or downstream of, Welsh Water manhole 'ST18730906'.
- 4.1.6 It is proposed to gravitate drainage from the existing development into the 225mm Public Combined Sewer running within the Marl. A Section 104 adoption agreement and 106 connection agreement will be required with Welsh Water to enable the foul drainage to connect to the public foul sewer.
- 4.1.7 The redevelopment proposals will affect the Combined Sewer within the Marl and will therefore necessitate diversion of the Public Sewer to avoid the proposed building foundations and provide suitable easements from proposed trees, SUDS features and other services. The diversion will need to be undertaken via a S185 diversion agreement with Welsh Water.

5 Surface Water Drainage

5.1.1 In October 2018, Welsh Government published the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining Surface Water Drainage Systems'. This standard is now mandatory for new developments with either a construction area greater than 100m² or more than 1 dwelling.

5.1.2 The principles that underpin the design of surface water management schemes to meet the standards area as follows;

SuDS schemes should aim to;

- ▶ Manage water on or close to the surface and as close to the source of the runoff as possible;
- ▶ Treat rainfall as a valuable natural resource
- ▶ Ensure pollution is prevented at source, rather than relying on the drainage system to treat or intercept it;
- ▶ Manage rainfall to help protect people from increased flood risk, and the environment from morphological and associated ecological damage resulting from changes in flow rates, patterns and sediment movement caused by the development;
- ▶ Take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep;
- ▶ Use the SuDS Management Train, using drainage components in series across a site to achieve a robust surface water management system (rather than using a single "end of pipe" feature, such as a pond, the serve the whole development);
- ▶ Maximise the delivery of benefits for amenity and biodiversity;
- ▶ Seek to make the best use of available land through multifunctional usage of public spaces and the public realm;
- ▶ Perform safely, reliably and effectively over the design life of the development taking into account the need for reasonable levels of maintenance;
- ▶ Avoid the need for pumping where possible;
- ▶ Be affordable, taking into account both construction and long-term maintenance costs and the additional environmental and social benefits afforded by the system

5.2 Standard S1 – Surface Water Runoff Destination

5.2.1 This standard reviews the disposal routes for surface water run-off. The destinations are split into 5 levels with level 1 being the most preferential and level 5 being the least preferred and only used in exceptional circumstances.

Priority Level 1: Surface water runoff is collected for use;

5.2.2 There are no known issues or stresses on the local Mains Water supply network within the vicinity of the site.

5.2.3 There are no current proposals to utilize rainwater at source or implement any green roof / blue roof systems for collection for use.

Priority Level 2: Surface water runoff is infiltrated to ground;

5.2.4 As discussed in Section 2.3, an intrusive investigation was undertaken by Terra Firma, which identified contaminants within the made ground underlying the site. Due to the risk of mobilising contaminants into the surrounding sensitive receptors, such as the River Taff and Cardiff Bay, infiltration drainage techniques are deemed unsuitable for the disposal of surface water runoff from the site.

Priority Level 3: Surface water runoff is discharged to a surface water body;

5.2.5 The nearest water body to the site is the River Taff which is approximately 16m from the south eastern boundary of the site, it is therefore proposed to discharge the redevelopment into the River Taff. Currently the site already benefits from a Public Surface Water sewer outfall into the Taff. It is proposed to continue to use the outfall which has a free discharge into Taff and ultimately Cardiff Bay. Reusing the existing outfall will ensure works are avoided along the bank of the bay which will reduce the need for vegetation clearance, reduce the risk of pollution to Cardiff Bay during construction activities and minimize disruption to the Taff Trail route.

5.2.6 The existing Surface Water Sewer will need to be diverted through the development to align with the new road layout. The diversion of the surface water sewer will be subject to a S185 diversion agreement with Welsh Water.

5.2.7 The principle of the continued use / connection into the divert sewer will be subject to agreement with Welsh Water and the SAB.

Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain or other drainage;

5.2.8 Surface water sewer connection has been discussed within Priority Level 3.

Priority Level 5: Discharge to a Combined Sewer

5.2.9 Not considered, a higher priority level is feasible.

5.3 Standard S2 – Surface Water Hydraulic Control

- 5.3.1 Drainage catchment plans have been produced for the pre and post development scenarios and are included in *Appendix F*. The existing catchment plan, drawing CC2083-CAM-ZZ-00-SK-52-0013, shows an existing impermeable area of 1.985 Ha in the main redevelopment area. The proposed catchment plan, drawing CC2083-CAM-ZZ-00-SK-52-0014, shows a proposed impermeable area of 2.358 Ha.
- 5.3.2 An existing model has been built for the existing Surface Water sewer that serves the site. The existing sewer is assumed to service properties west of Channel View Road, outside the site. The hydraulic model has been simulated for various storm events and summary of the existing discharges are shown in Table 2 below and a copy of the hydraulic modelling results are included in *Appendix G*;

Table 2: Existing Surface Water Discharges into Cardiff Bay

Storm Event	Critical Storm Duration	Peak Discharge Rate (l/s)
1 in 2 year	30 minute Winter	142.1
1 in 30 year	15 minute Winter	290.6
1 in 100 year	15 minute Winter	377.3

- 5.3.3 As discussed in Section 5.2, Cardiff Bay is a controlled water body which is tidally influenced and therefore it is unnecessary to restrict the runoff development to greenfield runoff rates. The existing outfall however will be reused and as such a 30% reduction to the existing peak discharge in the 1 in 30 year storm event is offered in line with G2.24 of the Statutory Standards for Sustainable Drainage. The proposed discharge restriction for the development will therefore be **203 l/s**. This will be achieved by using a standard vortex flow control device prior to the last pipe run leading to the outfall.
- 5.3.4 The development will be built out in a phased manner and as such there is likely to be multiple flow controls upstream of the last vortex control chamber, of varying types, to suit the phasing of the development. Equating the discharge restriction over the proposed catchment area, a discharge rate of 86 l/s/ha should be applied to each impermeable catchment within each phase.
- 5.3.5 Outline attenuation storage volumes have been assessed using the Quick Storage Estimate tool in Microdrainage. The attenuation requirements for the entire site and the phase 1 works are summarised in Tables 3 & 4 below and copies of calculations are included in *Appendix G*. Storage volumes have also been calculated with 10% urban creep allowance to accommodate future extensions and increased paved areas within private properties.

Table 3: Attenuation Storage Volume Range (m³) – Whole Site

Storm Event	Minimum Storage Volume (m ³)	Maximum Storage Volume (m ³)
1 in 100 year +40%CC (Catchment Area 2.475ha, discharge restriction 203l/s)	600	1,067
1 in 100 year +40%CC (with 10% urban creep allowance)	705	1,220

Table 4: Attenuation Storage Volume Range (m³) – Phase 1

Storm Event	Minimum Storage Volume	Maximum Storage Volume
1 in 100 year +40%CC (Catchment Area 0.222ha, discharge restriction 18.2l/s)	54	96
1 in 100 year +40%CC (with 10% urban creep allowance)	63	109

- 5.3.6 Outline drainage strategy drawings, CC2083-CAM-ZZ-00-GA-52-0100,101&102 included in *Appendix H* showing the general routing of the surface water drainage and provision of SUDS features to deliver the required attenuation storage.
- 5.3.7 The interception of runoff for the first 5mm of rainfall events will be reviewed on receipt of the finalised landscaping scheme for the site. The SuDS areas on the site will be compared against the catchment areas utilising Table G2.1.

5.4 Standard S3 – Water Quality

- 5.4.1 The receiving water body, the downstream section of the River Taff, is designated a Site of Importance for Nature Conservation (SINC) and important for migratory fish, otters, wildfowl and bankside vegetation acts as a major wildlife corridor. The water body should therefore be deemed as 'sensitive', and appropriate SuDs treatments will be required within the development to ensure the quality of the surface water runoff from the development is of an acceptable standard.
- 5.4.2 Generally the runoff from roofs will be of 'very low' pollution hazard levels and will require no more than one level of treatment prior to discharge from the site. Driveways, residential car parks, cul de sacs and general access roads would be deemed as 'low' pollution hazard levels. Generally runoff from these areas will require one to two levels of treatment. The Simple Index Approach method should be adopted to ensure sufficient treatment measures are in place.
- 5.4.3 A mix of SuDS features are proposed as part of a SuDS treatment train. This includes the use of green roofs, bioretention / rain gardens, SuDs planters, filter drains and detention basins.
- 5.4.4 All SuDS features will be lined with an impermeable membrane to prevent the potential of mobilising contaminants into the underlying groundwater.

5.5 Standard S4 – Amenity

- 5.5.1 The development proposals include significant enhancements to the Marl with greater connectivity given between the Taff Trail Route and Channel View Road and the proposed properties. The SUDs and landscaping strategy introduces green corridors and streets, linking the internal courtyards to the Marl. The amenity value of the park and outlook on the River Taff and Cardiff Bay have been key considerations in the design of the masterplan.
- 5.5.2 Communal courtyards and roof terraces are proposed within the Phase 1 area which will incorporate growing space, fruit trees, SuDS and seating space.
- 5.5.3 Some of the main SuDS features will be coupled with informal play areas, to create ‘Rain Parks’ for the benefit of the wider public. This will give opportunities for the introduction of educational information boards explaining the role and function of the SuDS features present in the design.

5.6 Standard S5 – Biodiversity

- 5.6.1 A landscaping strategy has been produced by Tetrattech and includes a significant coverage of new tree planting, shrubs and wildflower planting to compliment the new communal spaces created by the development.
- 5.6.2 The drainage design maximises the use of above ground, soft, SuDS features.

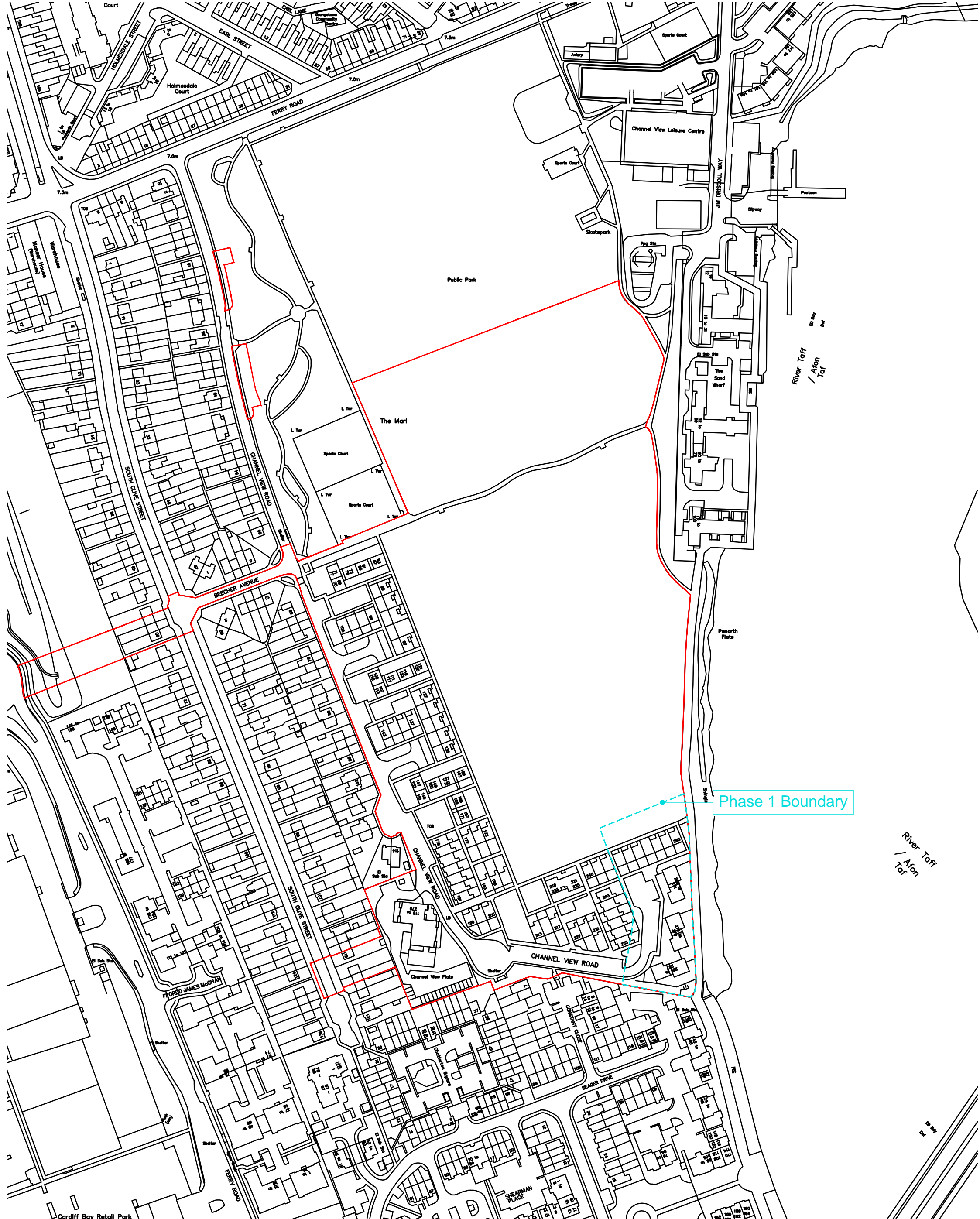
5.7 Standard S6 - Design of drainage for Construction, Operation and Maintenance and Structural Integrity

- 5.7.1 The SuDS solution has been designed in accordance with the SuDS manual and the site is generally served by shallow SuDS features, reducing the capital cost and long term maintenance costs of the scheme.
- 5.7.2 The masterplan has maximised the use of above ground, soft, SuDS features to reduce reliance on more engineered solutions such as extensive use of below ground storage tanks and permeable paving construction.
- 5.7.3 As the development includes multiple properties, the SAB will be responsible for adopting and maintaining the Surface Water drainage network. As such suitable maintenance plans and schedules will be provided within the SuDS application to inform future maintenance requirements and provisions.
- 5.7.4 There are no inherent safety issues with the proposed scheme. Generally the above ground SuDS features will be dry during normal conditions and very limited in terms of water depths during extreme events. All SuDS features are located in areas with good surveillance. Any residual risks associated with the SuDS features will be highlighted within the designer’s risk assessment submitted as part of the SuDS application.

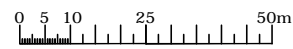
6 Conclusions

- 6.1.1 Welsh Water have confirmed there is sufficient capacity within the sewerage network for the additional peak foul flows generated by the development.
- 6.1.2 The foul water drainage will continue to gravitate to the 225mm diameter Public Combined Sewer which runs south to north through the site.
- 6.1.3 The existing Combined sewer and large proportion of the Public Surface Water sewer on site will be diverted to suit the realigned road network within the masterplan. The combined sewer will be diverted into the western side of the Marl. These diversions will be subject to S185 diversion agreements with Welsh Water.
- 6.1.4 The surface water system will be drain via an existing Public Surface Water sewer outfall into Cardiff Bay. Flows will be restricted to 203l/s, representing a 30% betterment to the pre development flows in a 1 in 30 year storm event.
- 6.1.5 Attenuation storage will be provided for the 1 in 100 year +40% storm event predominantly via a series of raingardens and detention basins. A 10% urban creep factor will be accommodated for the proposed catchment area.
- 6.1.6 The SuDs and landscaping scheme bring multiple amenity and biodiversity benefits to the area.
- 6.1.7 The surface water strategy will be subject to SAB approval and further detailed design following more detailed utility and drainage CCTV surveys.

Appendix A: Site Location Plan



Phase 1 Boundary



This drawing must not be scaled.
Figured dimensions and levels to be used.
Any inaccuracies must be notified to the architect.
Detail drawings and large scale drawings take precedence over smaller drawings.

