

Risk Assessment for Ionising Radiations Regulations 1999

Location of work	UHBristol Precinct
Date of commencement	Ongoing
Description of work	NHS
Source of Radiation	Naturally occurring radioactive materials Radon
Persons involved	Staff Patients / Relatives / Carers
Exposed Groups(critical groups)	Staff

Assessment

Radon is a naturally occurring radioactive gas that can seep out of the ground into buildings. Radon is now recognised to be the second largest cause of lung cancer in the UK after smoking. High concentrations of radon are found in ground floor buildings because they are usually at slightly lower pressure than the surrounding atmosphere; this allows radon from the sub-soil underneath buildings to enter through cracks and gaps in the floor. Cellars and basements have the highest levels.

The levels of radon must be risk assessed by the Trust. The Ionising Radiations Regulations 1999 (IRR99) come into effect where radon is present above the defined action level of 400 Bq/m³.

The current HSE guidance is that risk assessments should be done for all buildings in any 'radon affected area'. The British Geological Survey report for the UHBristol Precinct, see Appendix, showed that precinct is not in a radon affected area as the estimated probability of the property being above the Action Level for radon is 0-1%. It states that no radon protective measures are required for the report site.

Full radon monitoring is therefore not required across the whole site but HSE also recommend that, where workplaces are below ground and are occupied for more than an average of one hour per week (52 hours per year) the risk assessment should include radon monitoring measurements.

Measurements of buildings / locations below ground level were made in 2016. A total of 102 radon monitors were placed around the Trust, and left in situ for 16 weeks (Feb - June 2016) before reading. The measured concentrations of radon were all below the current action level for workplaces of 400 Bq/m³. They were also all below the proposed action level of 300 Bq/m³ which is anticipated to come into effect in 2018. The survey report is appended, below.

UHBristol Risk Rating: Low

Control Measures

None required for any UHBristol workplace.

Actions required

This radon risk assessment should be reviewed periodically, or if major building works are carried out, requiring ground works.

UHBristol Radon Risk assessment	Issue Date: 19/09/16	Issued By:	Review Date: 01/09/21.	Page: 1 of 2
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General Manager - Estates Maintenance

Date: 19/09/16

Radiation Protection Advisers

Date: 19/09/16

1. HPA - RCE-15: limitation of human exposure to radon. 2007
2. Radon in the workplace, Health and Safety Executive website
<http://www.hse.gov.uk/radiation/ionising/radon.htm#legalrequirements>
3. UHBristol Radon survey report 2016.pdf , see below

Survey of Environmental Radon Gas Concentrations - 2016

Introduction

Radon is a naturally occurring radioactive gas that can seep out of the ground into buildings. High concentrations of radon are found in ground floor buildings because they are usually at slightly lower pressure than the surrounding atmosphere; this allows radon from the sub-soil underneath buildings to enter through cracks and gaps in the floor. Cellars and basements have the highest levels.

The levels of radon must be risk assessed by the Trust. The Ionising Radiations Regulations 1999 (IRR99) come into effect where radon is present above the defined action level of 400 Bq/m³. A British Geological Survey report for the UHBristol precinct showed that it is not in a radon affected area, as the estimated probability of the property being above the Action Level for radon is 0-1%. Full radon monitoring is therefore not required across the whole site but HSE also recommend that, where workplaces are below ground and are occupied for more than an average of one hour per week (52 hours per year) the risk assessment should include radon monitoring measurements. Measurements must be made in all potentially affected buildings, as national surveys have shown that radon concentrations in adjacent or adjoining buildings can differ by as much as a factor of ten (due to local geology or building design and construction).

Method

Sites below ground level were identified across Trust premises by the Estates department (see appendix for plans). Radosure radon monitors were placed in the areas identified, at least 1 m from doors and windows and away from drafts caused by heating, ventilating vents, air conditioning vents, fans, doors, and windows. They were at least 50cm from the floor and where possible placed at face height to give a better representation of gas breathed. Where practical, they were placed where they could not be touched, or covered. Additionally they were placed away from direct sunlight and away from sources of humidity (e.g. showers).

Monitors were in place for 16 weeks (Feb - June 2016) before being read by the supplier, Radosure.

Summary and Actions

A total of 102 monitors were placed around the Trust in buildings below ground level. Monitor positions are marked on plans given in the appendix. Details results are given in tables, below.

The measured concentration of radon was in the range 56 to 163 Bq/m³.

The seasonally adjusted concentrations, which give a worst case, were in the range 74 to 214 Bq/m³.

The measured concentrations of radon are all below the current action level for workplaces of 400 Bq/m³. They are also all below the proposed action level of 300 Bq/m³ which is anticipated to come into effect in 2018.

Two monitors were unable to be collected due to asbestos clearance works and 1 monitor was lost.

No action is required. The radon risk assessment should be reviewed periodically, or if major building works are carried out.

