

Drainage Strategy

Hexagon Theatre Extension
Queens Walk, Reading, RG1 7QF

October 2024
HEX-MOM-ZZ-XX-RP-C-12001

Contents

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Checker

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Issue History

Rev.	Date	Comments
1	18.12.23	for planning - first draft
2	22.12.23	for planning - second draft
3	11.01.24	for planning - final draft
4	20.03.24	updated Appendix D
5	22.03.24	updated Appendix C, D & G
6	18.10.24	updated for revised scheme



1. Existing site and ground conditions

The proposed development site is on the north side of the existing Hexagon Theatre, Queens Walk, Reading RG1 7QF

The redline application boundary has a total area of approximately 5950m². Within that is a smaller development area of approximately 1650m².

The existing building to be demolished has an area of 551 m². The paving to the west (296m²) and east (717m²) are to be replaced as part of the project. The area to be rebuilt is currently entirely roof or impermeably paved in concrete and asphalt. The only permeable area within the redline is an area of grass with a tree to the south side of the west entrance (43m²). This grass area and tree are to be retained.

The proposed development is an extension building housing performance spaces with back and front of house facilities on the site of an existing theatre building. The development includes adjusted access from the road to the west and revised parking partly under the new extension to the east.

The site has existing ground levels of around 39.4m to 39.9m AOD on the west side of the to-be-demolished building and ground levels of 39.7 to 39.9m on the east side. A ramp drops on the east side to 39.0 to form a loading dock into the existing ground floor.

The British Geological Society records have been consulted. The BGS mapping suggests the site lies on superficial Taplow Gravel over the Seaford and Newhaven Chalk bedrock. Nearby historic boreholes from the BGS records suggest either a layer of sandy gravelly clay over chalk or shallow made ground over chalk. Ground water is noted at several metres below ground levels.

The development site is in flood zone 1 (low risk) and is shown to be at low risk of surface water (pluvial) flooding. There is a small area of flood risk indicated on the east side of the site and into Queens Walk in events with an annual probability of up to 0.1% (1:1000 year return period). From examination of the topographic survey, this appears to be a localised low point near the existing buildings and ramp down to form the loading dock.

There is also an area of surface water flood risk indicated in the ground to the south of the existing Hexagon Theatre but well away from the proposed extension building.

Mapping from the Long term flood risk pages on the gov.uk website is included in the appendices.

Reading Borough Local Plan Policy

Policy EN18: FLOODING AND SUSTAINABLE DRAINAGE SYSTEMS

Development will be directed to areas at lowest risk of flooding in the first instance, following the Sequential and Exceptions Test set out in the NPPF, and taking into account the effects of climate change. It will consider flooding from all sources, including fluvial, surface water, groundwater and sewer flooding. Where development in areas at risk of flooding is necessary, it will not reduce the capacity of the flood plain to store floodwater, impede the flow of floodwater or in any way increase the risks to life and property arising from flooding. Wherever possible, development should be designed to reduce flood risk, both on- and off-site.

All major developments must incorporate sustainable drainage systems (SuDS) as appropriate and in line with the Government's Technical Standards. Smaller schemes are encouraged to incorporate SuDS, where possible. Runoff rates should aim to reflect greenfield conditions and, in any case, must be no greater than the existing conditions of the site. Schemes should ensure that the movement of water through vertical infiltration as well as horizontal run-off does not worsen contamination effects. Wherever possible, SuDS provision should maximise ecological benefits, link into the existing Green Network, incorporate tree planting and landscaping and avoid damage to existing significant trees, including through changes to the site hydrology. All new developments in areas of flood risk should give priority to SuDS.



2. Proposed development

The proposed development is an extension to the existing Hexagon Theatre housing performance and rehearsal spaces together with back and front of house facilities.

The total area of the proposed new building is approximately 718m² of which 283m² is proposed as green roof. The existing Hexagon Theatre building roof overhangs part of the proposed building.

Within the development area, the access to the west is to be reconfigured to create a loading dock with a lowered vehicular access ramp. The area to the east is to be relaid as parking extending under part of the building footprint. The parking is to be in permeable paving but without infiltration due to proximity to foundations and the clay surface soils.

Within the broader redline application boundary, the drainage of the existing main theatre roof and surrounding paved areas are unchanged except for minor diversions where needed to accommodate the new building.



3. Existing surface water drainage

There are Thames Water surface and foul water sewers in the A329 and the service road to the west of the site flowing from north to south.

The foul sewer runs in the service road immediately to the west of the site having originated behind the student residential block to the north. This sewer is recorded as 225mm diameter. The on-site utilities survey records this sewer as it crosses the western entrance to the site and the existing building that is to be replaced discharges to this sewer at a chamber to the west (TW ref 0204). The recorded cover and invert levels are 39.66m and 38.52m AOD.

There is a 100mm pipe that enters the north edge of the site to the east of the existing building from the student residential building to the north. This is believed to be an unrecorded sewer transferred to Thames Water under the 2010 Flood and Water Act. This pipe clashes with the proposed loading dock ramp and will need to be diverted.

There are several surface water sewers recorded in the A329 to the west ranging in size from 150mm to 825mm. The sewer running in the service road immediately to the west of the site is recorded as 150mm at the point it passes the entrance and increasing to 300mm further south. The surface water connection from the north western end of the overall Hexagon Theatre site is recorded as 300mm diameter at the point it leaves the site to the south of the access point. The final chamber on the site has a cover level of 39.71m and invert of 37.57m AOD. It is not clear if this outfall connects to the sewer in the service road or continues to connect to the large surface water sewer in the A329. This connection is serving part of the main Hexagon Theatre roof as well as part of the building to be demolished and the western access paving.

The drainage to the east of the proposed building in the parking and in Queens Walk is all private with no sewers recorded.

The utilities surveys show that Queens Walk to the east of the site has surface water drainage in the form of gullies and piped network that flows to the north and probably outfalls to the Thames Water sewers in Oxford Road to the north. None of the flow from the site appears to discharge to this system.

There are surface water drains within the site area that flow to the south from the building to be demolished and from the existing Hexagon Theatre roof. These run to the south and into the land to the south of the Hexagon Theatre. Some of the pipes are shown to terminate into what were identified as soakaways in this land on the utilities surveys and it is assumed that all of the flow from the north east and eastern side of the existing theatre runs to soakaways although this has not been proven.

4. Proposed surface water drainage

The proposed development will require surface water drainage.

We have reviewed the options in the SUDS hierarchy in relation to this site.

1. Store rainwater for later use.

The theatre building will have a relatively low use of non-potable water. We do not consider this to be an ideal project for the inclusion of rainwater harvesting for re-use within the building and have not proposed it.

2. Use infiltration techniques, such as porous surfaces in non-clay areas.

The site is underlain by Taplow Gravel over Seaford and Newhaven Chalk. However nearby boreholes indicate that a sandy gravelly clay material overlies chalk, and thus the ground conditions are not likely suitable for infiltration.

The site is also small and it would be problematic to locate new soakaways or other infiltration features while maintaining separation to the existing and proposed foundations.

However, the existing private drainage to the east side of the building runs to the south and is believed to discharge to a soakaway system in the land to the south. The utilities surveys notes pipework from the theatre site discharging to soakaways.

Porous paving for the relaid parking area to the east is proposed as part of the landscape works. This is proposed as an under-drained system without infiltration. Porous or perforated pipes laid in the porous sub-base collect and convey the water to the piped surface water drainage system.

3. Attenuate rainwater in ponds or open water features for gradual release.

The site is small and it is not possible to incorporate open water features or ponds.

4. Attenuate rainwater by storing in tanks or sealed water features for gradual release.

Attenuation storage is proposed on the discharge to the existing system on the east side of the building to avoid overloading the existing drainage system. All of the new roof and the paving to the east side is to discharge to this existing system (believed to ultimately discharge to soakaways). The proposed attenuated system will discharge at up to 2l/s to the existing drainage system in all storms up to the 1:100 year plus climate change event. Storage is provided as a combination of storage within the sub-base to the permeable paving to the parking and below ground attenuation tank. The storage is sized for the 1:100 year plus 40% climate change event without surface flooding.

The drainage of the reconfigured access to the west is proposed as discharging unattenuated to the Thames surface water system using the existing connection. The area draining to the east is reduced in the proposed scheme and shows significant betterment compared to the existing areas discharged via this connection. Attenuation of the flows from this smaller western area is considered not to be practical due to the limited space, the loading dock, other services and limited depth available.

5. Discharge rainwater direct to a watercourse

There are no watercourses near the site.

6. Discharge rainwater to a surface water sewer/drain

The discharge from the new roof and the paving to the east side discharges to existing private surface water drainage and is believed to finally outfall to soakaways to the south of the site.

The reconfigured access to the west is to discharge to the existing Thames Water surface water sewer in the access road to the west of the entrance.

7. Discharge rainwater to the combined sewer.

Discharge to a combined sewer is not proposed.

The site is considered unsuitable for the use of infiltration drainage within the site area. An attenuated discharge to the existing surface water sewer system is proposed for the larger part of the site consisting of the new roof and parking areas to the east. The smaller area to the west is to discharge unattenuated to the Thames water sewers but with a substantially smaller drained area than the existing situation giving betterment to the Thames surface water sewer system. Attenuation of the discharge to the west is considered impractical due to the limited space and depth available.