Rev:	Chk'd:	Rev:
A Redline Amended.	AF 31.03.21	-
B Redline Amended.	RF 16.04.21	-

Chk'd:

PRELIMINARY	<input checked="" type="checkbox"/>
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TENDER	<input type="checkbox"/>
CONSTRUCTION	<input type="checkbox"/>

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Contract: Channel View, Cardiff
For: Cardiff Council

Title: Site Location Plan

Drawing No.	Rev.
20004 (05) 090	B

Scale: 1:1500 @ A3
Date: April 2020
Drawn: AF
Checked:

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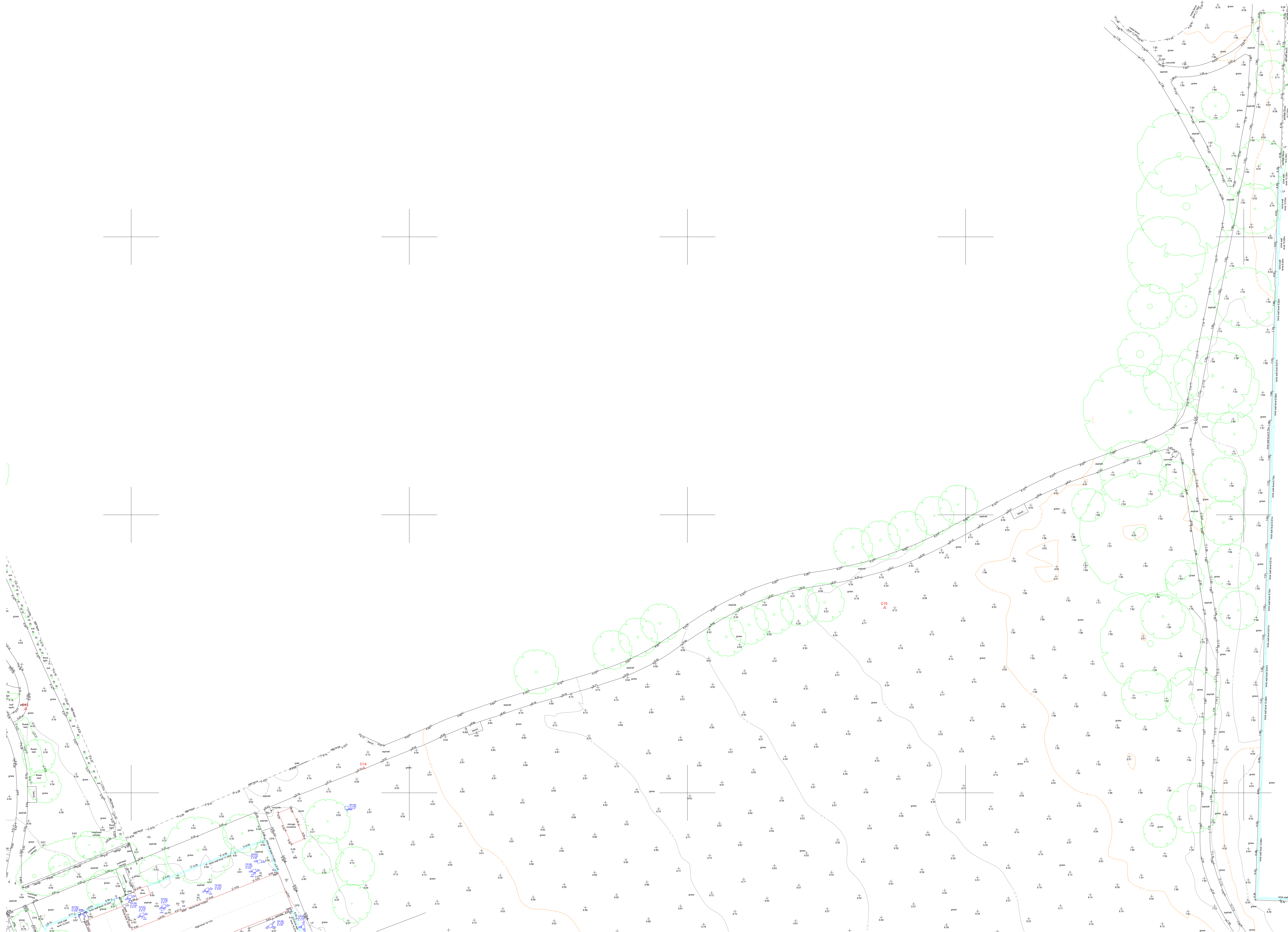
Appendix B: Topographical Survey

174300N

174250N

174200N

174150N



KEY TO ABBREVIATIONS

Ap	Asphalt	JB	Junction Box
B	Bolted	KO	Kerb Outlet
BH	Bench	LP	Lamp Post
BS	Bus Stop	MH	Manhole
BT	British Telecom Cover	MSF	Monitoring Well
BU	Bus/Shrub	NB	Name Board
CB	Telephone Control Cabinet	OHC	Overhead Cable
CA	Cable Television Cover	PO	Post
CC	Concrete	PB	Post Box
CPS	Concrete Paving Slabs	RE	Roading Eye
DK	Drop Kerb	RG	Road Gully
EIC	Electricity Inspection Cover	RS	Road Sign
EP	Electricity Pole	RWP	Rain Water Pipe
ER	Earth Road	SC	Stop Cock
FEL	Finished Floor Level	SV	Stop Valve
FH	Fire Hydrant	St	Stump
FP	Flag Pole	SV	Stop Valve
G	Gully	SVP	Soil Vent Pipe
GP	Gate Post	TCS	Telephone Box
GV	Gas Valve	TL	Traffic Light
IC	Inspection Cover	TP	Telegraph Pole

Fence And Wall Features

BURW	Block Retaining Wall
BW	Barbed Wire
BW	Block Wall
CRW	Concrete Retaining Wall
CB	Chain Barbed
CM	Corrugated Metal
CRBW	Concrete Post & Barbed Wire
CPCL	Concrete Post & Chainlink
CPCP	Concrete Post & Post
CPW	Concrete Post & Wire
GW	Gaeson Wall
HR	Hand Rail
I	Iron
M	Metal Railings
MW	Interwoven Wood Slat
MM	Metal Mesh
MPMR	Metal Post and Metal Rail
SRW	Stone Retaining Wall
WPBW	Wood Post & Barbed Wire
WPMR	Wood Post & Metal Rail
WPW	Wood Post & Wire
WPWR	Wood Post & Wood Rail

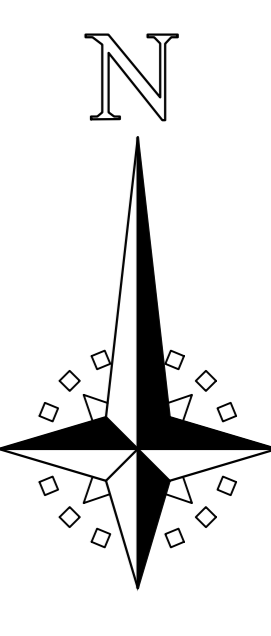
Drainage Features

CL	Cover Level
E	Invert Level
FWS	Foul Water Sewer
SWS	Storm Water Sewer
CWS	Combined Water Sewer
U/L	Unroute To L/R
D	Pipe Diameter (mm)
SL	Soil Level
→	Arrow indicates direction of flow
WL	Water Level with date and time taken
⌋	Embankment
○	EXISTING TREE (SPREAD - NEAREST METRE)
D	D. DIAMETER
S	S. SPREAD

Notes:

- All levels and grid relate to Ordnance Survey Datum derived by GPS.
- Do not scale from this drawing.

BENCH DATA			
Code	Easting	Northing	Level
C1	318115.00	174265.00	8.205
C2	318115.00	174265.00	8.205
C3	318115.00	174265.00	8.205
C4	318115.00	174265.00	8.205
C5	318115.00	174265.00	8.205
C6	318115.00	174265.00	8.205
C7	318115.00	174265.00	8.205
C8	318115.00	174265.00	8.205
C9	318115.00	174265.00	8.205
C10	318115.00	174265.00	8.205
C11	318115.00	174265.00	8.205
C12	318115.00	174265.00	8.205
C13	318115.00	174265.00	8.205
C14	318115.00	174265.00	8.205
C15	318115.00	174265.00	8.205
C16	318115.00	174265.00	8.205
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C71	318115.00	174265.00	8.205
C72	318115.00	174265.00	8.205
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C98	318115.00	174265.00	8.205
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C100	318115.00	174265.00	8.205



D	Additional detail added	10/09/20
C	Additional detail added	08/09/20
B	Additional detail added	05/08/20
A	Additional detail added	25/06/20

Rev	Description	Date

.....\3point surveys edited.png

10 Goldtops, Newport, NP20 4PH.
tel:01633 844984
email:info@3point surveys.co.uk
www.3point surveys.co.uk.

Client: Cambria Consulting Limited.

Site: Channell View Road, Cardiff.

Drawing: Topographic Survey Sheet 1 of 9.

Scale: A0@1:250 Date: June 2020

Designed By: C.M.K

Drawing No.: E1024-1-1 Rev D

174150N

174100N

174050N

174000N



KEY TO ABBREVIATIONS

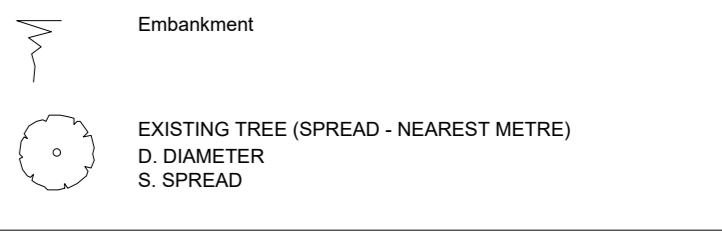
Ap	Asphalt	JB	Junction Box
B	Bollard	KD	Kerb Outlet
BH	Bench	LP	Lamp Post
BS	Bus Stop	MH	Manhole
BT	British Telecom Cover	MSF	Monitoring Well
BU	Bus/Shrub	NB	Name Board
CB	Telephone Control Cabinet	ODC	Overhead Cable
CA	Cable Television Cover	PO	Post
Conc.	Concrete	PB	Post Box
CPS	Concrete Paving Slab	RE	Reading Eye
DK	Drop Kerb	RG	Road Gully
Elc.	Electricity Inspection Cover	Rd	Road Sign
EP	Electricity Pole	RWP	Road Water Pipe
ER	Earth Rod	SC	Stop Cock
FEL	Finished Floor Level	SW	Stop Valve
FH	Fire Hydrant	St	Stump
FP	Flag Pole	SV	Stop Valve
G	Gully	SVP	Soil Vent Pipe
GP	Gate Post	TCS	Telephone Box
GV	Gas Valve	TL	Traffic Light
IC	Inspection Cover	TP	Telegraph Pole

Fence And Wall Features:

BURW	Block Retaining Wall
BW	Barbed Wire
BW	Block Wall
CRW	Concrete Retaining Wall
CB	Chain Barrier
CM	Corrugated Metal
CRWB	Concrete Post & Barbed Wire
CPL	Concrete Post & Chainlink
CPWP	Concrete Post & Post
CPW	Concrete Post & Wire
GW	Garden Wall
HRR	Hand Rail
M	Metal Railings
IM	Interwoven Wood Slat
MM	Metal Mesh
MPMR	Metal Post and Metal Rail
SRW	Stone Retaining Wall
WPBW	Wood Post & Barbed Wire
WPRW	Wood Post & Wire Rail
WPWR	Wood Post & Wire
WPRW	Wood Post & Wood Rail

Drainage Features:

CL	Cover Level
F	Invert Level
FWS	Foul Water Sewer
SWS	Storm Water Sewer
CWS	Combined Water Sewer
UTL	Untraced To L/R
D	Pipe Diameter (mm)
SL	Soil Level
A	Arrow indicates direction of flow
WL	Water Level with date and time taken



- Notes:**
- All levels and grid relate to Ordnance Survey Datum derived by GPS.
 - Do not scale from this drawing.

Spot Elevations

Point	Eastings	Northings	Level
CI	318115.83	174000.38	8.55
CI	318117.47	174001.88	8.66
CI	318118.17	174003.88	8.78
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CA	318102.88	174006.88	8.64
CA	318104.88	174008.88	8.65
CA	318106.88	174010.88	8.66
CA	318108.88	174012.88	8.67
CA	318110.88	174014.88	8.68
CA	318112.88	174016.88	8.69
CA	318114.88	174018.88	8.70
CA	318116.88	174020.88	8.71
CA	318118.88	174022.88	8.72
CA	318120.88	174024.88	8.73
CA	318122.88	174026.88	8.74
CA	318124.88	174028.88	8.75
CA	318126.88	174030.88	8.76
CA	318128.88	174032.88	8.77
CA	318130.88	174034.88	8.78
CA	318132.88	174036.88	8.79
CA	318134.88	174038.88	8.80
CA	318136.88	174040.88	8.81
CA	318138.88	174042.88	8.82
CA	318140.88	174044.88	8.83
CA	318142.88	174046.88	8.84
CA	318144.88	174048.88	8.85
CA	318146.88	174050.88	8.86
CA	318148.88	174052.88	8.87
CA	318150.88	174054.88	8.88
CA	318152.88	174056.88	8.89
CA	318154.88	174058.88	8.90
CA	318156.88	174060.88	8.91
CA	318158.88	174062.88	8.92
CA	318160.88	174064.88	8.93
CA	318162.88	174066.88	8.94
CA	318164.88	174068.88	8.95
CA	318166.88	174070.88	8.96
CA	318168.88	174072.88	8.97
CA	318170.88	174074.88	8.98
CA	318172.88	174076.88	8.99
CA	318174.88	174078.88	9.00
CA	318176.88	174080.88	9.01
CA	318178.88	174082.88	9.02
CA	318180.88	174084.88	9.03
CA	318182.88	174086.88	9.04
CA	318184.88	174088.88	9.05
CA	318186.88	174090.88	9.06
CA	318188.88	174092.88	9.07
CA	318190.88	174094.88	9.08
CA	318192.88	174096.88	9.09
CA	318194.88	174098.88	9.10
CA	318196.88	174100.88	9.11
CA	318198.88	174102.88	9.12
CA	318200.88	174104.88	9.13
CA	318202.88	174106.88	9.14
CA	318204.88	174108.88	9.15
CA	318206.88	174110.88	9.16
CA	318208.88	174112.88	9.17
CA	318210.88	174114.88	9.18
CA	318212.88	174116.88	9.19
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CA	318216.88	174120.88	9.21
CA	318218.88	174122.88	9.22
CA	318220.88	174124.88	9.23
CA	318222.88	174126.88	9.24
CA	318224.88	174128.88	9.25
CA	318226.88	174130.88	9.26
CA	318228.88	174132.88	9.27
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CA	318238.88	174142.88	9.32
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CA	318248.88	174152.88	9.37
CA	318250.88	174154.88	9.38
CA	318252.88	174156.88	9.39
CA	318254.88	174158.88	9.40
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CA	318258.88	174162.88	9.42
CA	318260.88	174164.88	9.43
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CA	318274.88	174178.88	9.50
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CA	318280.88	174184.88	9.53
CA	318282.88	174186.88	9.54
CA	318284.88	174188.88	9.55
CA	318286.88	174190.88	9.56
CA	318288.88	174192.88	9.57
CA	318290.88	174194.88	9.58
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CA	318328.88	174232.88	9.77
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CA	318382.88	174286.88	10.04
CA	318384.88	174288.88	10.05
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CA	318400.88	174304.88	10.13
CA	318402.88	174306.88	10.14
CA	318404.88	174308.88	10.15
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CA	318408.88	174312.88	10.17
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CA	318412.88	174316.88	10.19
CA	318414.88	174318.88	10.20
CA	318416.88	174320.88	10.21
CA	318418.88	174322.88	10.22
CA	318420.88	174324.88	10.23
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CA	318432.88	174336.88	10.29
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CA	318438.88	174342.88	10.32
CA	318440.88	174344.88	10.33
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CA	318444.88	174348.88	10.35
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CA	318448.88	174352.88	10.37
CA	318450.88	174354.88	10.38
CA	318452.88	174356.88	10.39
CA	318454.88	174358.88	10.40
CA	318456.88	174360.88	10.41
CA	318458.88	174362.88	10.42
CA	318460.88	174364.88	10.43
CA	318462.88	174366.88	10.44
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CA	318468.88	174372.88	10.47
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CA	318476.88	174380.88	10.51
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CA	318482.88	174386.88	10.54
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CA	318488.88	174392.88	10.57
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CA	318492.88	174396.88	10.59
CA	318494.88	174398.88	10.60
CA	318496.88	174400.88	10.61
CA	318498.88	174402.88	10.62
CA	318500.88	174404.88	10.63
CA	318502.88	174406.88	10.64
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CA	318506.88	174410.88	10.66
CA	318508.88	174412.88	10.67
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CA	318516.88	174420.88	10.71
CA	318518.88	174422.88	10.72
CA	318520.88	174424	



KEY TO ABBREVIATIONS

Ap	Asphalt	JB	Junction Box
B	Ballast	KO	Kerb Outlet
BH	Barbed	LP	Lamp Post
BS	Bus Stop	MH	Manhole
BT	British Telecom Cover	MSF	Monitoring Well
BU	Bus/Shrub	NB	Name Board
CB	Telephone Control Cabinet	OC	Overhead Cable
CA	Cable Television Cover	PO	Post
Conc.	Concrete	PB	Post Box
CPS	Concrete Paving Slabs	RE	Road Edge
DK	Drop Kerb	RG	Road Gully
Elc.	Electricity Inspection Cover	RS	Road Sign
EP	Electric Pole	RWP	Road Water Pipe
ER	Earth Road	SC	Stop Cock
FEL	Freshed Floor Level	SW	Stop Valve
FH	Fire Hydrant	St	Stump
FP	Flag Pole	SV	Stop Valve
G	Gully	SVP	Sid Vent Pipe
GP	Gate Post	TCS	Telephone Box
GV	Gas Valve	TL	Traffic Light
IC	Inspection Cover	TP	Telegraph Pole

Fence And Wall Features

BURW	Block Retaining Wall
BW	Barbed Wire
BW	Block Wall
CRW	Concrete Retaining Wall
CS	Chain Sided
CM	Corrugated Metal
CPBW	Concrete Post & Barbed Wire
CPCL	Concrete Post & Chainlink
CPCP	Concrete Post & Post
CPW	Concrete Post & Wire
GW	Garden Wall
HFR	Hand Rail
I	Iron
IR	Iron Railings
IM	Intervenor Wood Slat
MM	Metal Mesh
MPMR	Metal Post and Metal Rail
SRW	Stone Retaining Wall
WPBW	Wood Post & Barbed Wire
WPMR	Wood Post & Metal Rail
WPRW	Wood Post & Wire Rail
WPRW	Wood Post & Wood Rail

Drainage Features

CL	Cover Level
I	Invert Level
FWS	Foul Water Sewer
SWS	Storm Water Sewer
CWS	Combined Water Sewer
UTL	Unstable To L/R
D	Pipe Diameter (mm)
SL	Soil Level
A	Arrow indicates direction of flow
WL	Water Level with date and time taken
E	Embankment

Notes:

- All levels and grid relate to Ordnance Survey Datum derived by GPS.
- Do not scale from this drawing.