16/09/16

Results

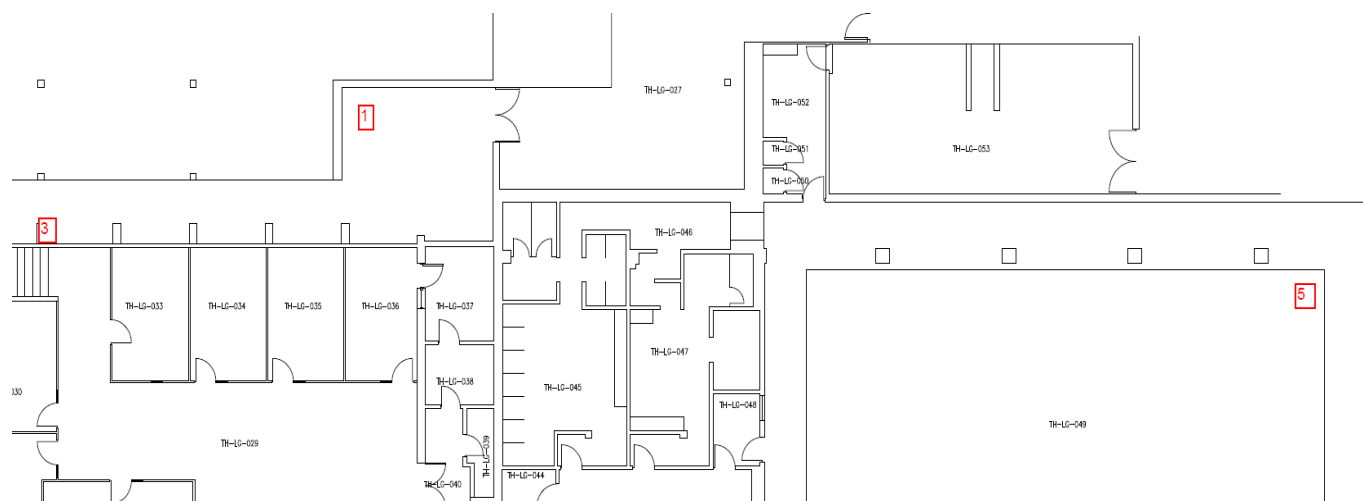
Building / Location	Position	Detector	Result (Bq/m ³)	Estimated Winter max (Bq/m ³)
Trust HQ Plant Room	On electric shock poster far right	55836	108	142
Trust HQ Plant Room	Far left wall between pipes and wires	55885	131	172
Trust HQ Plant Room	On wall right of door	55825	112	146
Trust HQ corridor	On wall by fire exit sign through reception turn right	55970	91	119
Trust HQ bike store	Far corner near lockers	55986	82	108
Queens Building telephone exchange level 1	Rear wall next to shelves	56163	96	126
Queens Building Physio level 1	Corridor behind male changing room	55841	72	95
Queens Building Physio level 1	Corridor towards lifts	55944	69	90
Queens Building Physio level 1	Physio store room behind lifts placed on back wall	55896	82	108
Queens Building Plant room level 1	Next to physio store room	56123	88	115
Queens Building Plant room level 1	Through white doors in physio on rear wall	55927	72	94
Queens Building Plant room/area level 1	Rear wall next to red coloured bed pan washer sign	55881	75	98
Queens Building Plant room workshop level 1	Rear wall tied to stop button	55895	63	82
Queens Building Plant room/area level 1	Left hand side of door to level 2 on wall	55879	81	106
Queens Building corridor to BHOC level 2	door at far end	55837	84	111
Queens Building corridor staff lift area level 2	Towards cashier end of corridor paced on rear wall	55936	73	95
Queens Building corridor bed store level 2	On middle pillar	55935	69	90
Queens Building new stair well level 2	On wall next to stairs	55886	81	106
Queens Building old lifts level 2	Long storage corridor behind the lifts far end RHS	55919	65	85
Queens Building Respiratory level 2	Consulting room 3 on wall	55915	81	106
Queens Building old lifts level 2	Long storage corridor behind the lifts records room RHS near door	56158	99	130
Queens Building old lifts level 2	Long storage corridor behind the lifts records room RHS far end	56146	89	116
Queens Building Psychiatry level 2	Room 3	56137	67	87
Queens Building Psychiatry level 2	Tea room (room 6)	55928	75	99
Queens Building Pharmacy level 3	Main area/reception LHS on shelf	55949	65	86
Queens Building Pharmacy level 3	Long corridor of offices far end LHS	55864	64	84
Queens Building ED nurses office	Nurses resource room rear wall	55876	72	94

Building / Location	Position	Detector	Result (Bq/m ³)	Estimated Winter max (Bq/m ³)
Queens Building ED nurses office	Registrars office behind PC on wall	55831	72	94
Stores level 4	Oxygen stores 6013686 hanging on metal rail	55907	73	95
Stores level 4	Deliveries tied to light switch on rear wall	55973	84	110
Stores level 4	Corridor to BHI lifts tied to light switch RHS	56174	76	100
Stores level 4	Gas store behind door LHS tied to light switch	55850	95	124
Stores level 4	Water tank room behind door RHS tied to plug	55880	75	98
Sterile services level 4	Store room area tied to shelf	55916	88	115
Sterile services level 4	Store room area rear wall behind PC	55840	69	90
Sterile services level 4	Plantroom behind ovens RHS tied to switch	55946	84	111
Sterile services level 4	Plantroom storeroom above desk in corner	56184	79	103
Level 5 BHI MRI	MRI control room	55863	75	98
Level 5 BHI MRI	MRI reception behind desk	56189	93	122
Level 5 BHI female changing room	Between lockers on wall	56024	77	101
Level 5 BHI male changing room	Next to mirror	55851	80	104
Level 5 BHI	Door next to lifts by changing rooms RHS	55846	74	97
Level 5 BHI	Female public toilets next to air freshener	55884	103	135
Level 5 BHI	Cycle store	55940	75	98
New ward block	Level 3 ward first cubicle LHS	55992	75	98
New ward block	Level 3 cleaners utility room Rear wall by blood monitor	55852	79	104
New ward block	level 3 pharmacy store rear shelf	55867	105	138
New ward block	level 3 equipment store shelf LHS	56091	84	111
Estates tea room	Back wall RHS	55920	75	98
Estates locker room	Between lockers on wall	55828	66	87
Estates store cupboard	Red handle door on frame	55918	102	133
Estates meeting room	Rear wall go through parking ticket collection	55887	94	123
Estates stores	Back wall next to shelf	55829	96	126
MEMO	Machine shop back wall between pipes	55838	89	116
MEMO	Engraving room wall RHS	55873	80	104
MEMO	Workshop back wall above desk	56060	83	108
MEMO	Welding room behind door	55866	70	91
BDH basement	Cleaners cupboard back stairs	56033	74	97
BDH basement	Workroom next to light switch	55952	80	104
BDH basement	Zone 24 behind door RHS	56018	121	158
BDH basement	Ladies changing room opposite shower	56046	78	102
BDH basement	Plant room opposite changing room	56050	80	104
BDH basement	Plant room RHS by steam door	56171	Monitor lost	
BDH basement	Plant room back wall by electric shock poster	56028	Monitor lost	
Eye hospital	Basement plant room	56141	76	100
Eye hospital	Basement staff room	56144	72	94