4.1. Discharge proposals

The proposed building and parking area to the east are proposed as discharging surface water via attenuation and a flow controlled gravity outlet to the private surface water drain running on the east side of the existing theatre, and believed to discharge to soakaways in the land to the south of the Hexagon Theatre. The proposed eastern system includes attenuation and flow restriction to limit the discharges to the existing downstream system and avoid overloading it.

The proposed roof incorporates an area of 283m² of green roof and the parking is proposed a permeable paving.

The drainage system on the west side is the existing drainage system modified to accommodate the ramp to the loading dock. The reconfigured access to the west is to discharge unattenuated to the Thames Water surface water sewer to the west but with a much reduced area connected to the outfall giving betterment to the sewer system.

The Qbar greenfield rate is calculated at 1.65 litres per second per hectare which equates to 0.27 l/s based on the overall development area for calculations of 1,650m². This is lower than the generally accepted lowest practical discharge using a vortex flow control in a gravity system. A flow of 2l/s is considered the lowest practical rate for a gravity discharge without undue risks of blockage. The attenuated discharge from the proposed building and parking to the east is therefore to be set to 2l/s in all storms up to the 1:100 year event including a 40% climate change allowance.

No urban creep allowance is included for a commercial development, and the development effectively fills the site in any event.

If the flows from the proposed building and parking areas to the east are discharged from the site at 2 l/s in all storms up to the 1:100 year event plus a 40% allowance for climate change, the attenuation storage volume required is calculated as approximately 85m³ from hydraulic model produced in the Flow hydraulic modelling software.

Storage is proposed in the porous sub-base below the permeable paving to the eastern parking supplemented with an attenuation tank. The sub-base will need to be divided into areas to prevent the water flowing to the lowest part of the parking area. For the purposes of this calculation, the model includes a 300mm thickness of type 3 porous sub-base set 130mm below the surface levels to represent the concrete block paving and

bedding grit over the sub-base. The area of permeable sub-base in the model is 247m² at 300mm thick and with 30% voids giving a potential storage volume of 22.2m³.

The remaining storage volume is to be provided in a below ground tank using plastic crate type storage. The tank is proposed as 90m² and 0.75m internal height with 95% void available in the crate type units giving a storage volume of 64.1m³.

Sufficient storage is provided in the pavement and attenuation tank structure in the eastern system and no surface flooding is proposed in all storms up to the 1:100 year plus climate change event.

The drainage in the western side is the existing system retained but modified to accommodate the lowered ramp to service the loading dock. The drainage here is currently accepting both the flows from the retained paved area and part of the roof of the existing building that is being replaced. The proposed roof will discharge entirely to the east and the area connected to the western drainage system and to the Thames Water sewer will reduce by approximately 250m².

DEFRA non statutory technical standard S5 for previously developed sites notes that the volume discharged in 1:100 year 6 hour storm event should be constrained to as close as reasonably practical to the greenfield volume and should not exceed the volume discharged from the previously developed site. Standard S6 notes that where the constraint on volume from previously developed site cannot practicably be achieved, the additional volume is to be discharged at a low rate.

The drainage system to the east is taking the proposed roof area and the parking to the east, and drains to the existing system to soakaway on land to the south.

The modified drainage to the west is taking the reconfigured access to the surface water sewer system but the area draining to the west is reduced from the current situation by removal from the western catchment of the existing roof area from the building being replaced.

Rainwater harvesting and reuse is not practicable for the western catchment. The use of soakaways or infiltration pavements in the western catchment is not practical and it will not be possible to reduce discharge volumes from this catchment to greenfield volumes.

The paved areas discharging in the western catchment are smaller than the current building and paved areas draining to the sewer. In the present day 1:100 year 6 hour storm, the discharge volume from the western catchment to the sewer will be less than from the current site.

4.2. SUDS train and attenuation proposals

The surface water drainage proposals utilise SUDS drainage measures including green roofs, porous paving, attenuation, and controlled discharge to the existing surface water drainage system.

The proposed roof to the replacement building includes approximately 283m² of green roof.

The parking areas to the east are proposed as permeable paving but without planned infiltration due to proximity to existing and proposed foundations. Porous or perforated pipes in the porous sub-base to the paving will collect the water and discharge to the surface water drainage system.

Additional attenuation is proposed in a below ground tanks under the parking to the east. A vortex flow control is to be used on the final gravity outlet from the system to control the surface water discharge to the existing surface water drainage to 2l/s for all storms up to the 1:100 year plus 40% climate change. The existing surface water system to the east is believed to discharge to soakaways to the south of the existing theatre.

The reconfigured loading dock to the west is to discharge to the Thames Water surface water sewers with a class 1 bypass interceptor included in the area used by lorries parked at the loading dock.

4.3. Maintenance

The SUDS and other drainage elements will be owned and maintained by the site owner. Adoption of the site drainage is not proposed.

The main SUDS drainage elements on the site will require periodic maintenance to maintain their effectiveness.

Permeable paving can become silted but the CIRIA SUDS Manual notes that the siltation has to be quite serious before the performance is significantly affected. Annual inspection and sweeping of the surface is recommended in the SUDS Manual.

Siltation and clogging is most likely to happen during the construction phase and this will need to be controlled by careful site management and consideration of the timing of laying of the permeable paved surfaces. Permeable pavements can be rehabilitated after clogging by the use of vacuum sweepers with water jets and oscillating brushes to remove silt from the joints.

Tank attenuation structures should be inspected using closed circuit television camera systems (CCTV) to identify issues and siltation problems. The CIRIA SUDS Manual recommends inspection every 5 years or more frequently if required. Siltation should be minimised by the inclusion of catch pit or silt trap chambers upstream of the attenuation structures to capture silts and grit. If siltation of the tanks does occur, clearance using jet washing techniques will be required. Silt traps should be regularly emptied of silts and grits either manually or using a 'gully sucker' lorry. The SUDS manual suggests annual inspection and cleaning of gullies and catchpits.

The vortex flow control chamber on the system outlet will require periodic inspection to remove any sediment or detritus collected. Debris should be cleared, and sediment removed. If the bypass door has become jammed or stiff, it should be freed off and lubricated. The chamber should be opened, inspected and any debris removed on an at least annual basis and checked as required if there is any evidence of blockage.

4.4. Exceedance events and overland flow routes

In the event of rainfall exceeding the capacity of the drainage systems, overland flows could develop from the drainage systems on the site. Overland flows could potentially enter the site from the surrounding areas although the scope for this appears limited.

The proposed building is in replacement of an existing building at the same location. The paved areas to east and west will be at broadly the same levels as the existing paved areas. The overall exceedance flow routes and risks will not be significantly changed in the proposed situation

The Environment Agency long term surface water (pluvial) flood risk mapping indicates that there is a low risk of flooding from surface water on the eastern edge of the site and around the site. Low risk is defined as having an annual probability of between 0.1% and 1% (1:1000 year to 1:100 year return period). From examination of the topographical survey, this area of potential pluvial flood risk appears to be associated with a localised low area associated with the basement access to the adjacent existing development.

The western side of the site falls towards the existing public highway to the west and the highway falls from south to north past the western site entrance. There appears little risk of overland flows entering from the west. In the event of exceedance flows developing on the site in the western access, the proposed ramp to form the loading dock would tend to fill with water, but water would escape to the west once it reached a level of around 39.60m AOD, and well before it reached floor level of the proposed building at 40.20m AOD.

The proposed parking on the eastern side falls away from the proposed building toward the existing private access road to the east. Water in that area can escape along the existing access road further to the east but not until it reaches a level of around 40m AOD. This is the same as the existing situation. Water could escape to the north into the undercroft of the student residential building and shopping mall, this is also the same situation as currently.

The existing Hexagon Theatre roof is to remain unchanged. This drains to rainwater downpipes located at each of the main columns. The northernmost column and downpipe drops internally through the existing building to be replaced and will also be internal in the proposed building. The existing drainage connection from this downpipe runs to the west and is to be diverted around the new loading dock ramp.

An internal chamber is provided at the change in direction on this run and an external chamber as the pipe leaves the building. The external chamber cover level is lower than the internal chamber. In the event of a blockage of the drainage system running to the west, water would likely be expressed externally in the first instance if the blockage were outside the building. If a blockage were to occur on the internal pipework, water may then be expressed inside the building. This risk exists in the existing situation. The pipe that will be below the building slab is to be replaced with a new pipe minimising the risk of blockage due to pipe degradation and chambers provided for maintenance access. There will remain a residual risk of internal flooding if the pipes become blocked but this will need to be managed by maintenance.

Exceedance flow route plans are included in the appendices.

5. Summary

The Environment Agency flood zone mapping for planning shows the site lies entirely within Flood Zone 1 with no areas of higher flood risk nearby.

The eastern edge of the site is shown within an area of surface water (pluvial) flood risk on the Environment Agency on-line Long Term Flood Risk mapping (<https://flood-warning-information.service.gov.uk/long-term-flood-risk/>). The risk is described as low with an annual probability of between 0.1% (1:1000 year return period) and 1% (1:100 year). From examination of the topographic survey, this appears to be a localised low point near the existing buildings and ramp down to form the loading dock.

The site is not considered suitable for infiltration drainage or soakaways due to the proximity of existing foundations and limited space. From nearby historic boreholes, the shallow soils are expected to be clay with gravel and unlikely to be suitable for shallow infiltration.

The proposed building and parking to the east are to discharge at an attenuated rate of 2l/s to the existing drainage to the east of the existing Hexagon Theatre. This drainage runs south and is believed to discharge to soakaways in the land to the south of the existing theatre.