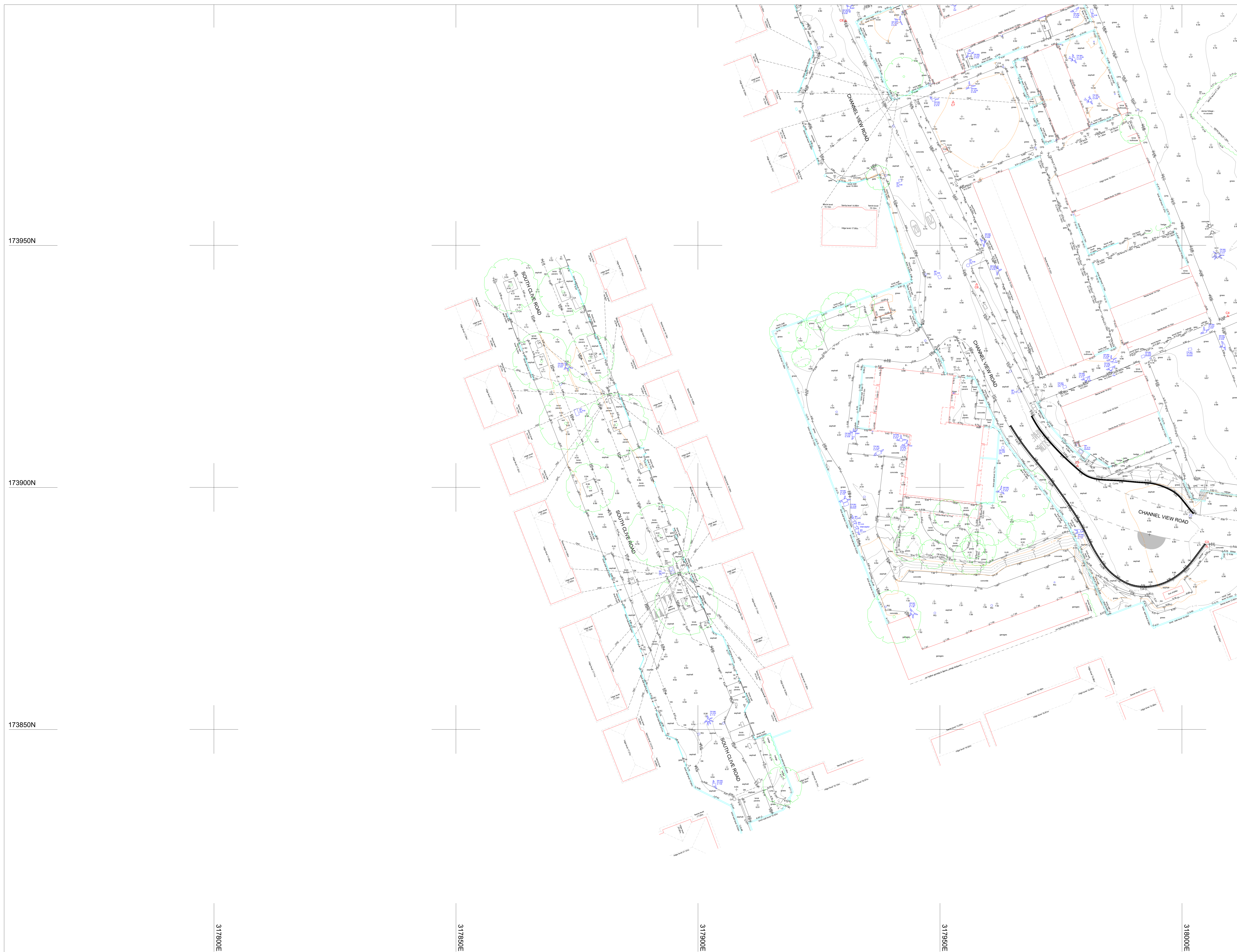
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6	CL	318133.73	173901.36	8.265
7	CL	318137.71	173901.36	8.265
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27	CL	318217.31	173901.36	8.265
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29	CL	318225.27	173901.36	8.265
30	CL	318229.25	173901.36	8.265
31	CL	318233.23	173901.36	8.265
32	CL	318237.21	173901.36	8.265
33	CL	318241.19	173901.36	8.265
34	CL	318245.17	173901.36	8.265
35	CL	318249.15	173901.36	8.265
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67	CL	318377.00	173901.36	8.265
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70	CL	318389.00	173901.36	8.265
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75	CL	318409.00	173901.36	8.265
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78	CL	318421.00	173901.36	8.265
79	CL	318425.00	173901.36	8.265
80	CL	318429.00	173901.36	8.265
81	CL	318433.00	173901.36	8.265
82	CL	318437.00	173901.36	8.265
83	CL	318441.00	173901.36	8.265
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85	CL	318449.00	173901.36	8.265
86	CL	318453.00	173901.36	8.265
87	CL	318457.00	173901.36	8.265
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90	CL	318469.00	173901.36	8.265
91	CL	318473.00	173901.36	8.265
92	CL	318477.00	173901.36	8.265
93	CL	318481.00	173901.36	8.265
94	CL	318485.00	173901.36	8.265
95	CL	318489.00	173901.36	8.265
96	CL	318493.00	173901.36	8.265
97	CL	318497.00	173901.36	8.265
98	CL	318501.00	173901.36	8.265
99	CL	318505.00	173901.36	8.265
100	CL	318509.00	173901.36	8.265

D	Additional detail added	10/09/20
C	Additional detail added	08/09/20
B	Additional detail added	05/08/20
A	Additional detail added	25/06/20

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10 Goldtops, Newport, NP20 4PH.
tel:01633 844984
email:info@3pointsurveys.co.uk
www.3pointsurveys.co.uk.

Client: Cambria Consulting Limited.
Site: Channel View Road, Cardiff.
Drawing: Topographic Survey Sheet 3 of 9.
Scale: A0@1:250 Date: June 2020
Designed By: C.M.K.
Drawing No.: E1024-1-3 Rev D



KEY TO ABBREVIATIONS

Ap	Asphalt	JB	Junction Box
B	Ballast	KO	Kerb Outlet
BH	Benches	LP	Lamp Post
BS	Bus Stop	MH	Manhole
BT	British Telecom Cover	MM	Monitoring Well
BU	Bus/Shrub	NB	Name Board
CB	Telephone Control Cabinet	OC	Overhead Cable
CA	Cable Television Cover	PO	Post
Conc.	Concrete	PB	Post Box
CPS	Concrete Paving Slabs	RE	Reading Eye
DK	Drop Kerb	RG	Road Gully
ELC	Electricity Inspection Cover	RGS	Road Sign
EP	Electric Pole	RWP	Road Water Pipe
ER	Earth Road	SC	Stop Cock
FEL	Finished Floor Level	SW	Stop Valve
FH	Fire Hydrant	St	Stump
FP	Flag Pole	SV	Stop Valve
G	Gully	SVP	Sid Vent Pipe
GP	Gate Post	TCS	Telephone Box
GV	Gas Valve	TL	Traffic Light
IC	Inspection Cover	TP	Telegraph Pole

Fence And Wall Features

BURW	Block Retaining Wall
BW	Barbed Wire
EW	Brick Wall
CRW	Concrete Retaining Wall
CS	Chain Slabbed
CM	Corrugated Metal
CRBW	Concrete Post & Barbed Wire
CPCL	Concrete Post & Chainlink
CPCP	Concrete Post & Post
CPW	Concrete Post & Wire
GW	Garden Wall
HR	Hand Rail
M	Metal Railings
MW	Interwoven Wood Slat
MM	Metal Mesh
MPMR	Metal Post and Metal Rail
SRW	Stone Retaining Wall
WPBW	Wood Post and Barbed Wire
WPMR	Wood Post and Metal Rail
WPW	Wood Post & Wire
WPMR	Wood Post & Wood Rail

Drainage Features

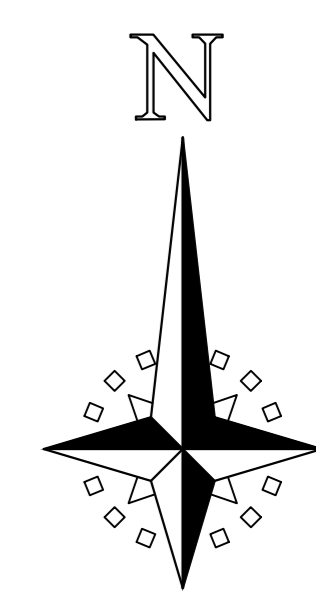
CL	Cover Level
L	Invert Level
FWS	Foul Water Sewer
SWS	Storm Water Sewer
CWS	Combined Water Sewer
UTL	Utility To L/R
D	Pipe Diameter (mm)
SL	Soil Level
WL	Water Level with date and time taken
Embankment	Embankment

Notes:

- All levels and grid relate to Ordnance Survey Datum derived by GPS.
- Do not scale from this drawing.

Point Coordinates

Point	Northings	Eastings	Level
CI	174113.83	173861.38	8.55
CI	174117.81	173861.38	8.55
CI	174121.79	173861.38	8.55
CI	174125.77	173861.38	8.55
CI	174129.75	173861.38	8.55
CI	174133.73	173861.38	8.55
CI	174137.71	173861.38	8.55
CI	174141.69	173861.38	8.55
CI	174145.67	173861.38	8.55
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CI	174153.63	173861.38	8.55
CI	174157.61	173861.38	8.55
CI	174161.59	173861.38	8.55
CI	174165.57	173861.38	8.55
CI	174169.55	173861.38	8.55
CI	174173.53	173861.38	8.55
CI	174177.51	173861.38	8.55
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CI	174189.45	173861.38	8.55
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CI	174201.39	173861.38	8.55
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CI	174209.35	173861.38	8.55
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CI	174221.29	173861.38	8.55
CI	174225.27	173861.38	8.55
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CI	174233.23	173861.38	8.55
CI	174237.21	173861.38	8.55
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CI	174245.17	173861.38	8.55
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CI	174253.13	173861.38	8.55
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CI	174300.89	173861.38	8.55
CI	174304.87	173861.38	8.55
CI	174308.85	173861.38	8.55
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CI	174392.43	173861.38	8.55
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CI	174404.37	173861.38	8.55
CI	174408.35	173861.38	8.55
CI	174412.33	173861.38	8.55
CI	174416.31	173861.38	8.55
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CI	174424.27	173861.38	8.55
CI	174428.25	173861.38	8.55
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CI	174440.19	173861.38	8.55
CI	174444.17	173861.38	8.55
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CI	174472.03	173861.38	8.55
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D	Additional detail added	10/09/20
C	Additional detail added	08/09/20
B	Additional detail added	05/08/20
A	Additional detail added	25/06/20
Rev	Description	Date

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10 Goldtops, Newport, NP20 4PH.
tel:01633 844984
email:info@3pointsurveys.co.uk
www.3pointsurveys.co.uk.

Client: Cambria Consulting Limited.

Site: Channel View Road, Cardiff.

Drawing: Topographic Survey Sheet 4 of 9.

Scale: A0@1:250 Date: June 2020

Designed By: C.M.K

Drawing No.: E1024-1-4 Rev D

173950N

173900N

173850N

317800E

317900E

317950E

317800E

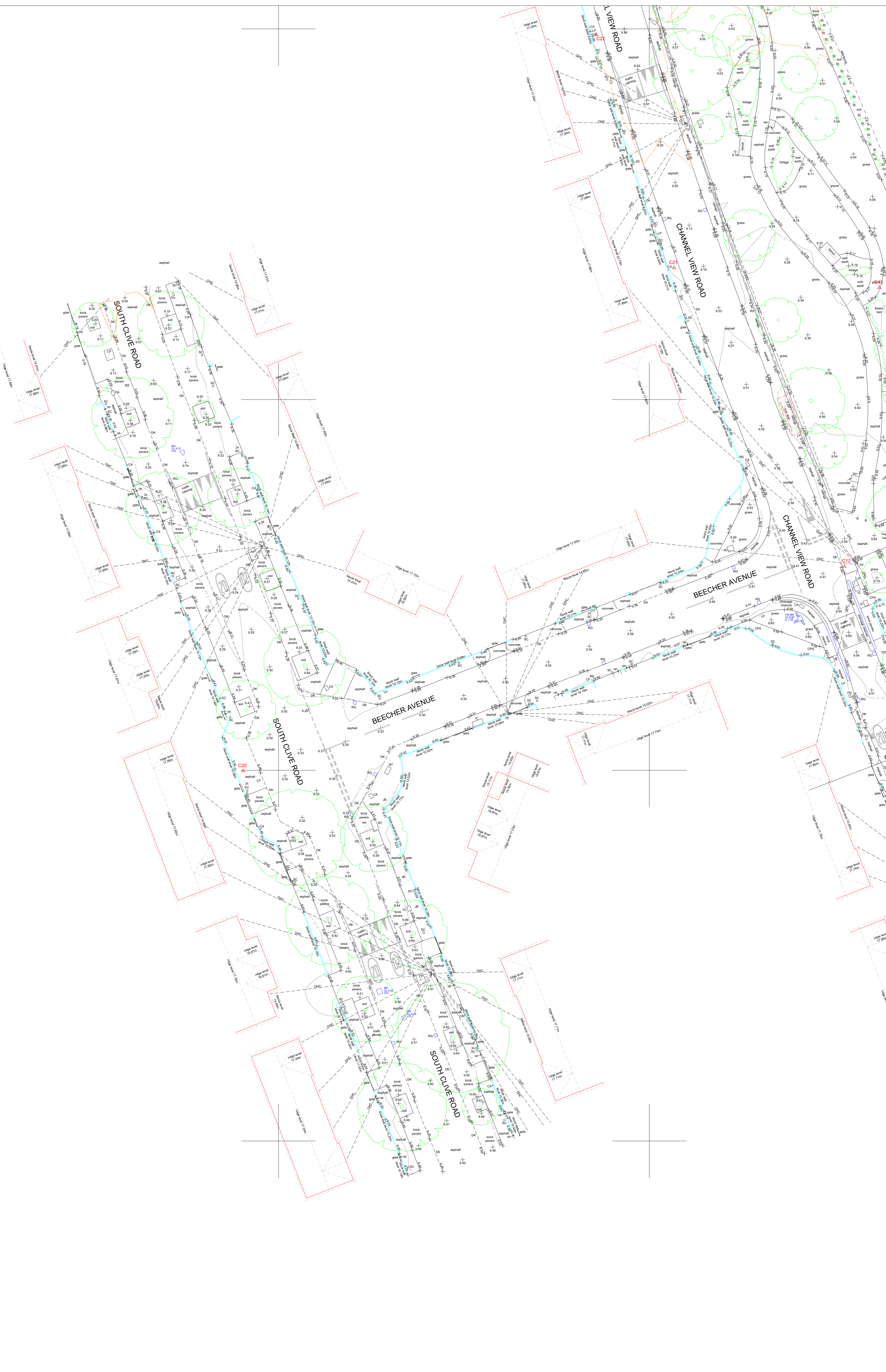
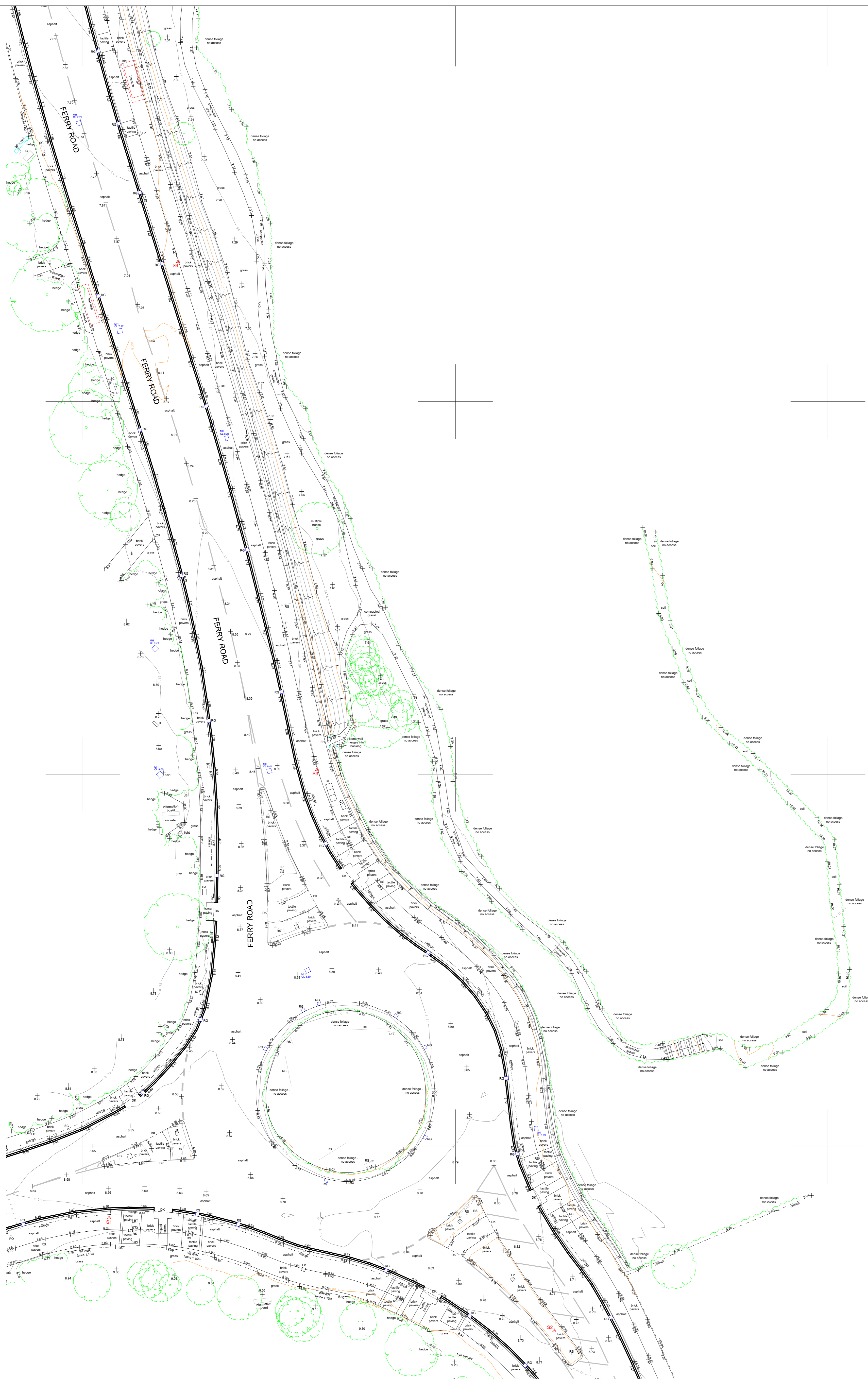
318000E

174200N

174150N

174100N

174050N



KEY TO ABBREVIATIONS

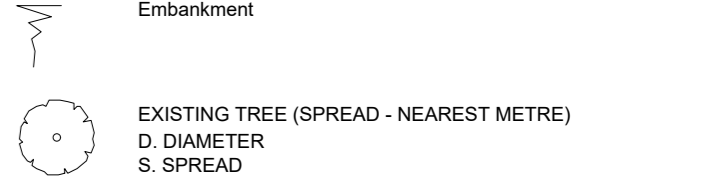
AP	Asphalt	JB	Junction Box
B	Bolted	KO	Kerb Outlet
BH	Benchmark	LP	Lamp Post
BS	Bus Stop	MH	Manhole
BT	British Telecom Cover	MW	Monitoring Well
BU	Bulk/Storage	NB	Name Board
CB	Telephone Control Cabinet	OH	Overhead Cable
CA	Cast Aluminium Cover	PO	Post
CC	Concrete	PS	Post Box
CPS	Concrete Paving Slabs	RE	Road Edge
DK	Drop Kerb	RG	Road Gully
ELC	Electricity Inspection Cover	RS	Road Sign
EP	Electric Pole	RWP	Rain Water Pipe
ER	Earth Road	SC	Stop Cock
FEL	Finished Floor Level	SW	Stop Valve
FH	Fire Hydrant	St	Stump
FP	Flag Pole	SV	Stop Valve
G	Gully	SVP	Sid Vent Pipe
GP	Gate Post	TCS	Telephone Box
GV	Gas Valve	TL	Traffic Light
IC	Inspection Cover	TP	Telegraph Pole

Fence And Wall Features:

BURW	Block Retaining Wall
BW	Barbed Wire
BW	Brick Wall
CRW	Concrete Retaining Wall
CB	Chain Bordered
CM	Corrugated Metal
CRBW	Concrete Post & Barbed Wire
CPCL	Concrete Post & Chainlink
CPWP	Concrete Post & Post
CPW	Concrete Post & Wire
GW	Garrison Wall
HR	Hand Rail
M	Metal Railings
MW	Interwoven Wood Slat
MM	Metal Mesh
MPMR	Metal Post and Metal Rail
SRW	Stone Retaining Wall
WPBW	Wood Post & Barbed Wire
WPMR	Wood Post & Metal Rail
WPRW	Wood Post & Wire
WPMR	Wood Post & Wood Rail

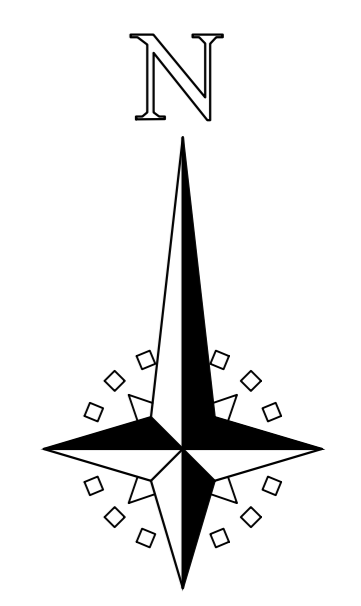
Drainage Features:

CL	Cover Level
L	Invert Level
FWS	Foul Water Sewer
SWS	Storm Water Sewer
CWS	Combined Water Sewer
UTL	Unstable To LR
D	Pipe Diameter (mm)
SL	Soil Level
W	Water Level with date and time taken



- Notes:**
- All levels and grid relate to Ordnance Survey Datum derived by GPS.
 - Do not scale from this drawing.