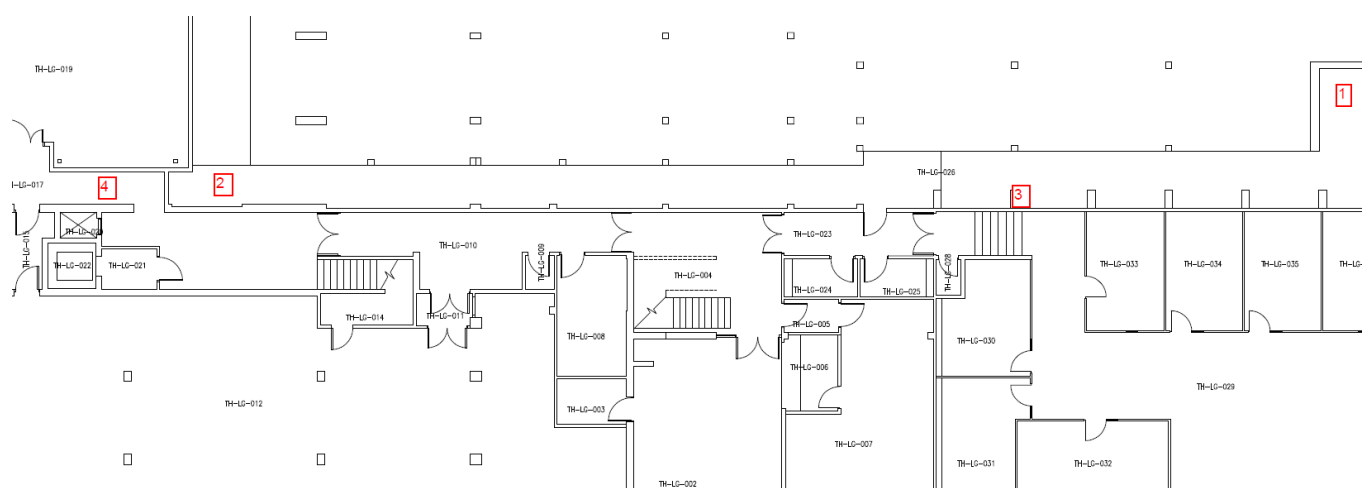
Building / Location	Position	Detector	Result (Bq/m ³)	Estimated Winter max (Bq/m ³)
Education centre	Level 1 corner by lifts	56177	80	105
Education centre	Level 1 Next to bike shed	55929	86	113
Education centre	Level 1 Bike shed	55902	64	84
Education centre	Level 1 room RHS bike shed	56110	85	111
Education centre	Level 2 door towards old BRI tunnel	55820	79	104
BRHC	Level 2 staff room corner by switch	55908	120	157
BRHC	Offices to right of reception down steps on wall in corner	56039	90	118
BRHC	Level 2 bottom of spiral stair case from x-ray	55974	74	97
BRHC	Level 2 by office photocopier	56139	71	93
BHOC level 2	Linac B office	56161	79	103
BHOC level 2	Linac A office	56181	77	101
BHOC level 1	Gamma knife office	55981	69	91
Stores level 4	In gated area	55960	77	101
Stores level 4	Linen store	55959	70	91
STMH	Level A plant room from delivery doors	56149	65	85
STMH	Level A plant room next to lifts	56169	Monitor lost	
STMH	Level A records room rear wall	55954	69	91
STMH	Level A records room behind wooden stairs	56058	77	101
BHOC level 2	Linac B control area	56064	110	144
BHOC level 2	Linac D entrance area	55968	91	119
BHOC level 2	Linac G changing area	55878	70	92
BHOC level 2	Physics store near G	55938	137	180
BHOC level 2	Unused bunker area	56106	125	164
BHOC level 2	Linac A	56153	72	94
BHOC level 2	Linac C	55990	89	116
BHOC level 2	Linac G	55962	124	162
BHOC level 2	Linac F	56053	86	113
Central Health clinic	Basement first long tunnel LHS	55948	108	142
Central Health clinic	Basement room LHS	56136	58	76
Central Health clinic	Basement second long tunnel LHS	56063	163	214
Central Health clinic	Basement end of corridor	56012	85	111
SBCH	Control room x-ray	56025	83	109
SBCH	Room 110	55933	96	126
SBCH	Room 111	55861	69	90
SBCH	Superintendent Radiographer's office	56037	69	90
BRI, A907	Medical Physics	56167	56	74