The reconfigured access and loading dock to the west are to continue to drain to the Thames Water surface water sewers without attenuation but with the replacement building draining to the east, there will be a significantly reduced area connected to the western outfall giving betterment to the sewer system

The proposed scheme is to be drained using a sustainable drainage system based the use of green roofs, permeable paving and attenuation with controlled outflow discharging to the existing private drainage system.

The proposed building is in replacement of an existing building at the same location. The paved areas to east and west will be at broadly the same levels as the existing paved areas. The overall exceedance flow routes and risks will not be significantly changed in the proposed situation.

The proposed drainage is to remain private. Management and maintenance responsibility for the drainage is to remain with the site owner.

The proposed surface water drainage layout is included in Appendix D. This has been prepared to verify the overall drainage strategy, but is a draft version and subject to change. Final layouts will be submitted following coordination and development with the wider project design team.

The proposed surface water drainage strategy is compliant with Reading Borough Local Plan Policy.

A proposed theatre development is considered appropriate at this site in terms of drainage strategy.

6. Closure and Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the research carried out. The results of the research should be viewed in the context of the work that has been carried out and no liability can be accepted for matters outside the stated scope of the research. Any comments made on the basis of the information obtained from third parties are given in good faith on the assumption that the information is accurate. No independent validation of third party information has been made.

Advice provided within this report is based on current guidelines available at the time of writing. This report is subject to amendment in light of additional information becoming available or statutory consultee review, including the Environment Agency or Lead Local Flood Authority.

This report is written in the context of an agreed scope of work and should only be used in this specific context. Re-interpretation of this report in whole or in part may become necessary if additional information becomes available or legislation or guidance changes.

Legal or other advice is not provided; the advice of the Client's legal advisors or other specialists may also be required.

APPENDICES

The following appendices are included.

Appendix A: Existing Topographic and utilities surveys

Appendix B: Thames Water sewer records

Appendix C: Proposed site plans

Appendix D: Proposed drainage strategy layouts

Appendix E: Exceedance flow routes

Appendix F: Detailed long term surface water flood risk mapping

Appendix G: Surface water calculations

Appendix A: Existing Topographic and utilities surveys



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This drawing is to be read in conjunction with all other relevant contract documents and other consultants information.

Do not scale from this drawing or digital data contained within. Dimensional accuracy may not be a true representation of actual setting out.

Work only to figured dimensions. If in doubt, ask.

Unless noted otherwise, all dimensions in millimeters, all levels in meters.

All levels and dimensions to be checked on site by persons carrying out the work. Please report any discrepancies to Momentum.



Rev	Date	By	Description
P01	11.09.23	SG	Stage 2 Issue
P02	15.12.23	EA	Stage 3 Issue

Date	Scale	Format
July '23	1:200	A3
Drawn	Reviewed	Approved
SG	EA	RH

Work Stage & Reason For Issue
Stage 3
For information

Client
Reading Borough Council

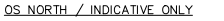
Project Number & Title
5544 Hexbox

Sheet Number & Title
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BO	Borehole	MKR	Marker
BH	Borehole	MT	Mercury Telecom Cover
BT	British Telecom	QHC	Overhead Cable
CATV	Cable TV Cover	CHP	Overhead Pipe
CB	Cable Box	PS	Post Box
CL	Cover Level	RE	Roading Eye
CM	Cover Manhole	RS	Road Sign
DN	Down Pipe	RS	Road Sign
EA	Electricity Junction Box	RWA	Rain Water Pipe
EC	Electricity Cover	STC	Street Traffic Control
EE	Electricity Pole	STA	Traverse Station
ER	Electricity Road	SV	Stop Valve
FH	Fire Hydrant	SVP	Soft Vent Pipe
G	Gully	TE	Telephone Box
GI	Gully Inlet	TJB	Telephone Junction Box
IC	Inspection Cover	TPT	Trial Pit
IO	Iron	T	Traffic Light
LB	Litterbin	T	Telephone Pole
LC	Lamp Column	VP	Vent Pipe
LP	Lamp Post	WM	Water Meter
MN	Manhole	WV	Water Valve

Underground Services Abbreviations			
A	Approximate	I	Invert Level
AD	Adopted Centre	INT	Interceptor
BD	Block Drop	NVD	No Valve Drops
BL	Blank	NV	No Valve Lift
C	Catch	NVE	No Valve Exit
CC	Catch Churn	OF	Off Flow Point
CCP	Catch Pit	OSA	Outside Survey Area
CPL	Catch Pit Base Level	P	Point
CRL	Cable Rise	PVC	Polyvinyl Chloride Comp
D	Depth of Service (in metres)	P	Point
ED	End of Duct	PS	Post Signal
E	Empty	RM	Rising Main
F	Flow	S	Sanitary
GR	Ground Penetrating Radar	SN	San Sew
GRP	Ground Penetrating Radar	SL	San Line
GR	Gas Rise	SL	San Line
HT	High Voltage	SS	San Sew
HDPE	High Pressure Polyethylene	SSS	San Sew Steel
		T	Tank
		UT	Unable to Find
		UT	Unable to Gain Access
		UT	Unable to Lift
		UT	Unable to Road
		UT	Unable to Trace
		VR	Water Recovery
		VR	Vapour
		WR	Water Riser

Legend			
	Cable TV		Heating Pipe
	Communications		LPG
	Compressed Air		Offset Fill Pipe
	Drainage - Combined		Oil Pipe
	Drainage - Foul		Road Trace
	Drainage - Surface		Survey Boundary
	Ducting - Empty		Telecoms
	Ducting - Full		Traffic Control
	Electric Cable		Trench Sog
	Electric		Unidentified
	Electric - HV		Vapour Recover
	Fuel Pipe		Vent Pipe
	Gas		Water
	Gas Guage Line		

PAS 12b: 2014 Quality & Confidence Levels

(A)	Horizontal and vertical position verified visually (Accuracy: Horizontal (± 50 mm) Vertical (± 25 mm))
(B1)	Horizontal and vertical location of the utility detected by mu Estimated accuracy: ± 150 mm or $\pm 15\%$ of detected depth whichever is greater.)
(B2)	Horizontal and vertical location of the utility detected by one of the geophysical techniques used.
(B3)	Horizontal location only of the utility detected by one of the geophysical techniques used.
(B4)	Horizontal location only; Horizontal (± 500 mm) Vertical – Undefined
(C)	A utility segment which is suspected to exist but has not been detected and is therefore shown as an assumed route. (Estimated accuracy: Undefined)
(D)	Route transcribed from utility asset plans and correlated to indicators and surface features. (Estimated accuracy: Undefined)
(E)	Route transcribed from utility asset plans (Estimated accuracy: Undefined)

NB: 'P' suffixed to the quality level indicates GPR data has been post-processed. QL(A) is inferred at all MH's & IC's unless otherwise stated.

[illegible]

The survey has been oriented to Ordnance Survey (OS) National Grid (OSGB36) using Industry Standard Network RTP/GPS equipment utilising OS Active Network (OS Net). A true OSGB36 coordinate has been established on site using the OSTN15 (transformation) & OSGB15 (geoid models). The survey detail has been correlated to this point and a first one (or more) OSGB36 points established to produce a true OS bearing angle orientation. Scale factor 1.0 has been applied therefore the survey coordinates are shown on a pseudo OS grid.

All levels are in metres unless otherwise specified
All heights are in millimetres unless otherwise specified

3	-	-	-		
2	-	-	-		
1	-	-	-		
0		IS	First Complete Issue	05/01/2018	
Prelim		-	Preliminary - Not Complete		
Rev	Svyr	QA Check	Description		Date