Point	Northing	Easting	Level
1	174100.00	174050.00	8.50
2	174100.00	174050.00	8.50
3	174100.00	174050.00	8.50
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76	174100.00	174050.00	8.50
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95	174100.00	174050.00	8.50
96	174100.00	174050.00	8.50
97	174100.00	174050.00	8.50
98	174100.00	174050.00	8.50
99	174100.00	174050.00	8.50
100	174100.00	174050.00	8.50



D	Additional detail added	10/09/20
C	Additional detail added	08/09/20
B	Additional detail added	05/08/20
A	Additional detail added	25/06/20

Rev	Description	Date

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10 Goldtops, Newport, NP20 4PH.
tel:01633 844984
email:info@3pointsurveys.co.uk
www.3pointsurveys.co.uk.

Client: Cambria Consulting Limited.
Site: Channel View Road, Cardiff.

Drawing: Topographic Survey
Sheet 5 of 9.

Scale: A0@1:250 Date: June 2020
Designed By: C.M.K

Drawing No.: E1024-1-5 Rev D

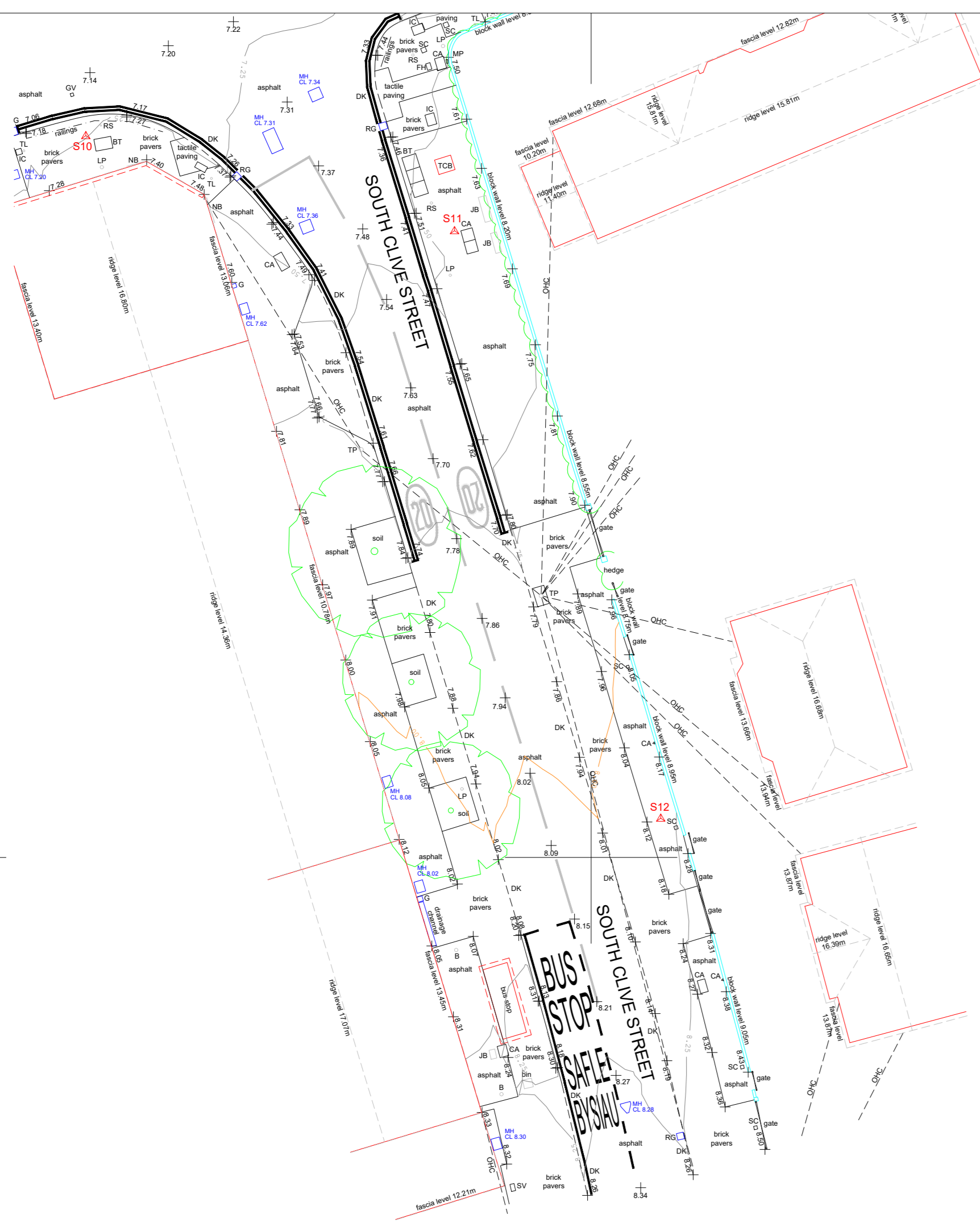
3177850E

3177850E

3177850E

3177850E

3177850E



174300N

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174200N

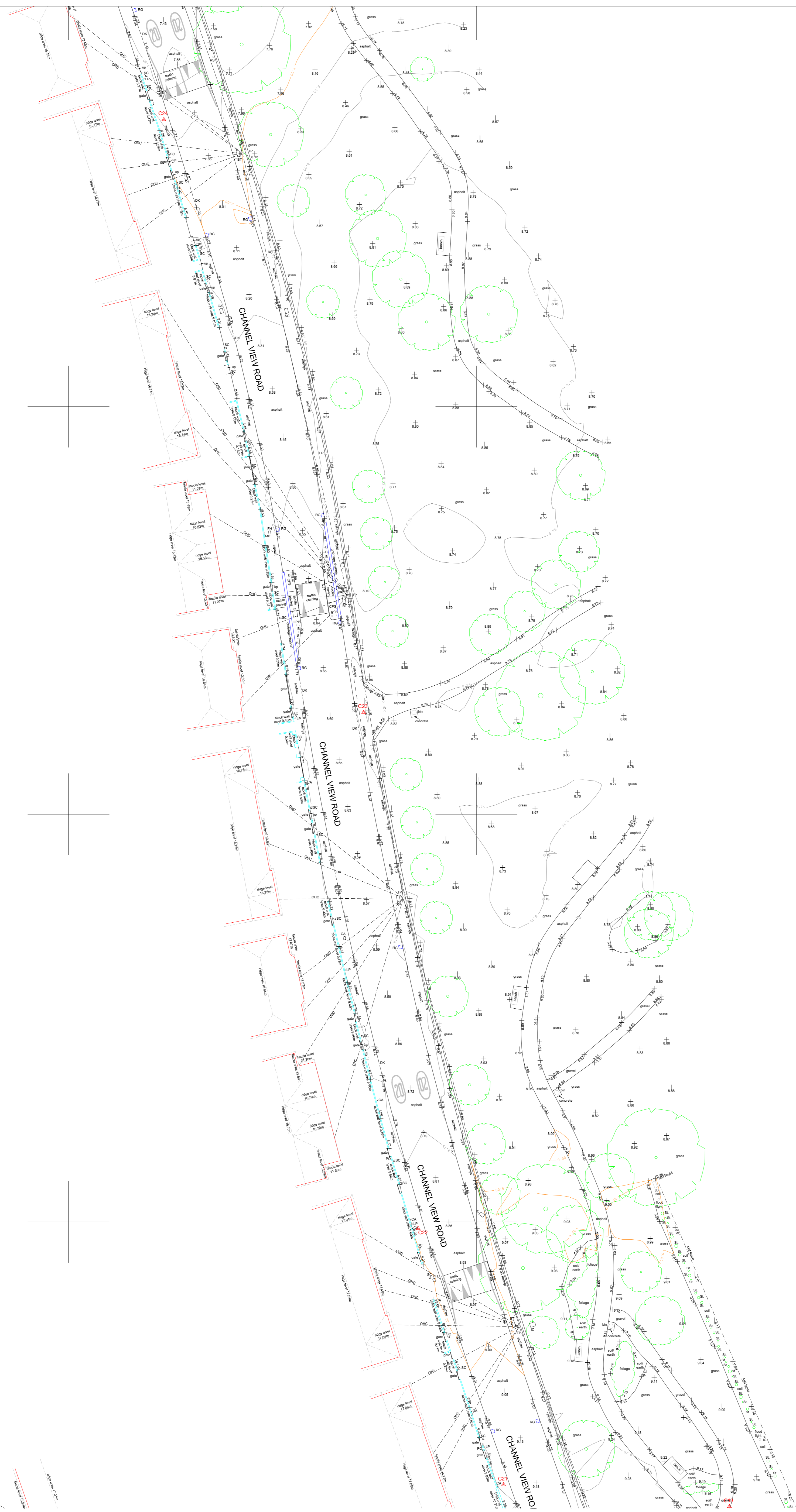
317750E

317800E

317850E

317900E

317950E



KEY TO ABBREVIATIONS

Ap	Asphalt	JB	Junction Box
B	Ballast	KO	Kerb Outlet
BH	Bench	LP	Lamp Post
BS	Bus Stop	MH	Manhole
BT	British Telecom Cover	MW	Manhole
BU	Bulk/Strut	NB	Name Board
CB	Telephone Control Cabinet	DHC	Overhead Cable
CA	Cable Television Cover	PO	Post
Conc.	Concrete	PB	Post Box
CPS	Concrete Paving Slabs	RE	Roading Eye
DK	Drop Kerb	RG	Road Gully
Elc.	Electricity Inspection Cover	RH	Road Sign
EP	Electric Pole	RWP	Road Water Pipe
ER	Earth Road	SC	Stop Cock
FEL	Finished Floor Level	SWS	Storm Water
FH	Fire Hydrant	St	Stump
FP	Flag Pole	SV	Stop Valve
G	Gully	SVP	Sid Vent Pipe
GP	Gas Post	TCS	Telephone Box
GV	Gas Valve	TL	Traffic Light
IC	Inspection Cover	TP	Telegraph Pole

Fence And Wall Features:

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BW	Barbed Wire
BW	Block Wall
CRW	Concrete Retaining Wall
CS	Chain Siding
CM	Corrugated Metal
CPBW	Concrete Post & Barbed Wire
CPCL	Concrete Post & Chainlink
CPCP	Concrete Post & Post
CPW	Concrete Post & Wire
GW	Garden Wall
HR	Hand Rail
I	Iron
M	Metal Railings
MW	Interwoven Wood Slat
MM	Metal Mesh
MPMR	Metal Post and Metal Rail
SRW	Stone Retaining Wall
WPBW	Wood Post & Barbed Wire
WPMR	Wood Post & Metal Rail
WPW	Wood Post & Wire
WPMR	Wood Post & Wire
WPMR	Wood Post & Wire
WPMR	Wood Post & Wire

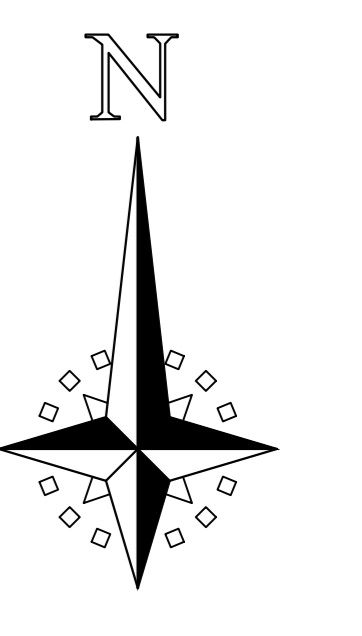
Drainage Features:

CL	Cover Level
IL	Invert Level
FWS	Foul Water Sewer
SWS	Storm Water Sewer
CWS	Combined Water Sewer
UTL	Untraced To L/R
D	Pipe Diameter (mm)
SL	Soil Level
→	Arrow indicates direction of flow
WL	Water Level with date and time taken
—	Embankment
○	EXISTING TREE (SPREAD - NEAREST METRE)
D	D. DIAMETER
S	S. SPREAD

Notes:

- All levels and grid relate to Ordnance Survey Datum derived by GPS.
- Do not scale from this drawing.

Point	Northings	Eastings	Height
C1	174115.343	317885.38	8.855
C2	174117.861	317887.00	8.862
C3	174120.379	317888.62	8.869
C4	174122.897	317890.24	8.876
C5	174125.415	317891.86	8.883
C6	174127.933	317893.48	8.890
C7	174130.451	317895.10	8.897
C8	174132.969	317896.72	8.904
C9	174135.487	317898.34	8.911
C10	174138.005	317900.00	8.918
C11	174140.523	317901.62	8.925
C12	174143.041	317903.24	8.932
C13	174145.559	317904.86	8.939
C14	174148.077	317906.48	8.946
C15	174150.595	317908.10	8.953
C16	174153.113	317909.72	8.960
C17	174155.631	317911.34	8.967
C18	174158.149	317912.96	8.974
C19	174160.667	317914.58	8.981
C20	174163.185	317916.20	8.988
C21	174165.703	317917.82	8.995
C22	174168.221	317919.44	9.002
C23	174170.739	317921.06	9.009
C24	174173.257	317922.68	9.016
C25	174175.775	317924.30	9.023
C26	174178.293	317925.92	9.030
C27	174180.811	317927.54	9.037
C28	174183.329	317929.16	9.044
C29	174185.847	317930.78	9.051
C30	174188.365	317932.40	9.058
C31	174190.883	317934.02	9.065
C32	174193.401	317935.64	9.072
C33	174195.919	317937.26	9.079
C34	174198.437	317938.88	9.086
C35	174200.955	317940.50	9.093
C36	174203.473	317942.12	9.100
C37	174205.991	317943.74	9.107
C38	174208.509	317945.36	9.114
C39	174211.027	317946.98	9.121
C40	174213.545	317948.60	9.128
C41	174216.063	317950.22	9.135
C42	174218.581	317951.84	9.142
C43	174221.099	317953.46	9.149
C44	174223.617	317955.08	9.156
C45	174226.135	317956.70	9.163
C46	174228.653	317958.32	9.170
C47	174231.171	317959.94	9.177
C48	174233.689	317961.56	9.184
C49	174236.207	317963.18	9.191
C50	174238.725	317964.80	9.198
C51	174241.243	317966.42	9.205
C52	174243.761	317968.04	9.212
C53	174246.279	317969.66	9.219
C54	174248.797	317971.28	9.226
C55	174251.315	317972.90	9.233
C56	174253.833	317974.52	9.240
C57	174256.351	317976.14	9.247
C58	174258.869	317977.76	9.254
C59	174261.387	317979.38	9.261
C60	174263.905	317981.00	9.268
C61	174266.423	317982.62	9.275
C62	174268.941	317984.24	9.282
C63	174271.459	317985.86	9.289
C64	174273.977	317987.48	9.296
C65	174276.495	317989.10	9.303
C66	174279.013	317990.72	9.310
C67	174281.531	317992.34	9.317
C68	174284.049	317993.96	9.324
C69	174286.567	317995.58	9.331
C70	174289.085	317997.20	9.338
C71	174291.603	317998.82	9.345
C72	174294.121	318000.44	9.352
C73	174296.639	318002.06	9.359
C74	174299.157	318003.68	9.366
C75	174301.675	318005.30	9.373
C76	174304.193	318006.92	9.380
C77	174306.711	318008.54	9.387
C78	174309.229	318010.16	9.394
C79	174311.747	318011.78	9.401
C80	174314.265	318013.40	9.408
C81	174316.783	318015.02	9.415
C82	174319.301	318016.64	9.422
C83	174321.819	318018.26	9.429
C84	174324.337	318019.88	9.436
C85	174326.855	318021.50	9.443
C86	174329.373	318023.12	9.450
C87	174331.891	318024.74	9.457
C88	174334.409	318026.36	9.464
C89	174336.927	318027.98	9.471
C90	174339.445	318029.60	9.478
C91	174341.963	318031.22	9.485
C92	174344.481	318032.84	9.492
C93	174347.000	318034.46	9.499
C94	174349.518	318036.08	9.506
C95	174352.036	318037.70	9.513
C96	174354.554	318039.32	9.520
C97	174357.072	318040.94	9.527
C98	174359.590	318042.56	9.534
C99	174362.108	318044.18	9.541
C100	174364.626	318045.80	9.548



D	Additional detail added	10/09/20
C	Additional detail added	08/09/20
B	Additional detail added	05/08/20
A	Additional detail added	25/06/20
Rev	Description	Date

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10 Goldtops, Newport, NP20 4PH.
 tel:01633 844984
 email:info@3pointsurveys.co.uk
 www.3pointsurveys.co.uk.