Appendix

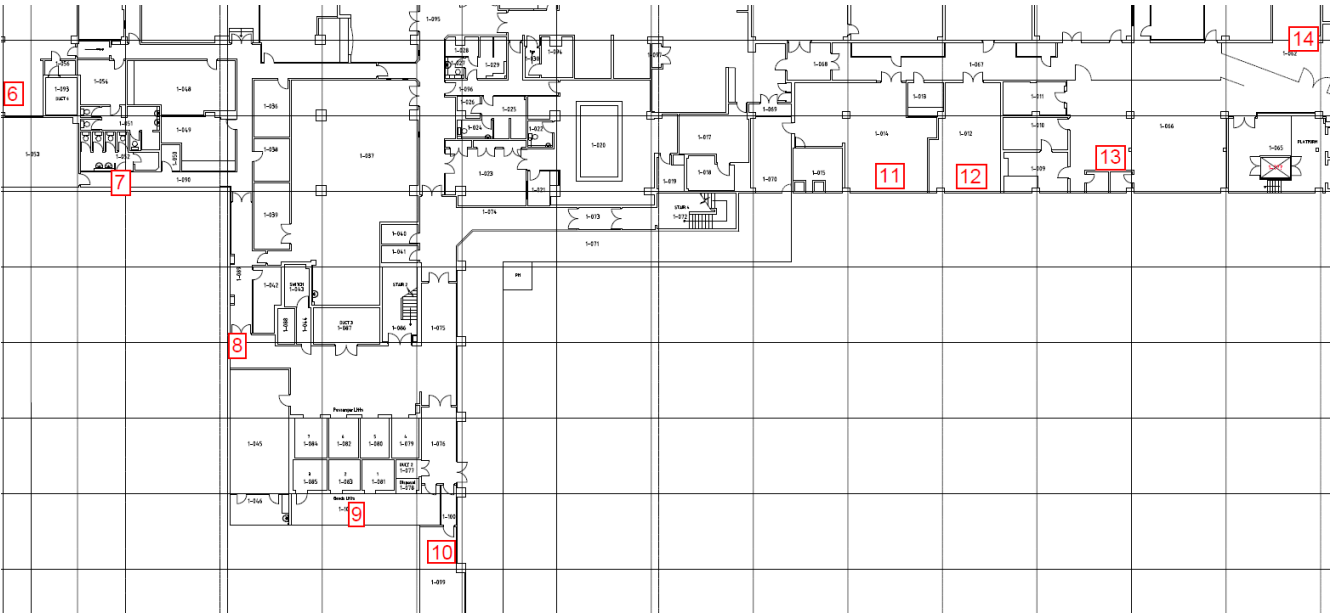
Trust HQ map 1



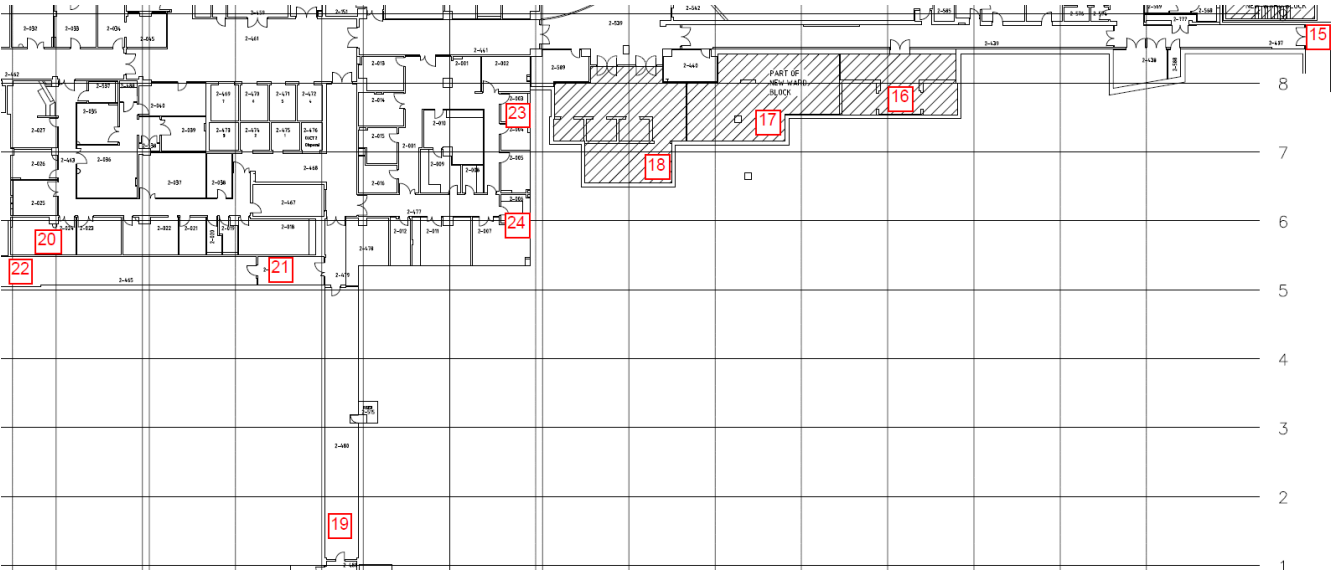
Trust HQ map 2



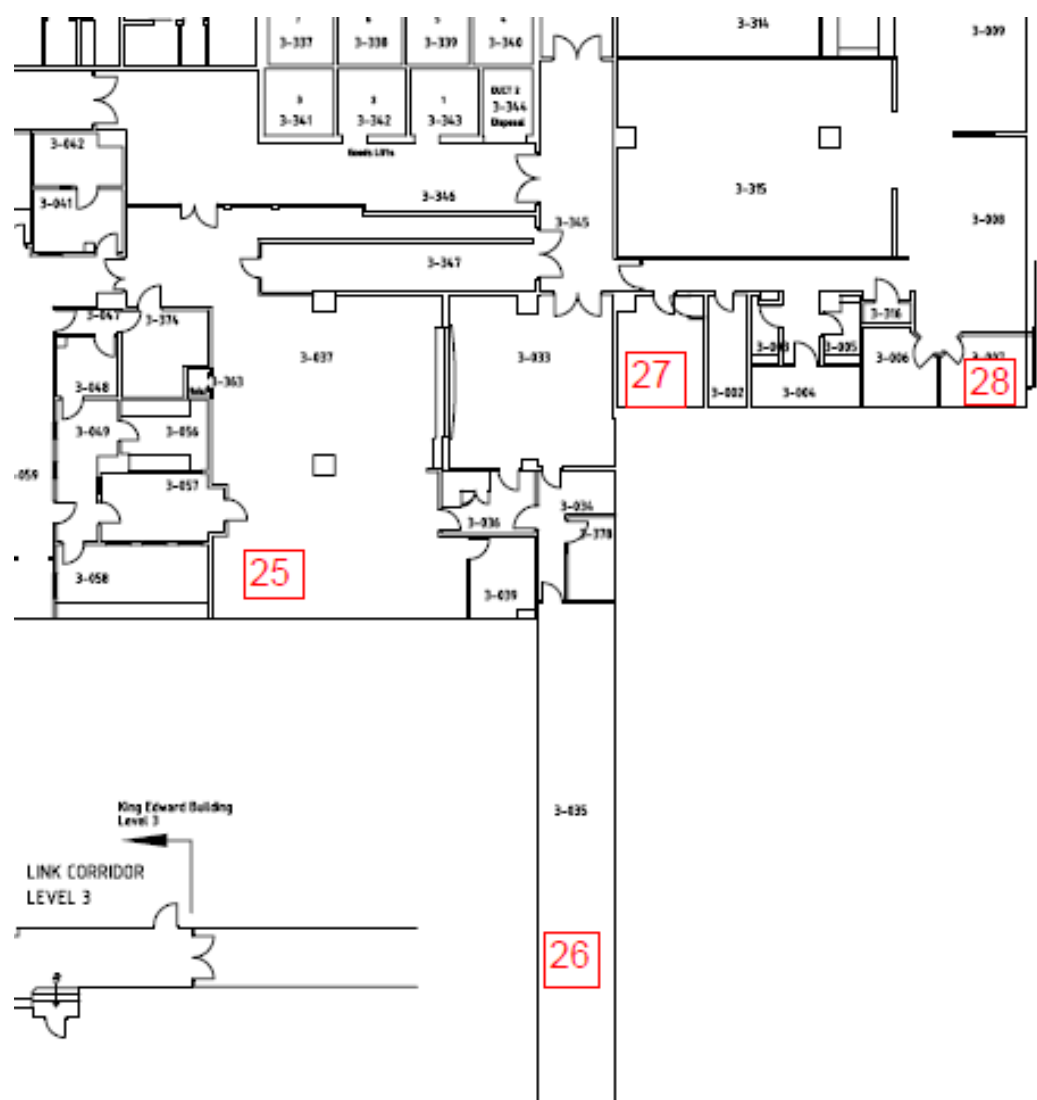
Queens building level 1



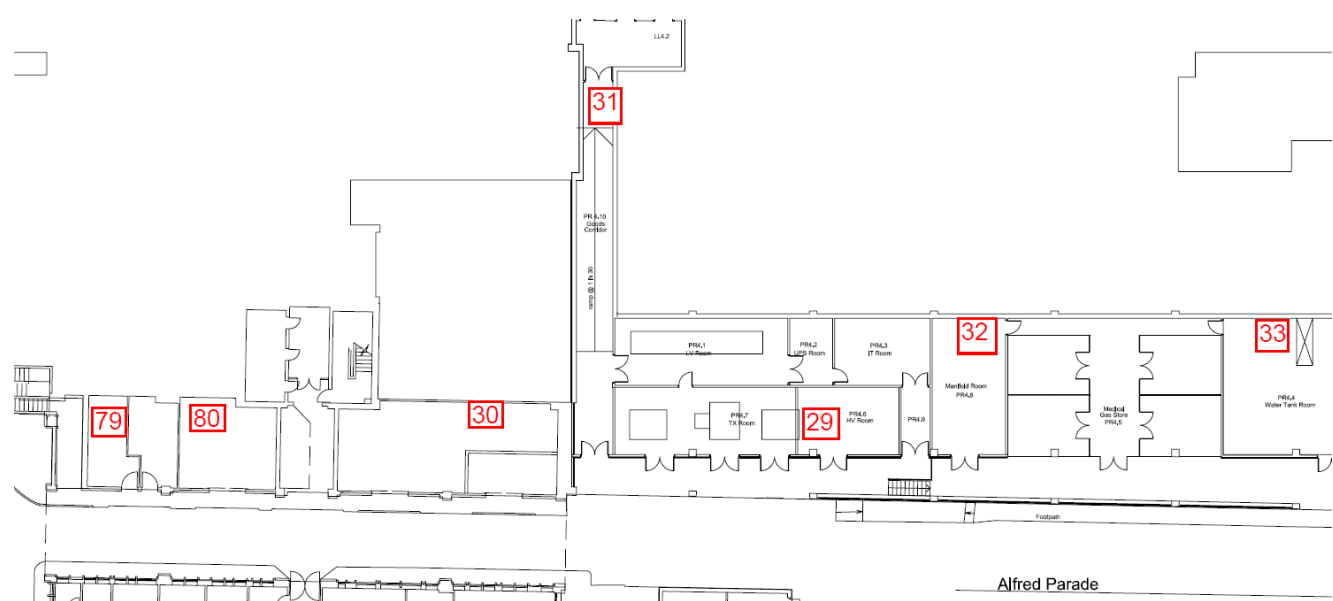
