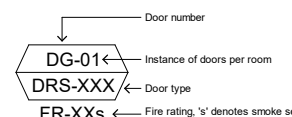
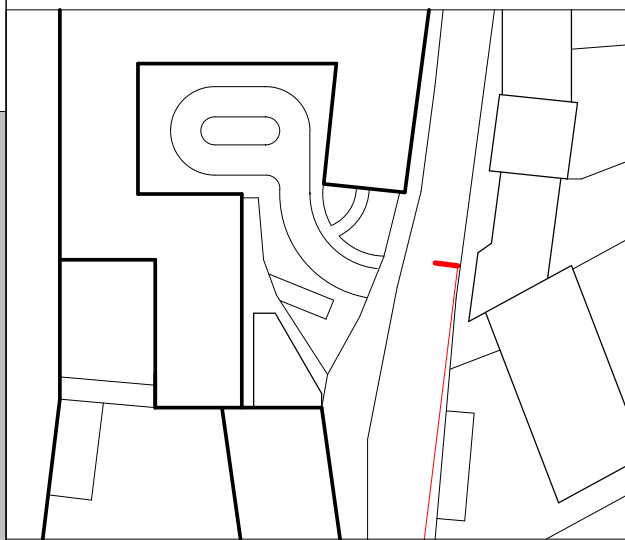


$$\begin{array}{r} +20.345 \\ \times +20.345 \\ \hline \times +20.345 \end{array}$$

Door

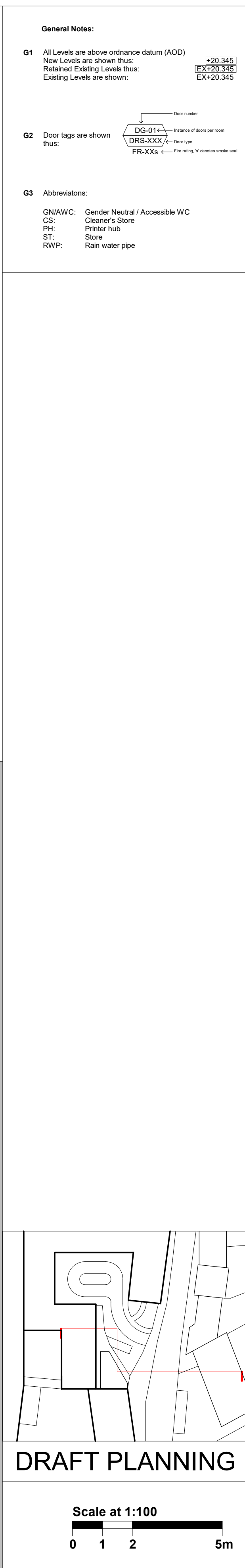


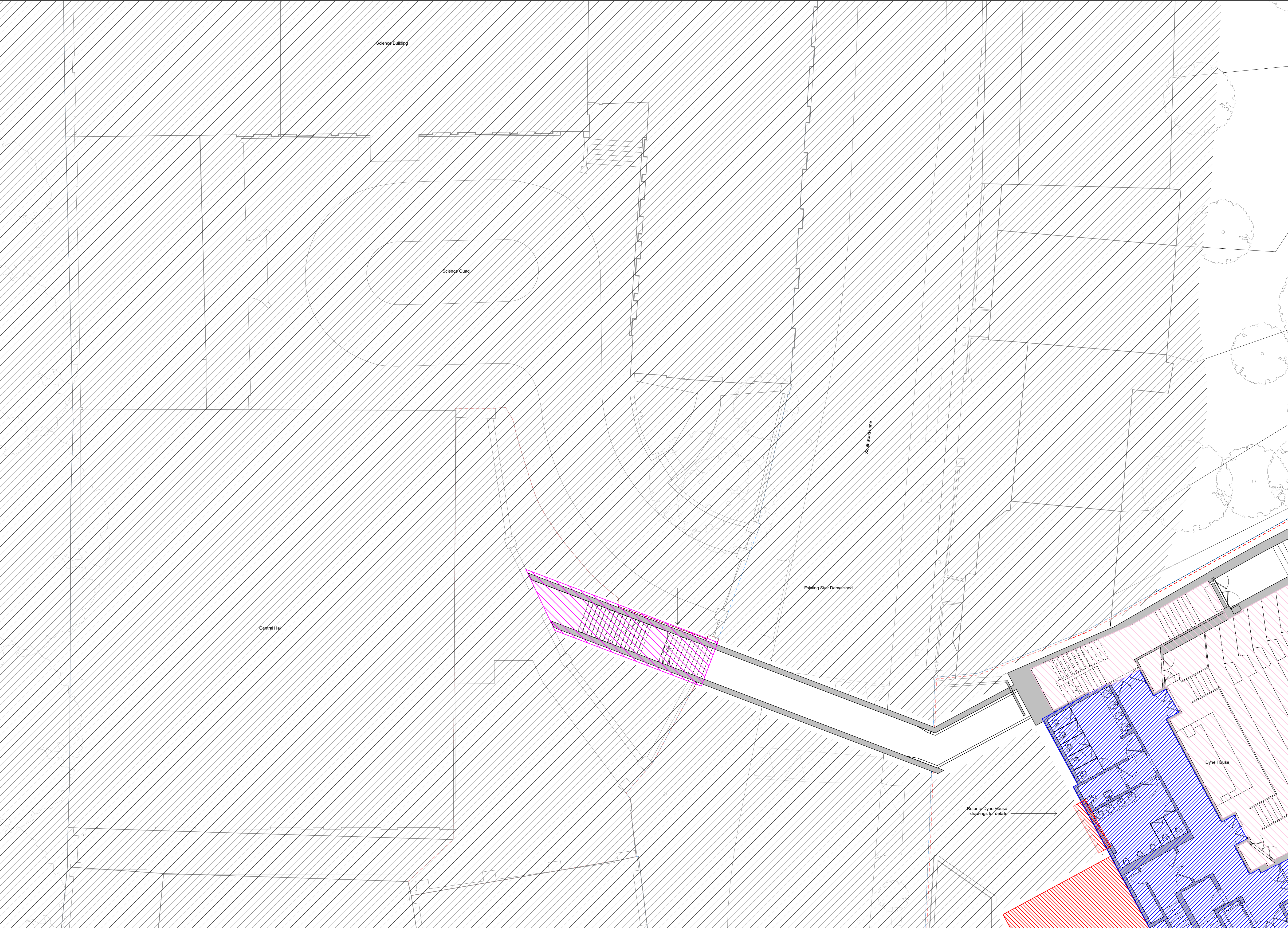
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe



Scale at 1:100

[illegible]

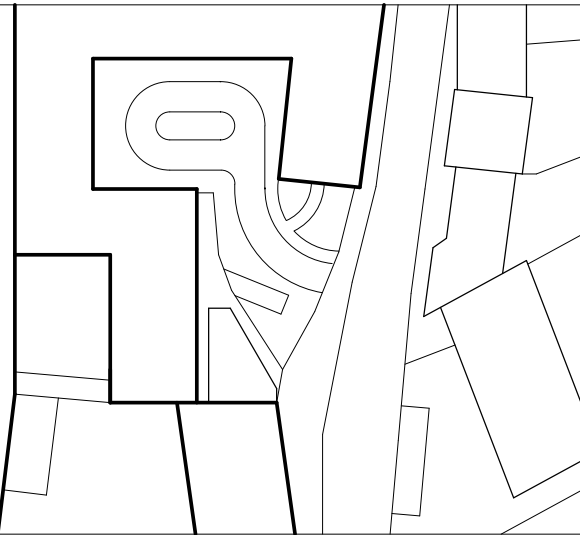
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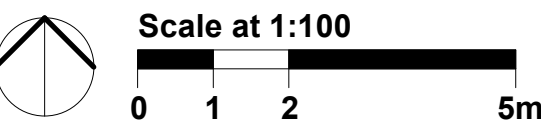
- General Notes:**
- G1** All Levels are above ordnance datum (AOD)
New Levels are shown thus: +20.345
Retained Existing Levels thus: [EX+20.345]
Existing Levels are shown: EX+20.345
- G2** Door tags are shown thus: DG-011 DRS-XXX FR-XXG
Door number
Instance of doors per room
Door type
Fire rating, 'X' denotes smoke seal
- G3** Abbreviations:
GN/AWC: Gender Neutral / Accessible WC
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe

- KEY - DEMOLITION PLAN:**
- Existing structures, hard standings, scrub and vegetation removal, excluding trees and boundary walls.
 - Existing buildings to be demolished
 - Existing Dyne House strip out and facade removal. Northern staircase to be retained
 - Existing Dyne House structural demolition, including existing stair and lift core, structural slab
 - Existing spaces to be retained
 - Penetration through existing Dyne House slab to form new risers (1 & 2) and new southern stair
 - Refer to drawing 2112 for forecourt, Gibbon Garden, tree and rear demolition information
 - Existing trees to be removed
 - Property Boundary

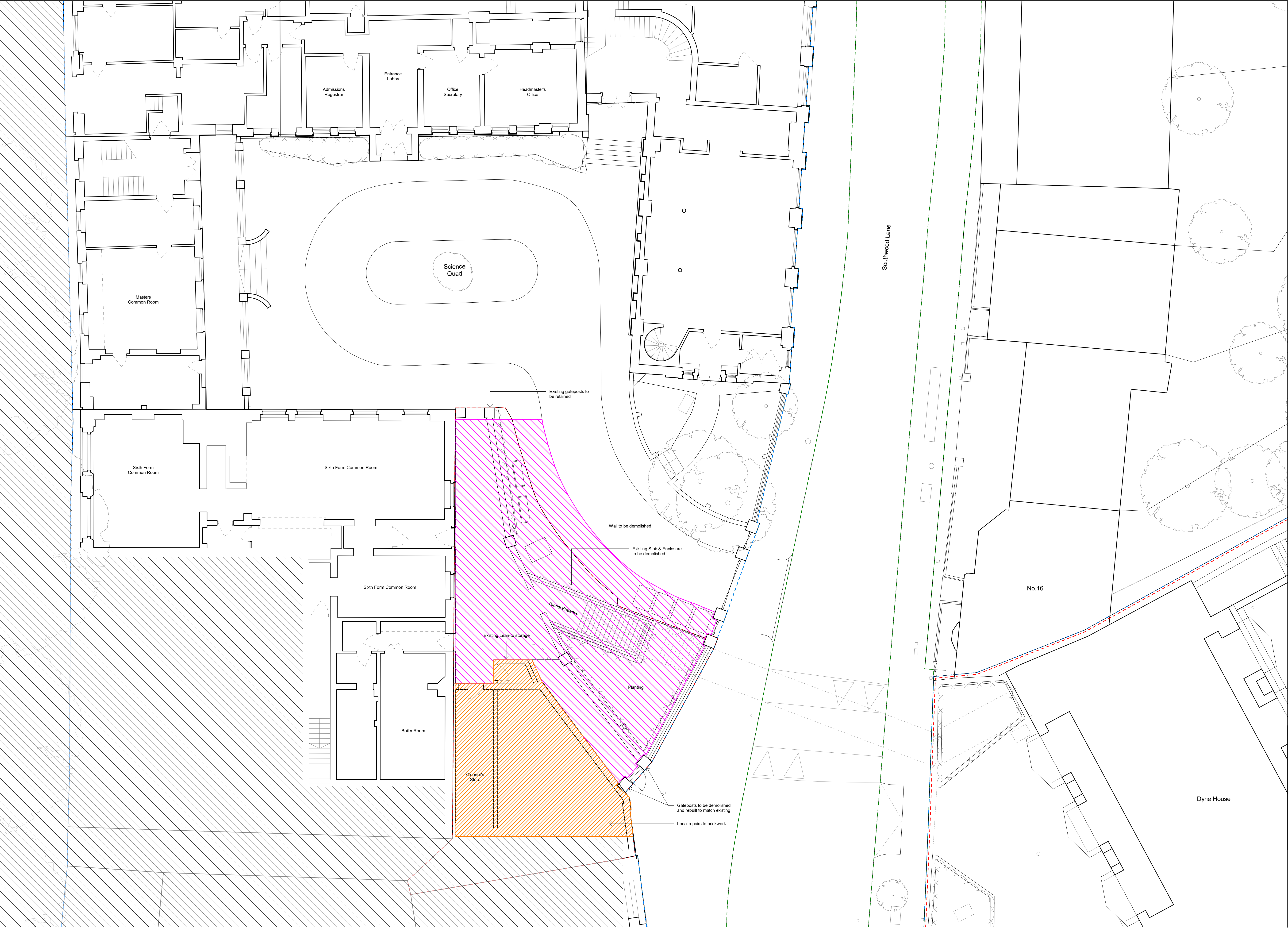
-01



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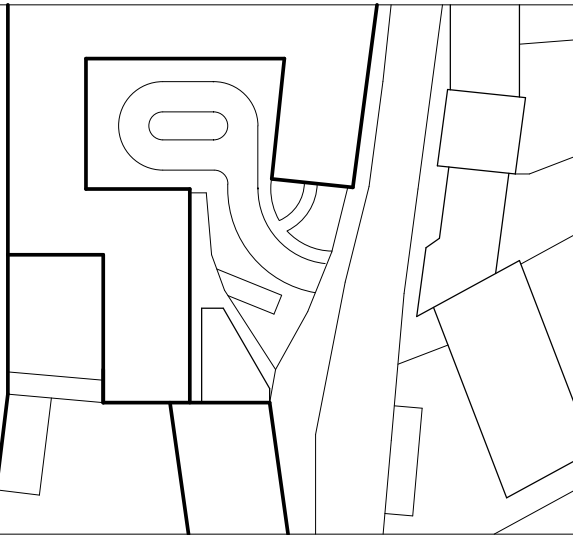


Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction	Date	Rev.	Description	Approved By	Date	Rev.	Description	Approved By	Project	Highgate School Island Site	Sort Code	Drawing Number	Rev.
						11.01.17	A	Memo 005, Draft GA Plan and Section issue to Design Team	JW					Subject	Island Site - Level -01	A/HS-IS	2310	D
						17.02.17	B	Memo 009, Draft Sections and West Elevation	JW						Demolition Plans			
						13.03.17	C	Stage 2 Fire Review	JW					Architects	Hopkins Architects Limited			
						11.07.2019	D	Draft Planning Issue to Client	JW						27 Broadley Terrace, London, NW1 6LG			
															T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 03/15/17	Scale: As indicated	A1

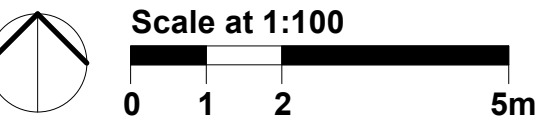


- General Notes:**
- G1** All Levels are above ordnance datum (AOD)
New Levels are shown thus: [Symbol] +20.345
Retained Existing Levels thus: [Symbol] EX+20.345
Existing Levels are shown: [Symbol] EX+20.345
- G2** Door tags are shown thus: [Symbol] DG-011 [Symbol] DRS-XXX [Symbol] FR-XXS
Door number
Instance of doors per room
Door type
Fire rating, 'V' denotes smoke seal
- G3** Abbreviations:
GN/AWC: Gender Neutral / Accessible WC
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe

- KEY - DEMOLITION PLAN:**
- [Symbol] Existing structures, hard standings, scrub and vegetation removal, excluding trees and boundary walls.
 - [Symbol] Existing buildings to be demolished
 - [Symbol] Existing Dyne House slip out and facade removal. Northern staircase to be retained
 - [Symbol] Existing Dyne House structural demolition, including existing stair and lift core structural slab
 - [Symbol] Existing spaces to be retained
 - [Symbol] Penetration through existing Dyne House slab to form new risers (1 & 2) and new southern stair
 - [Symbol] Refer to drawing 2112 for forecourt, Gibbon Garden, trees and rear demolition information
 - [Symbol] Existing trees to be removed
 - [Symbol] Property Boundary



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Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction

Date	Rev.	Description	Approved By
11.07.2019	A	Draft Planning Issue to Client	JW

Date	Rev.	Description	Approved By

Project	Highgate School Island Site
Subject	Island Site - Level 00
Architects	Hopkins Architects Limited 27 Broadway Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk

Sort Code	Drawing Number	Rev.
A/HS-IS	2311	A
Date: 05/15/19	Scale: As indicated A1	



General Notes:

G1 All Levels are above ordnance datum (AOD)
New Levels are shown thus: +20.345
Retained Existing Levels thus: EX+20.345
Existing Levels are shown: EX+20.345

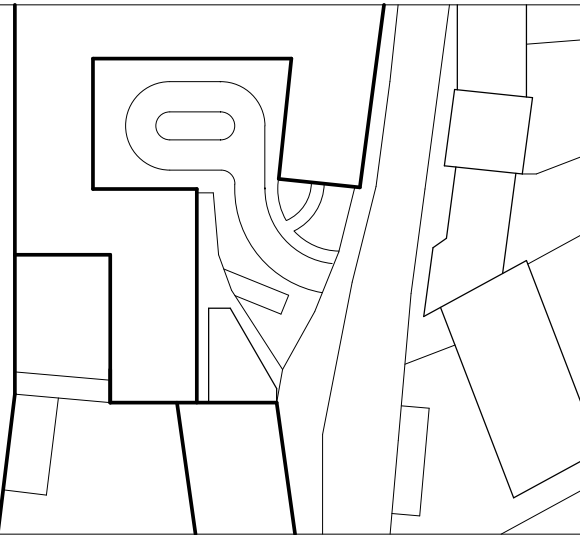
G2 Door tags are shown thus: DG-011 DRS-XXX FR-XXX

G3 Abbreviations:

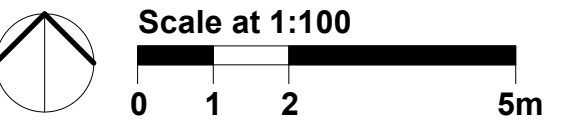
GN/AWC: Gender Neutral / Accessible WC
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe

KEY - DEMOLITION PLAN:

- Existing structures, hard standings, scrub and vegetation removal, excluding trees and boundary walls.
- Existing buildings to be demolished.
- Existing Dyne House strip out and facade removal. Northern staircase to be retained.
- Existing Dyne House structural demolition, including existing stair and lift core, structural slab.
- Existing spaces to be retained.
- Penetration through existing Dyne House slab to form new risers (1 & 2) and new southern stair.
- Refer to drawing 2112 for forecourt, Gibbon Garden, trees and rear demolition information.
- Existing trees to be removed.
- Property Boundary.