Client: Cambria Consulting Limited.

Site: Channel View Road, Cardiff.

Drawing: Topographic Survey Sheet 6 of 9.

Scale: A0@1:250 Date: June 2020

Designed By: C.M.K

Drawing No.: E1024-1-6 Rev D

174450N

174400N

174350N

174300N



KEY TO ABBREVIATIONS

Asp	Asphalt	JB	Junction Box
B	Bolted	KO	Kerb Outlet
BH	Bench	LP	Lamp Post
BS	Bus Stop	MH	Manhole
BT	British Telecom Cover	MW	Manhole
BU	Bulk/Bush	NB	Name Board
CB	Telephone Control Cabinet	ORC	Overhead Cable
CA	Cable Television Cover	PO	Post
CC	Concrete	PS	Post Box
CPS	Concrete Paving Slabs	RE	Roading Eye
DK	Drop Kerb	RG	Road Gully
EIC	Electricity Inspection Cover	RS	Road Sign
EP	Electricity Pole	RWP	Rain Water Pipe
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FH	Fire Hydrant	St	Shump
FP	Flag Pole	SV	Stop Valve
G	Gully	SVP	Soil Vent Pipe
GP	Gate Post	TCS	Telephone Box
GV	Gas Valve	TL	Traffic Light
IC	Inspection Cover	TP	Telegraph Pole

Fence And Wall Features:

BURW	Block Retaining Wall
BW	Barbed Wire
BW	Brick Wall
CRW	Concrete Retaining Wall
CS	Chain Sashed
CM	Corrugated Metal
CRWB	Concrete Post & Barbed Wire
CPCL	Concrete Post & Chainlink
CPWP	Concrete Post & Post
CPW	Concrete Post & Wire
GW	Garden Wall
HR	Hand Rail
I	Metal Railings
IM	Interwoven Wood Slat
MM	Metal Mesh
MPMR	Metal Post and Metal Rail
SRW	Stone Retaining Wall
WPBW	Wood Post & Barbed Wire
WPMR	Wood Post & Metal Rail
WPWR	Wood Post & Wire
WPWR	Wood Post & Wood Rail

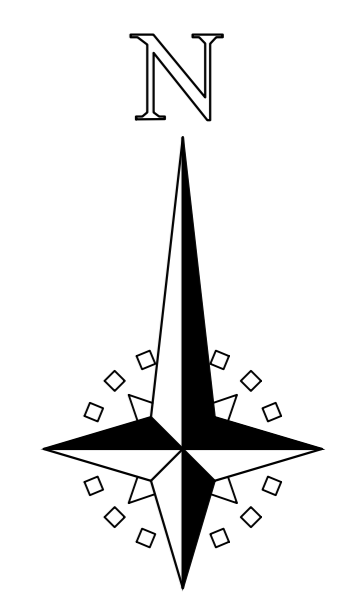
Drainage Features:

CL	Cover Level
L	Invert Level
FWWS	Foul Water Sewer
SWS	Storm Water Sewer
CWS	Combined Water Sewer
UTL	Unstable To L/R
D	Pipe Diameter (mm)
SL	Soil Level
→	Arrow indicates direction of flow
WL	Water Level with date and time taken

Notes:

- All levels and grid relate to Ordnance Survey Datum derived by GPS.
- Do not scale from this drawing.

Point	Easting	Northing	Level
C1	174413.843	173881.36	8.565
C2	174417.267	173881.36	8.565
C3	174420.691	173881.36	8.565
C4	174424.115	173881.36	8.565
C5	174427.539	173881.36	8.565
C6	174430.963	173881.36	8.565
C7	174434.387	173881.36	8.565
C8	174437.811	173881.36	8.565
C9	174441.235	173881.36	8.565
C10	174444.659	173881.36	8.565
C11	174448.083	173881.36	8.565
C12	174451.507	173881.36	8.565
C13	174454.931	173881.36	8.565
C14	174458.355	173881.36	8.565
C15	174461.779	173881.36	8.565
C16	174465.203	173881.36	8.565
C17	174468.627	173881.36	8.565
C18	174472.051	173881.36	8.565
C19	174475.475	173881.36	8.565
C20	174478.899	173881.36	8.565
C21	174482.323	173881.36	8.565
C22	174485.747	173881.36	8.565
C23	174489.171	173881.36	8.565
C24	174492.595	173881.36	8.565
C25	174496.019	173881.36	8.565
C26	174499.443	173881.36	8.565
C27	174502.867	173881.36	8.565
C28	174506.291	173881.36	8.565
C29	174509.715	173881.36	8.565
C30	174513.139	173881.36	8.565
C31	174516.563	173881.36	8.565
C32	174519.987	173881.36	8.565
C33	174523.411	173881.36	8.565
C34	174526.835	173881.36	8.565
C35	174530.259	173881.36	8.565
C36	174533.683	173881.36	8.565
C37	174537.107	173881.36	8.565
C38	174540.531	173881.36	8.565
C39	174543.955	173881.36	8.565
C40	174547.379	173881.36	8.565
C41	174550.803	173881.36	8.565
C42	174554.227	173881.36	8.565
C43	174557.651	173881.36	8.565
C44	174561.075	173881.36	8.565
C45	174564.499	173881.36	8.565
C46	174567.923	173881.36	8.565
C47	174571.347	173881.36	8.565
C48	174574.771	173881.36	8.565
C49	174578.195	173881.36	8.565
C50	174581.619	173881.36	8.565
C51	174585.043	173881.36	8.565
C52	174588.467	173881.36	8.565
C53	174591.891	173881.36	8.565
C54	174595.315	173881.36	8.565
C55	174598.739	173881.36	8.565
C56	174602.163	173881.36	8.565
C57	174605.587	173881.36	8.565
C58	174609.011	173881.36	8.565
C59	174612.435	173881.36	8.565
C60	174615.859	173881.36	8.565
C61	174619.283	173881.36	8.565
C62	174622.707	173881.36	8.565
C63	174626.131	173881.36	8.565
C64	174629.555	173881.36	8.565
C65	174632.979	173881.36	8.565
C66	174636.403	173881.36	8.565
C67	174639.827	173881.36	8.565
C68	174643.251	173881.36	8.565
C69	174646.675	173881.36	8.565
C70	174650.099	173881.36	8.565
C71	174653.523	173881.36	8.565
C72	174656.947	173881.36	8.565
C73	174660.371	173881.36	8.565
C74	174663.795	173881.36	8.565
C75	174667.219	173881.36	8.565
C76	174670.643	173881.36	8.565
C77	174674.067	173881.36	8.565
C78	174677.491	173881.36	8.565
C79	174680.915	173881.36	8.565
C80	174684.339	173881.36	8.565
C81	174687.763	173881.36	8.565
C82	174691.187	173881.36	8.565
C83	174694.611	173881.36	8.565
C84	174698.035	173881.36	8.565
C85	174701.459	173881.36	8.565
C86	174704.883	173881.36	8.565
C87	174708.307	173881.36	8.565
C88	174711.731	173881.36	8.565
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C90	174718.579	173881.36	8.565
C91	174722.003	173881.36	8.565
C92	174725.427	173881.36	8.565
C93	174728.851	173881.36	8.565
C94	174732.275	173881.36	8.565
C95	174735.699	173881.36	8.565
C96	174739.123	173881.36	8.565
C97	174742.547	173881.36	8.565
C98	174745.971	173881.36	8.565
C99	174749.395	173881.36	8.565
C100	174752.819	173881.36	8.565



D	Additional detail added	10/09/20
C	Additional detail added	08/09/20
B	Additional detail added	05/08/20
A	Additional detail added	25/06/20

Rev	Description	Date
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10 Goldtops, Newport, NP20 4PH.
tel:01633 844984
email:info@3pointsurveys.co.uk
www.3pointsurveys.co.uk.

Client: Cambria Consulting Limited.

Site: Channel View Road, Cardiff.

Drawing: Topographic Survey Sheet 7 of 9.

Scale: A0@1:250 Date: June 2020

Designed By: C.M.K

Drawing No:

E1024-1-7 Rev D

3177800E

3177800E

317800E

317800E

317900E

174350N

174300N

174250N

174200N



KEY TO ABBREVIATIONS

Ap	Asphalt	JB	Junction Box
B	Ballast	KO	Kerb Outlet
BH	Benchmark	LP	Lamp Post
BS	Bus Stop	MH	Manhole
BT	British Telecom Cover	MSF	Monitoring Well
BU	Bulk/Burub	NB	Name Board
CB	Telephone Control Cabinet	OHC	Overhead Cable
CA	Cable Television Cover	PO	Post
Conc.	Concrete	PB	Post Box
CPS	Concrete Paving Slabs	RE	Roading Eye
DK	Drop Kerb	RG	Road Gully
Elc.	Electricity Inspection Cover	RS	Road Sign
EP	Electricity Pole	RWP	Rain Water Pipe
ER	Earth Road	SC	Stop Cock
FEL	Finished Floor Level	SW	Stop Wire
FH	Fire Hydrant	St	Stamp
FP	Flag Pole	SV	Stop Valve
G	Gully	SVP	Soil Vent Pipe
GP	Gate Post	TCS	Telephone Box
GV	Gas Valve	TL	Traffic Light
IC	Inspection Cover	TP	Telegraph Pole

Fence And Wall Features:

BURW	Block Retaining Wall
BW	Barbed Wire
BW	Block Wall
CRW	Concrete Retaining Wall
CB	Chain Barbed
CM	Corrugated Metal
CRBW	Concrete Post & Barbed Wire
CPCL	Concrete Post & Chainlink
CPWP	Concrete Post & Post
CPW	Concrete Post & Wire
GW	Garden Wall
HR	Hand Rail
I	Iron
M	Metal Railings
MW	Interwoven Wood Slat
MM	Metal Mesh
MPMR	Metal Post and Metal Rail
SRW	Stone Retaining Wall
WPBW	Wood Post & Barbed Wire
WPMR	Wood Post & Metal Rail
WPRW	Wood Post & Wire
WPRW	Wood Post & Wood Rail

Drainage Features:

CL	Cover Level
E	Invert Level
FWS	Foul Water Sewer
SWS	Storm Water Sewer
CWS	Combined Water Sewer
UTL	Unstable To L/R
D	Pipe Diameter (mm)
SL	Soil Level
A	Arrow indicates direction of flow
WL	Water Level with date and time taken

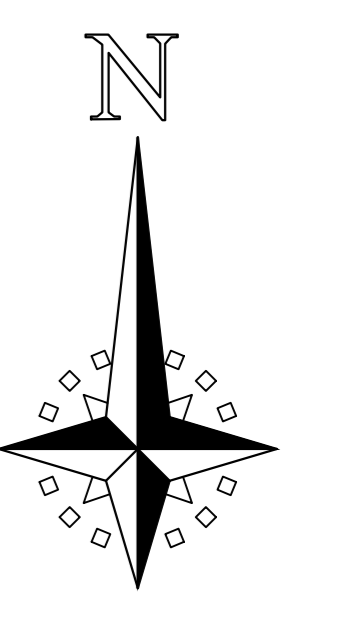
Embankment

EXISTING TREE (SPREAD - NEAREST METRE)
D. DIAMETER
S. SPREAD

Notes:

- All levels and grid relate to Ordnance Survey Datum derived by GPS.
- Do not scale from this drawing.

Point	Code	Height	Level
1	104115.00	174300.00	8.200
2	104115.00	174300.00	8.200
3	104115.00	174300.00	8.200
4	104115.00	174300.00	8.200
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6	104115.00	174300.00	8.200
7	104115.00	174300.00	8.200
8	104115.00	174300.00	8.200
9	104115.00	174300.00	8.200
10	104115.00	174300.00	8.200
11	104115.00	174300.00	8.200
12	104115.00	174300.00	8.200
13	104115.00	174300.00	8.200
14	104115.00	174300.00	8.200
15	104115.00	174300.00	8.200
16	104115.00	174300.00	8.200
17	104115.00	174300.00	8.200
18	104115.00	174300.00	8.200
19	104115.00	174300.00	8.200
20	104115.00	174300.00	8.200
21	104115.00	174300.00	8.200
22	104115.00	174300.00	8.200
23	104115.00	174300.00	8.200
24	104115.00	174300.00	8.200
25	104115.00	174300.00	8.200
26	104115.00	174300.00	8.200
27	104115.00	174300.00	8.200
28	104115.00	174300.00	8.200
29	104115.00	174300.00	8.200
30	104115.00	174300.00	8.200
31	104115.00	174300.00	8.200
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33	104115.00	174300.00	8.200
34	104115.00	174300.00	8.200
35	104115.00	174300.00	8.200
36	104115.00	174300.00	8.200
37	104115.00	174300.00	8.200
38	104115.00	174300.00	8.200
39	104115.00	174300.00	8.200
40	104115.00	174300.00	8.200
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42	104115.00	174300.00	8.200
43	104115.00	174300.00	8.200
44	104115.00	174300.00	8.200
45	104115.00	174300.00	8.200
46	104115.00	174300.00	8.200
47	104115.00	174300.00	8.200
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50	104115.00	174300.00	8.200
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84	104115.00	174300.00	8.200
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96	104115.00	174300.00	8.200
97	104115.00	174300.00	8.200
98	104115.00	174300.00	8.200
99	104115.00	174300.00	8.200
100	104115.00	174300.00	8.200



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Rev	Description	Date

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email:info@3pointsurveys.co.uk
www.3pointsurveys.co.uk.

Client: Cambria Consulting Limited.
Site: Channel View Road, Cardiff.

Drawing: Topographic Survey
Sheet 8 of 9.

Scale: A0@1:250 Date: June 2020
Designed By: C.M.K

Drawing No.: E1024-1-8 Rev D

174150N

174100N

174050N

174000N

317600E

317500E

317700E

317500E

KEY TO ABBREVIATIONS

Ap	Asphalt	JB	Junction Box
B	Ballast	KO	Kerb Outlet
BH	Benchmark	LP	Lamp Post
BS	Bus Stop	MH	Manhole
BT	British Telecom Cover	MSF	Monitoring Well
BU	Bulk/Strut	NB	Name Board
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FH	Fire Hydrant	St	Stamp
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G	Gully	SVP	Sid Vent Pipe
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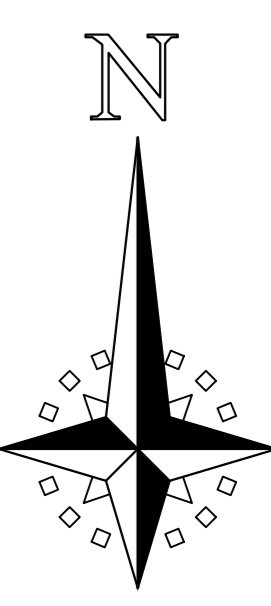
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Notes:

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- Do not scale from this drawing.

Point	Northings	Eastings	Level
1	174150.00	317500.00	8.200
2	174150.00	317500.00	8.200
3	174150.00	317500.00	8.200
4	174150.00	317500.00	8.200
5	174150.00	317500.00	8.200
6	174150.00	317500.00	8.200
7	174150.00	317500.00	8.200
8	174150.00	317500.00	8.200
9	174150.00	317500.00	8.200
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100	174150.00	317500.00	8.200



D	Additional detail added	10/09/20
C	Additional detail added	08/09/20
B	Additional detail added	05/08/20
A	Additional detail added	25/06/20

Rev	Description	Date

.....\3pointsurveys edited.png

10 Goldtops, Newport, NP20 4PH.
tel:01633 844984
email:info@3pointsurveys.co.uk
www.3pointsurveys.co.uk.

Client: Cambria Consulting Limited.
Site: Channel View Road, Cardiff.

Drawing: Topographic Survey Sheet 9 of 9.

Scale: A0@1:250 Date: June 2020
Designed By: C.M.K

Drawing No.: E1024-1-9 Rev D

Appendix C: Proposed Site Layout

Channel View Road Visitor Parking
(See extract below)

Channel View Road Visitor Parking

Phase 1 Boundary

This drawing must not be scaled. Figured dimensions and levels to be used. Any inaccuracies must be notified to the architect. Detail drawings and large scale drawings take precedence over smaller drawings.

Rev:	Chk'd:	Rev:	Chk'd:	Rev:	Chk'd:	Rev:	Chk'd:
A	AF	25.04.20					
B	AF	07.05.20					
C	AF	29.05.20					
D	AF	01.02.21					
E	AF	01.02.21					
F	AF	16.04.21					
G	AF	16.04.21					

PRELIMINARY	✓
PLANNING	
DESIGN	
TENDER	
CONSTRUCTION	

powelldobson
ARCHITECTS

Contract: Channel View, Cardiff
For: Cardiff Council
Title: Site Development Layout

Drawing No. 20004(05) 100
Rev. G

Scale: 1:500 @ A0
Date: March 2020
Drawn: AF
Checked: BK

Cardiff Office: Suite 11, Building One, Eastern Business Park, Wern Fawr Lane, Old St. Mellons, Cardiff CF23 8BA. Tel: +44 (0)1352 301 001. www.powelldobson.com

Appendix D: Existing Drainage Layouts



DRG NO. 0104

FURTHER SURVEY REQUIRED TO ESTABLISH EXACT ALIGNMENT. ROUTE ASSUMED, INDICATIVE ONLY.