Queens building level 2



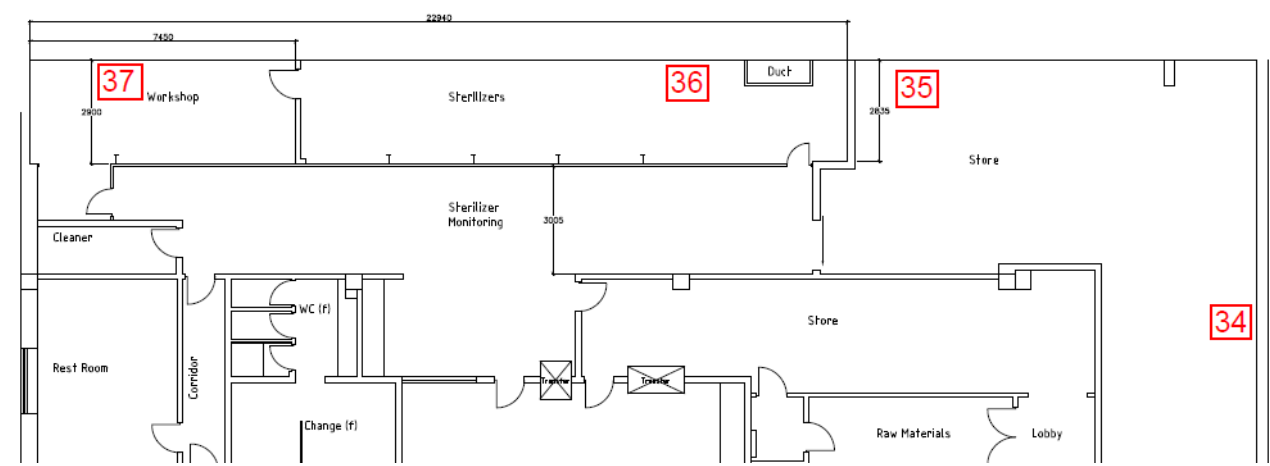
Queens building level 3



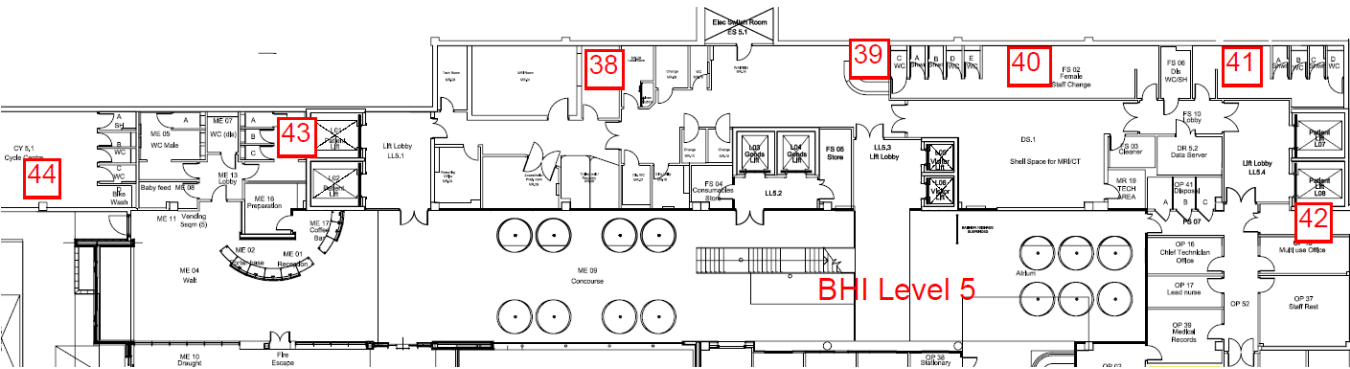
Level 4 stores



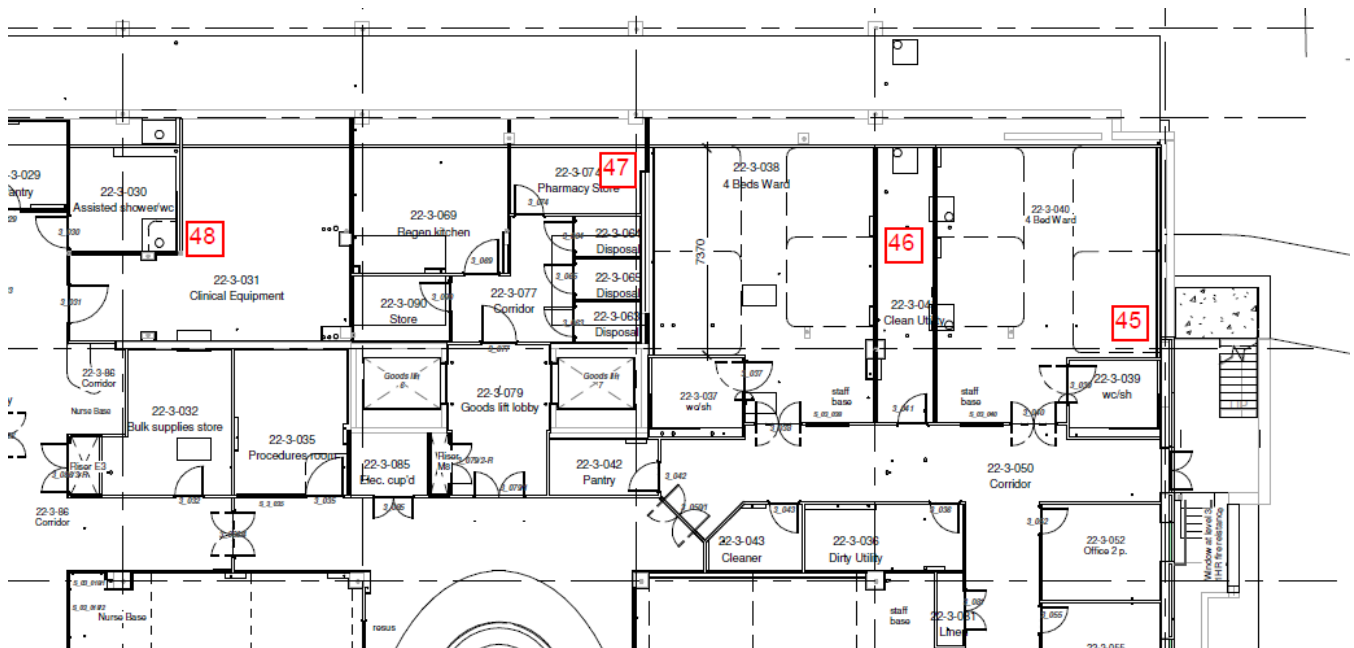
Sterile services (CSSD)