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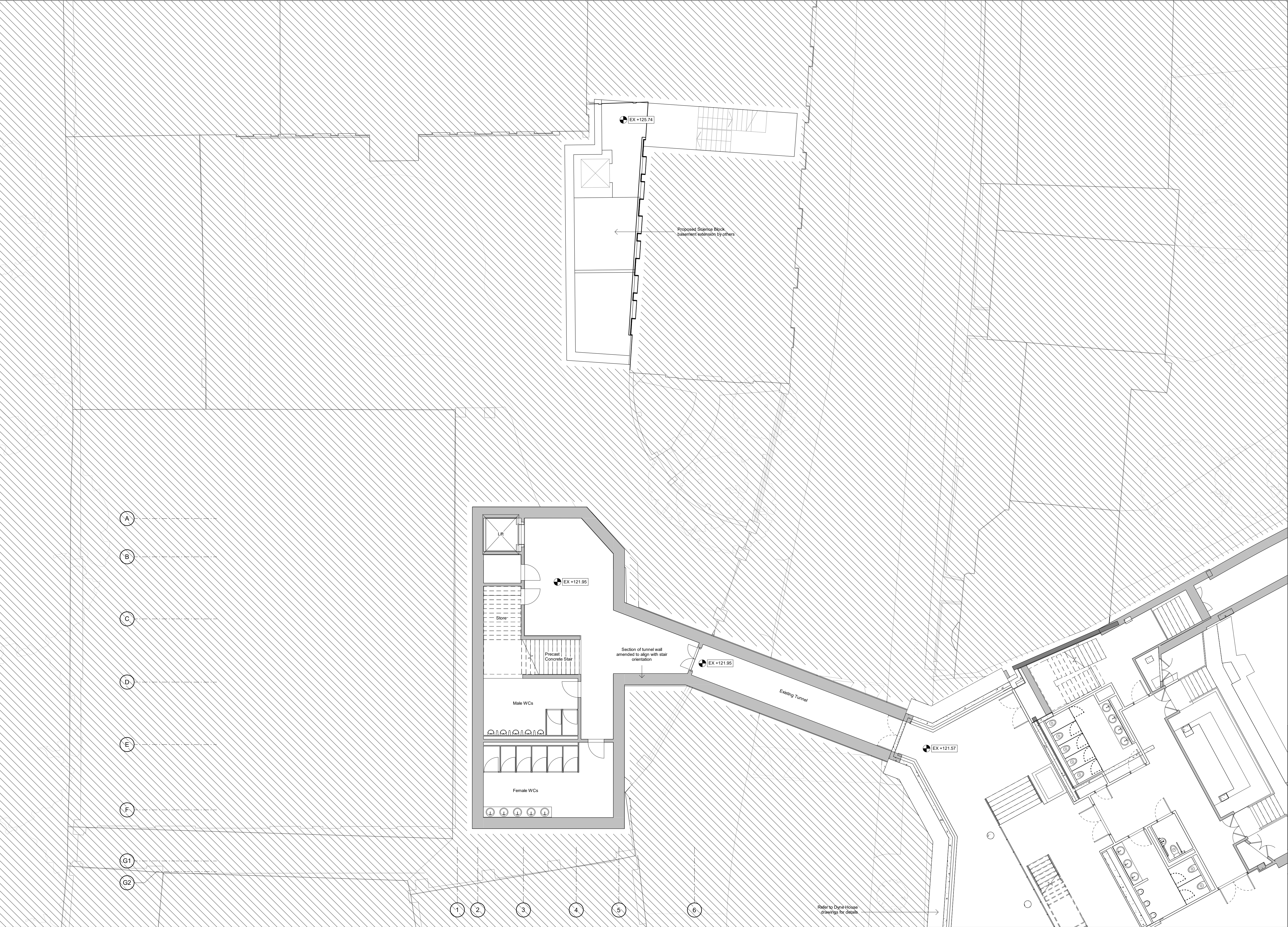
Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction

Date	Rev.	Description	Approved By
11.06.2018	A	Issued for Initial Costing	JG
27.07.2018	B	Memo_0002_Stage 2 Backgrounds & Costing Issue	JG
21.09.2018	C	Memo_0003_Stage 2 Issue	JG
11.07.2019	D	Draft Planning Issue to Client	JW

Date	Rev.	Description	Approved By

Project	Highgate School Island Site
Subject	Island Site - Level 01
Architects	Hopkins Architects Limited 27 Broadway Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk

Sort Code	Drawing Number	Rev.
A/HS-IS	2312	D
Date: 06/04/19	Scale: As indicated	A1



- General Notes:**
- G1** All Levels are above ordnance datum (AOD)
New Levels are shown thus: +20.345
Retained Existing Levels thus: [EX+20.345]
Existing Levels are shown: EX+20.345
- G2** Door tags are shown thus:

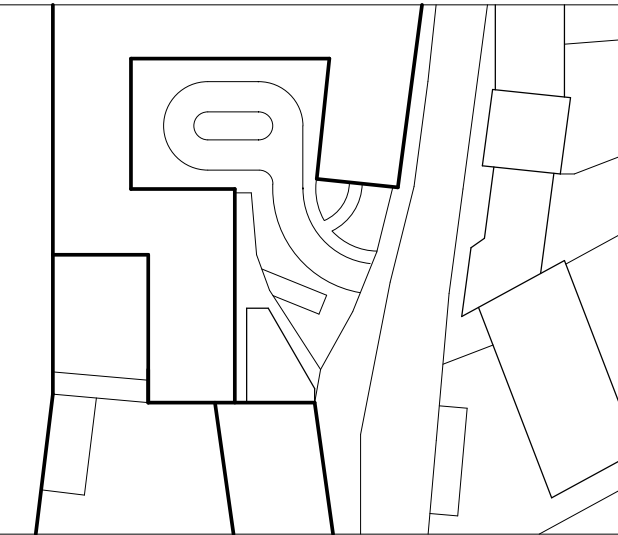
DG-011

DRS-XXX

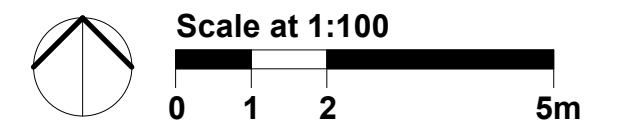
FR-XXx

Door number
Instance of doors per room
Door type
Fire rating 'X' denotes smoke seal
- G3** Abbreviations:
- GN/AWC: Gender Neutral / Accessible WC
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe

-01



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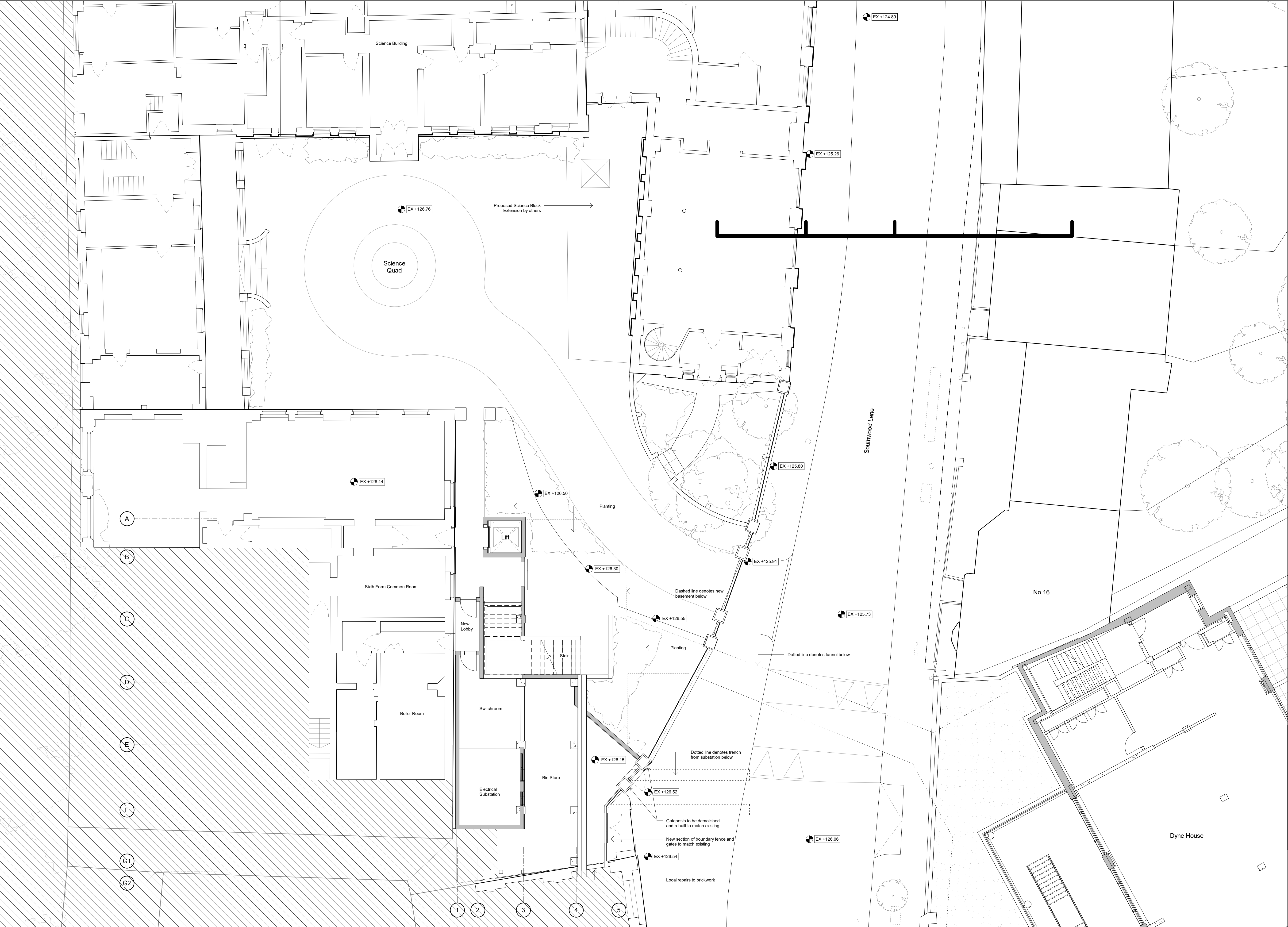
Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction

Date	Rev.	Description	Approved By
10.07.2018	A	Issued for Costing	JG
20.07.2018	B	Memo_0001_Draft Stage 2 Backgrounds Issue	JG
27.07.2018	C	Memo_0002_Stage 2 Backgrounds & Costing Issue	JG
21.09.2018	D	Memo_0003_Stage 2 Issue	JG
11.07.2019	E	Draft Planning Issue to Client	JW

Date	Rev.	Description	Approved By

Project	Highgate School Island Site
Subject	Island Site - Level -01
Architects	Hopkins Architects Limited 27 Broadway Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk

Sort Code	Drawing Number	Rev.
A/HS-IS	2410	E
Date: 06/05/19	Scale: 1 : 100	at A1



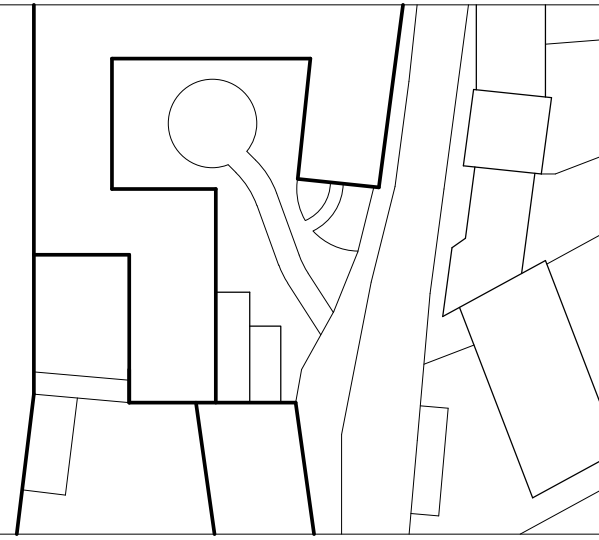
General Notes:

G1 All Levels are above ordnance datum (AOD)
New Levels are shown thus: EX+20.345
Retained Existing Levels thus: EX+20.345
Existing Levels are shown: EX+20.345

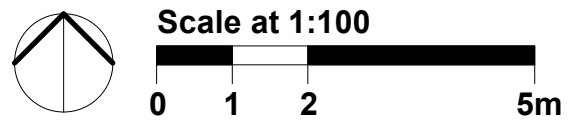
G2 Door tags are shown thus: DG-011 DRS-XXX FR-XXx
Door number
Instance of doors per room
Door type
Fire rating, 'V' denotes smoke seal

G3 Abbreviations:
GN/AWC: Gender Neutral / Accessible WC
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe

00



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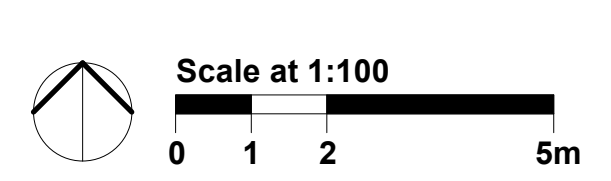
Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction

Date	Rev.	Description	Approved By
10.07.2018	A	Issued for Costing	JG
20.07.2018	B	Memo_0001_Draft Stage 2 Backgrounds Issue	JG
27.07.2018	C	Memo_0002_Stage 2 Backgrounds & Costing Issue	JG
21.09.2018	D	Memo_0003_Stage 2 Issue	JG
11.07.2019	E	Draft Planning Issue to Client	JW

Date	Rev.	Description	Approved By

Project	Highgate School Island Site
Subject	Island Site - Level 00 Proposed GA Plans
Architects	Hopkins Architects Limited 27 Broadway Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk

Sort Code	Drawing Number	Rev.
A/HS-IS	2411	E
Date: 06/03/19	Scale: 1 : 100	at A1



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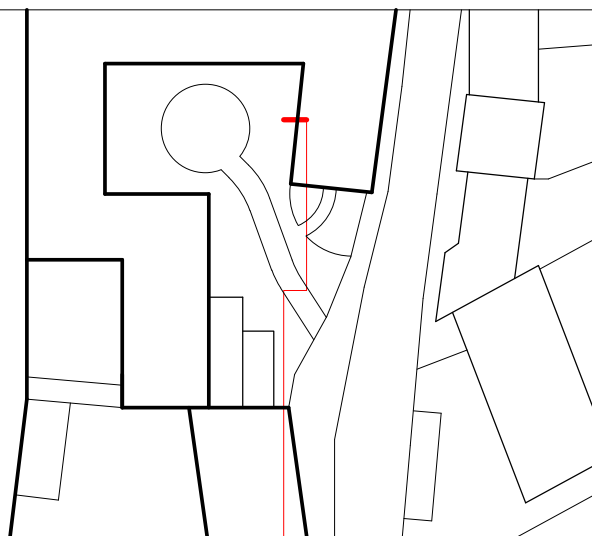


Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction	Date	Rev.	Description	Approved By	Date	Rev.	Description	Approved By	Project	Highgate School Island Site	Sort Code	Drawing Number	Rev.
						10.07.2018	A	Issued for Costing	JG					Subject	Island Site - Roof Level	A/HS-IS	2413	E
						20.07.2018	B	Memo_0001_Draft Stage 2 Backgrounds Issue	JG									
						27.07.2018	C	Memo_0002_Stage 2 Backgrounds & Costing Issue	JG									
						21.09.2018	D	Memo_0003_Stage 2 Issue	JG									
						11.07.2019	E	Draft Planning Issue to Client	JW									
														Architects	Hopkins Architects Limited 27 Broadway Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 06/03/19	Scale: 1 : 100	at A1

New Levels are shown thus: +20.345
Retained Existing Levels thus: EX+20.345
Existing Levels are shown: EX+20.345

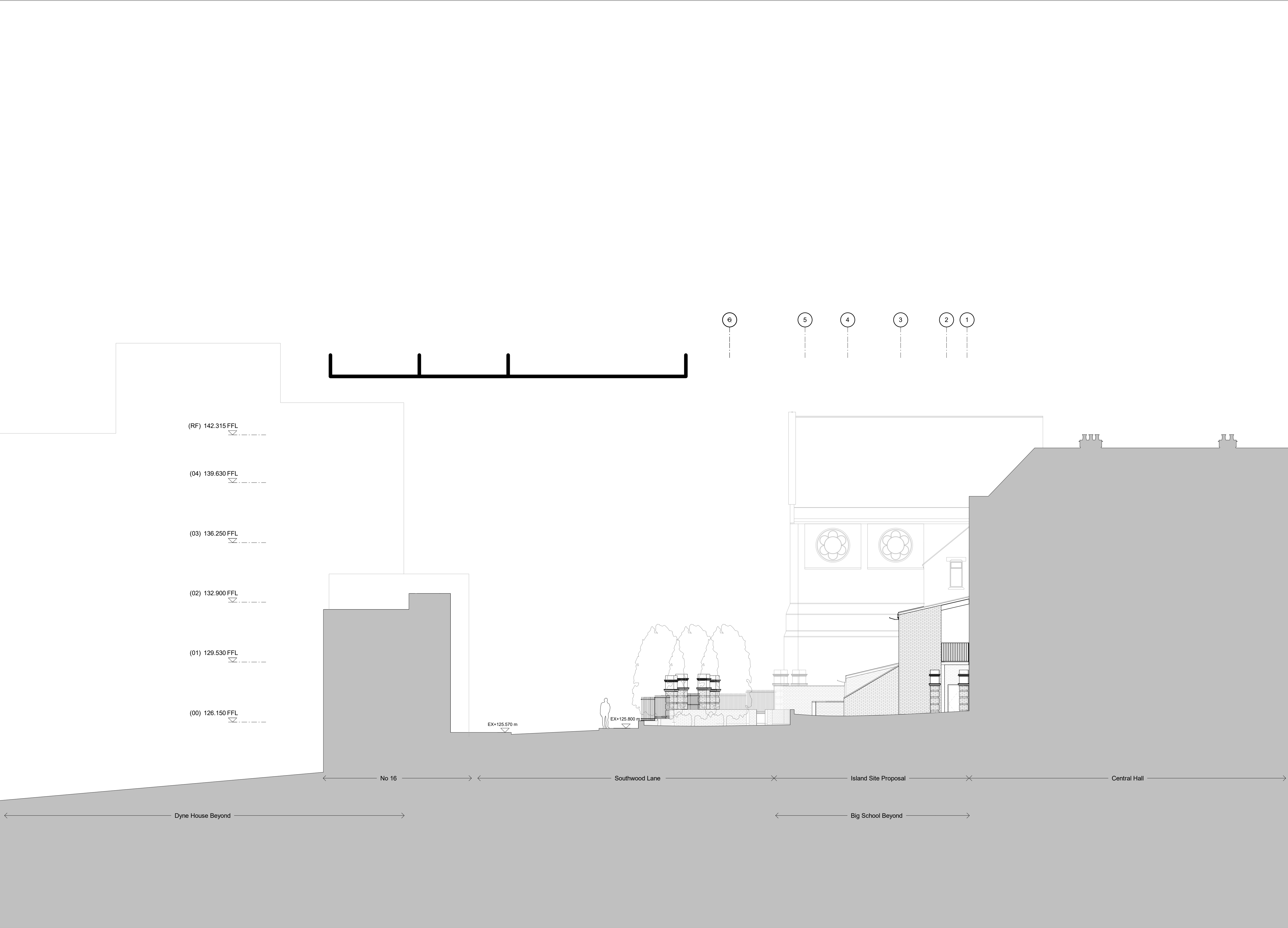
thus:

GN/AWC: Gender Neutral / Accessible WC
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe

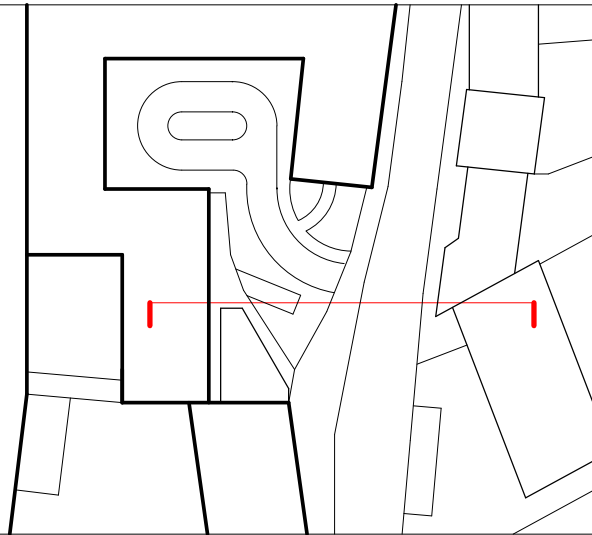


Scale at 1:100

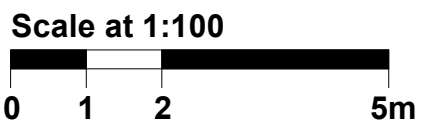
[illegible]



- General Notes:**
- G1** All Levels are above ordnance datum (AOD)
New Levels are shown thus: [Symbol] +20.345
Retained Existing Levels thus: [Symbol] EX+20.345
Existing Levels are shown: [Symbol] EX+20.345
- G2** Door tags are shown thus: [Symbol] DG-011 [Symbol] DRS-XXX [Symbol] FR-XXX
Door number
Instance of doors per room
Door type
Fire rating, 'V' denotes smoke seal
- G3** Abbreviations:
GN/AWC: Gender Neutral / Accessible WC
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe



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Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction	Date	Rev.	Description	Approved By	Date	Rev.	Description	Approved By	Project	Highgate School Island Site	Sort Code	Drawing Number	Rev.
						21.09.2018	A	Memo: 0003_Stage 2 Issue	JG					Subject	Island Site - North Elevation	A/HS-IS	2511	B
						11.07.2019	B	Draft Planning Issue to Client	JW						Proposed Elevations			
														Architects	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 06/03/19	Scale: 1 : 100	at A1

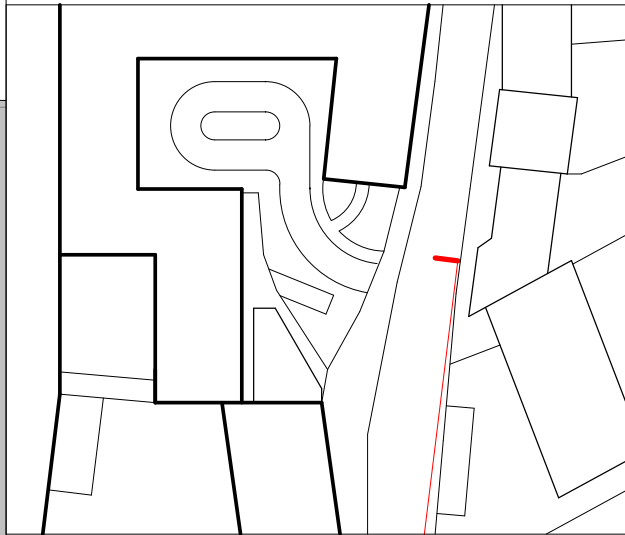


General Notes:

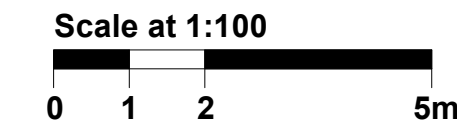
G1 All Levels are above ordnance datum (AOD)
New Levels are shown thus: [Symbol] +20.345
Retained Existing Levels thus: [Symbol] EX+20.345
Existing Levels are shown: [Symbol] EX+20.345

G2 Door tags are shown thus: [Symbol] DG-011 ← Instance of doors per room
[Symbol] DRS-XXX ← Door type
[Symbol] FR-XXG ← Fire rating, 'V' denotes smoke seal

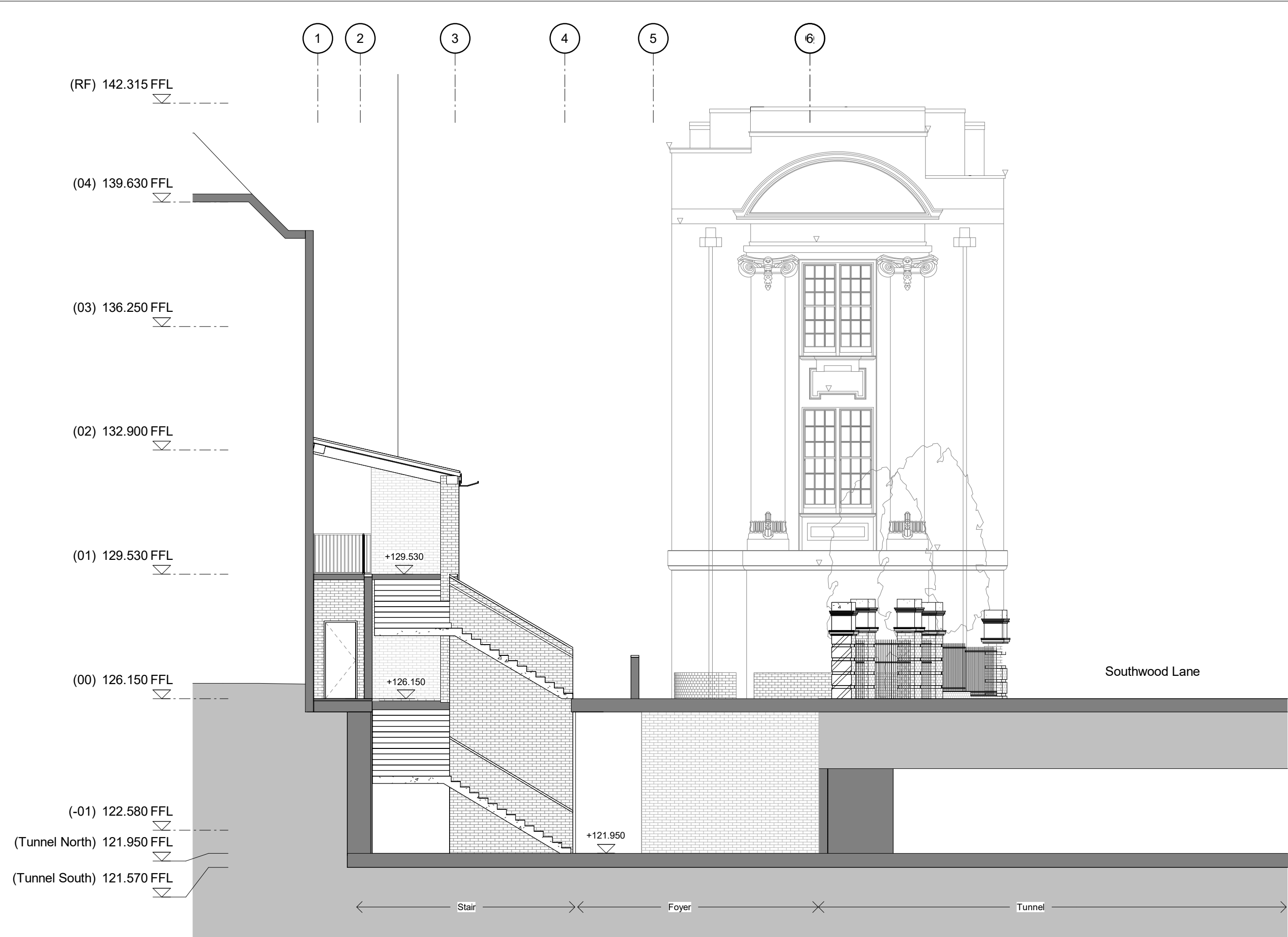
G3 Abbreviations:
GN/AWC: Gender Neutral / Accessible WC
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe