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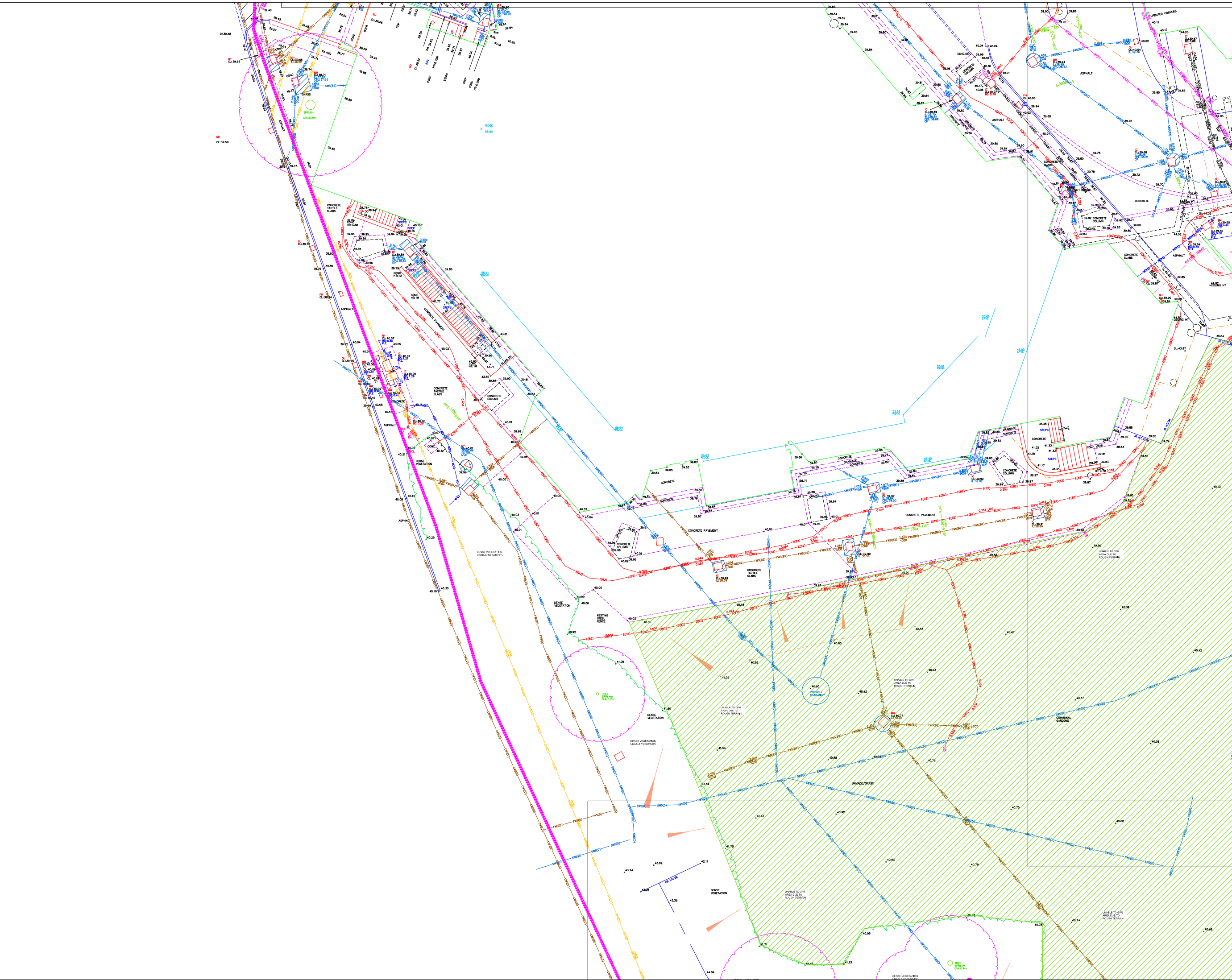
Unit 22, Theale Lakes Bus. Pk, Moulden Way	READING, RG7 4GB	T +44 (0)118 930 111
G.3 Bedford House, 69-79 Fulham High St	LONDON, SW6 3JW	T +44 (0)203 651 111
5th Floor 1 Temple Way	BRISTOL, BS2 0BY	T +44 (0)117 303 111
Unit G9, The Arch, 48-52 Floodgate St	BIRMINGHAM, B5 5SL	T +44(0)121 752 111

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SURVEYED	PS	READING COUNCIL
DRAWN	PS	
SCALE	1:100	

JOB No	DRAWING NUMBER
UM/223/0034	UM/223/0034/P/0001





OS NORTH / INDICATIVE ONLY

Topographical Abbreviations

BH	Borehole	MKR	Marker
BOL	Bolton	MT	Mercury Telecom Cover
BT	British Telecom Cover	OHC	Overhead Cable
CATV	Cable TV Cover	OPF	Overhead Pipe
CL	Cover Level	PB	Post Box
CM	Cable Marker	RE	Rodding Eye
CP	Cable Pit	RG	Road Gully
CS	Cable Street	RS	Road Sign
EJB	Electricity Junction Box	RWP	Rain Water Pipe
EC	Electricity Cover	SC	Stop Cock
EP	Electricity Pole	STA	Traverse Station
EPH	Earthling Hole	STP	Stop Vent Pipe
FI	Fire Hydrant	SVP	Soil Vent Pipe
GV	Gas Valve	TJB	Telephone Junction Box
IO	Inspection Cover	TL	Traffic Light
KO	Keel Outlet	TR	Telephone Pole
LC	Lamp Column	UP	Vent Pipe
LP	Lamp Post	WM	Water Meter
LV	Manhole	WV	Water Valve

Underground Services Abbreviations

AC	Asbestos Cement	INT	Interceptor
AD	Asbestos Duct	NAD	No Visible Ducts
BL	Base Level	NVP	No Visible Pipes
BR	Brick	NVE	No Visible Lint
CI	Cast Iron	OF	Offset Fill Point
CP	Catch Pit	OSA	Outside Survey Area
CR	Cable Riser	PE	Polyethylene Pipe
CPL	Catch Pit Base Level	PVC	Polyethylene Plastic Compail
CR	Cable Riser	PR	Pipe Riser
D	Depth to Service (in metres)	PS	Poor Sign
DI	Ductile Iron	PT	Peg Trip
ED	Empty Duct	RM	Rising Main
EOT	End of Trace	SA	Swan Neck
GRN	Ground Penetrating Radar	SN	Sewer
GPR	Ground Penetrating Radar	SP	Spur (Grey) Iron
GR	Gas Riser	SL	Silt Level
HV	High Voltage	SS	Stainless Steel
HDPE	High Pressure Polyethylene	T	Tank
		UT	Unable to Find
		UTCA	Unable to Gain Access
		UTL	Unable to Lift
		UTR	Unable to Rod
		UTS	Unable to Survey
		UTT	Unable to Trace
		VC	Verified Day
		VR	Vapour Recovery
		WR	Water Riser

Legend

—(TV)(00)—	Cable TV	—(H)(02)—	Heating Pipe
—(OM)(00)—	Communications	—(L)(02)—	LPG
—(AW)(00)—	Compressed Air	—(O)(02)—	Offset Fill Pipe
—(C)(02)—	Drainage - Combined	—(P)(02)—	Oil Pipe
—(F)(02)—	Drainage - Fault	—(R)(02)—	Radar Trace
—(S)(02)—	Drainage - Surface	—(S)(02)—	Survey Boundary
—(D)(02)—	Ducting	—(T)(02)—	Telecoms
—(E)(02)—	Ducting - Empty	—(T)(02)—	Traffic Control
—(E)(02)—	Earth Cable	—(T)(02)—	Trench Scar
—(E)(02)—	Electric	—(U)(02)—	Unidentified
—(H)(02)—	Electric - HV	—(V)(02)—	Vapour Recovery
—(F)(02)—	Fuel Pipe	—(V)(02)—	Vent Pipe
—(G)(02)—	Gas	—(W)(02)—	Water
—(G)(02)—	Gas Guage Line		

PAS 128:2014 Quality & Confidence Levels

(A) Horizontal and vertical position verified visually (Accuracy Horizontal (±50 mm) Vertical (±25 mm))

(B1) Horizontal and vertical location of the utility detected by multi geophysical techniques used. (Estimated accuracy: ±150 mm or ±15% of detected depth whichever is greater).

(B2) Horizontal and vertical location of the utility detected by one of the geophysical techniques used. (Estimated accuracy: ±250 mm or ±40% of detected depth whichever is greater).

(B3) Horizontal location only of the utility detected by one of the geophysical techniques used. (Estimated accuracy: Horizontal (±500 mm) Vertical - Undefined)

(B4) A utility segment which is suspected to exist but has not been detected and is therefore shown as an assumed route. (Estimated accuracy: Undefined)

(C) Route transcribed from utility asset plans and correlated to vi indicators and surface features. (Estimated accuracy: Undefined)

(D) Route transcribed from utility asset plans (Estimated accuracy: Undefined)

NB: 'P' suffixed to the quality level indicates GPR data has been post-processed. QL(A) is inferred at all Mf's & IC's unless otherwise stated.

Disclaimer

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Notes

The survey has been oriented to Ordnance Survey (OS) National Grid (OSGB36) using industry Standard Network RTK GPS equipment utilising the OS Active Network (OS Net). A true OSGB36 coordinate has been established on site using the OSN15 (transformations) & OSB15 (geoid) models. The survey detail has been correlated to this point and a further one (or more) OSGB36 points established to produce a true OS bearing & angle orientation. Scale factor 1.0 has been applied therefore the survey coordinates are shown on a pseudo OS grid.

All levels are in metres unless otherwise specified
All heights are in millimetres unless otherwise specified

3	-	-	-	-
2	-	-	-	-
1	-	-	-	-
0	-	IS	First Complete Issue	OS/DA
Prelim	-	-	Preliminary - Not Complete	-
Rev	Svr	QA Check	Description	Date

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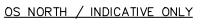
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PAS 128 Utility Mapping Surveys - Desktop Utility Report Generation - GPR Surveys & Post-processing
Drawing - Pressure Water Jetting - Confined Space Entry - Corrosion & Piping Scanning

SURVEYED	PS	READING COUNCIL
DRAWN	PS	
SCALE	1:100	
MINISTER QUARTER		
UTILITY MAPPING SURVEY		
JOB No	DRAWING NUMBER	
UM/223/0034	UM/223/0034/P/0002	
A0 Sheet - 1,189mm X 841mm		



Topographical Abbreviations

BH	Borehole	MKR	Marker
BS	Bolt	MR	Mercury Telephone
BT	British Telecom cover	OHC	Overhead Cable
CATV	Cable TV	OC	Overhead Cable
CCTV	Closed Circuit TV	PB	Post Box
CL	Cable Level	RL	Rodding Eye
CS	Cable Junction Box	RG	Road Gully
DC	Down Pipe	RS	Road Sign
DE	Electricity Distribution	RP	Road Water Pipe
EP	Electricity Cover	SC	Stop Clock
EV	Electric Vehicle	TA	Traverse Arm
FL	Earthling Road	VP	Vent Pipe
FN	Fuel Filler	VB	Vault
G	Gully	VB	Telephone Box
GV	Gully Vent	VB	Telephone Box
IC	Inspection Cover	TPT	Trap
KO	Keep Out	TL	Telephone Light
LB	Litter Bin	TP	Telephone
L	Lamp Column	VP	Vent Pipe
LP	Lamp Post	W	Water Meter
MN	Manhole	WV	Water Valve