EXISTING SURFACE WATER OUTFALL INTO CARDIFF BAY UNABLE TO BE SURVEYED. BANK INACCESSIBLE DUE TO VEGETATION COVER.

DRG NO. 0105

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 THE CONTRACTOR IS TO REFER TO THE SPECIFICATION, FULL SCHEDULE OF RESIDUAL RISKS IN THE CONTRACT DOCUMENTATION AND ALSO TO INFORMATION FROM OTHER DESIGNERS, IN PARTICULAR THE M&E CONSULTANT REGARDING EXISTING LIVE SERVICES.
 THIS SYMBOL IS USED TO HIGHLIGHT INSTANCES OF RISK WITHIN THE CONSTRUCTION PROCESS. ALWAYS CHECK FOR LATER REVISIONS OF THIS DRAWING.

KEY:
 - - - - - EXISTING DCWW COMBINED SEWER
 - - - - - EXISTING DCWW SURFACE WATER SEWER
 - - - - - EXISTING PRIVATE FOUL DRAIN
 - - - - - EXISTING PRIVATE SURFACE WATER DRAIN

NOTES:
 1. EXISTING DRAINAGE SHOWN BASED ON MANHOLE SURVEYS AND WELSH WATER RECORDS. THE SITE WILL BE SUBJECT TO UTILITY AND CCTV DRAINAGE SURVEYS TO CONFIRM EXACT ROUTING OF DRAINAGE THROUGH THE SITE. A NUMBER OF ACCESS COVERS WERE UNABLE TO BE LIFTED.

P02	RE-ISSUE FOR PAC CONSULTATION	AR	BW	WJ
				22/04/21
P01	FIRST ISSUE FOR COMMENT	SJ	BW	WJ
				02/10/20
Rev.	Description	By	Chk	App



Project:
CHANNEL VIEW, CARDIFF

Drawing Title:
EXISTING DRAINAGE LAYOUT OVERALL PLAN

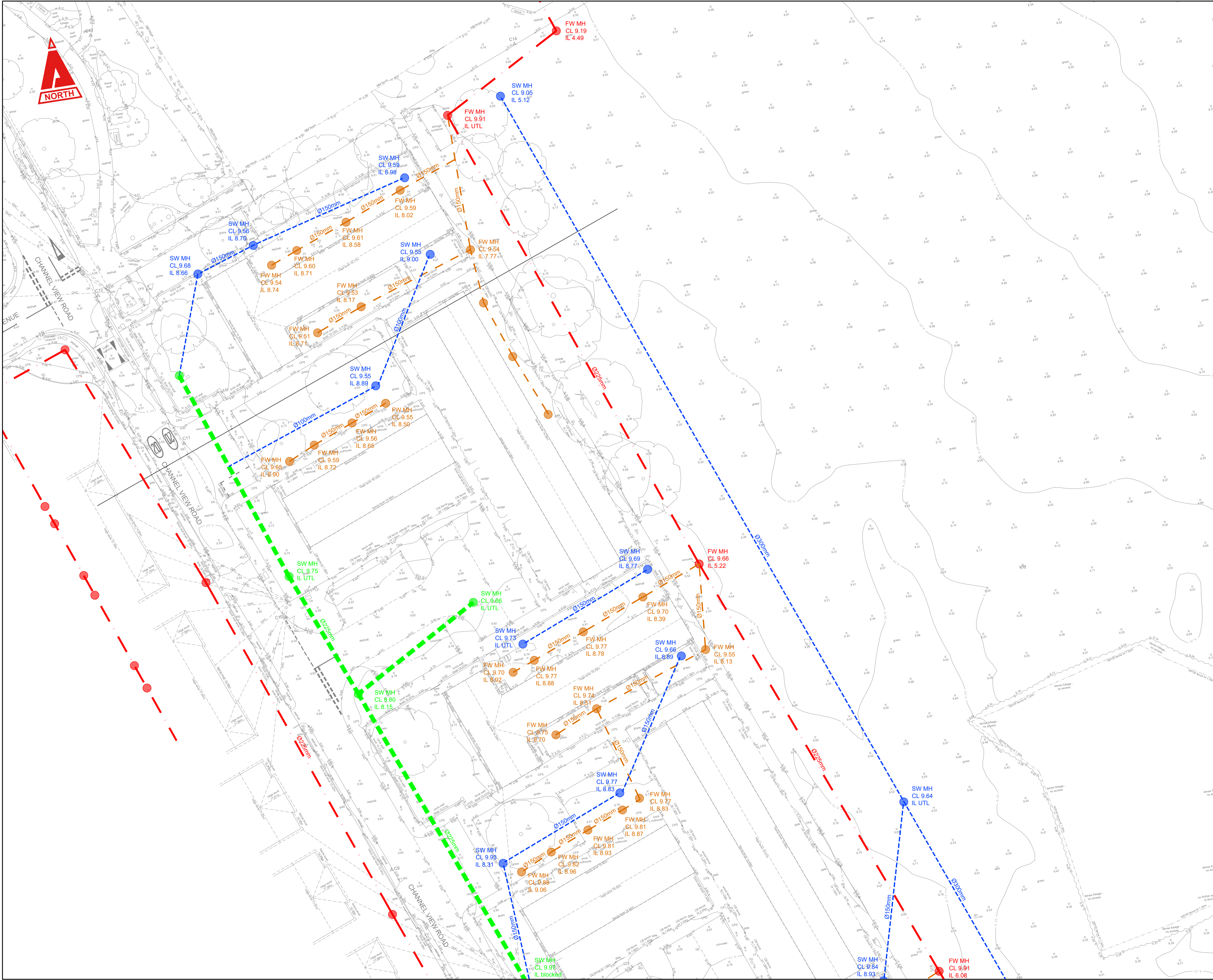
Drawing No.
CC2083 CAM ZZ 00 GA C 52 0103

Project No.	Org.	Vol.	Level	Type	Dis.	Class	No.

Suitability Status:	Scale @A1:	Rev.
PRELIMINARY	1:500	P02

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 Constructive Thinking

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 16 Plas St. Pol de Leon W www.cambria.co.uk
 Penarth Marina @cambriauk
 Cardiff, CF64 1TR uk.linkedin.com/in/cambriauk



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 THIS SYMBOL IS USED TO HIGHLIGHT INSTANCES OF RISK WITHIN THE CONSTRUCTION PROCESS. ALWAYS CHECK FOR LATER REVISIONS OF THIS DRAWING.

- KEY:**
- EXISTING DCWW COMBINED SEWER
 - EXISTING DCWW SURFACE WATER SEWER
 - EXISTING PRIVATE FOUL DRAIN
 - EXISTING PRIVATE SURFACE WATER DRAIN

- NOTES:**
- EXISTING DRAINAGE SHOWN BASED ON MANHOLE SURVEYS AND WELSH WATER RECORDS. THE SITE WILL BE SUBJECT TO UTILITY AND CCTV DRAINAGE SURVEYS TO CONFIRM EXACT ROUTING OF DRAINAGE THROUGH THE SITE. A NUMBER OF ACCESS COVERS WERE UNABLE TO BE LIFTED.

P02	RE-ISSUE FOR PAC CONSULTATION	AR	BW	WJ
				22/04/21
P01	FIRST ISSUE FOR COMMENT	SJ	BW	WJ
				02/10/20
Rev.	Description	By	Chk	App



Client:
CHANNEL VIEW, CARDIFF

Drawing Title:
EXISTING DRAINAGE PLAN (SHEET 1 OF 2)

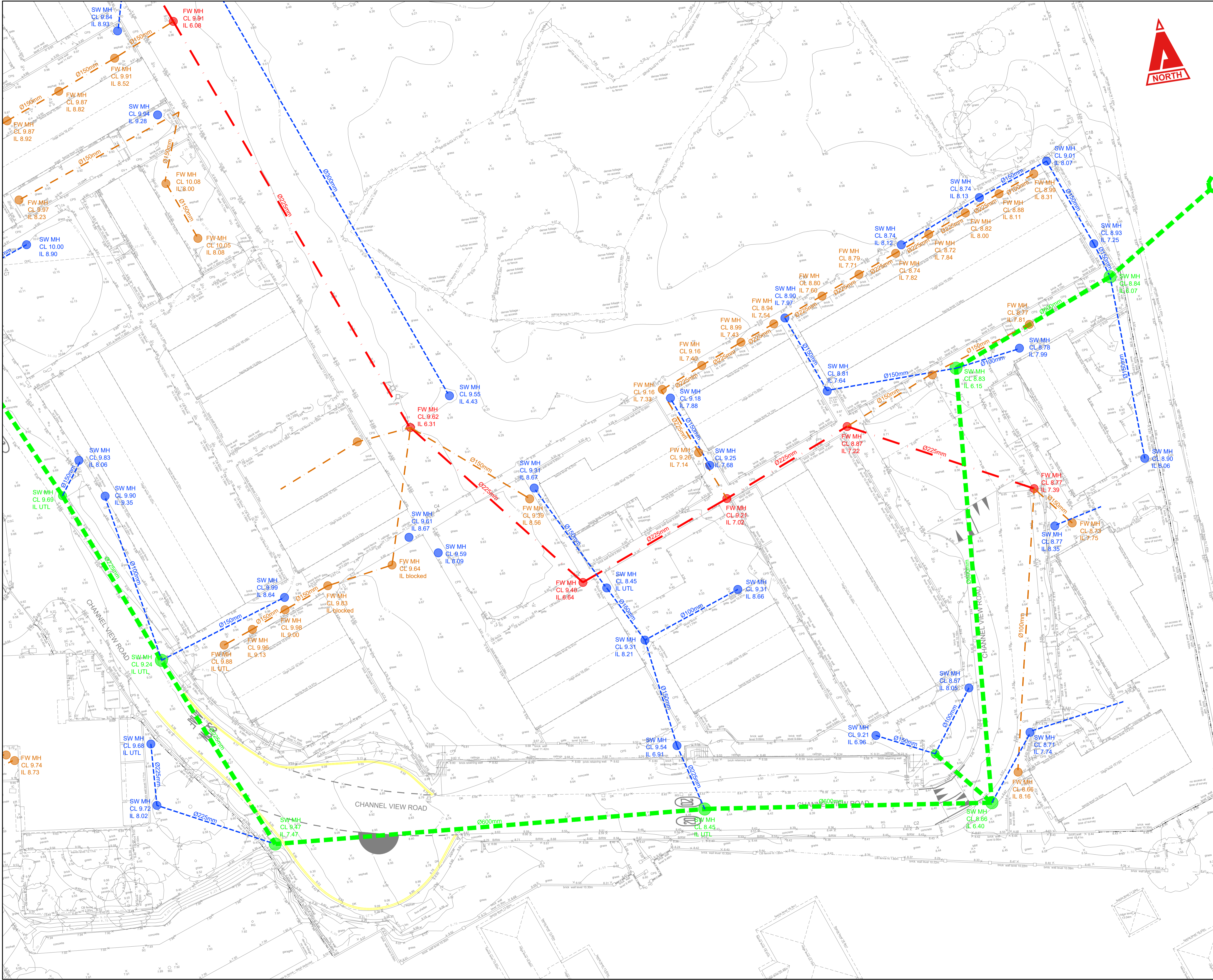
Drawing No.
CC2083 CAM ZZ 00 GA C 52 0104

Project No.	Org.	Vol.	Level	Type	Dis.	Class	No.

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⚠ THIS SYMBOL IS USED TO HIGHLIGHT INSTANCES OF RISK WITHIN THE CONSTRUCTION PROCESS. ALWAYS CHECK FOR LATER REVISIONS OF THIS DRAWING.

- KEY:**
- EXISTING DCWW COMBINED SEWER
 - EXISTING DCWW SURFACE WATER SEWER
 - EXISTING PRIVATE FOUL DRAIN
 - EXISTING PRIVATE SURFACE WATER DRAIN
- NOTES:**
- EXISTING DRAINAGE SHOWN BASED ON MANHOLE SURVEYS AND WELSH WATER RECORDS. THE SITE WILL BE SUBJECT TO UTILITY AND CCTV DRAINAGE SURVEYS TO CONFIRM EXACT ROUTING OF DRAINAGE THROUGH THE SITE. A NUMBER OF ACCESS COVERS WERE UNABLE TO BE LIFTED.

P02	RE-ISSUE FOR PAC CONSULTATION	AR	BW	WJ
				22/04/21
P01	FIRST ISSUE FOR COMMENT	SJ	BW	WJ
				02/10/20
Rev.	Description	By	Chk	App



Project:
CHANNEL VIEW, CARDIFF

Drawing Title:
EXISTING DRAINAGE PLAN (SHEET 2 OF 2)

Drawing No:
CC2083 CAM ZZ 00 GA C 52 0105

Project No.	Org.	Vol.	Level	Type	Dis.	Class	No.

Suitability Status:	Scale @A1:	Rev.
PRELIMINARY	1:250	P02

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Appendix E: Welsh Water Pre Planning Enquiry Response

Mrs Elise Coalter
Cardiff Council
County Hall Room 412
County Hall Atlantic Wharf
Cardiff
CF10 4UW

Date: 13/10/2020
Our Ref: PPA0005185

Dear Mrs Coalter

Grid Ref: 318012 174029
Site Address: Channel View Road Cardiff, CF11 7HY
Development: 359 dwellings, 1 x retail, 1 x food & drink

I refer to your pre-planning enquiry received relating to the above site, seeking our views on the capacity of our network of assets and infrastructure to accommodate your proposed development. Having reviewed the details submitted I can provide the following comments which should be taken into account within any future planning application for the development.

ASSET PROTECTION

The proposed development site is crossed by both public sewers and watermains with the approximate position being marked on the attached Statutory Public Sewer Record & Water Plan. The positions of these assets shall be accurately located and marked out on site before works commence and no operational development shall be carried out within 3 metres either side of the centreline of the public sewer or 3.5 meters either side of the centreline of the watermains .

Our strong recommendation is that your site layout takes into account the location of the assets crossing the site and should be referred to in any master-planning exercises or site layout plans submitted as part of any subsequent planning application. Further information regarding Asset Protection is provided in the attached

You are also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist you may contact Dwr Cymru Welsh Water on 0800 085 3968 to establish the location and status of the apparatus in and around your site.

Please be mindful that under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

PUBLIC SEWERAGE NETWORK

The proposed development site is located in the immediate vicinity of a predominantly combined public sewerage system which drains to Cardiff Bay Wastewater Treatment Works (WwTW).

Surface Water Drainage

As of 7th January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy which states that discharge to a combined sewer shall only be made as a last resort. Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to a surface water drainage body in liaison with the Land Drainage Authority and/or Natural Resources Wales.

Foul Water Drainage – Sewerage Network

We have considered the impact of foul flows generated by the proposed development and concluded that flows can be accommodated within the public sewerage system. We advise that the flows should be connected to the combined sewer at or downstream of manhole ST18730906 located in the south-east of the development site.

Should a planning application be submitted for this development we will seek to control these points of communication via appropriate planning conditions and therefore recommend that any drainage layout or strategy submitted as part of your application takes this into account.

However, should you wish for an alternative connection point to be considered please provide further information to us in the form of a drainage strategy, preferably in advance of a planning application being submitted.

You may need to apply to Dwr Cymru Welsh Water for any connection to the public sewer under Section 106 of the Water industry Act 1991. However, if the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer



(i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Foul Sewers and Lateral Drains, and conform with the publication "Sewers for Adoption"- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com.

SEWAGE TREATMENT

No problems are envisaged with the Waste Water Treatment Works for the treatment of domestic discharges from this site.

WATER SUPPLY

A water supply can be made available to service this proposed development. Initial indications are that a connection can be made from the existing watermain located onsite. The cost of providing new on-site watermains can be calculated upon the receipt of detailed site layout plans which should be sent to the above address.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at developer.services@dwrcymru.com

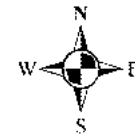
Please quote our reference number in all communications and correspondence.

Yours faithfully,



Owain George
Planning Liaison Manager
Developer Services

Please Note that demands upon the water and sewerage systems change continually; consequently the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.