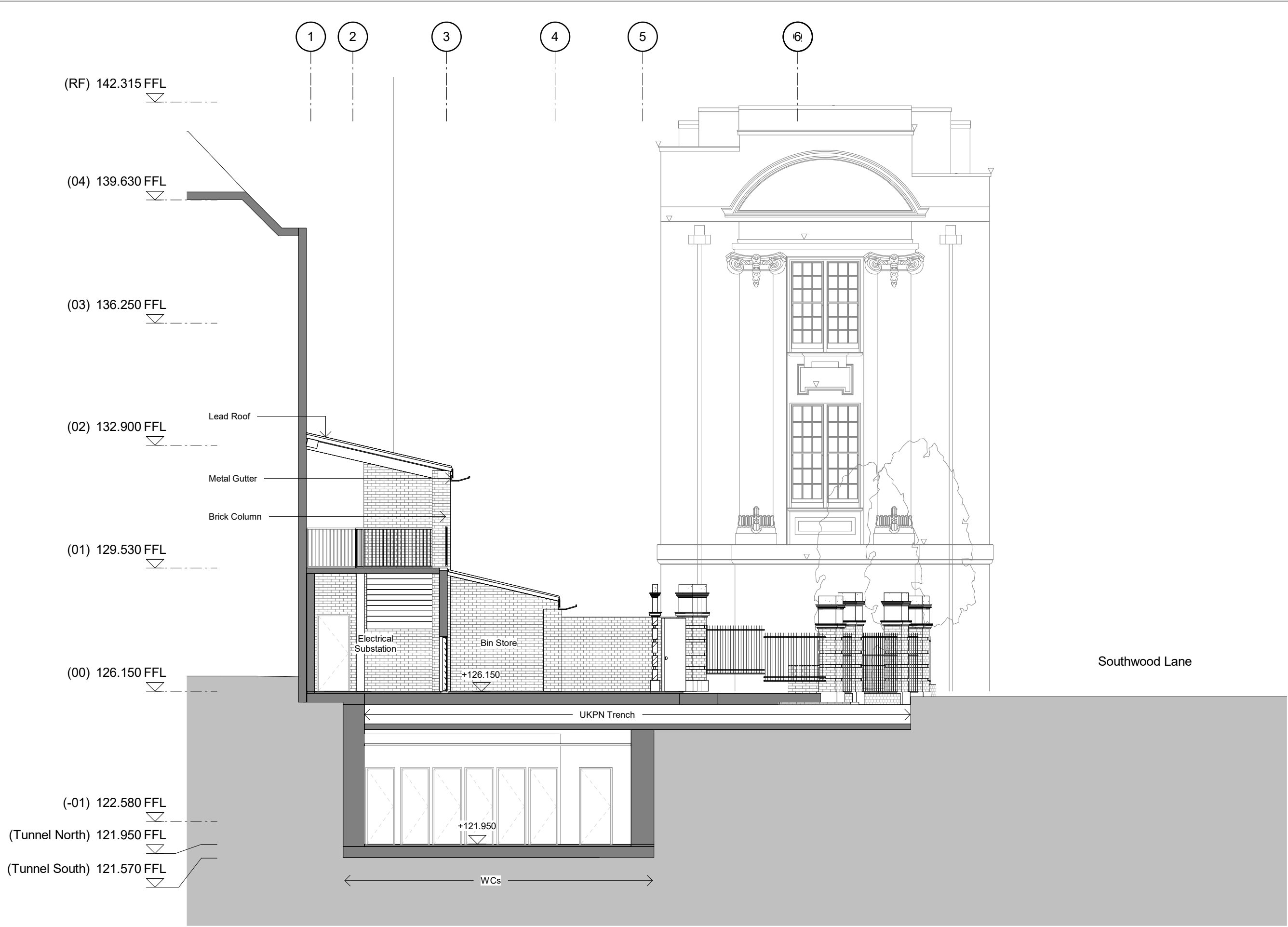
DRAFT PLANNING



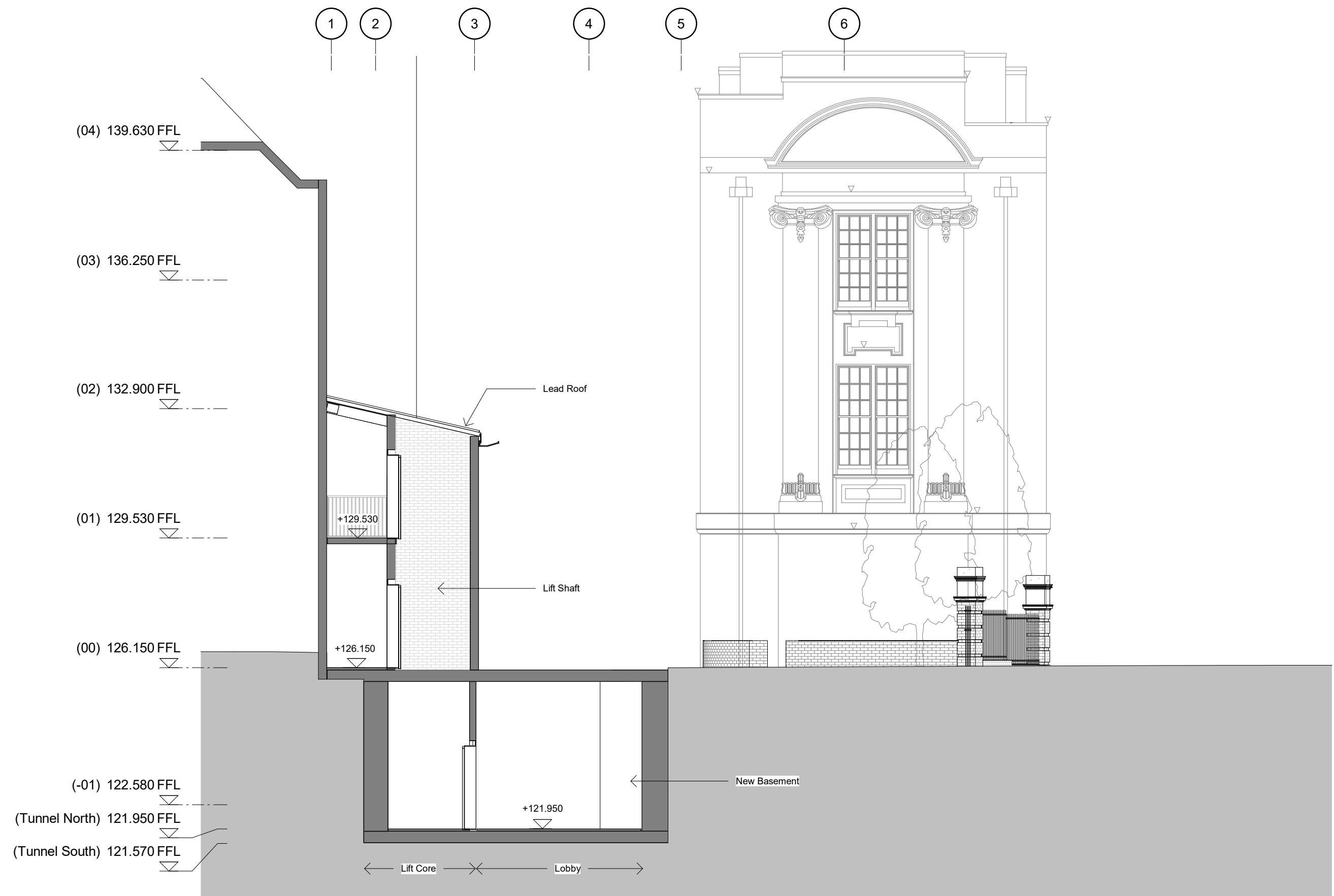
Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction	Date	Rev.	Description	Approved By	Date	Rev.	Description	Approved By	Project	Subject	Architects	Sort Code	Drawing Number	Rev.
						21.09.2018	A	Memo: 0003_Stage 2 Issue	JG					Highgate School Island Site	Island Site - East Elevation (Southwood Lane)	Hopkins Architects Limited	A/HS-IS	2512	B
						11.07.2019	B	Draft Planning Issue to Client	JW						Proposed Elevations	27 Broadley Terrace, London, NW1 6LG			
																T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 06/03/19	Scale: 1 : 100	at A1



1 Section through Staircase
2610 1 : 100



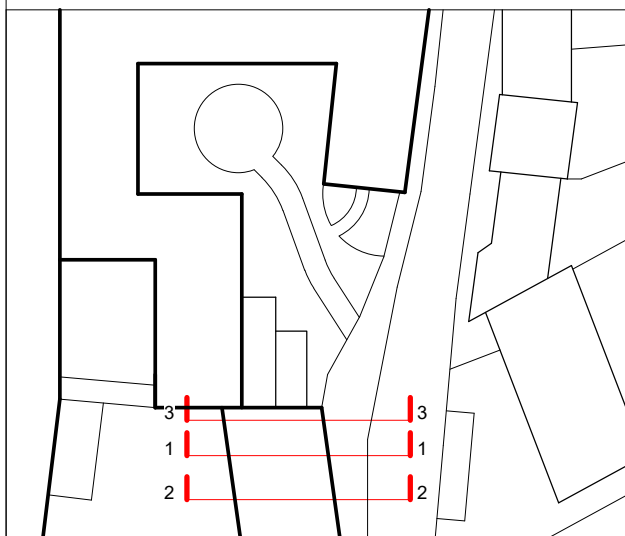
2 Section through substation and WC's
2610 1 : 100



3 Section through Lift Core
2610 1 : 100

General Notes:

- G1 All Levels are above ordnance datum (AOD)
New Levels are shown thus: [Symbol] 20.345
Retained Existing Levels thus: [Symbol] EX-20.345
Existing Levels are shown: [Symbol] EX-20.345
- G2 Door tags are shown thus: [Symbol] DG-011 [Symbol] DRS-XXX [Symbol] FR-XXX
Door number
Instance of doors per room
Door type
Fire rating, 'V' denotes smoke seal
- G3 Abbreviations:
GN/AWC: Gender Neutral / Accessible WC
CS: Cleaner's Store
PH: Printer hub
ST: Store
RWP: Rain water pipe



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Scale at 1:100
0 1 2 5m

Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction

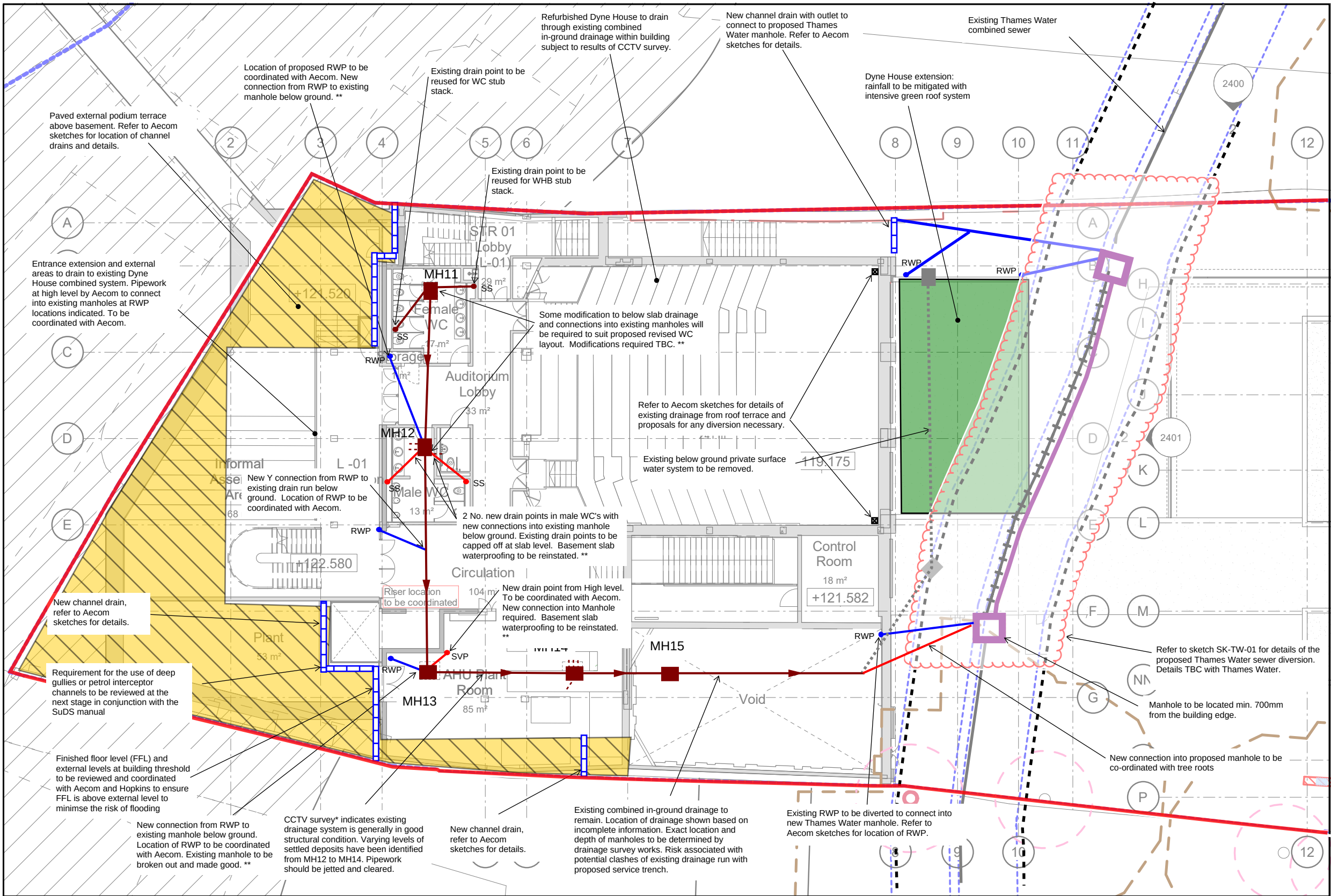
Date	Rev.	Description	Approved By
27.07.2018	A	Memo_0006_Stage 2 Backgrounds & Costing Issue	JG
21.09.2018	B	Memo_0003_Stage 2 Issue	JG
11.07.2019	C	Draft Planning Issue to Client	JW

Date	Rev.	Description	Approved By

Project	Highgate School Island Site
Subject	Proposed Cross Sections
Architects	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk

Sort Code	Drawing Number	Rev.
A/HS-IS	2610	C
Date: 06/03/19	Scale: 1 : 100	at A1

Appendix G – Drainage Drawings



NOTES

1. ALL DIMENSIONS ARE IN METRES AND LEVELS ARE IN METRES AOD UNLESS STATED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING OR THE DIGITAL DATA. ONLY FIGURED DIMENSIONS ARE TO BE USED.
3. EXISTING THAMES WATER SEWER INFORMATION IS AS PER DRAWING 9406-5 BY RANDELL SURVEYS LLP ISSUED DECEMBER 2014
4. EXISTING DRAINAGE WITHIN DYNE HOUSE BASEMENT IS BASED ON ANSELL AND BAILEY RECORD DRAWING FOUNDATIONS AND DRAINAGE - PLAN DATED MARCH 1965 AND CCTV SURVEY REPORT BY SEWER SURVEYS DATED FEBRUARY 2017.
5. REFER TO SK-TW-01 FOR PROPOSED DIVERSION OF EXISTING THAMES WATER SEWER
6. ALL PIPEWORK 150mmØ UNLESS OTHERWISE LABELLED.
7. ALL EXTERNAL PIPEWORK TO BE VITRIFIED CLAY. ALL DRAIN RUNS BELOW STRUCTURAL SLAB ARE TO BE CAST IRON.
8. PIPES TO BE LAID SOFFIT TO SOFFIT UNLESS OTHERWISE SPECIFIED.
9. WHERE PIPEWORK ENTERS/EXITS STRUCTURES OR RUNS OVER/BELOW STRUCTURES WITHIN THE GROUND, ROCKER PIPES MUST BE USED.
10. THE INVERT LEVEL OF THE INSPECTION CHAMBER TO BE EQUAL TO THE LOWEST INVERT OF CONNECTING PIPEWORK.
11. FOUL PIPEWORK TO BE LAID AT THE FOLLOWING MIN. GRADIENT
100Ø = 1 : 40 GRADIENT
150Ø = 1 : 80 GRADIENT
12. SURFACE WATER PIPEWORK TO BE LAID TO THE FOLLOWING MIN. GRADIENT
100Ø = 1 : 100 GRADIENT
150Ø = 1 : 150 GRADIENT
13. ALL PIPEWORK WITH LESS THAN 600mm COVER IN PEDESTRIAN AREAS AND LESS THAN 1200mm COVER IN AREAS SUBJECT TO VEHICLE LOADING REQUIRE 150mm CONCRETE SURROUND PROTECTION.
14. ALL PROPOSED DRAINAGE TO BE COORDINATED WITH EXISTING AND PROPOSED UNDERGROUND SERVICES.
15. CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING ALL APPROVALS ARE IN PLACE FROM THE LOCAL COUNCIL AND THAMES WATER.
16. ALL NEW MANHOLES WITHIN BUILDING TO INCLUDE SEALED PIPEWORK
17. ALL MANHOLES IN BASEMENT TO HAVE DOUBLE SEALED COVERS.
18. ALL INTERFACES BETWEEN ABOVE GROUND AND BELOW GROUND DRAINAGE TO HAVE RODDING ACCESS

KEY

- Proposed private surface water sewer
- Proposed private foul water sewer
- Existing private combined sewer to be retained
- Existing private combined sewer to be removed. Pipework to be removed and/or capped to prevent ingress of water
- Existing Thames Water public sewer 450mm dia
- Thames Water public sewer to be made redundant following diversion
- Proposed public combined sewer
- Existing private foul water inspection chamber
- Proposed public combined water - 1500x1350 precast manhole
- RWP Proposed rain water pipe
- SVO Proposed sewer vent outlet
- Planning boundary
- Channel Drain

*Information based on CCTV survey undertaken by Sewer Surveys UK on 24/02/2017. It should be noted that there is no plan for this CCTV survey and there is significant uncertainty in the layout and levels. A new CCTV survey should be carried out, particularly if proposals to reuse the existing system using pipe bursting is to be considered.

** Where possible existing connections should be reused to minimise disruption and break out of existing slab for modifications to existing drainage system.