Underground Services Abbreviations

AB	Approximate	INT	Invert Level
AC	Access	ISC	Intercept
BL	Back Drop	NVD	No Visible Ducts
BS	Bulk Level	NV	No Visible Runs
BR	Brick	NVA	No Visible EIT
C	Cable	OF	Offset From Pipe
CO	Concrete	OSA	Outside Survey Area
CP	Catch	PE	Polyethylene Pipe
CPL	Catch Pit Base Level	PCP	Polypropylene Composite Pipe
CS	Chemical Service (in metres)	PIR	Pipe Rider
DD	Duct	PT	Ped Trap
ED	End of Trace	RA	Rising Main
ET	End of Trace	SA	Sewerage
FP	Flow Penetrating Rod	SB	Shallow Bed
GR	Gas Reinforced Fibre	SG	Shunt (Grey) Iron
GRV	High Voltage	SL	Shallow Level
HDPE	High Pressure Polyethylene	SS	Stainless Steel Tank
		UT	Unable to Find
		UTFA	Unable to Find Access
		UTS	Unable to Find Service
		UTR	Unable to Trace
		UTRS	Unable to Trace Service
		VR	Vapour Recovery
		WR	Waste Water
		WR	Water Rider

Legende

TU(002)	Cable TV	HE(02)	Heating Pipe
CU(02)	Communications	LP(02)	LPG
AR(02)	Compressed Air	OF(02)	Offsite Fil Pipe
DR(002)	Drainage – Combined	OI(02)	Oil Pipe
FR(002)	Drainage – Fuel	ST(02)	Steam Trace
SR(002)	Drainage – Surface	SB(002)	Survey Boundary
DU(02)	Ducting	BT(02)	Telecoms
EO(02)	Ducting – Empty	TC(02)	Traffic Control
EA(02)	Earth Cable	FR(02)	French Scar
EL(02)	Electric	UN(02)	Unidentified
EH(02)	Electric – HV	VR(02)	Vapor Recovery
FI(02)	Fuel Pipe	VN(02)	Vent Pipe
GA(002)	Gas	WB(02)	Water
GU(02)	Fuel Gauge Line		

PAS 128:2014 Quality & Confidence Levels

- | | |
|-----|---|
| (A) | Horizontal and vertical position verified visually
(Accuracy: Horizontal (± 250 mm) Vertical (± 25 mm)) |
| (B) | Horizontal and vertical location of the utility detected by multi geophysical techniques used.
(Estimated accuracy: ± 150 mm or $\pm 15\%$ of detected depth is greater) |
| (C) | Horizontal and vertical location of the utility detected by one or more geophysical techniques used.
(Estimated accuracy: ± 250 mm or $\pm 40\%$ of detected depth is greater) |
| (D) | Horizontal location only of the utility detected by one of the geophysical techniques used.
(Estimated accuracy: Horizontal (± 500 mm) Vertical – Undefined) |
| (E) | Horizontal location of the utility detected by one or more geophysical techniques used.
(Estimated accuracy: Horizontal (± 500 mm) Vertical – Undefined)
The utility was not located at the indicated depth, but has not been detected and is therefore shown as an assumed route. |
| (F) | Route transcribed from utility asset plans and correlated to visible indicators and surface features.
(Estimated accuracy: Undefined) |
| (G) | Route transcribed from utility asset plans
(Estimated accuracy: Undefined) |

NB: 'P' suffixed to the quality level indicates GPR data has been post-processed. QL(A) is inferred at all MH's & IC's unless otherwise stc

Disclaimer

[illegible]

Notes

The survey has been oriented to Ordnance Survey (OS) National Grid (OSGB36) using industry Standard Network RTK GPS equipment utilising the OS Active Network (OS Net). A true OS (OSGB36) coordinate has been established on stationing the OS (OSGB36) formation to OSB3 (geoid) models. The survey detail has been correlated to this point and a further one (or more) OSGB36 points established to produce a true OS bearing & angle orientation. Scale factor 1.0 has been applied therefore the survey coordinates are shown on a pseudo OS grid.

All levels are in metres unless otherwise specified
All heights are in millimetres unless otherwise specified

3	-	-	-	-
2	-	-	-	-
1	-	-	-	-
0		IS	First Complete Issue	05/04/
Prelim		-	Preliminary - Not Complete	-
Rev	Svyr	QA Check	Description	Date

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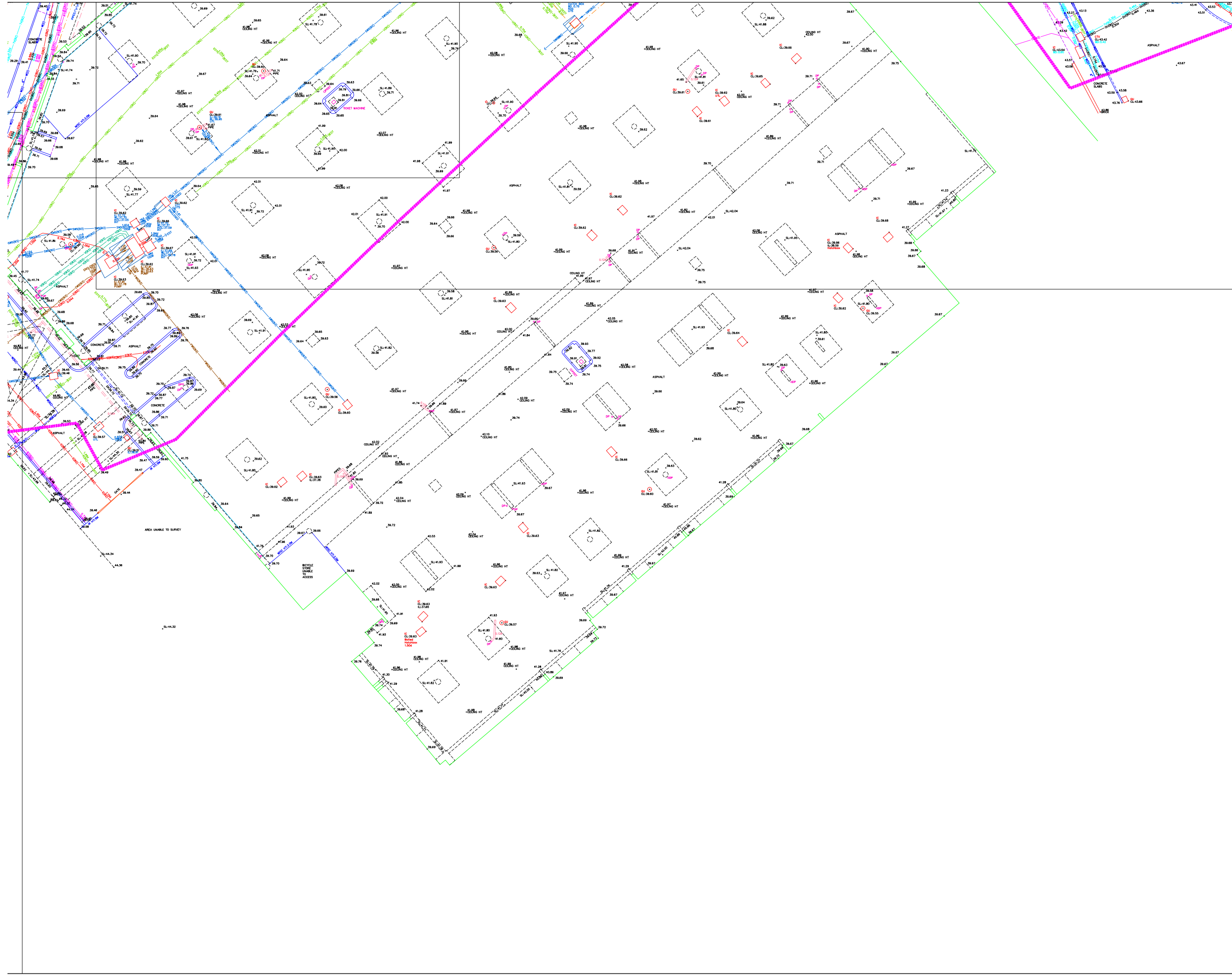
SURVEYED	PS	READING COUNCIL
DRAWN	PS	
SCALE	1:100	

MINISTER QUARTER

UTILITY MAPPING SURVEY

JOB No	DRAWING NUMBER
UM/223/0034	UM/223/0034/P/0005

A0 Sheet - 1,189mm X 841mm



OS NORTH / INDICATIVE ONLY

Topographical Abbreviations

BH	Borehole	MKR	Marker
BOL	Bollard	MT	Mercury Telecom Cover
BT	British Telecom Cover	OHC	Overhead Cable
CATV	Cable TV Cover	OHP	Overhead Pipe
CCTV	Closed Circuit TV	PB	Post Box
CL	Cover Level	PE	Rodding Eye
CM	Cable Marker	RG	Road Gully
CP	Down Pipe	RS	Road Surface
ECB	Electricity Junction Box	RWP	Rain Water Pipe
EC	Electricity Cover	SC	Stop Valve
EP	Electricity Pole	STA	Traverse Station
ER	Earthing Rod	TV	Telephone
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FL	Gas Valve	TB	Telephone Junction Box
GV	Gas Valve	TL	Traffic Light
IC	Inspection Cover	TL	Telephone Pole
KO	Kerb Outlet	UP	Vent Pipe
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MAN	Manhole		