LEGEND(Representative of most common features)

- | | | | |
|--|---|--|--|
| | Real chamber | | Quotient |
| | Surface water chamber | | Septic tank |
| | Exhausted chamber | | Water flow line |
| | Exhausted sewer overflow | | Ring main |
| | Special purpose chamber | | Gravity sewer |
| | Treatment works | | Private sewer |
| | Pumping station | | Private sewer adjacent to Sewer, SSI, adoption agreement |
| | SB, Sewer rehabilitation installation (SRI) | | Private Sewer Transfer |
| | SO, Sewer | | Lateral Drain |
| | SA, Sewer | | Inspection Chamber |
| | SB, Sewer | | |
| | SA, Sewer | | |
| | SB, Sewer | | |
| | SA, Sewer | | |

Notes:

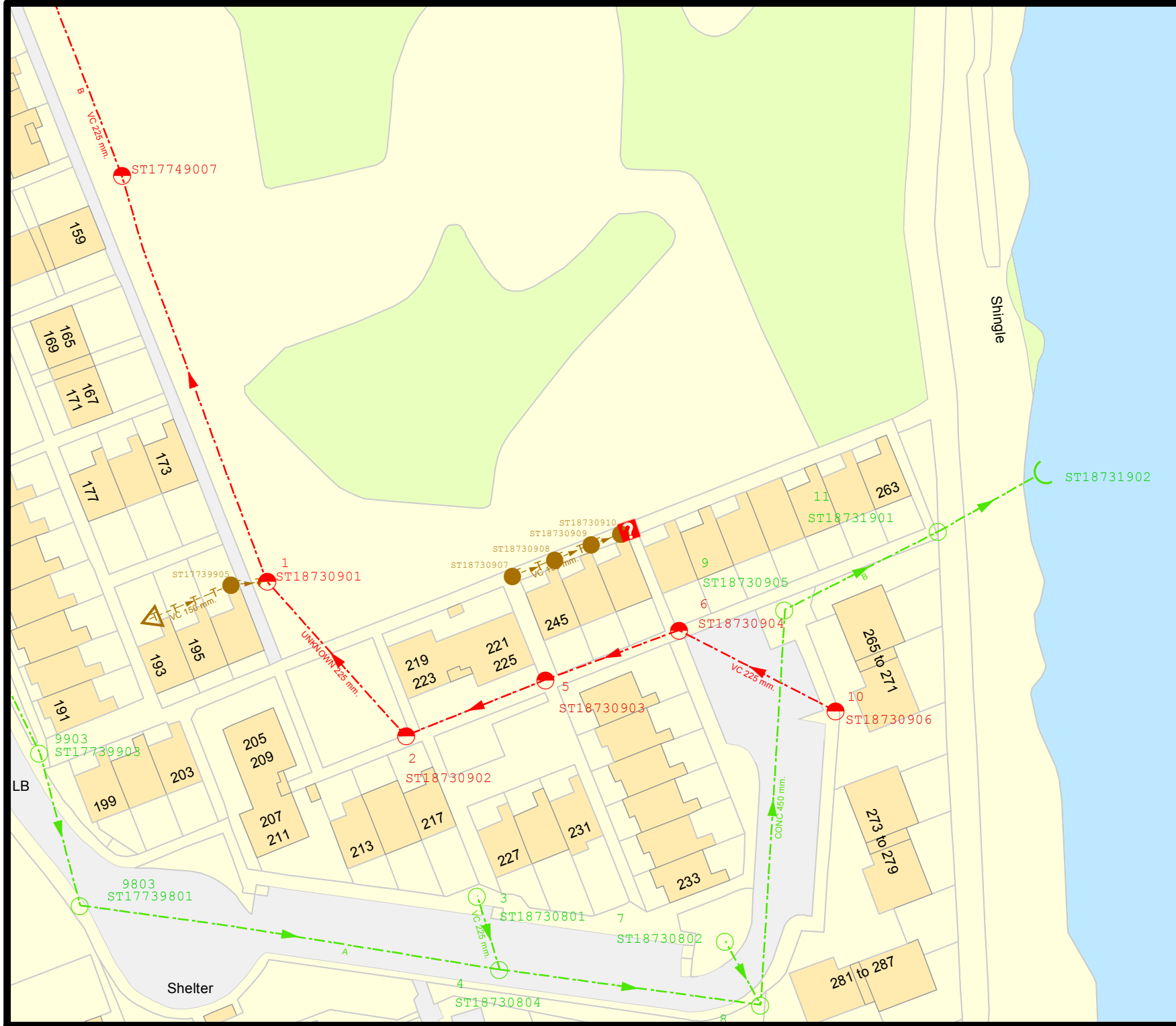
Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation.

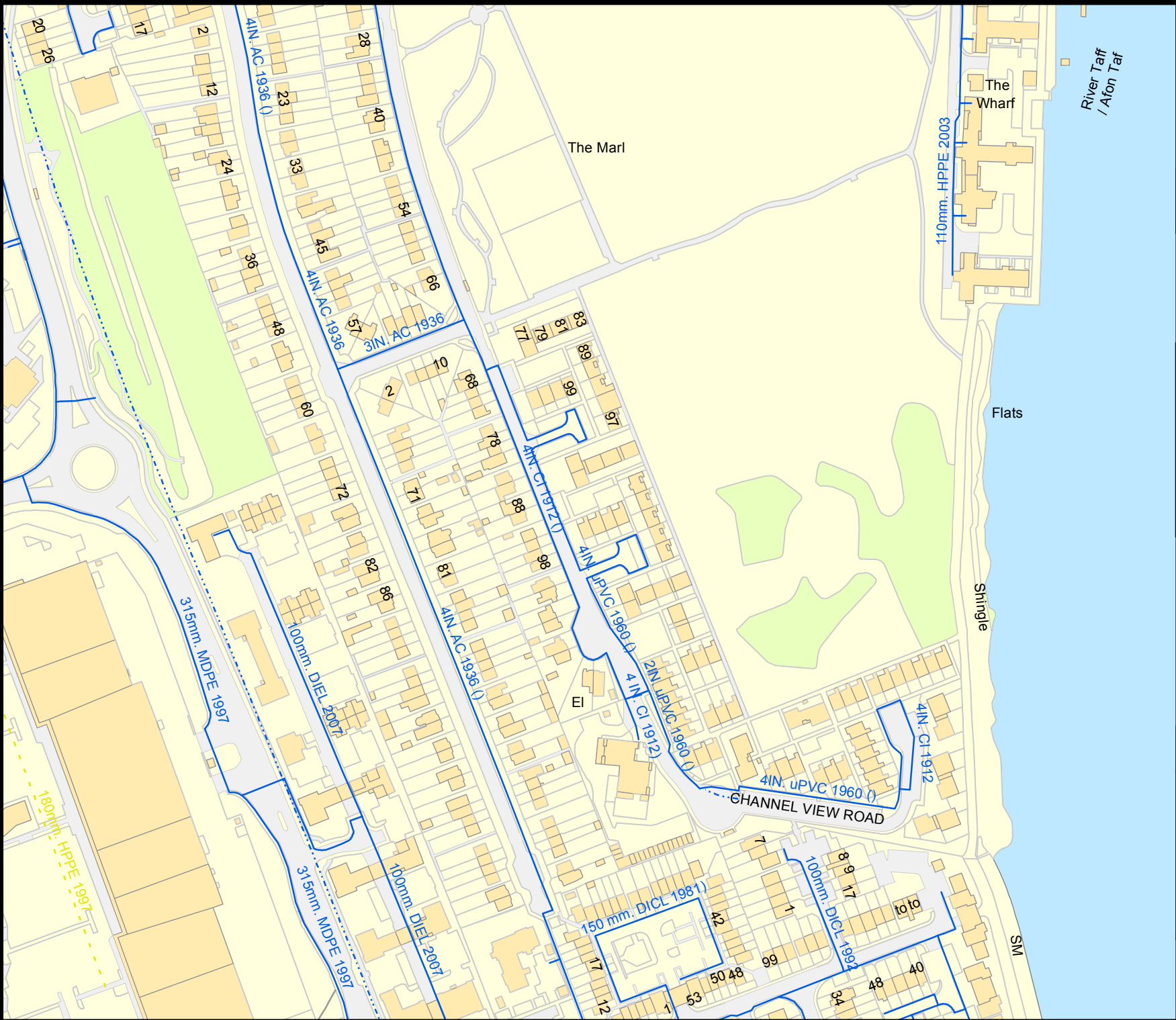
Dŵr Cymru Cymdeithas y Cwmni Cyf. This information is to the position of its underground apparatus by way of general guidance only and on the understanding that it is based on the best information available and is not to be relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The error of location appears before carrying out any excavations are entirely on you. The information which is supplied by the Company is done so in accordance with statutory requirements of sections 103 and 109 of the Water Industry Act 1989 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of water mains, surface water, lateral drains or drainage manholes and any other underground utilities. It is therefore advised that the furnishing of this information is entirely without prejudice to the provisions of the New Roads and Street Works Act 1991 and the Company's liability is compensated for any damage to its apparatus.

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

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Map Ref: 318058,173958
 Map scale: 1:808
 Printed by: Davies Nicholas
 Printed on: 13 Oct 2020





PPA0005185 Water Main Plan



LEGEND

Clear network	Water valve	Manhole
Pressure monitoring valve	Water Treatment Works	Water Pumping Station
Meter	Existing manhole	Non operational manhole
Bulk meter	Flow Water	Flow Water
Substation	Water main colour indicates the type	Flow Water
Gas end	Flow Water	Flow Water
Air valve	Flow Water	Flow Water

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation.

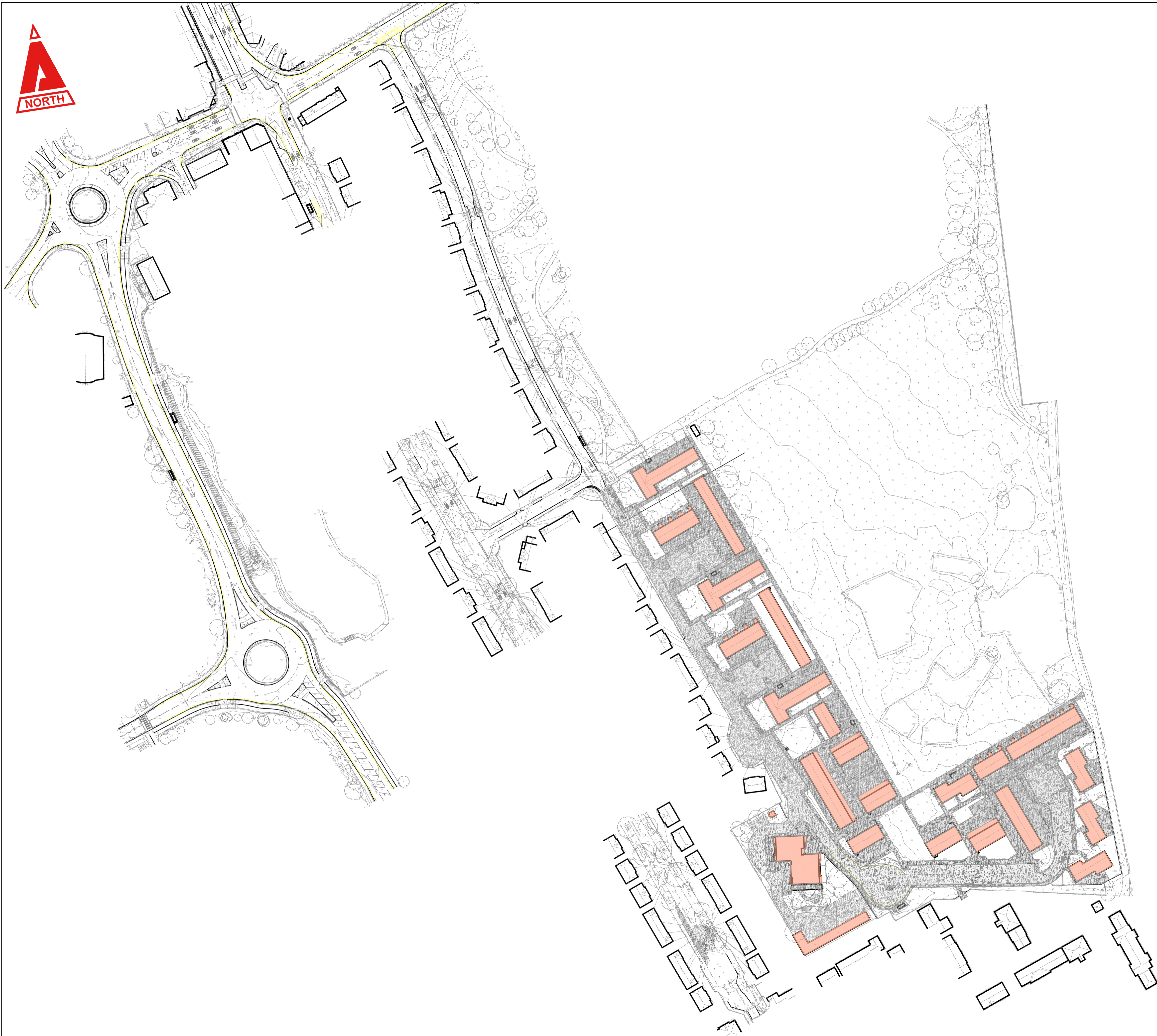
Dŵr Cymru Cynnydd (the Company) gives this information as to the position of its underground apparatus by way of general guidance only and on the understanding that it is based on the best information available and is warranted as to its correctness in relation to the position of excavations or other works made in the vicinity of the company's apparatus. The error of locating apparatus before carrying out any excavations are entirely on you. The information which is supplied by the Company is done so in accordance with statutory requirements of sections 103 and 109 of the Water Industry Act 1991 which is based upon the level of information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of water mains, service pipes, drains, sub-stations or other apparatus and any other apparatus laid before 1 September 1986, or if they do, the location of these apparatus may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provisions of the New Roads and Street Works Act 1991 and the Company's liability is limited to the best of its knowledge.

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

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Map Ref: 317929,174036
Map scale: 1:2500
Printed by: Hackman Jeremy
Printed on: 12 Oct 2020

Appendix F: Drainage Catchment Plans




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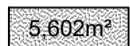
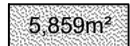

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 THIS SYMBOL IS USED TO HIGHLIGHT INSTANCES OF RISK WITHIN THE CONSTRUCTION PROCESS. ALWAYS CHECK FOR LATER REVISIONS OF THIS DRAWING.

KEY:

-  5,602m² ROOF CATCHMENT
-  5,859m² ROAD CATCHMENT
-  8,600m² FOOTPATHS/PATIOS CATCHMENT

TOTAL IMPERMEABLE CATCHMENT = 2.006Ha

NOTES:

1. IN THE ABSENCE OF TOPOGRAPHICAL SURVEY INFORMATION FOR ENCLOSED PRIVATE GARDENS, THE CATCHMENTS IN THESE AREAS HAVE BEEN PRODUCED BASED ON AERIAL IMAGES. A SIGNIFICANT PORTION OF PRIVATE GARDENS HAVE BEEN PAVED OVER.

P03	ISSUED FOR PAC CONSULTATION	AR	BW	WJ
				22/04/21
P02	REVISED TO SUIT ARCHITECTS CHANGES (REV.C)	AR	BW	WJ
				15/04/21
P01	FIRST ISSUE FOR COMMENT	BW	BW	WJ
				02/10/20
Rev.	Description	By	Chk	App



Project:
**CHANNEL VIEW,
 CARDIFF**

Drawing Title:
**EXISTING DRAINAGE
 CATCHMENT PLAN**

Drawing No.
CC2083 CAM ZZ 00 SK C 52 0013

Project No. Org. Vol. Level Type Dis. Class No.

Suitability Status: PRELIMINARY Scale @A1: 1:1000 Rev: P03

CAMBRIA
 Constructive Thinking

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 Cardiff, CF64 1TR uk.linkedin.com/in/cambriauk




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KEY:

- 8,950m² PROPOSED ROOF CATCHMENT
- 8,120m² PROPOSED ROAD CATCHMENT
- 6,510m² PROPOSED FOOTPATHS CATCHMENT

TOTAL IMPERMEABLE CATCHMENT AREA = 2.358 Ha

P03	IMPERMEABLE CATCHMENTS REVISED TO SUIT NEW BOUNDARY LINE AND ARCHITECTS LAYOUT.	AR	BW	WJ	22/04/21
P02	IMPERMEABLE CATCHMENTS REVISED TO SUIT NEW BOUNDARY LINE AND MARL PROPOSALS.	AR	BW	WJ	12/04/21
P01	FIRST ISSUE FOR COMMENT	BW	BW	WJ	02/10/20
Rev.	Description	By	Chk	App	

Client:

CARDIFF
CAERDYDD

Project:
**CHANNEL VIEW,
CARDIFF**

Drawing Title:
**PROPOSED DRAINAGE
CATCHMENT PLAN**

Drawing No.
CC2083 CAM ZZ 00 SK C 52 0014

Project No.	Org.	Vol.	Level	Type	Dis.	Class	No.

Suitability Status: PRELIMINARY Scale @A1: 1:1000 Rev: P03

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Appendix G: Hydraulic Calculations

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	33.305	0.260	128.1	0.168	5.00	0.0	0.600	o	225	Pipe/Conduit
1.001	19.860	0.100	198.6	0.023	0.00	0.0	0.600	o	225	Pipe/Conduit
2.000	21.394	0.435	49.2	0.147	5.00	0.0	0.600	o	150	Pipe/Conduit
1.002	50.253	0.050	1005.1	0.172	0.00	0.0	0.600	o	225	Pipe/Conduit
1.003	20.213	0.020	1010.7	0.041	0.00	0.0	0.600	o	225	Pipe/Conduit
3.000	20.560	0.185	111.1	0.179	5.00	0.0	0.600	o	150	Pipe/Conduit
1.004	58.619	0.117	501.0	0.119	0.00	0.0	0.600	o	225	Pipe/Conduit
1.005	27.955	0.056	499.2	0.056	0.00	0.0	0.600	o	225	Pipe/Conduit
1.006	31.493	0.062	508.0	0.243	0.00	0.0	0.600	o	225	Pipe/Conduit
1.007	62.661	0.641	97.8	0.160	0.00	0.0	0.600	o	600	Pipe/Conduit
1.008	41.827	0.429	97.5	0.103	0.00	0.0	0.600	o	600	Pipe/Conduit
1.009	63.457	0.250	253.8	0.173	0.00	0.0	0.600	o	600	Pipe/Conduit
1.010	26.096	0.080	326.2	0.358	0.00	0.0	0.600	o	600	Pipe/Conduit
1.011	19.242	0.070	274.9	0.056	0.00	0.0	0.600	o	600	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	8.510	0.168	0.0	1.15	45.9
1.001	8.250	0.191	0.0	0.92	36.7
2.000	8.660	0.147	0.0	1.44	25.4
1.002	8.150	0.510	0.0	0.40	16.1
1.003	8.100	0.551	0.0	0.40	16.0
3.000	8.340	0.179	0.0	0.95	16.8
1.004	8.080	0.849	0.0	0.58	23.0
1.005	7.963	0.905	0.0	0.58	23.0
1.006	7.907	1.148	0.0	0.57	22.8
1.007	7.470	1.308	0.0	2.46	696.5
1.008	6.829	1.411	0.0	2.47	697.4
1.009	6.400	1.584	0.0	1.52	430.9
1.010	6.150	1.942	0.0	1.34	379.7
1.011	6.070	1.998	0.0	1.46	413.9

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.168	0.168	0.168
1.001	-	-	100	0.023	0.023	0.023
2.000	-	-	100	0.147	0.147	0.147
1.002	-	-	100	0.172	0.172	0.172
1.003	-	-	100	0.041	0.041	0.041
3.000	-	-	100	0.179	0.179	0.179
1.004	-	-	100	0.119	0.119	0.119
1.005	-	-	100	0.056	0.056	0.056
1.006	-	-	100	0.243	0.243	0.243
1.007	-	-	100	0.160	0.160	0.160
1.008	-	-	100	0.103	0.103	0.103
1.009	-	-	100	0.173	0.173	0.173
1.010	-	-	100	0.358	0.358	0.358
1.011	-	-	100	0.056	0.056	0.056
				Total	Total	Total
				1.998	1.998	1.998

Free Flowing Outfall Details for Storm


Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.011		7.000	6.000	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 318039 173923 ST 18039 73923
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750