Title: STAGE 2 - UPPER CATCHMENT IN-GROUND DRAINAGE PLAN

Job: DYNE HOUSE

Job No.: 404

Sketch No.: SK C100

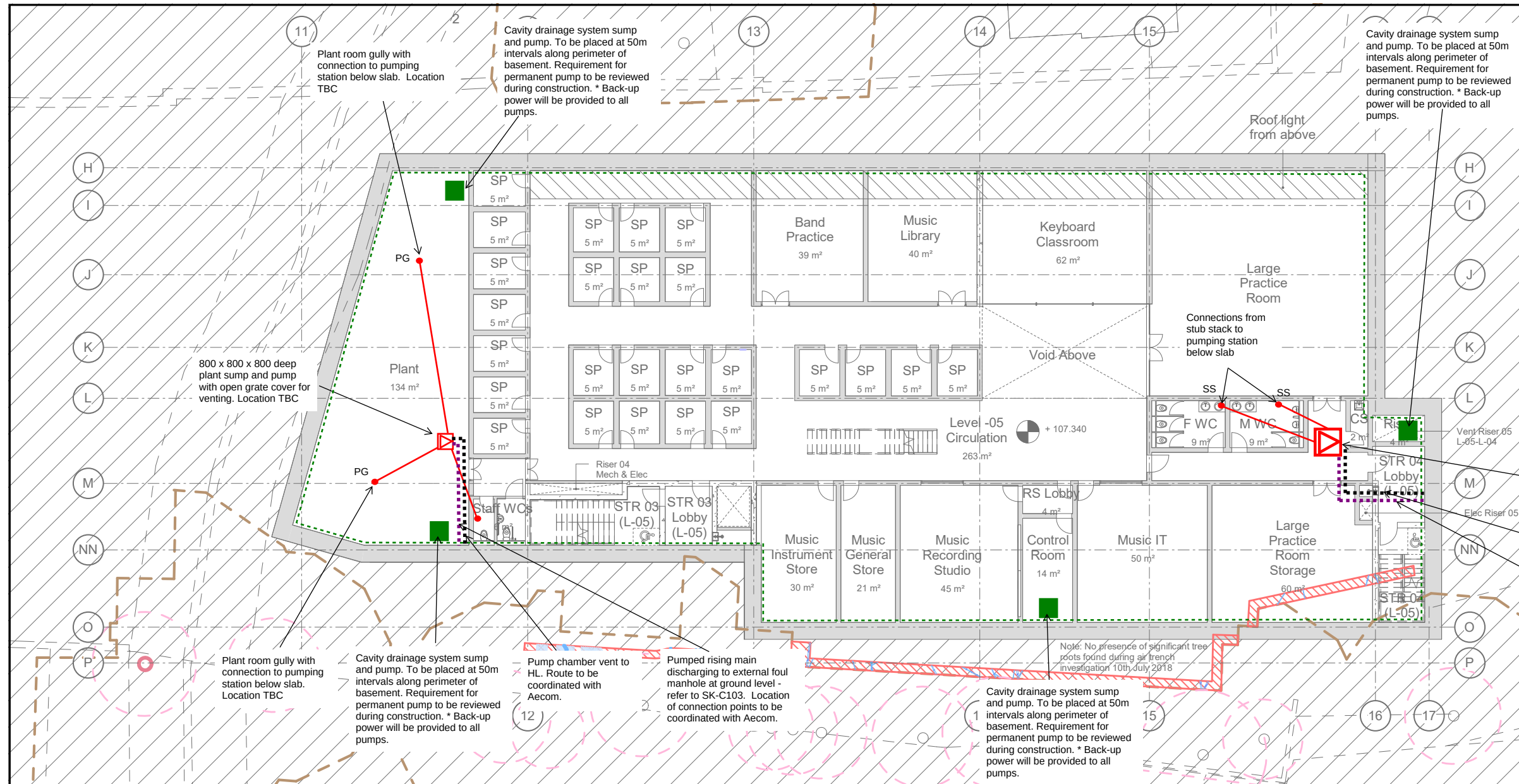
Date: 19/10/2018

By: EXP - TF QA - FW



expedition

- NOTES**
1. ALL DIMENSIONS ARE IN METRES AND LEVELS ARE IN METRES AOD UNLESS STATED OTHERWISE.
 2. DO NOT SCALE FROM THIS DRAWING OR THE DIGITAL DATA. ONLY FIGURED DIMENSIONS ARE TO BE USED.
 3. REFER TO SK-C101 FOR PROPOSED DIVERSION OF EXISTING THAMES WATER SEWER. REFER TO SK-C100 FOR UPPER CATCHMENT IN GROUND DRAINAGE AND SK-C103 FOR LOWER CATCHMENT EXTERNAL IN GROUND DRAINAGE.
 4. ALL PIPEWORK 100mm UNLESS OTHERWISE LABELLED.
 5. ALL DRAIN RUNS BELOW STRUCTURAL SLAB ARE TO BE CAST IRON.
 6. PIPES TO BE LAID SOFFIT TO SOFFIT UNLESS OTHERWISE SPECIFIED.
 7. WHERE PIPEWORK ENTERS/EXITS STRUCTURES OR RUNS OVER/BELOW STRUCTURES WITHIN THE GROUND, ROCKER PIPES MUST BE USED.
 8. THE INVERT LEVEL OF THE INSPECTION CHAMBER TO BE EQUAL TO THE LOWEST INVERT OF CONNECTING PIPEWORK.
 9. FOUL PIPEWORK TO BE LAID AT THE FOLLOWING MIN. GRADIENT
100ø = 1 : 40 GRADIENT
150ø = 1 : 80 GRADIENT
 10. SURFACE WATER PIPEWORK TO BE LAID TO THE FOLLOWING MIN. GRADIENT
100ø = 1 : 100 GRADIENT
150ø = 1 : 150 GRADIENT
 11. ALL PIPEWORK WITH LESS THAN 600mm COVER REQUIRE 150mm CONCRETE SURROUND PROTECTION.
 14. ALL PROPOSED DRAINAGE TO BE COORDINATED WITH EXISTING AND PROPOSED UNDERGROUND SERVICES.
 15. CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING ALL APPROVALS ARE IN PLACE FROM THE LOCAL COUNCIL AND THAMES WATER.
 16. ALL MANHOLES WITHIN BUILDING TO INCLUDE SEALED PIPEWORK. ALL MANHOLES WITHIN BUILDING TO HAVE DOUBLE SEALED LOCKABLE COVERS.
 17. ALL SUMP LOCATIONS TO BE CO-ORDINATED WITH THE DESIGN TEAM ALONG WITH RISING MAIN AND VENTING PIPEWORK.
 18. IN GROUND DRAINAGE TO BE CO-ORDINATED WITH SERVICE TRENCHES
 19. ALL INTERFACES BETWEEN ABOVE GROUND AND BELOW GROUND DRAINAGE TO HAVE RODDING ACCESS
 20. PIPEWORK TO BE PROTECTED BY HEAVE PROTECTION SYSTEM.



KEY

- | | | | |
|-------|--|-------|---|
| — | Proposed private foul water sewer | - - - | Extent of tree root zone taken from Architects drawings |
| PG | Proposed plant room gully | ▨ | Tree root investigative trenches taken from Architects drawings |
| ▣ | Proposed sump and pump | | |
| ---- | Proposed rising main | | |
| | Proposed vent | | |
| ---- | Cavity drain channel | | |
| ■ | Cavity sump. Cast in situ reinforced concrete 1 x 1, depth approx. 1.5 | | |
- * Each sump will require a rising main, sump vent and control panel above ground level. Location of the sumps TBC at next stage to co-ordinate with riser locations and ceiling void transfers.

Title: STAGE 2 - LOWER CATCHMENT IN-GROUND DRAINAGE PLAN LEVEL -5

Job: DYNE HOUSE

Job No.: 404

Sketch No.: SK C102

Date: 19/10/2018

By: EXP - AK QA-FW

SITE AREAS
TOTAL SITE AREA: 4128²
TOTAL IMPERMEABLE AREA : 3397M²
LANDSCAPE AREA: 887M²
GREEN ROOF AREA: 766M²
PARADE GROUND WITH SUB-BASE FOR ATTENUATION AREA: 1054M²

1:100 YEAR + 40% CC: 201M

PARADE GROUND WITH SUB-BASE FOR ATTENUATION: 201M

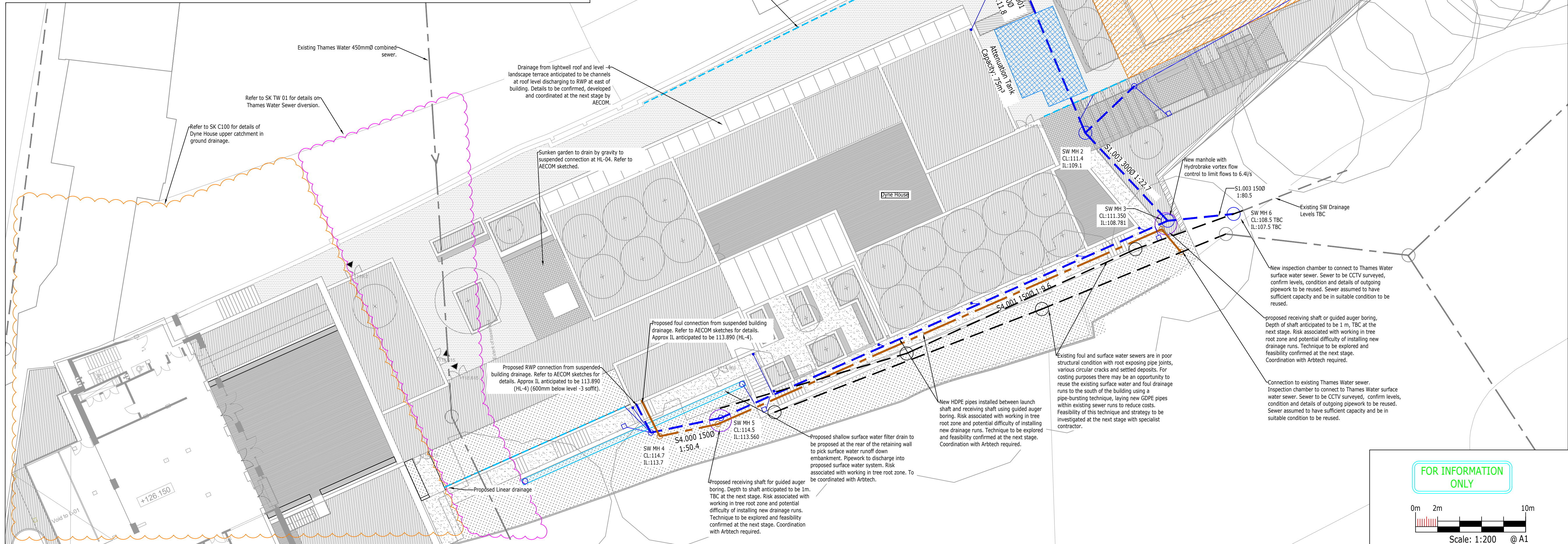
SITE RUNOFF LIMITED TO: 6.4L/S

PROPOSED SURFACE WATER DRAINAGE STRATEGY

SURFACE WATER RUNOFF FROM ALL PROPOSED IMPERMEABLE AREAS WILL BE COLLECTED VIA THE PROPOSED SURFACE WATER DRAINAGE NETWORK. THE RUNOFF FROM THE SITE WILL BE LIMITED TO ALLOWABLE DISCHARGE OF 6.4L/S PRIOR RELEASING THE WATER INTO THE EXISTING SEWER. THE SURPLUS OF THE SURFACE WATER RUNOFF WILL BE ATTENUATED WITHIN THE SUB-BASE BUILT-UP OF THE LINED PERMEABLE PAVING WHICH IS PROPOSED ON THE FOOTPATHS AROUND THE PARADE GROUND AND THE MUGA/NETBALL PITCH. POSITIVE DRAINAGE HAS BEEN PROVIDED TO THE SOFT LANDSCAPE AREA IN THE PARADE GROUND AS THE GROUND SLOPES DOWN STEEPLY TOWARDS THE RESIDENTIAL AREAS BELOW.

SURFACE WATER RUNOFF FROM THE SITE WILL BE ATTENUATED WITHIN THE SUB-BASE BUILT-UP OF THE LINED PERMEABLE PAVING WHICH IS PROPOSED ON THE FOOTPATHS AROUND THE PARADE GROUND AND THE MUGA/NETBALL PITCH.THE ATTENUATED WATER WILL BE RELEASED TO THE EXISTING SEWER AT LATER STAGE.

THE PROPOSED GREEN ROOFS WILL CATCH THE RAINFALL AND SLOWDOWN THE RUNOFF FROM THE AREA TO THE PROPOSED SYSTEM. GREEN ROOFS WILL CONTRIBUTE IN EASING PRESSURE ON THE WIDER SYSTEM . THE PROPOSED GREEN ROOF SYSTEM WILL ALSO PROVIDE BIODIVERSITY AND WATER QUALITY FOR THE SITE AND WIDER AREA.



1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S, STRUCTURAL AND CIVIL ENGINEER'S DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES AOD.
3. DO NOT SCALE FROM THIS DRAWING OR THE DIGITAL DATA. ONLY FIGURED DIMENSIONS ARE TO BE USED.
4. THE CONTRACTOR IS TO NOTIFY THE CONTRACT ADMINISTRATOR OF ANY DISCREPANCIES BETWEEN THE STRUCTURAL DRAWINGS AND ANY OTHER CONTRACT DOCUMENTS.
5. ALL PROPOSED LEVELS TO BE AGREED AND COORDINATED WITH THE ARCHITECT AND LANDSCAPE ARCHITECT.
6. DETAILS OF THE SUB-BASE ARRANGEMENT ARE INDICATIVE AND TO BE AGREED AT LATER STAGE THE DESIGN.
7. EXISTING DRAINAGE LAYOUT AND LEVELS TO BE CONFIRMED.
8. LATEST SITE LAYOUT
"6472_HS_DH_L_101_A_Landscape General Arrangement" RECEIVED FROM LDA ON 08.06.2022.
9. FEASIBILITY OF UTILISING THE SUB-BASE OF THE MUGA PITCH FOR ATTENUATION OF SURFACE WATER FLOWS FROM THE SITE NEEDS TO BE CONFIRMED WITH THE SPECIALIST. SHOULD THIS NOT BE POSSIBLE, AN UNDERGROUND ATTENUATION TANK WILL BE REQUIRED, LOCATED BETWEEN THE REAR OF THE LOWER BUILDING AND THE PARADE GROUND. THE LOCATION OF THE TANK WILL NEED TO BE COORDINATED WITH THE LANDSCAPE ARCHITECT.
10. THE PROPOSED ATTENUATION STRATEGY REQUIRED COORDINATION WITH THE GEOTHERMAL PILES PROPOSED BENEATH THE MUGA PITCH AT THE NEXT STAGE.

 PROPOSED PARADE GROUND
SUB-BASE TO ATTENUATE SW
RUNOFF FROM DYNE HOUSE

 PROPOSED ATTENUATION TANK

- | | |
|---|--|
|  | PROPOSED SURFACE WATER PIPE CHAMBER |
|  | PROPOSED LINEAR DRAINAGE CHANNEL |
|  | PROPOSED RAINWATER PIPE AND CONNECTION |
|  | PROPOSED GULLY AND CONNECTION |
|  | PROPOSED SURFACE WATER PIPE |
|  | PROPOSED FOUL WATER CHAMBER |
|  | EXISTING FOUL WATER DRAINAGE BASED ON THAMES WATER ASSET MAP |
|  | EXISTING FOUL WATER DRAINAGE BASED ON THAMES WATER ASSET MAP |
|  | EXISTING SURFACE WATER DRAINAGE TO BE REMOVED |
|  | PROPOSED RECEIVING SHAFT OR GUIDED AUGER BORING |
|  | PROPOSED FILTER DRAIN |

02	For Planning	20.07.22	ZA	FW
01	For Planning	02.07.22	ZA	FW
Rev	Description	Date	Chk	App

Status:

FOR PLANNING

Client

HIGHGATE SCHOOL

Expedition Engineering
Hamilton House
1 Temple Avenue
London EC4Y 0HA



+44 (0) 20 7307 1000
www.expedition.uk.com
info@expedition.uk.com

Project HIGHGATE SCHOOL
DYNE HOUSE

Title CONCEPT DRIANAGE
STRATEGY

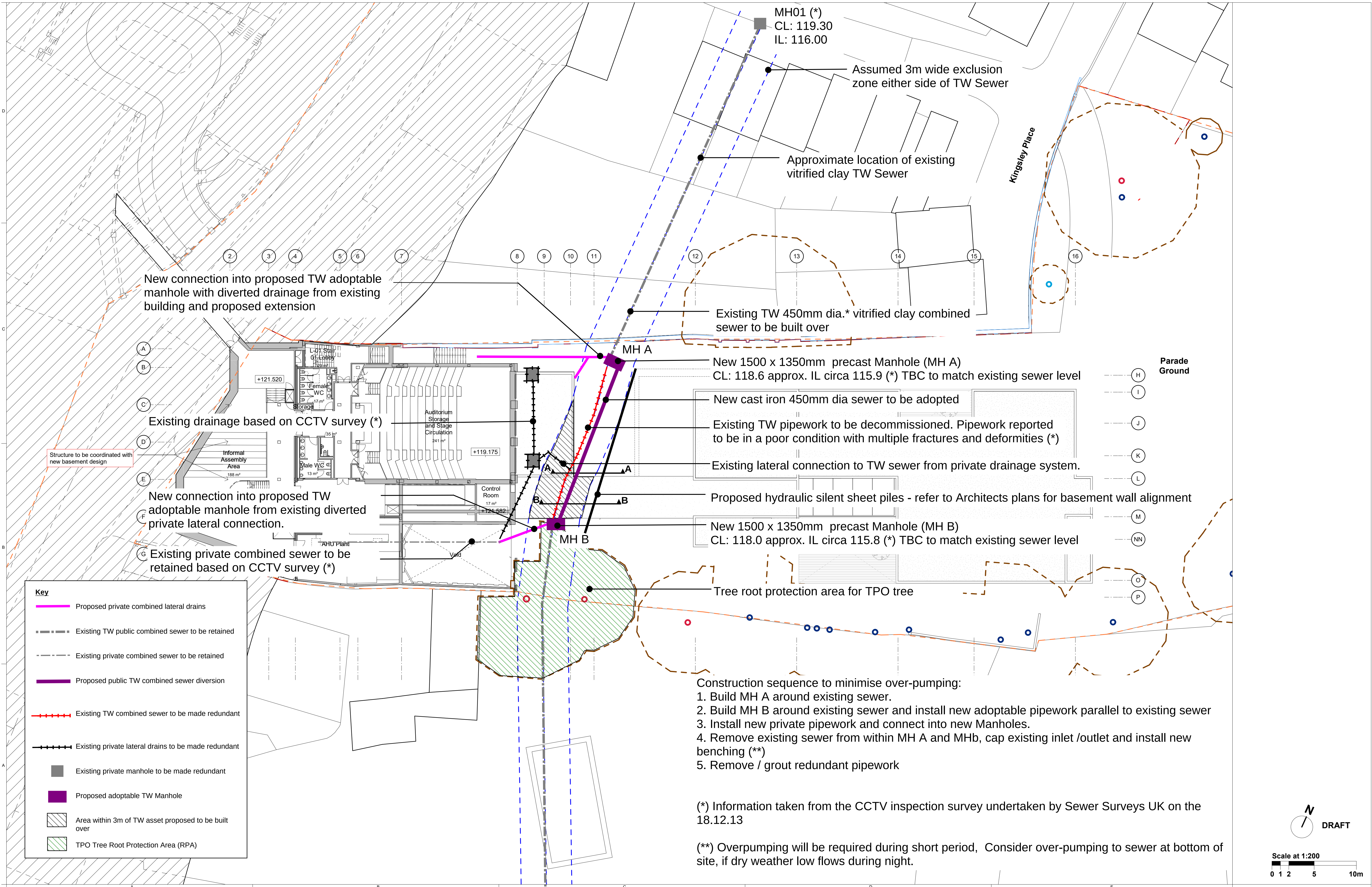
Scales 1:200@A1

Drawn Z

Drg No. SK C103

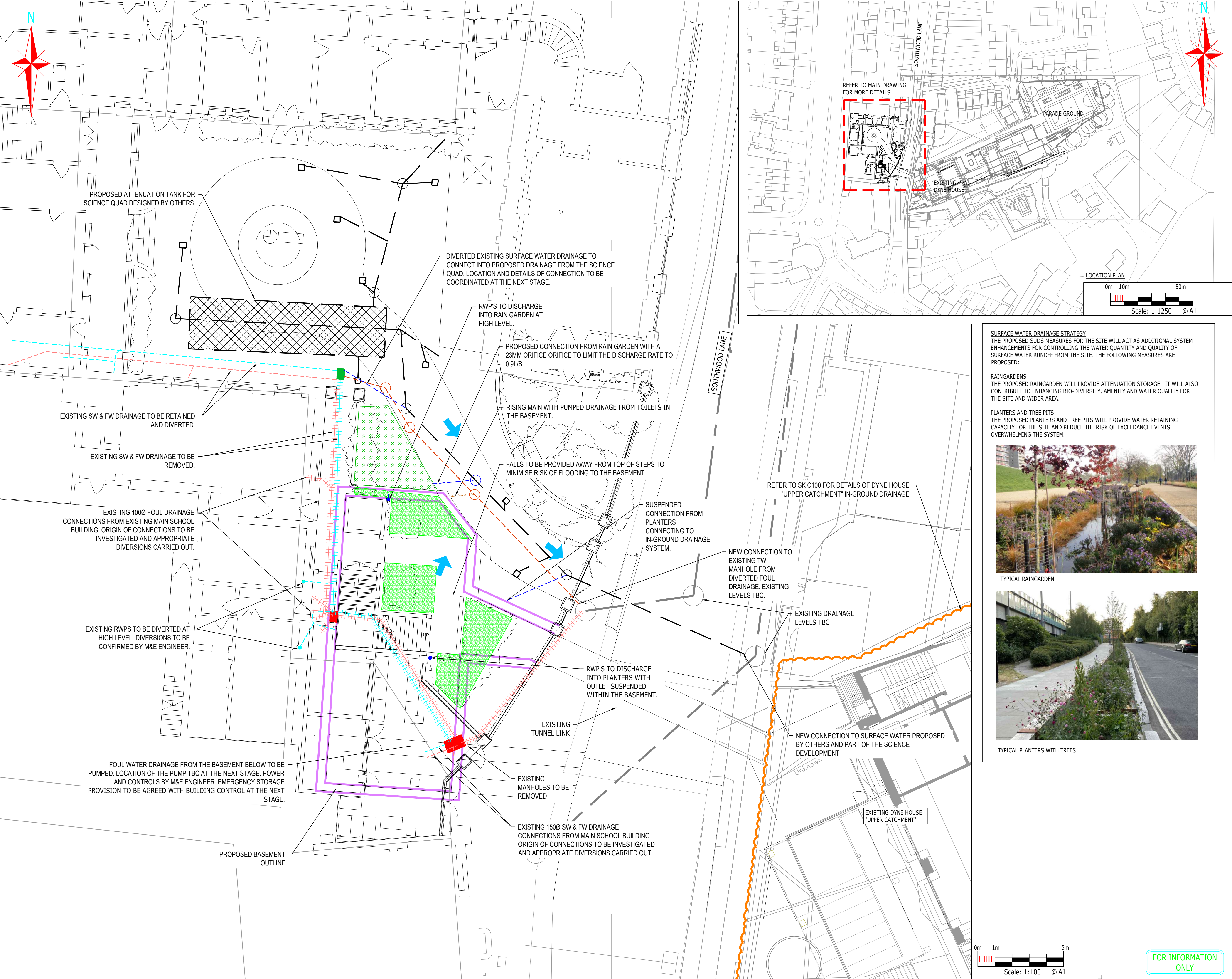
Job No. 404

Rev 02



DYNE HOUSE HIGHGATE SCHOOL - PROPOSED DIVERSION OF EXISTING TW SEWER FOR DISCUSSION- EXPEDITION 27/07/18 - REV 3
SKETCH NO.: 585-SK-TW-01

Project	Highgate School Dyne House 3	Sort Code	Drawing Number	Rev.
Subject	Proposed Level -1 Plan	A/HS-DH3	1099	C
Architects	Hopkins Architects Partnership LLP 27 Broadway Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date 30.09.16	Scale1:200	at A1



Notes

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS', STRUCTURAL AND CIVIL ENGINEER'S DRAWINGS AND SPECIFICATIONS.
- ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES AOD.
- DO NOT SCALE FROM THIS DRAWING OR THE DIGITAL DATA. ONLY FIGURED DIMENSIONS ARE TO BE USED.
- PROPOSED DRAINAGE LAYOUT TO BE COORDINATED WITH DRAINAGE LAYOUT FOR THE SCIENCE QUAD BY PRICE & MYERS AT THE NEXT STAGE.
- PROPOSED DRAINAGE ARRANGEMENT TO BE AGREED AND COORDINATED WITH LANDSCAPE ARCHITECT. LOCATIONS OF THE RWPS TO BE CONFIRMED BY ARCHITECT.
- DRAINAGE LAYOUT BASED ON LATEST ARCHITECTURAL LAYOUT "HS-15_2110_C_190711" RECEIVED FROM HOPKINS 28.10.2019.
- IN-GROUND DRAINAGE TO BE COORDINATED WITH EXISTING UTILITIES ON SITE
- ALL MANHOLES IN BASEMENT TO INCLUDED SEALED PIPEWORK AND TO HAVE DOUBLE SEALED LOCKABLE COVERS.
- PIPEWORK WITHIN THE BASEMENT TO BE PROTECTED BY A HEAVE PROTECTION SYSTEM.
- EXISTING DRAINAGE LAYOUT BASED ON SPAFLOW CCTV SURVEY DATED ON APRIL 2012. LIMITED INFORMATION IS AVAILABLE ON CONNECTIONS FROM THE EXISTING SCHOOL BUILDING. FURTHER INVESTIGATIONS WILL BE REQUIRED TO CONFIRM THE EXISTING DRAINAGE ARRANGEMENT AND DETERMINE MOST APPROPRIATE STRATEGY FOR DRAINAGE TO BE DIVERTED.

KEY

- PROPOSED RAIN GARDENS (AT GRADE)
- PROPOSED PLANTERS AND TREE PITS (ABOVE THE BASEMENT)
- PROPOSED SURFACE WATER PIPEWORK AND CHAMBER
- PROPOSED FOUL WATER PIPEWORK AND CHAMBER
- PROPOSED RISING MAIN CONNECTION FROM BASEMENT
- EXISTING FW DRAINAGE TO BE RETAINED OR DIVERTED
- EXISTING SW DRAINAGE TO BE RETAINED OR DIVERTED
- EXISTING FW DRAINAGE TO BE REMOVED
- EXISTING SW DRAINAGE TO BE REMOVED
- EXISTING MANHOLE TO BE REMOVED
- EXISTING MANHOLE TO BE RETAINED
- PROPOSED SURFACE WATER DRAINAGE FOR THE SCIENCE QUAD BY PRICE & MYERS
- EXISTING FOUL WATER DRAINAGE BASED ON THAMES WATER ASSET MAP
- EXISTING SURFACE WATER DRAINAGE BASED ON THAMES WATER ASSET MAP
- PROPOSED OVERLAND FLOOD ROUTE

02 For Planning 19.07.22 ZA FW

01 For Planning 02.07.22 ZA FW

Rev	Description	Date	Chk	App

Status

FOR PLANNING

Client

HIGHGATE SCHOOL

Expedition Engineering
Hamilton House
1 Temple Avenue
London EC4V 0HA

+44 (0) 20 7307 1000
www.expedition.uk.com
info@expedition.uk.com

Project HIGHGATE SCHOOL
DYNE HOUSE TUNNEL LINK BUILDING ON ISLAND SITE

Title CONCEPT DRIANAGE STRATEGY

Scales 1:200@A1 Drawn ZA

Drg No. SK C104

Job No. 404 Rev 02

FOR INFORMATION ONLY

Appendix H – Haringey SUDS Proforma

1. Project & Site Details	Project / Site Name (including sub-catchment / stage / phase where appropriate)	Dyne House - Highgate Schools Project Pre-planning Drianage Statement
	Address & post code	Southwood Lane, Highgate, London, N6 5EE
	OS Grid ref. (Easting, Northing)	E 528388 N 187487
	LPA reference (if applicable)	
	Brief description of proposed work	Front extension & extensive remodelling of the existing building including an eastwards extension. Construction of a new building & corridor linking the back of the exisitng building to the new building.
	Total site Area	5480 m ²
	Total existing impervious area	4720 m ²
	Total proposed impervious area	3240 m ²
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No Site is within Flood Zone 1
	Existing drainage connection type and location	TW 450mm combined sewer (upper). TW 225mm combined sewer (lower)
	Designer Name	Fiona Wyatt
	Designer Position	Associate Director
Designer Company	Expedition Engineering	

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility		
	Superficial geology classification	Made Ground	
	Bedrock geology classification	Bagshot Formation underlain by the Claygate Member	
	Site infiltration rate	Not recorded m/s	
	Depth to groundwater level	5 to 9 m below ground level	
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	Proposed (Y/N)
	1 store rainwater for later use	N	N
	2 use infiltration techniques, such as porous surfaces in non-clay areas	N	N
	3 attenuate rainwater in ponds or open water features for gradual release	N	N
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	Y
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	Y	Y
	7 discharge rainwater to the combined sewer.	Y	N
2c. Proposed Discharge Details			
Proposed discharge location	TW 450mm combined sewer (upper). TW 225mm surface water sewer (lower)		
Has the owner/regulator of the discharge location been consulted?	Yes TW have been consulted to agree the principles of the build over		

3. Drainage Strategy	3a. Discharge Rates & Required Storage				
		Greenfield (GF) runoff rate (l/s)	Existing discharge rate (l/s)	Required storage for GF rate (m ³)	Proposed discharge rate (l/s)
	Qbar	2.6			
	1 in 1	2.2	30	201	15
	1 in 30	5.9	96	201	38
	1 in 100	8.2	96	201	38
	1 in 100 + CC			201	38
	Climate change allowance used		40%		
	3b. Principal Method of Flow Control		Hydrobrake		
	3c. Proposed SuDS Measures				
		Catchment area (m ²)	Plan area (m ²)	Storage vol. (m ³)	
	Rainwater harvesting	0		0	
	Infiltration systems	0		0	
	Green roofs	766	766	0	
	Blue roofs	0	0	0	
	Filter strips	0	0	0	
	Filter drains	0	0	0	
	Bioretention / tree pits	0	0	0	
	Pervious pavements	0	0	0	
	Swales	0	0	0	
	Basins/ponds	0	0	0	
	Attenuation tanks	3240		201	
	Total	4006	766	201	

4. Supporting Information	4a. Discharge & Drainage Strategy	Page/section of drainage report
	Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Section 2.2 (Page 2) and Section 6.2 (Page 6) (Ground Investigation report included in Appendix C)
	Drainage hierarchy (2b)	Section 6.2 (Page 6)
	Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 5 (Page 5)
	Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Section 6.4 and 6.5 (Page 7&8) Appendix J
	Proposed SuDS measures & specifications (3b)	Section 6.5 and 6.6 (Page 8) Appendix G
	4b. Other Supporting Details	Page/section of drainage report
	Detailed Development Layout	Appendix F
	Detailed drainage design drawings, including exceedance flow routes	Appendix G
	Detailed landscaping plans	Appendix F
	Maintenance strategy	Section 8 (Appendix K)
	Demonstration of how the proposed SuDS measures improve:	
	a) water quality of the runoff?	Section 6.6 (page 8)
	b) biodiversity?	Section 6.7 (Page 8)
	c) amenity?	Section 6.7 (Page 8)

Appendix I – TW Correspondence

From: DEVELOPER.SERVICES@THAMESWATER.CO.U
To: [Fiona Wyatt](#)
Cc: [Fred Labbe](#); [John Gerrard](#); [Andrew Komarnycky](#); [Jack Gregory](#); [Daniel O'Connell](#); [Gwyn Jones](#)
Subject: RE: RE: RE: RE: RE: RE: DS6051776 PDEV N6 5EE Dyne House Highgate
Date: 12 October 2018 14:56:33
Attachments: [pastedImage1](#)
[pastedImage1](#)
[image001.png](#)
[image001.png](#)
[image001.png](#)
[image001.png](#)

Dear Fiona

As discussed on the phone today; I cannot issue a technical approval letter, but can confirm that Thames Water support your proposal in principal.

Once you have appointed the contractor, please send me the construction details drawings to progress the application further.

Kind Regards

Artur Jaroma

Developer Services – Sewer Adoptions Engineer
Office: 0203 577 8082
artur.jaroma@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB
Find us online at developers.thameswater.co.uk



Original Text

From: "DEVELOPER.SERVICES@THAMESWATER.CO.U"
<DEVELOPER.SERVICES@THAMESWATER.CO.UK>
To: fiona.w@expedition.uk.com
Fred Labbe <fred.l@expedition.uk.com>; John Gerrard
<john.g@expedition.uk.com>; Andrew Komarnycky
CC: <andrew.k@expedition.uk.com>; Jack Gregory <jack.g@hopkins.co.uk>; Daniel
O'Connell <Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones
<Gwyn.Jones@highgateschool.org.uk>
Sent: 11.10.18 14:40:22
Subject: RE: RE: RE: RE: RE: RE: DS6051776 PDEV N6 5EE Dyne House Highgate

Fiona

Rectangular 1500mmx1350mm manhole is not standard in SFA 7th, and I suspect you may struggle to profile the benching for 450mm sewer. I therefore must be adamant to see the design of this manhole before issuing a technical approval.