Underground Services Abbreviations

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CPL	Catch Pit Base Level	PPC	Polyethylene Plastic Compail
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EDT	End of Trace	SA	Sewer
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GRP	Glass Reinforced Plastic	SS	Stainless Steel
GR	Gas Riser	SL	Spot Level
HV	High Voltage	SS	Stainless Steel
HDPE	High Pressure Polyethylene	T	Tank
		UTF	Unable to Find
		UTCA	Unable to Gain Access
		UTL	Unable to Lift
		UTR	Unable to Rod
		UTS	Unable to Survey
		UTT	Unable to Trace
		UTW	Unable to Dig
		VR	Vapour Recovery
		WR	Water Riser

Legend

TV(00)	Cable TV	H(02)	Heating Pipe
CM(00)	Communications	L(03)	LPG
CM(00)	Compressed Air	OM(02)	Offset FFI Pipe
CM(00)	Drainage - Combined	OM(02)	Oil Pipe
CM(00)	Drainage - Fault	OM(02)	Radar Trace
CM(00)	Drainage - Surface	OM(02)	Survey Boundary
CM(00)	Ducting	OM(02)	Telecoms
CM(00)	Ducting - Empty	OM(02)	Traffic Control
CM(00)	Earth Cable	OM(02)	Trench Scar
CM(00)	Electric	OM(02)	Unidentified
CM(00)	Electric - HV	OM(02)	Vapour Recovery
CM(00)	Fuel Pipe	OM(02)	Vent Pipe
CM(00)	Gas	OM(02)	Water
CM(00)	Fuel Gauge Line		

PAS 128:2014 Quality & Confidence Levels

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(B2) Horizontal and vertical location of the utility detected by one of the geophysical techniques used. (Estimated accuracy: ±250 mm or ±40% of detected depth whichever is greater).

(B3) Horizontal location only of the utility detected by one of the geophysical techniques used. (Estimated accuracy: Horizontal (±500 mm) Vertical - Undefined)

(B4) A utility segment which is suspected to exist but has not been detected and is therefore shown on an assumed route. (Estimated accuracy: Undefined)

(C) Route transcribed from utility asset plans and correlated to vi indicators and surface features. (Estimated accuracy: Undefined)

(D) Route transcribed from utility asset plans (Estimated accuracy: Undefined)

NB: 'P' suffixed to the quality level indicates GPR data has been post-processed. Q(A) is inferred at all M's & IC's unless otherwise stated.

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All levels are in metres unless otherwise specified

All heights are in millimetres unless otherwise specified

3	-	-	-	-
2	-	-	-	-
1	-	-	-	-
0	-	IS	First Complete Issue	OS/PA
Prelim	-	-	Preliminary - Not Complete	-
Rev	Svr	QA Check	Description	Date

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PAS 128 Utility Mapping Surveys - Desktop Utility Record Searches - GPR Surveys & Post-processing
Drainage - Pressure Water Jetting - Confined Space Entry - Corrosion & Piping Scanning