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Cambria House 16-17a Plas St Pol de Leon Penarth Marina		
Date 27/10/2020 16:10 File Channel View Existing S...	Designed by Benwhyman Checked by	
XP Solutions	Network 2019.1	

Synthetic Rainfall Details

Cv (Winter) 0.840
Storm Duration (mins) 30

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria


Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 318039 173923 ST 18039 73923
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840
Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON
Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	2	+0%	2/15 Summer	30/15 Summer		
1.001	2	30 Winter	2	+0%	2/15 Summer	30/15 Summer		
2.000	3	15 Summer	2	+0%	2/15 Summer	2/30 Winter		
1.002	4	30 Winter	2	+0%	2/15 Summer	30/15 Summer		
1.003	5	30 Winter	2	+0%	2/15 Summer	30/15 Summer		
3.000	6	15 Summer	2	+0%	2/15 Summer	30/15 Summer		
1.004	7	30 Winter	2	+0%	2/15 Summer	30/15 Summer		
1.005	8	30 Winter	2	+0%	2/15 Summer	100/15 Summer		
1.006	9	30 Winter	2	+0%	2/15 Summer	30/15 Summer		
1.007	10	30 Winter	2	+0%				
1.008	11	30 Winter	2	+0%				
1.009	13	30 Winter	2	+0%	100/15 Winter			
1.010	14	30 Winter	2	+0%	30/15 Winter			
1.011	15	30 Winter	2	+0%	100/15 Summer			

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XP Solutions		Network 2019.1

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Level Exceeded
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status		
1.000	1	9.622	0.887	0.000	0.38	16.5	FLOOD RISK	25		
1.001	2	9.674	1.199	0.000	0.32	10.8	FLOOD RISK	21		
2.000	3	9.425	0.615	0.000	0.66	15.9	FLOOD RISK	30		
1.002	4	9.652	1.277	0.000	1.82	28.2	FLOOD RISK	14		
1.003	5	9.523	1.198	0.000	3.19	30.6	SURCHARGED	4		
3.000	6	9.267	0.777	0.000	0.97	15.3	SURCHARGED	21		
1.004	7	9.450	1.145	0.000	2.06	45.6	SURCHARGED	8		
1.005	8	8.944	0.756	0.000	2.30	49.3	SURCHARGED	2		
1.006	9	8.660	0.528	0.000	3.11	66.4	SURCHARGED	12		
1.007	10	7.618	-0.452	0.000	0.14	79.7	OK			
1.008	11	6.983	-0.446	0.000	0.15	89.1	OK			
1.009	13	6.628	-0.372	0.000	0.31	105.0	OK			
1.010	14	6.458	-0.292	0.000	0.52	137.6	OK			
1.011	15	6.355	-0.315	0.000	0.46	142.1	OK			

Quick Storage Estimate (Whole Site)

The screenshot shows the 'Quick Storage Estimate' software window with the 'Variables' tab selected. The window title is 'Quick Storage Estimate'. On the left is a navigation pane with 'Variables' highlighted. The main area contains the following fields:

Variable	Value
FEH Rainfall	FEH Rainfall
Return Period (years)	100
Version	2013
Point	Point
Site	GB 318039 173923 ST 18039 73923
Cv (Summer)	0.750
Cv (Winter)	0.840
Impermeable Area (ha)	2.475
Maximum Allowable Discharge (l/s)	203.0
Infiltration Coefficient (m/hr)	0.00000
Safety Factor	2.0
Climate Change (%)	40

Buttons at the bottom: Analyse, OK, Cancel, Help.

Footer: Enter Area between 0.000 and 999.999

The screenshot shows the 'Quick Storage Estimate' software window with the 'Results' tab selected. The window title is 'Quick Storage Estimate'. On the left is a navigation pane with 'Results' highlighted. The main area displays the following text:

Global Variables require approximate storage of between 600 m³ and 1067 m³.

These values are estimates only and should not be used for design purposes.

Buttons at the bottom: Analyse, OK, Cancel, Help.

Footer: Enter Area between 0.000 and 999.999

Quick Storage Estimate (Whole Site with 10% Urban Creep)

Quick Storage Estimate

Micro Drainage

Variables

FEH Rainfall

Return Period (years) 100

Version 2013 Point ...

Site GB 318039 173923 ST 18039 73923

Cv (Summer) 0.750

Cv (Winter) 0.840

Impemeable Area (ha) 2.723

Maximum Allowable Discharge (l/s) 203.0

Infiltration Coefficient (m/hr) 0.00000

Safety Factor 2.0

Climate Change (%) 40

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 705 m³ and 1220 m³.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Quick Storage Estimate (Phase 1)

Quick Storage Estimate

Micro Drainage

Variables

FEH Rainfall	Cv (Summer)	0.750
Return Period (years) 100	Cv (Winter)	0.840
Version 2013 Point	Impermeable Area (ha)	0.222
Site GB 318039 173923 ST 18039 73923	Maximum Allowable Discharge (l/s)	18.2
	Infiltration Coefficient (m/hr)	0.00000
	Safety Factor	2.0
	Climate Change (%)	40

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 54 m³ and 96 m³.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

Quick Storage Estimate (Phase 1 with 10% Urban Creep)

Micro Drainage

Variables

FEH Rainfall	Cv (Summer)	0.750
Return Period (years): 100	Cv (Winter)	0.840
Version: 2013	Impemeable Area (ha)	0.244
Point	Maximum Allowable Discharge (l/s)	18.2
Site: GB 318039 173923 ST 18039 73923	Infiltration Coefficient (m/hr)	0.00000
	Safety Factor	2.0
	Climate Change (%)	40

Analyse OK Cancel Help

Enter Area between 0.000 and 999.999

Micro Drainage

Results

Global Variables require approximate storage of between 63 m³ and 109 m³.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Area between 0.000 and 999.999


Appendix H: Drainage Strategy Plans



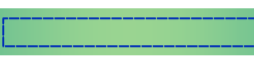

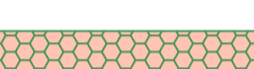
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KEY:

=====	EXISTING SURFACE WATER SEWER
-----	EXISTING COMBINED SEWER
-----	PROPOSED SURFACE WATER SEWER DIVERSION
-----	PROPOSED COMBINED SEWER DIVERSION
-----	PROPOSED SURFACE WATER DRAIN
-----	PROPOSED FOUL WATER SEWER
	PROPOSED RAIN GARDEN
	PROPOSED DETENTION BASIN
-----	PROPOSED FILTER DRAIN
	PROPOSED GREEN ROOF

- NOTES:**
1. THE CONCEPT DRAINAGE STRATEGY IS SUBJECT TO APPROVAL BY THE SAB, WELSH WATER AND NRW.
 2. THE STRATEGY IS SUBJECT TO FURTHER SURVEY WORKS (UTILITY GPR AND DRAINAGE CCTV SURVEYS).
 3. ALL SUDS PROVISIONS WILL NEED TO BE LINED WITH AN IMPERMEABLE MEMBRANE TO PREVENT THE RISK OF MOBILISING CONTAMINANTS.

RAINGARDENS WILL COLLECT RUN-OFF FROM THE REALIGNED AND WIDENED SECTIONS OF CHANNEL VIEW ROAD.

EXISTING SURFACE WATER SEWER DIVERTED THROUGH NEW ROAD ALIGNMENT. SUBJECT TO S185 DIVERSION AGREEMENT WITH WELSH WATER.

ONLINE SHALLOW ATTENUATION BASINS, CASCADED THROUGH THE MARL. BASINS SITED FOR EASE OF PHASING OF THE SURFACE WATER DRAINAGE NETWORK.

EXISTING 225mm PUBLIC COMBINED SEWER TO BE DIVERTED INTO THE MARL. 6m EASEMENT HAS BEEN ACCOMMODATED WITHIN THE LANDSCAPING PROPOSALS. SUBJECT TO S185 DIVERSION AGREEMENT WITH WELSH WATER.

EXISTING 600mm PUBLIC SURFACE WATER SEWER OUTFALL INTO CARDIFF BAY TO BE REUSED.

HYDROBRAKE FLOW CONTROL CHAMBER. RESTRICTED TO 203 l/s, REPRESENTING A 30% REDUCTION IN PRE DEVELOPMENT FLOWS WITHIN A 1 IN 30 YEAR RETURN PERIOD.

P02	REVISED TO MATCH LATEST MASTER PLAN	LW	BW	WJ	22/04/21
P01	FIRST ISSUE FOR COMMENT	SJ	BW	WJ	29/10/20
Rev.	Description	By	Chk	App	



Project:
CHANNEL VIEW,
CARDIFF

Drawing Title:
DRAINAGE STRATEGY
OVERALL PLAN

Drawing No.:
CC2083 CAM ZZ 00 GA C 52 1010

Project No.	Org.	Vol.	Level	Type	Dis.	Class	No.

Suitability Status:	Scale @A1:	Rev:
PRELIMINARY	NTS	P02

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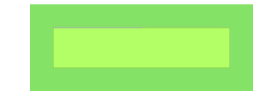
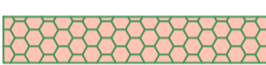
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-----	PROPOSED FOUL WATER SEWER
	PROPOSED RAIN GARDEN
	PROPOSED DETENTION BASIN
-----	PROPOSED FILTER DRAIN
	PROPOSED GREEN ROOF

- NOTES:**
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P02	REVISED TO MATCH LATEST MASTER PLAN	LW	BW	WJ
				22/04/21
P01	FIRST ISSUE FOR COMMENT	SJ	BW	WJ
				29/10/20

Rev.	Description	By	Chk	App
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Client:
CHANNEL VIEW,
CARDIFF

Drawing Title:
DRAINAGE STRATEGY
(SHEET 1 OF 2)

Drawing No.:
CC2083 CAM ZZ 00 GA C 52 0101

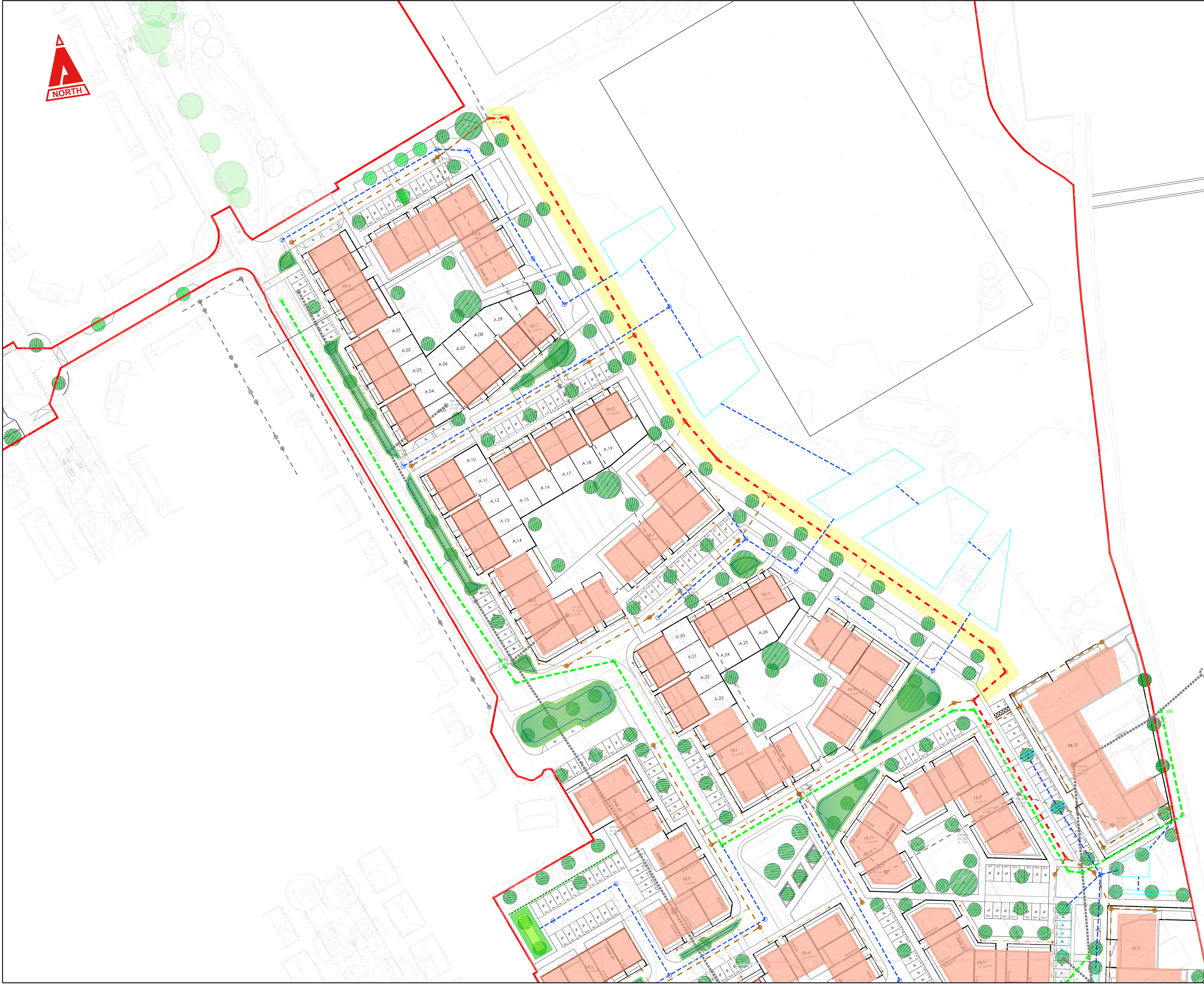
Project No.	Org.	Vol.	Level	Type	Dis.	Class	No.
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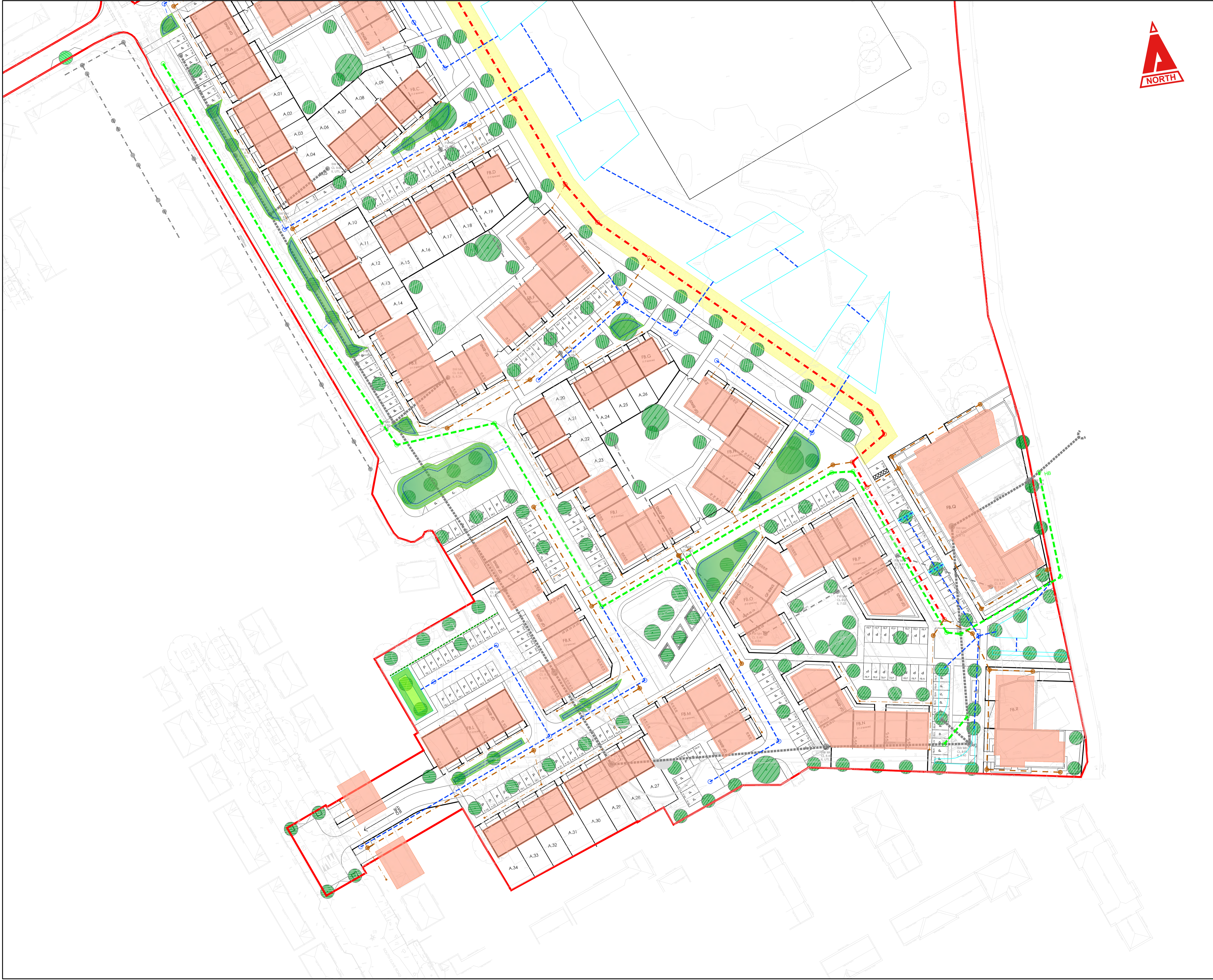
Suitability Status:	Scale @A1:	Rev.
PRELIMINARY	1:500	P02

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-----	PROPOSED FILTER DRAIN
-----	PROPOSED GREEN ROOF

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P02	REVISED TO MATCH LATEST MASTER PLAN	LW	BW	WJ
				22/04/21
P01	FIRST ISSUE FOR COMMENT	SJ	BW	WJ
				29/10/20
Rev.	Description	By	Chk	App



Client:
CHANNEL VIEW, CARDIFF

Drawing Title:
DRAINAGE STRATEGY (SHEET 2 OF 2)

Drawing No.
 CC2083 CAM ZZ 00 GA C 52 0102

Project No.	Org.	Vol.	Level	Type	Dis.	Class	No.

Suitability Status:	Scale @A1:	Rev.
PRELIMINARY	1:500	P02

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