Kind Regards

Artur Jaroma

Developer Services – Sewer Adoptions Engineer

Office: 0203 577 8082

artur.jaroma@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

Find us online at developers.thameswater.co.uk



Original Text

From: Fiona Wyatt <fiona.w@expedition.uk.com>
To: DEVELOPER.SERVICES@THAMESWATER.CO.U
<DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Fred Labbe <fred.l@expedition.uk.com>; John Gerrard
<john.g@expedition.uk.com>; Andrew Komarnycky
CC: <andrew.k@expedition.uk.com>; Jack Gregory <jack.g@hopkins.co.uk>; Daniel
O'Connell <Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones
<Gwyn.Jones@highgateschool.org.uk>
Sent: 09.10.18 08:54:43
Subject: RE: RE: RE: RE: DS6051776 PDEV N6 5EE Dyne House Highgate

Artur,

Thanks for your email, we are not yet at that stage of developed design to have construction details available. The construction details will be in accordance with Sewers for Adoption 7th Edition. Is this sufficient for you to process the application.

Many Thanks

Fiona

From: DEVELOPER.SERVICES@THAMESWATER.CO.U
<DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Sent: 28 September 2018 09:12
To: Fiona Wyatt <fiona.w@expedition.uk.com>
Cc: Fred Labbe <fred.l@expedition.uk.com>; John Gerrard <john.g@expedition.uk.com>; Eva
MacNamara <eva.m@expedition.uk.com>; Andrew Komarnycky
<andrew.k@expedition.uk.com>; Jack Gregory <jack.g@hopkins.co.uk>; Daniel O'Connell
<Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones <Gwyn.Jones@highgateschool.org.uk>
Subject: RE: RE: RE: RE: DS6051776 PDEV N6 5EE Dyne House Highgate

Fiona

Thank you for sending updated drawing.

I also would need to see a construction detail of the new manholes, in particular the benching profile.

Regards

Artur Jaroma

Developer Services – Sewer Adoptions Engineer

Office: 0203 577 8082

artur.jaroma@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

Find us online at developers.thameswater.co.uk



Original Text

From: Fiona Wyatt <fiona.w@expedition.uk.com>
To: [DEVELOPER.SERVICES@THAMESWATER.CO.U](mailto:DEVELOPER.SERVICES@THAMESWATER.CO.UK)
<DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Fred Labbe <fred.l@expedition.uk.com>; John Gerrard
<john.g@expedition.uk.com>; Eva MacNamara <eva.m@expedition.uk.com>; Andrew
CC: Komarnycky <andrew.k@expedition.uk.com>; Jack Gregory
<jack.g@hopkins.co.uk>; Daniel O'Connell
<Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones
<Gwyn.Jones@highgateschool.org.uk>
Sent: 26.09.18 14:52:54
Subject: RE: RE: RE: DS6051776 PDEV N6 5EE Dyne House Highgate

Apologies,, this time with attachment

Kind Regards

Fiona

From: Fiona Wyatt

Sent: 26 September 2018 14:51

To: 'DEVELOPER.SERVICES@THAMESWATER.CO.U'

<DEVELOPER.SERVICES@THAMESWATER.CO.UK>

Cc: Fred Labbe <fred.l@expedition.uk.com>; John Gerrard <john.g@expedition.uk.com>; Eva MacNamara <eva.m@expedition.uk.com>; Andrew Komarnycky <andrew.k@expedition.uk.com>; Jack Gregory <jack.g@hopkins.co.uk>; Daniel O'Connell <Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones <Gwyn.Jones@highgateschool.org.uk>

Subject: RE: RE: RE: DS6051776 PDEV N6 5EE Dyne House Highgate [Filed 26 Sep 2018 14:51]

Artur,

As requested please find updated proposed drainage layout in line with the standards and additional information requested below.

I trust this is sufficient at this stage. Please note that the project does not have planning at this stage and therefore no contractor is appointed.

Kind Regards

Fiona

From: DEVELOPER.SERVICES@THAMESWATER.CO.U

<DEVELOPER.SERVICES@THAMESWATER.CO.UK>

Sent: 25 September 2018 09:39

To: Fiona Wyatt <fiona.w@expedition.uk.com>

Cc: Fred Labbe <fred.l@expedition.uk.com>; John Gerrard <john.g@expedition.uk.com>; Eva MacNamara <eva.m@expedition.uk.com>; Andrew Komarnycky <andrew.k@expedition.uk.com>; Jack Gregory <jack.g@hopkins.co.uk>; Daniel O'Connell <Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones <Gwyn.Jones@highgateschool.org.uk>

Subject: RE: RE: RE: DS6051776 PDEV N6 5EE Dyne House Highgate

Fiona

Can you update your proposed drainage layout with the following standards and provide additional documents as per below list please?

1. Site plan layout showing location of the manholes with cover and invert levels, sewers with pipe diameter and gradients, site boundary. Include the following statement: 'All adoptable drainage works to be constructed as detailed in Sewers for Adoption, 7th edition' or as stipulated in Thames Water's Addendum.

please use following colouring:

- sewers to be abandoned - orange
- proposed fw sewers – brown
- existing fw sewers - constant black
- private drains - grey
- site boundary - green constant line

2. New sewers long sections with proposed cover and invert levels, pipe dia and bedding class.
3. Construction details.
4. Estimated value of construction works
5. Manhole schedule.
6. Method statement for the removal of the existing sewers

Kind Regards

Artur Jaroma

Developer Services – Sewer Adoptions Engineer

Office: 0203 577 8082

artur.jaroma@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

Find us online at developers.thameswater.co.uk



Original Text

From: Fiona Wyatt <fiona.w@expedition.uk.com>
To: [DEVELOPER.SERVICES@THAMESWATER.CO.U](mailto:DEVELOPER.SERVICES@THAMESWATER.CO.UK)
<DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Fred Labbe <fred.l@expedition.uk.com>; John Gerrard
<john.g@expedition.uk.com>; Eva MacNamara <eva.m@expedition.uk.com>; Andrew
CC: Komarnycky <andrew.k@expedition.uk.com>; Jack Gregory
<jack.g@hopkins.co.uk>; Daniel O'Connell
<Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones
<Gwyn.Jones@highgateschool.org.uk>
Sent: 21.09.18 08:08:50
Subject: RE: RE: DS6051776 PDEV N6 5EE Dyne House Highgate

Artur,

Thanks for your response below.

We accept both the conditions stated below regarding the piling and also that associated with the new manhole.

Based on this, are you able to confirm approval of the diversion works?

Many Thanks

Fiona

From: [DEVELOPER.SERVICES@THAMESWATER.CO.U](mailto:DEVELOPER.SERVICES@THAMESWATER.CO.UK)
<DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Sent: 10 September 2018 11:17
To: Fiona Wyatt <fiona.w@expedition.uk.com>
Cc: Fred Labbe <fred.l@expedition.uk.com>; John Gerrard <john.g@expedition.uk.com>; Eva MacNamara <eva.m@expedition.uk.com>; Andrew Komarnycky <andrew.k@expedition.uk.com>; Jack Gregory <jack.g@hopkins.co.uk>; Daniel O'Connell <Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones <Gwyn.Jones@highgateschool.org.uk>
Subject: RE: RE: DS6051776 PDEV N6 5EE Dyne House Highgate

Dear Fiona

Apologies for a late response.

We are happy for the new sewer being laid with 1.5m clearance from the piling under following 2 conditions:

1. The piling is undertaken before the sewer is built and adopted
2. The cctv is carried out to check the condition of the sewer after the piling.

Unfortunately, I must be adamant in terms of the new manhole though. It needs min 700mm clearance distance from the external face of the building. This is due the requirement of the safe access for maintenance. It also should be constructed after the piling.

Kind Regards

Artur Jaroma

Developer Services – Sewer Adoptions Engineer
Office: 0203 577 8082
artur.jaroma@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB
Find us online at developers.thameswater.co.uk



Original Text

From: Fiona Wyatt <fiona.w@expedition.uk.com>
To: [DEVELOPER.SERVICES@THAMESWATER.CO.U](mailto:DEVELOPER.SERVICES@THAMESWATER.CO.UK)
<DEVELOPER.SERVICES@THAMESWATER.CO.UK>
John Gerrard <john.g@expedition.uk.com>; Andrew Komarnycky <andrew.k@expedition.uk.com>; Jack Gregory <jack.g@hopkins.co.uk>; Daniel O'Connell <Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones <Gwyn.Jones@highgateschool.org.uk>; Eva MacNamara <eva.m@expedition.uk.com>; Fred Labbe <fred.l@expedition.uk.com>

Sent: 16.08.18 15:29:10

Subject: RE: DS6051776 PDEV N6 5EE Dyne House Highgate

Artur,

Thank you for your time on the phone just now, as discussed please see my responses to your below comments

1. The current proposals are to replace a section of existing pipework in poor condition and as such we are constrained with the alignment for the replaced section of pipework. The a new section of cast iron pipework will provide significant improvements to the existing public sewer and we believe the proposals will have minimum impact on the sewer. We have based the proposed foundation design on specification 5.2 provided in the conditions for the grantor undertaking form which states:

When using piled foundations, the proposed foundations are to be a minimum of 1.5 metres from the public sewer. Only continuous Flight Augured piles are acceptable.

2. The new manholes will be constructed in accordance with Sewers for Adoption 7th edition – Typical manhole detail Type 2.
3. Based on the anticipated Invert Levels of the existing sewer, it is believed there will be approximately 1.5m from the RC ground beam to the crown of the sewer, therefore any deflections will have minimal impact on the sewer below.
4. The existing public sewer does not have any manhole access points at this location. Our proposals are to provide a manhole upstream and downstream of the section of pipework being built over to improve access to sewer and in particular the existing lateral connection from the building which is to be maintained. The location of the manhole as currently shown is at the edge of the tree root protection area of a TPO tree. We are not able to move the manhole further away from the proposed building without significantly and unacceptably impacting on the roots of the TPO. We believe that the current proposals to introduce two additional manholes provides TW enhanced access to the sewer in the future and is an improvement on the existing access.

I trust the above helps to resolve your comments but please don't hesitate to contact me if you have any further questions.

Kind Regards

Fiona

From: [DEVELOPER.SERVICES@THAMESWATER.CO.U](mailto:DEVELOPER.SERVICES@THAMESWATER.CO.UK)

<DEVELOPER.SERVICES@THAMESWATER.CO.UK>

Sent: 15 August 2018 10:03

To: Fiona Wyatt <fiona.w@expedition.uk.com>

Cc: John Gerrard <john.g@expedition.uk.com>; Andrew Komarnycky

<andrew.k@expedition.uk.com>; Jack Gregory <jack.g@hopkins.co.uk>; Daniel O'Connell

<Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones <Gwyn.Jones@highgateschool.org.uk>

Subject: DS6051776 PDEV N6 5EE Dyne House Highga

Dear Fiona

Thank you for submitting your application in relation to the above site.

In order for Thames Water to progress the application further, we require following information and/or amendments:

1. The minimum distance from the new sewer to the foundation piles should be 3m.
2. Please provide construction details of the new manholes
3. Please leave a void space between RC ground beam and the top of the ground cover, to prevent impact of the beam deflection onto the new sewer.
4. All manholes should be constructed with min 1.2m distance from the face of the building.

Should you have any further queries, please do not hesitate to contact me again

Kind Regards

Artur Jaroma

Developer Services – Sewer Adoptions Engineer

Office: 0203 577 8082

artur.jaroma@thameswater.co.uk

Clearwater Court, Vastern Road, Reading, RG1 8DB

Find us online at developers.thameswater.co.uk



Original Text

From: Fiona Wyatt <fiona.w@expedition.uk.com>

To: [DEVELOPER.SERVICES@THAMESWATER.CO.U](mailto:DEVELOPER.SERVICES@THAMESWATER.CO.UK)
<DEVELOPER.SERVICES@THAMESWATER.CO.UK>

John Gerrard <john.g@expedition.uk.com>; Andrew Komarnycky
<andrew.k@expedition.uk.com>; Jack Gregory <jack.g@hopkins.co.uk>; Daniel
CC: O'Connell <Daniel.O'Connell@highgateschool.org.uk>; Gwyn Jones
<Gwyn.Jones@highgateschool.org.uk>

Sent: 07.08.18 14:13:23

Subject: Dyne House - Application for Diversion

Reference: Dyne House, Highgate School

Please find attached our completed Application to Divert a Public sewer Form for the above site together with the supporting information required to process the application. Please note that we have already submitted an Application for Build Over for which we have the reference number: DS6050529.

If you require any further information please don't hesitate to contact me.

I look forward to hearing from you

Kind Regards

Fiona

Fiona Wyatt MEng CEng MICE
Associate

T + 44 20 7307 1000

DD + 44 20 7307 1038

EXPEDITION

The Clove Building
4 Maguire Street
London SE1 2NQ

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Appendix J - Drainage Calculations



expedition

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Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by: Andrew Komarnycky

Site name: Dyne House

Site location:

Site Details

Latitude: 51.57217° N

Longitude: 0.14783° W

Reference: 1281839229

Date: Jul 19 2022 17:49

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 0.43

Methodology

Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Soil characteristics

Default

Edited

SOIL type: 4 4

HOST class: N/A N/A

SPR/SPRHOST: 0.47 0.47

Hydrological characteristics

Default

Edited

SAAR (mm): 661 682

Hydrological region: 6 6

Growth curve factor 1 year: 0.85 0.85

Growth curve factor 30 years: 2.3 2.3

Growth curve factor 100 years: 3.19 3.19

Growth curve factor 200 years: 3.74 3.74

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

Default

Edited

Q_{BAR} (l/s): 1.94 2.01

1 in 1 year (l/s): 1.65 1.71

1 in 30 years (l/s): 4.46 4.63

1 in 100 year (l/s): 6.19 6.42

1 in 200 years (l/s): 7.26 7.53

Edited SAAR is taken from FEH Point Data for site, see following page for FEH extract

Edited values used for greenfield runoff estimate

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.