SURVEYED PS

DRAWN PS

SCALE 1:100

READING COUNCIL

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UTILITY MAPPING SURVEY

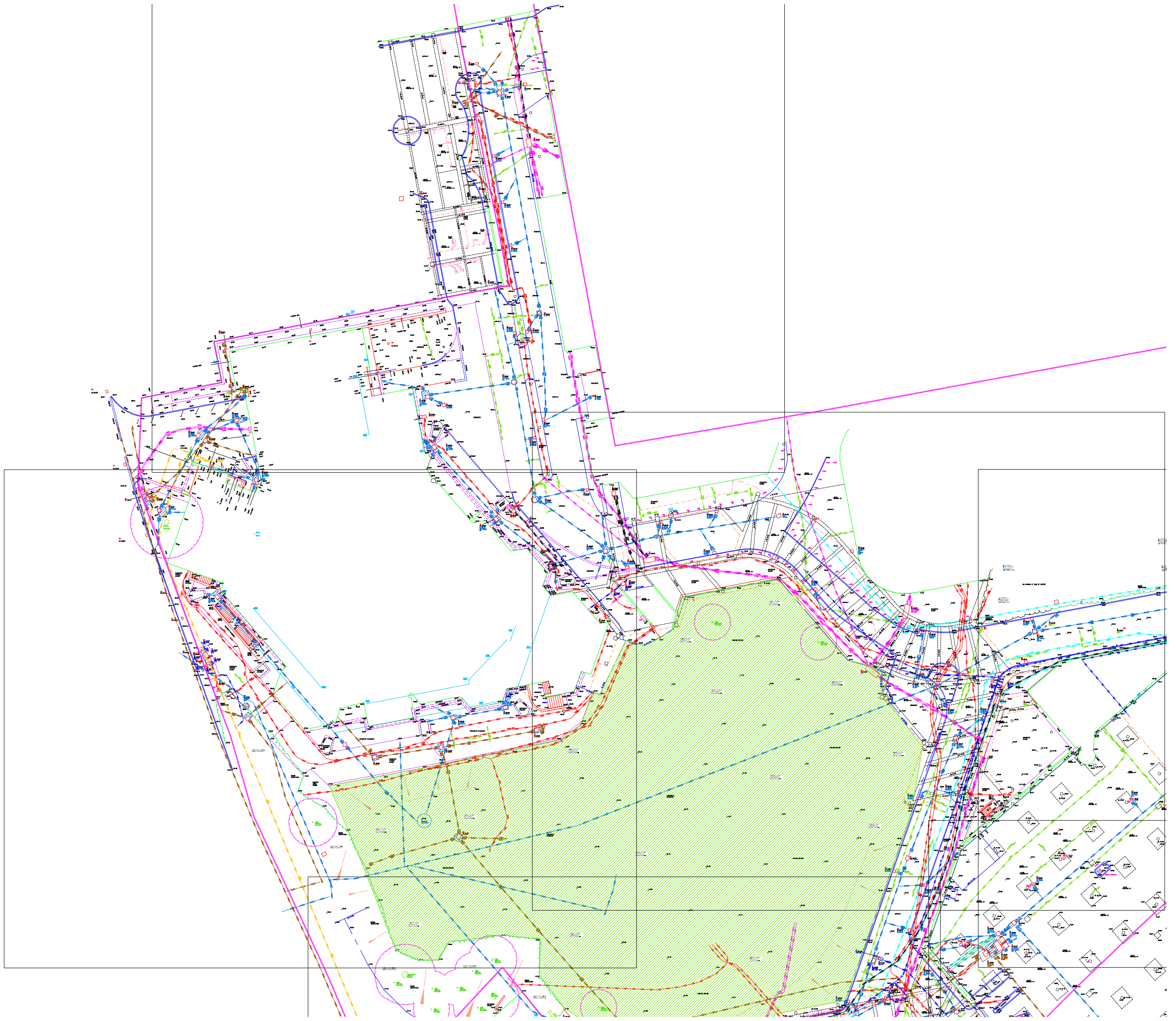
JOB No

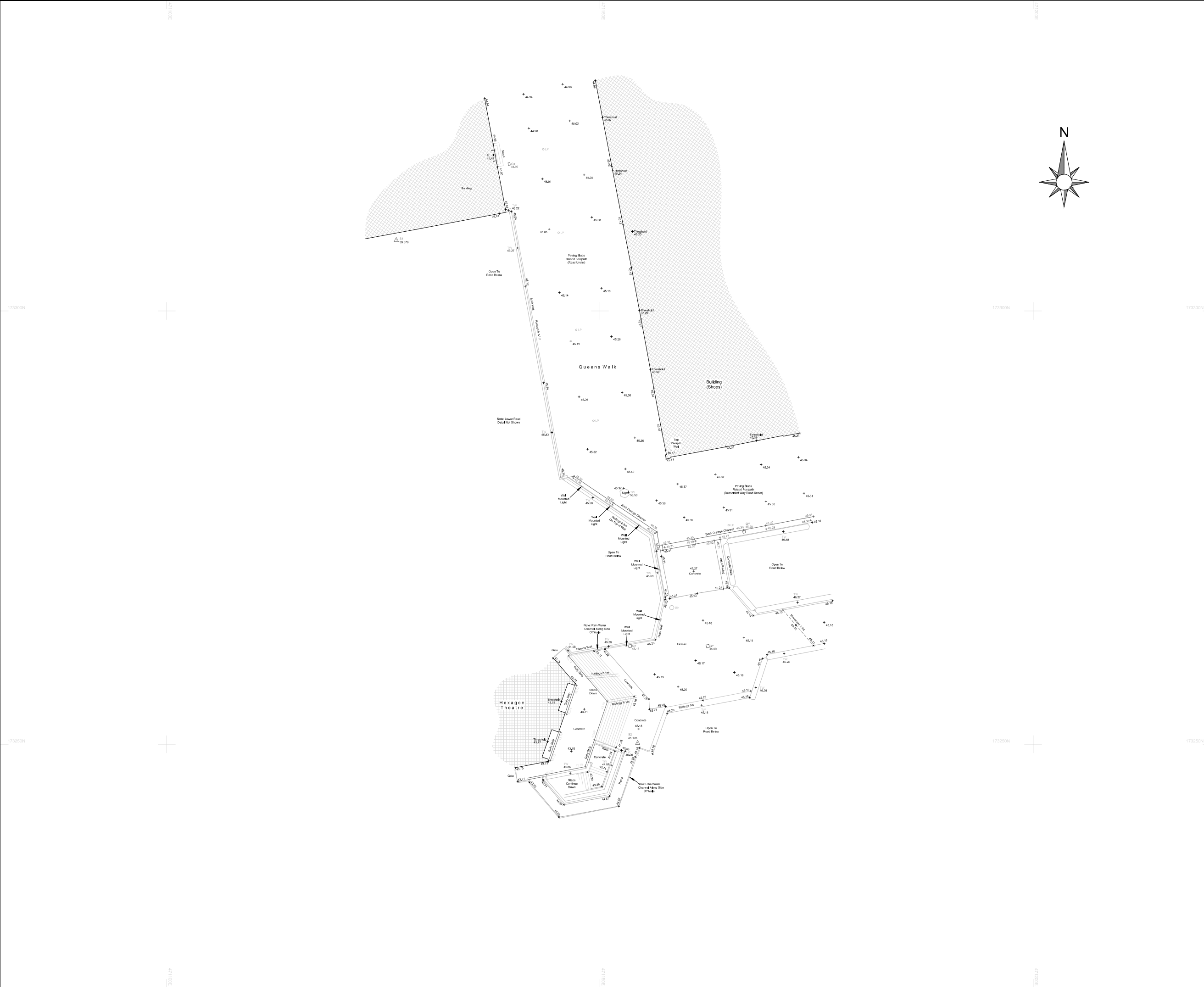
DRAWING NUMBER

UM/223/0034

UM/223/0034/P/0006

A0 Sheet - 1,189mm X 841mm





Notes

- The survey was carried out in August 2023.
- Survey grid based on Ordnance Survey (OS) National Grid. Survey control taken from topographical survey supplied by the client drawing number RT/223/0021/P/0001.
- All levels are in metres and are above Ordnance Survey Newlyn Datum. Survey control taken from topographical survey supplied by the client drawing number RT/223/0021/P/0001.
- All quoted dimensions are in metres.

Abbreviations

AV	Air Valve	IR	Iron Rail
BH	Bore Hole	JB	Junction Box
BL	Bullard	KO	Kerb Outlet
BM	Bench Mark	LB	Letter Box
BN	Beacon	LP	Lamp Post
BS	Bus Stop Sign	L/L	Larch Lap
BT	British Telecom Cover	MH	Manhole
B/W	Barbed Wire	MK	Marker Post
CB	Control Box	MW	Monitoring Well
CB	Close Boarded	NP	Name Plate
CCTV	Closed Circuit TV	P	Post
C/I	Corrugated Iron	PL	Pavement Light
CL	Cover Level	PM	Parking Meter
CL	Chain Link	PR	Post And Rail
CNP	Chestnut Paling	P/W	Post And Wire
Col	Column	RE	Rodding Eye
Conc	Concrete	RS	Road Sign
CPS	Concrete Paving Slabs	RWP	Rain Water Pipe
C/P	Concrete Panel	SC	Stop Cock
CTV	Cable TV	SF	Soffit Level
D	Trunk Diameter	SP	Sign Post
DP	Down Pipe	S/R	Steel Railing
D/C	Drainage Channel	ST	Stamp
DPC	Damp Proof Course	SV	Stop Valve
EB	Electricity Box	SVP	Soil Vent Pipe
EC	Electricity Cover	SW	Surface Water
EP	Electricity Pole	Tac	Tactile Paving
ER	Earth Rod	TCB	Telephone Call Box
FL	Floor Level	TL	Traffic Light
FH	Fire Hydrant	TLC	Traffic Light Service Cover
FE	Floodlight	TP	Telephone Pole
FW	Foul Water	TW	Top Of Wall Level
GL	Ground Light	UTL	Unable To Lift
GM	Gas Meter	VC	Unknown Valve Cover
GP	Gate Post	VP	Vent Pipe
GV	Gas Valve	WCL	Window Cill Level
GY	Gully	WHL	Window Head Level
h	Height	WL	Water Level
HR	Hand Rail	WM	Water Meter
IC	Inspection Cover	WM	Wire Mesh
IL	Invert Level	WO	Wash Out Valve
INV	Ditch Invert Level	WV	Water Valve

Survey Control

Station	Easting	Northing	Level
S1	471126.489	173308.159	39.878
S2	471154.346	173250.132	45.176

ISSUE/ REVISION

Rev	Date	Status/ Amendment	Drawn	Checked
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Scale Bar

1:200 0 2m 4m 6m 8m 10m 12m 14m 16m 18m 20m
1:100 0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
1:50 0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
1:500 0 10m 20m 30m 40m 50m

For reference only. Do not scale off this drawing

BES GEOMATICS

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Client: Reading Borough Council

Project: **The Hexagon Theatre, Queens Walk, Berkshire RG1 7QF**

Title: **Topographical Survey - Podium Level**

Sheet Number:

Status: **For Approval** Checked: **CE**

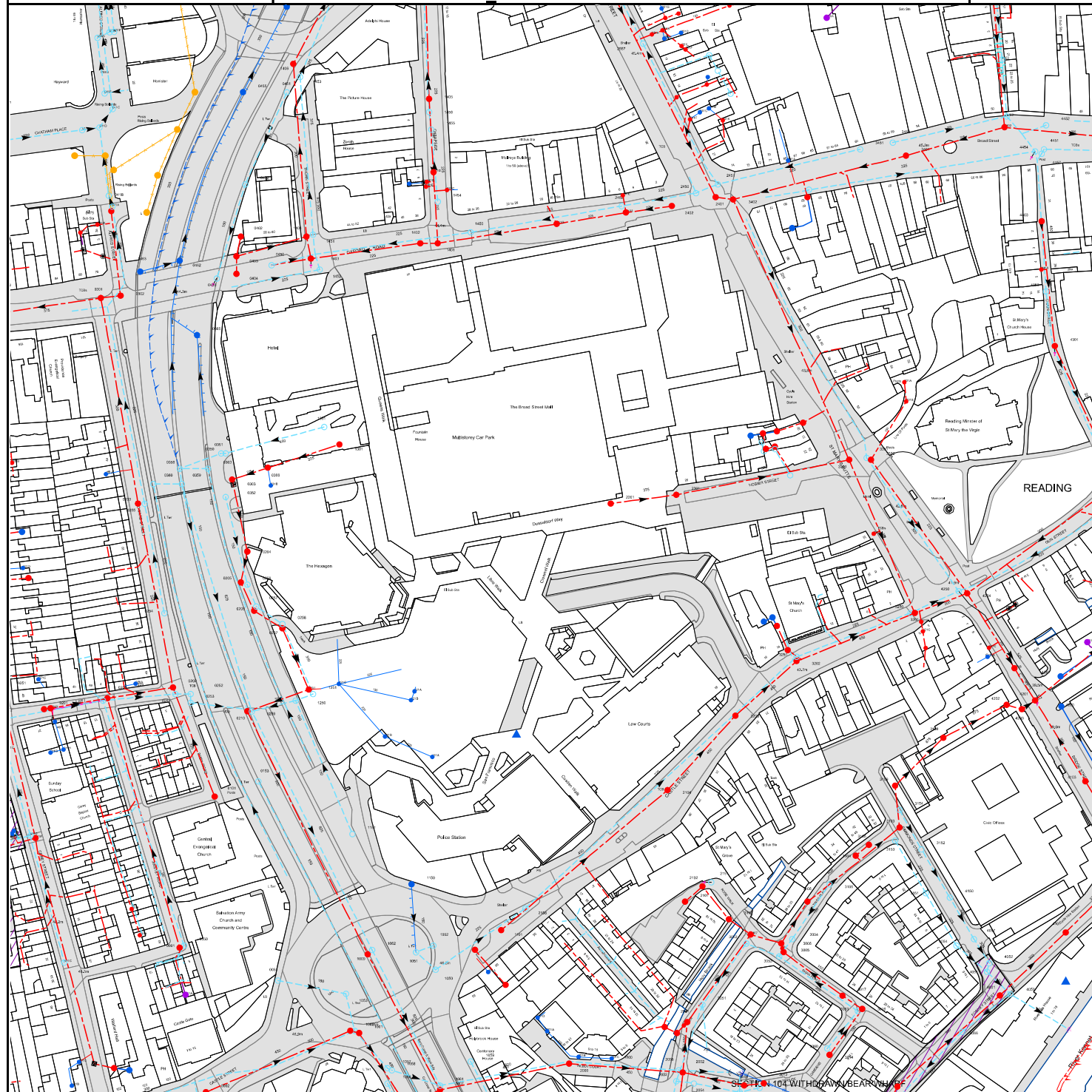
Drawn: **JL** Date: **13/10/2023** Scale: **1:200 @ A1**