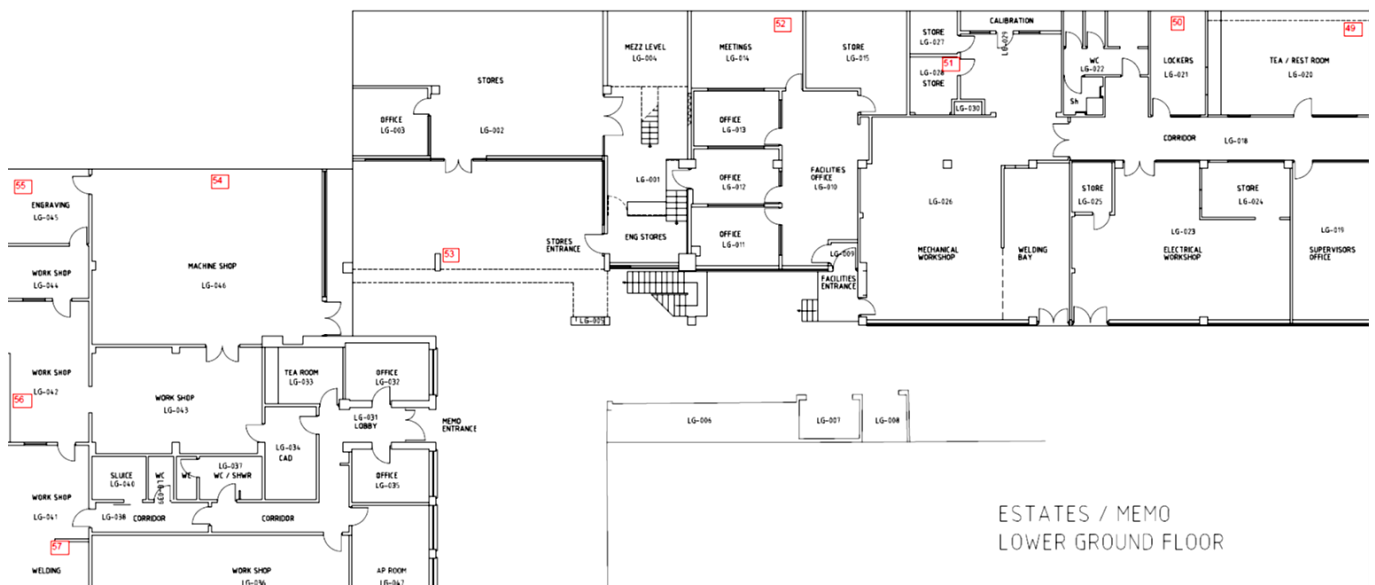
BHI level 5



New ward block level 3



Estates / MEMO building



ESTATES / MEMO
LOWER GROUND FLOOR

1st Floor Plan

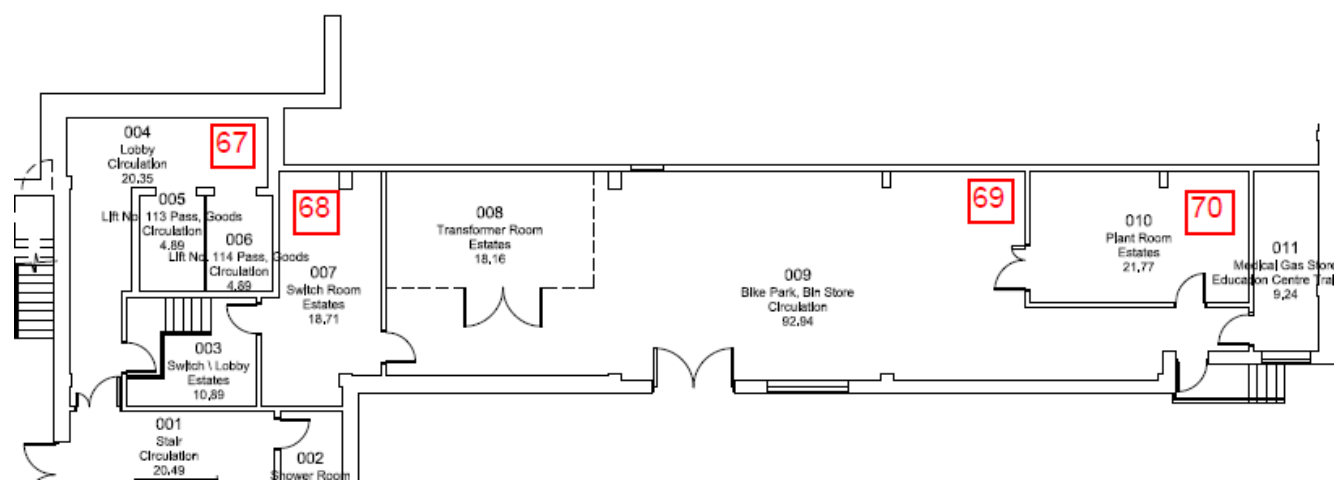
Rooms and Areas:

- B-001
- B-002
- B-003
- B-004
- B-005
- B-006
- B-007
- B-008
- B-009
- B-010
- B-011
- B-012
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- B-039
- B-040
- B-041
- B-042
- B-043
- VOID

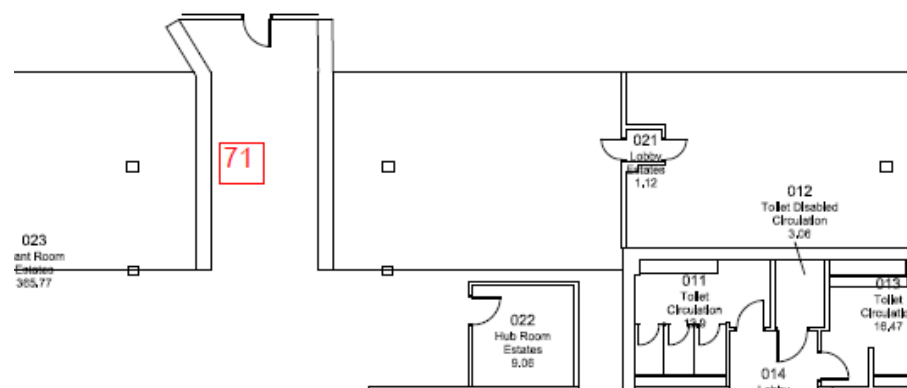
Highlighted Areas:

- 58
- 59
- 60
- 61
- 62
- 63
- 64

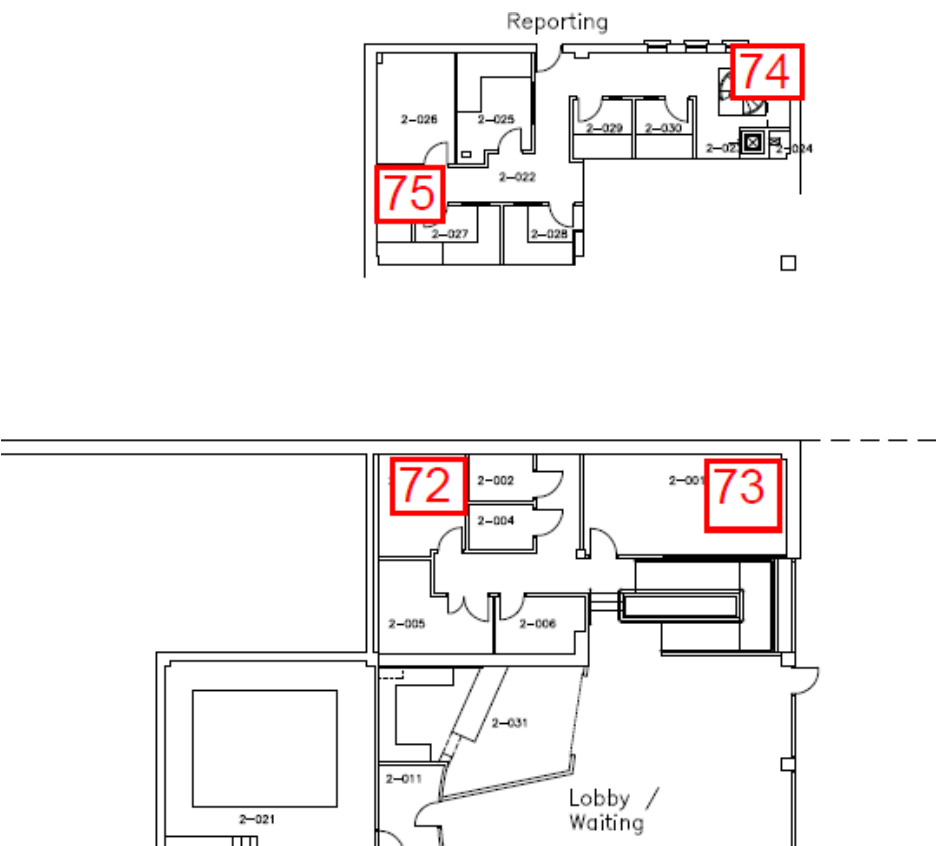
Education centre level 1



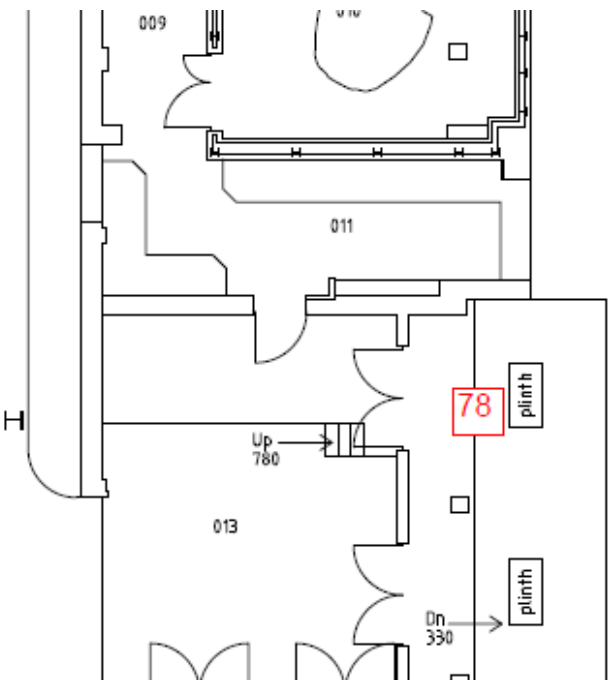
Education centre level 2



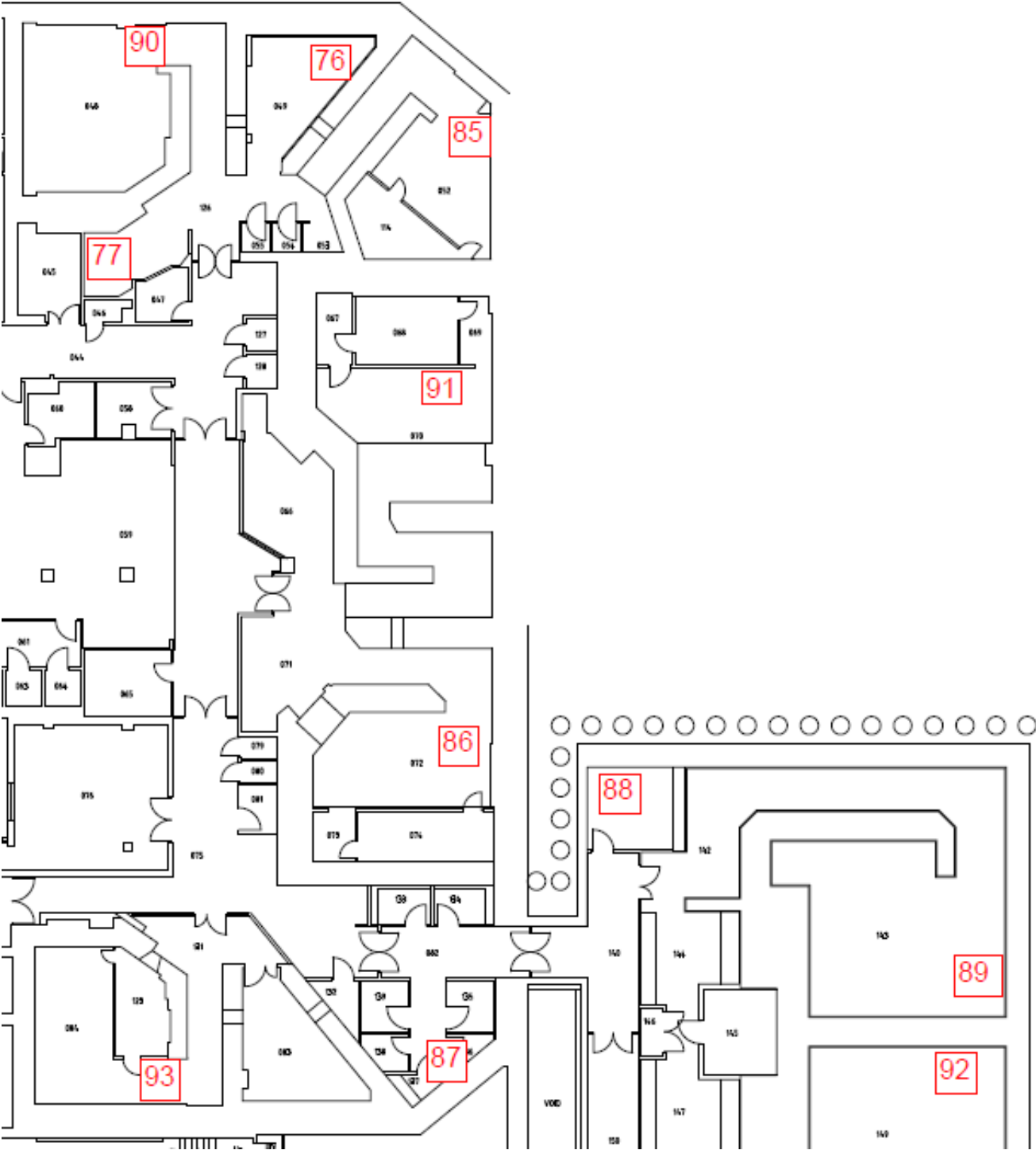
Bristol Royal Hospital for Children – Level 2 – Radiology reporting and reception offices



Bristol Haematology and Oncology centre level 1



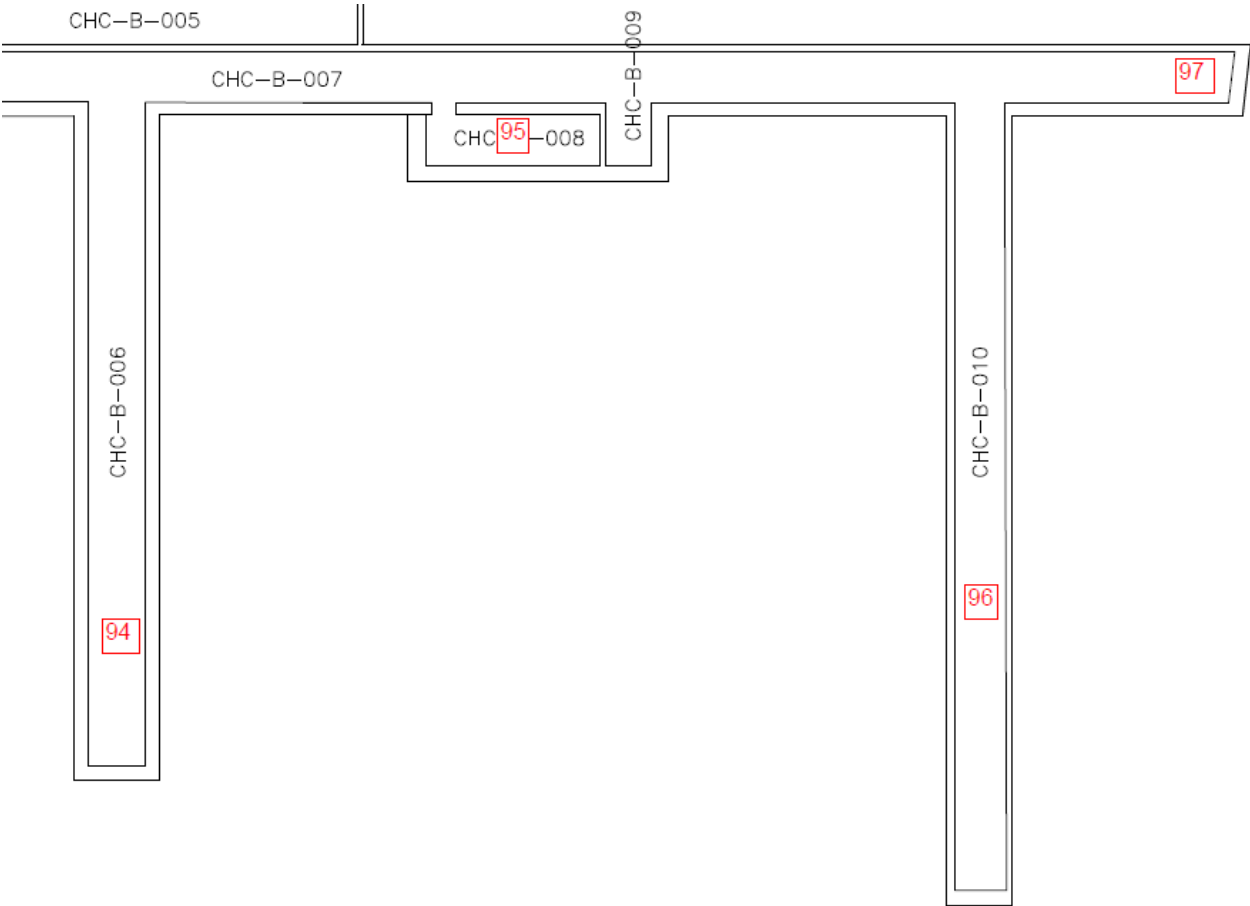
Bristol Haematology and Oncology Centre level 2



St Michaels Hospital level A



Central Health Clinic basement



South Bristol Community Hospital