Project No: **BES23344** Drg No: **1** Rev: **A**

TOPOGRAPHICAL SURVEYS GPS MEASURED BUILDING SURVEYS
3D LASER SCANNING AS-BUILT SURVEYS AREA MEASUREMENTS

Appendix B: Thames Water sewer records

Asset Location Search Sewer Map - ALS/ALS Standard/2023_4779837



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 471222,173278

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
241F	n/a	n/a
241C	n/a	n/a
241B	n/a	n/a
2555	n/a	n/a
2455	n/a	n/a
241A	n/a	n/a
351L	n/a	n/a
3455	n/a	n/a
351K	n/a	n/a
351A	n/a	n/a
3451	45.34	44.52
3450	45.35	44.17
041G	n/a	n/a
041E	n/a	n/a
051G	n/a	n/a
041H	n/a	n/a
041D	44.55	41.55
0301	43.98	40.93
041F	n/a	n/a
041B	44.5	41.84
051E	n/a	n/a
0475	n/a	n/a
041A	44.13	42.03
041C	44.5	41.5
0302	43.97	41.01
0463	n/a	n/a
0462	n/a	n/a
0453	36.96	36.16
0404	44	41.34
0403	44.24	41.02
0402	45.02	42.4
0455	n/a	n/a
0452	39.56	38.63
0450	44.05	42.34
0551	36.74	34.98
0451	43.06	42.02
1406	43.44	40.66
1453	43.69	41.86
1404	44.11	40.93
1403	44.18	40.97
1451	44.08	42.22
1452	44.06	42.53
1351	n/a	n/a
1301	39.58	38.98
141A	n/a	n/a
1402	44.41	41.28
141E	n/a	n/a
141B	n/a	n/a
1456	44.43	42.66
1405	n/a	n/a
1455	44.43	42.8
141D	n/a	n/a
1454	44.45	43.04
241G	n/a	n/a
2401	44.97	n/a
2451	45.11	43.88
3402	44.86	41.11
33MD	n/a	n/a
33MJ	n/a	n/a
33MN	n/a	n/a
33ML	n/a	n/a
33MF	n/a	n/a
33MC	n/a	n/a
341A	n/a	n/a
34ME	n/a	n/a
33LN	n/a	n/a
34LN	n/a	n/a
34MH	n/a	n/a
331A	n/a	n/a
3401	45.28	41.81
441A	n/a	n/a
92MN	n/a	n/a
0255	44.65	43.44
0203	44.71	n/a
0359	n/a	n/a
0360	n/a	n/a
031A	n/a	n/a
0358	n/a	n/a
931B	n/a	n/a
0365	n/a	n/a
3250	42.27	n/a
3201	42.25	n/a
321B	n/a	n/a
321C	n/a	n/a
4250	41.63	n/a
4204	41.47	n/a
421C	n/a	n/a
421D	n/a	n/a
0253	45.86	n/a
0250	46.15	44.53
0201	46.12	43.07

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0251	45.78	44.4
0252	45.81	44.22
0202	45.78	42.82
021A	n/a	n/a
921C	n/a	n/a
0254	45.27	44.22
92LM	n/a	n/a
921D	n/a	n/a
3152	n/a	n/a
4103	38.95	36.37
4152	38.9	37.42
3108	39.77	35.77
4203	n/a	n/a
4260	39.45	37.7
4202	39.85	35.7
4201	39.58	36.05
4261	39.6	38.33
421B	n/a	n/a
421A	n/a	n/a
32LE	n/a	n/a
0363	n/a	n/a
0101	46.09	43.51
0350	39.09	37.13
0351	39.05	37.25
0352	39.43	38.01
0303	39.59	38.65
0205	39.83	38.42
0210	n/a	n/a
0204	39.7	n/a
0256	39.82	37.6
0259	n/a	n/a
0206	40.06	38.44
0257	40.02	37.61
0153	n/a	n/a
0366	n/a	n/a
031B	n/a	n/a
0258	40	37.38
0207	40.56	38.35
1250	40.74	36.97
1201	42.7	38.27
1251	42.79	37
121C	n/a	n/a
1151	45.43	44.3
111B	n/a	n/a
121B	n/a	n/a
1150	46.37	45.12
121A	n/a	n/a
111A	n/a	n/a
2201	n/a	n/a
2104	44.88	40.66
2301	44.13	40.62
2102	41.08	39.33
2151	41.09	39.42
3203	44.23	40.1
33MH	n/a	n/a
32ME	n/a	n/a
33MM	n/a	n/a
32LN	n/a	n/a
32LM	n/a	n/a
32LJ	n/a	n/a
33ME	n/a	n/a
3202	43.85	39.65
3251	43.75	n/a
3155	39.34	37.75
3301	43.25	39.88
3104	39.59	37.9
3351	43.13	41.43
3105	39.7	38.04
3302	43.15	39.99
321A	n/a	n/a
3109	39.81	35.76
3153	39.8	37.76
3103	39.67	35.77
3154	n/a	n/a
011A	n/a	n/a
011B	n/a	n/a
911F	47.4	45.775
911D	47.15	46.01
911K	n/a	n/a
911L	n/a	n/a
911G	n/a	n/a
911H	n/a	n/a
911I	n/a	n/a
9201	46.32	43.34
921B	n/a	n/a
2054	38.76	37.06
3012	38.73	37.44
2052	38.79	37.06
2002	38.85	36.04
2056	38.89	35.55
2003	40.03	36.45
201C	n/a	n/a
201B	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2061	n/a	n/a
201A	n/a	n/a
2060	n/a	n/a
2001	39.03	36
201D	n/a	n/a
2051	38.94	37.13
10ND	n/a	n/a
101A	n/a	n/a
3053	39.09	37.16
3005	39.12	37.04
3052	39.35	37.15
3006	39.12	35.9
3054	39.12	37.41
3107	39.47	35.85
1101	45.48	41.83
3111	40.31	39.16
2158	45.55	43.79
2101	40.96	39.46
3106	39.22	35.97
0002	48.33	45.4
001B	n/a	n/a
00KM	n/a	n/a
00KL	n/a	n/a
001C	n/a	n/a
001A	n/a	n/a
901C	n/a	n/a
0001	47.66	44.82
0050	47.61	46.57
0051	47.28	45.99
1053	47.02	45.47
1002	46.71	n/a
1055	46.71	n/a
1001	46.73	n/a
1009	n/a	n/a
1062	n/a	n/a
1056	45.96	45.02
1057	46.18	42.13
1058	46.13	n/a
1051	46.33	44.53
1052	46.08	45.12
1050	45.98	n/a
1007	n/a	n/a
1061	n/a	n/a
1059	45.18	44.2
10MN	n/a	n/a
3060	38.96	37.41
3014	38.92	37.59
3017	38.89	37.29
3063	38.82	37.37
3016	38.85	37.36
3019	38.69	36.98
3151	39.74	37.63
4150	n/a	n/a
4054	39.66	37.45
4066	38.64	n/a
4057	39.61	36.9
4051	39.04	36.63
4052	39.12	n/a
4001	38.81	36.81
4050	38.84	n/a
4101	38.99	36.76
3055	38.69	36.89
3059	38.69	37.17
3008	38.74	37.26
4553	45.02	44.06
4402	45.1	41.67
4453	45.02	43.81
4454	44.93	42.33
4457	n/a	n/a
4403	44.44	41.29
4451	45.02	43.68
4452	45.03	43.72
4350	43.99	41.32
4301	43.64	40.39
4302	41.55	38.44
4351	41.63	39.72
331B	n/a	n/a
1401	44.42	41.32
141C	n/a	n/a
1450	44.57	n/a
2452	44.92	43.6
241E	n/a	n/a
2403	44.99	41.78
2557	n/a	n/a
251A	n/a	n/a
251G	n/a	n/a
251B	n/a	n/a
251E	n/a	n/a
25KH	n/a	n/a
2402	44.98	41.92
2458	n/a	n/a
25KK	n/a	n/a
251D	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
251L	n/a	n/a
251F	n/a	n/a
2450	44.99	n/a
2456	n/a	n/a
2457	n/a	n/a
051F	n/a	n/a
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

	Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Storm Sewer
	Foul Trunk Sewer
	Confined Trunk Sewer
	Surface Water Rising Main
	Vacuum
	Vent Pipe
	Sludge Sewer
	Surface Trunk Sewer
	Foul Rising Main
	Combined Rising Main
	Thames Water Proposed
	Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

	Sewer
	Proposed
	Culverted Watercourse
	Decommissioned Sewer
	Ownership of this drainage network is currently unknown

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve
	Dam Chase
	Fitting
	Meter
	Vent

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Ancillary
	Control Valve
	Drop Pipe
	Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Inlet
	Outfall
	Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

	Change of Characteristic Indicator
	Invert Level
	Public / Private Pumping Station
	Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Chamber
	Operational Site

Ducts or Crossings

	Casement
	Conduit Bridge
	Subway
	Tunnel

- 5) 'n' or 'p' on a manhole indicates that data is unavailable.
- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540

Appendix C: Proposed site plans

EXISTING
STUDENT RESIDENTIAL

THE CONTRACTOR IS TO CHECK AND VERIFY ALL BUILDING AND SITE DIMENSIONS, LEVELS AND SEWER INVERT LEVELS AT CONNECTION POINTS BEFORE WORK STARTS.

THIS DRAWING IS TO BE READ AND CHECKED IN CONJUNCTION
WITH ENGINEERS AND OTHER SPECIALIST DRAWINGS.

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TO BE READ IN CONJUNCTION WITH GA PLANS, SECTIONS
AND ELEVATIONS.

- Auditorium
- Studio
- FOH
- FOH Support
- BOH
- BOH Circulation
- Plant

Scale 1:100

A	11/09/24	Stage 3 - GA Freeze
REV	DATE	DESCRIPTION

HaworthTompkins

110 Golden Lane, London, EC1Y 0TL
+44 (0)20 7250 3225 | www.haworthtompkins.com

2323 HEXAGON THEATRE, READING

DRG

PROPOSED G+1 PLAN

DRG No	HEX-HTL-ZZ-01-DR-A-00101	REV
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SCALE	1 : 100@A1	1:200@A3	DATE	11/09/
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DRAWN	INSPECTED BY
HTL	JM / I

STATUS	STAGE 3
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Appendix D: Proposed drainage strategy layouts