Tools

Point data at 528373,187529

HIGHGATE SCHOOLS - DYNE HOUSE /
ISLAND SITE

Rainfall

Export

Coordinates 528373, 187529

NGR TQ 28373 87529

Bfihost 0.540

Bfihost19 0.460

Propwet 0.290

Saar6190 682 mm

Map

Catchments



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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes sadfsadf Manhole Sizes sadfsadf

FEH Rainfall Model	
Return Period (years)	100
FEH Rainfall Version	2013
Site Location GB 528373 187529 TQ 28373 87529	
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

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	Auto Design
1.000	7.741	0.450	17.2	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	35.666	0.446	80.0	0.058	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	6.834	0.085	80.0	0.058	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	15.220	1.294	11.8	0.034	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	150.00	5.05	110.800	0.000	0.0	0.0	0.0	2.44	43.1	0.0
2.000	150.00	5.41	110.800	0.058	0.0	0.0	0.0	1.46	58.2	23.6
2.001	150.00	5.48	110.354	0.116	0.0	0.0	0.0	1.46	58.2	47.1
1.001	150.00	5.54	110.194	0.150	0.0	0.0	0.0	4.61	325.8	60.9

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4 Maguire Street London SE1 2NQ					Highgate School-Parade Ground SW Drainage Calcs																																																																															
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Innovyze					Network 2020.1																																																																															
<u>Network Design Table for Storm</u> <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Section Type</th><th>Auto Design</th></tr><tr><td>3.000</td><td>6.399</td><td>1.165</td><td>5.5</td><td>0.009</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.002</td><td>10.947</td><td>0.109</td><td>100.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td>Pipe/Conduit</td><td></td></tr><tr><td>4.000</td><td>7.054</td><td>0.140</td><td>50.4</td><td>0.000</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr><tr><td>4.001</td><td>44.374</td><td>4.628</td><td>9.6</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.003</td><td>6.117</td><td>0.076</td><td>80.5</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>150</td><td>Pipe/Conduit</td><td></td></tr></table>													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	Auto Design	3.000	6.399	1.165	5.5	0.009	5.00	0.0	0.600	o	150	Pipe/Conduit		1.002	10.947	0.109	100.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		4.000	7.054	0.140	50.4	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit		4.001	44.374	4.628	9.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		1.003	6.117	0.076	80.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
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	Auto Design																																																																									
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1.002	10.947	0.109	100.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit																																																																										
4.000	7.054	0.140	50.4	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit																																																																										
4.001	44.374	4.628	9.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit																																																																										
1.003	6.117	0.076	80.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit																																																																										
<u>Network Results Table</u> <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL (m)</th><th>Σ I.Area (ha)</th><th>Σ Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>3.000</td><td>150.00</td><td>5.02</td><td>110.215</td><td>0.009</td><td>0.0</td><td>0.0</td><td>0.0</td><td>4.33</td><td>76.5</td><td>3.7</td></tr><tr><td>1.002</td><td>150.00</td><td>5.66</td><td>108.900</td><td>0.159</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.57</td><td>111.1</td><td>64.6</td></tr><tr><td>4.000</td><td>150.00</td><td>5.08</td><td>113.700</td><td>0.000</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.42</td><td>25.1</td><td>0.0</td></tr><tr><td>4.001</td><td>150.00</td><td>5.31</td><td>113.560</td><td>0.000</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.27</td><td>57.8</td><td>0.0</td></tr><tr><td>1.003</td><td>150.00</td><td>5.75</td><td>108.781</td><td>0.159</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.12</td><td>19.8«</td><td>64.6</td></tr></table>													PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	3.000	150.00	5.02	110.215	0.009	0.0	0.0	0.0	4.33	76.5	3.7	1.002	150.00	5.66	108.900	0.159	0.0	0.0	0.0	1.57	111.1	64.6	4.000	150.00	5.08	113.700	0.000	0.0	0.0	0.0	1.42	25.1	0.0	4.001	150.00	5.31	113.560	0.000	0.0	0.0	0.0	3.27	57.8	0.0	1.003	150.00	5.75	108.781	0.159	0.0	0.0	0.0	1.12	19.8«	64.6						
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)																																																																										
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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.058	0.058	0.058
2.001	-	-	100	0.058	0.058	0.058
1.001	-	-	100	0.034	0.034	0.034
3.000	-	-	100	0.009	0.009	0.009
1.002	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.000	0.000	0.000
4.001	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.159	0.159	0.159

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/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	1
Number of Online Controls	1	Number of Time/Area Diagrams	11
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 528373 187529 TQ 28373 87529
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: MH3, DS/PN: 1.003, Volume (m³): 4.4

Unit Reference	MD-SHE-0098-6400-2569-6400
Design Head (m)	2.569
Design Flow (l/s)	6.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	98
Invert Level (m)	108.781
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.569	6.4
Flush-Flo™	0.430	4.8
Kick-Flo®	0.875	3.9
Mean Flow over Head Range	-	4.9

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	1.200	4.5	3.000	6.9	7.000	10.3
0.200	4.4	1.400	4.8	3.500	7.4	7.500	10.6
0.300	4.7	1.600	5.1	4.000	7.9	8.000	11.0
0.400	4.8	1.800	5.4	4.500	8.3	8.500	11.3
0.500	4.8	2.000	5.7	5.000	8.8	9.000	11.6
0.600	4.7	2.200	5.9	5.500	9.2	9.500	11.9
0.800	4.3	2.400	6.2	6.000	9.6		
1.000	4.1	2.600	6.4	6.500	9.9		

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4 Maguire Street London SE1 2NQ		Highgate School-Parade Ground SW Drainage Calcs																																																																																																																																																																											
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<u>Storage Structures for Storm</u> <u>Complex Manhole: MH3, DS/PN: 1.003</u> <u>Tank or Pond</u> Invert Level (m) 108.900 <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>41.0</td><td>1.828</td><td>41.0</td><td>1.829</td><td>0.0</td></tr></table> <u>Tank or Pond</u> Invert Level (m) 110.950 <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>316.0</td><td>0.400</td><td>316.0</td><td>0.401</td><td>0.0</td></tr></table> <u>Time Area Diagram for Green Roof at Pipe Number 1.000 (Storm)</u> Area (m³) 51 Evaporation (mm/day) 1 Depression Storage (mm) 8 Decay Coefficient 0.050 <table><tr><td>Time (mins)</td><td>Area (ha)</td><td>Time (mins)</td><td>Area (ha)</td><td>Time (mins)</td><td>Area (ha)</td><td>Time (mins)</td><td>Area (ha)</td></tr><tr><td>From: To:</td><td></td><td>From: To:</td><td></td><td>From: To:</td><td></td><td>From: To:</td><td></td></tr><tr><td>0 4</td><td>0.000927</td><td>32 36</td><td>0.000187</td><td>64 68</td><td>0.000038</td><td>96 100</td><td>0.000008</td></tr><tr><td>4 8</td><td>0.000759</td><td>36 40</td><td>0.000153</td><td>68 72</td><td>0.000031</td><td>100 104</td><td>0.000006</td></tr><tr><td>8 12</td><td>0.000621</td><td>40 44</td><td>0.000125</td><td>72 76</td><td>0.000025</td><td>104 108</td><td>0.000005</td></tr><tr><td>12 16</td><td>0.000509</td><td>44 48</td><td>0.000103</td><td>76 80</td><td>0.000021</td><td>108 112</td><td>0.000004</td></tr><tr><td>16 20</td><td>0.000416</td><td>48 52</td><td>0.000084</td><td>80 84</td><td>0.000017</td><td>112 116</td><td>0.000003</td></tr><tr><td>20 24</td><td>0.000341</td><td>52 56</td><td>0.000069</td><td>84 88</td><td>0.000014</td><td>116 120</td><td>0.000003</td></tr><tr><td>24 28</td><td>0.000279</td><td>56 60</td><td>0.000056</td><td>88 92</td><td>0.000011</td><td></td><td></td></tr><tr><td>28 32</td><td>0.000229</td><td>60 64</td><td>0.000046</td><td>92 96</td><td>0.000009</td><td></td><td></td></tr></table> <u>Time Area Diagram for Green Roof at Pipe Number 1.000 (Storm)</u> Area (m³) 98 Evaporation (mm/day) 1 Depression Storage (mm) 30 Decay Coefficient 0.050 <table><tr><td>Time (mins)</td><td>Area (ha)</td><td>Time (mins)</td><td>Area (ha)</td><td>Time (mins)</td><td>Area (ha)</td><td>Time (mins)</td><td>Area (ha)</td></tr><tr><td>From: To:</td><td></td><td>From: To:</td><td></td><td>From: To:</td><td></td><td>From: To:</td><td></td></tr><tr><td>0 4</td><td>0.001781</td><td>24 28</td><td>0.000536</td><td>48 52</td><td>0.000162</td><td>72 76</td><td>0.000049</td></tr><tr><td>4 8</td><td>0.001458</td><td>28 32</td><td>0.000439</td><td>52 56</td><td>0.000132</td><td>76 80</td><td>0.000040</td></tr><tr><td>8 12</td><td>0.001194</td><td>32 36</td><td>0.000360</td><td>56 60</td><td>0.000108</td><td>80 84</td><td>0.000033</td></tr><tr><td>12 16</td><td>0.000977</td><td>36 40</td><td>0.000294</td><td>60 64</td><td>0.000089</td><td>84 88</td><td>0.000027</td></tr><tr><td>16 20</td><td>0.000800</td><td>40 44</td><td>0.000241</td><td>64 68</td><td>0.000073</td><td>88 92</td><td>0.000022</td></tr><tr><td>20 24</td><td>0.000655</td><td>44 48</td><td>0.000197</td><td>68 72</td><td>0.000059</td><td>92 96</td><td>0.000018</td></tr></table>						Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	41.0	1.828	41.0	1.829	0.0	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	316.0	0.400	316.0	0.401	0.0	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	From: To:		From: To:		From: To:		From: To:		0 4	0.000927	32 36	0.000187	64 68	0.000038	96 100	0.000008	4 8	0.000759	36 40	0.000153	68 72	0.000031	100 104	0.000006	8 12	0.000621	40 44	0.000125	72 76	0.000025	104 108	0.000005	12 16	0.000509	44 48	0.000103	76 80	0.000021	108 112	0.000004	16 20	0.000416	48 52	0.000084	80 84	0.000017	112 116	0.000003	20 24	0.000341	52 56	0.000069	84 88	0.000014	116 120	0.000003	24 28	0.000279	56 60	0.000056	88 92	0.000011			28 32	0.000229	60 64	0.000046	92 96	0.000009			Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	From: To:		From: To:		From: To:		From: To:		0 4	0.001781	24 28	0.000536	48 52	0.000162	72 76	0.000049	4 8	0.001458	28 32	0.000439	52 56	0.000132	76 80	0.000040	8 12	0.001194	32 36	0.000360	56 60	0.000108	80 84	0.000033	12 16	0.000977	36 40	0.000294	60 64	0.000089	84 88	0.000027	16 20	0.000800	40 44	0.000241	64 68	0.000073	88 92	0.000022	20 24	0.000655	44 48	0.000197	68 72	0.000059	92 96	0.000018
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Time Area Diagram for Green Roof at Pipe Number 1.000 (Storm)

Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)
96	100	0.000015	104	108	0.000010	112	116	0.000007			
100	104	0.000012	108	112	0.000008	116	120	0.000005			

Time Area Diagram at Pipe Number 1.000 for Storm

Total Area (ha) 0.042

Time (mins) Area
From: To: (ha)

0 5 0.042

Time Area Diagram for Green Roof at Pipe Number 4.000 (Storm)

Area (m³) 73 Evaporation (mm/day) 1
Depression Storage (mm) 30 Decay Coefficient 0.050

Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)
0	4	0.001327	32	36	0.000268	64	68	0.000054	96	100	0.000011
4	8	0.001086	36	40	0.000219	68	72	0.000044	100	104	0.000009
8	12	0.000889	40	44	0.000180	72	76	0.000036	104	108	0.000007
12	16	0.000728	44	48	0.000147	76	80	0.000030	108	112	0.000006
16	20	0.000596	48	52	0.000120	80	84	0.000024	112	116	0.000005
20	24	0.000488	52	56	0.000099	84	88	0.000020	116	120	0.000004
24	28	0.000400	56	60	0.000081	88	92	0.000016			
28	32	0.000327	60	64	0.000066	92	96	0.000013			

Time Area Diagram for Green Roof at Pipe Number 4.000 (Storm)

Area (m³) 134 Evaporation (mm/day) 1
Depression Storage (mm) 8 Decay Coefficient 0.050

Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)
0	4	0.002435	32	36	0.000492	64	68	0.000099	96	100	0.000020
4	8	0.001994	36	40	0.000403	68	72	0.000081	100	104	0.000016
8	12	0.001632	40	44	0.000330	72	76	0.000067	104	108	0.000013
12	16	0.001336	44	48	0.000270	76	80	0.000054	108	112	0.000011
16	20	0.001094	48	52	0.000221	80	84	0.000045	112	116	0.000009
20	24	0.000896	52	56	0.000181	84	88	0.000037	116	120	0.000007
24	28	0.000733	56	60	0.000148	88	92	0.000030			
28	32	0.000600	60	64	0.000121	92	96	0.000024			

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Time Area Diagram for Green Roof at Pipe Number 4.001 (Storm)

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
48 52 0.000135	68 72 0.000050	88 92 0.000018	108 112 0.000007				
52 56 0.000111	72 76 0.000041	92 96 0.000015	112 116 0.000006				
56 60 0.000091	76 80 0.000033	96 100 0.000012	116 120 0.000005				
60 64 0.000074	80 84 0.000027	100 104 0.000010					
64 68 0.000061	84 88 0.000022	104 108 0.000008					

Time Area Diagram for Green Roof at Pipe Number 4.001 (Storm)

Area (m³) 220 Evaporation (mm/day) 1
Depression Storage (mm) 60 Decay Coefficient 0.050

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.003998	32 36 0.000807	64 68 0.000163	96 100 0.000033				
4 8 0.003273	36 40 0.000661	68 72 0.000133	100 104 0.000027				
8 12 0.002680	40 44 0.000541	72 76 0.000109	104 108 0.000022				
12 16 0.002194	44 48 0.000443	76 80 0.000089	108 112 0.000018				
16 20 0.001796	48 52 0.000363	80 84 0.000073	112 116 0.000015				
20 24 0.001471	52 56 0.000297	84 88 0.000060	116 120 0.000012				
24 28 0.001204	56 60 0.000243	88 92 0.000049					
28 32 0.000986	60 64 0.000199	92 96 0.000040					

Time Area Diagram at Pipe Number 4.001 for Storm

Total Area (ha) 0.037

Time (mins) Area
From: To: (ha)

0 5 0.037

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/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	1
Number of Online Controls	1	Number of Time/Area Diagrams	11
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 528373 187529 TQ 28373 87529
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 35, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Half Drain Time (mins)
1.000	IC1	15 minute 2 year Winter I+0%	111.500	110.844	-0.106	0.000	
2.000	IC3	15 minute 2 year Winter I+0%	111.500	110.863	-0.162	0.000	
2.001	IC2	15 minute 2 year Winter I+0%	111.400	110.458	-0.121	0.000	
1.001	MH1	15 minute 2 year Winter I+0%	111.400	110.259	-0.234	0.000	
3.000	IC4	15 minute 2 year Winter I+0%	111.350	110.231	-0.134	0.000	
1.002	MH2	120 minute 2 year Winter I+0%	111.350	109.357	0.157	0.000	
4.000	MH4	15 minute 2 year Winter I+0%	114.700	113.747	-0.103	0.000	
4.001	MH5	15 minute 2 year Winter I+0%	114.500	113.604	-0.106	0.000	
1.003	MH3	120 minute 2 year Winter I+0%	111.350	109.354	0.423	0.000	64

Pipe

PN	US/MH Name	Flow (l/s)	Status
1.000	IC1	6.9	OK
2.000	IC3	9.4	OK

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

		Pipe		
		US/MH	Flow	
PN	Name	(1/s)	Status	
2.001	IC2	17.6		OK
1.001	MH1	29.2		OK
3.000	IC4	1.5		OK
1.002	MH2	11.4	SURCHARGED	
4.000	MH4	4.4		OK
4.001	MH5	10.5		OK
1.003	MH3	4.8	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/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 1
 Number of Online Controls 1 Number of Time/Area Diagrams 11
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
 FEH Rainfall Version 2013
 Site Location GB 528373 187529 TQ 28373 87529
 Data Type Point
 Cv (Summer) 0.750
 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Half Drain Time (mins)
1.000	IC1	180 minute 30 year Winter I+35%	111.500	111.080	0.130	0.000	
2.000	IC3	180 minute 30 year Winter I+35%	111.500	111.082	0.057	0.000	
2.001	IC2	180 minute 30 year Winter I+35%	111.400	111.078	0.499	0.000	
1.001	MH1	180 minute 30 year Winter I+35%	111.400	111.076	0.582	0.000	
3.000	IC4	180 minute 30 year Winter I+35%	111.350	111.072	0.707	0.000	
1.002	MH2	180 minute 30 year Winter I+35%	111.350	111.072	1.872	0.000	
4.000	MH4	15 minute 30 year Winter I+35%	114.700	113.797	-0.053	0.000	
4.001	MH5	15 minute 30 year Winter I+35%	114.500	113.651	-0.059	0.000	
1.003	MH3	180 minute 30 year Winter I+35%	111.350	111.069	2.138	0.000	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

		Pipe		
		US/MH	Flow	
PN	Name	(1/s)		Status
1.000	IC1	6.5		SURCHARGED
2.000	IC3	8.2		SURCHARGED
2.001	IC2	16.5		SURCHARGED
1.001	MH1	27.4		SURCHARGED
3.000	IC4	1.3		FLOOD RISK
1.002	MH2	27.0		FLOOD RISK
4.000	MH4	15.7		OK
4.001	MH5	37.2		OK
1.003	MH3	6.1		FLOOD RISK

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/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	1
Number of Online Controls	1	Number of Time/Area Diagrams	11
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 528373 187529 TQ 28373 87529
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Cv (Summer)	0.750
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Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 35, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	IC1	240 minute 100 year Winter I+40%	111.500	111.349	0.399	0.000
2.000	IC3	240 minute 100 year Winter I+40%	111.500	111.351	0.326	0.000
2.001	IC2	240 minute 100 year Winter I+40%	111.400	111.347	0.768	0.000
1.001	MH1	240 minute 100 year Winter I+40%	111.400	111.344	0.851	0.000
3.000	IC4	360 minute 100 year Winter I+40%	111.350	111.341	0.976	0.000
1.002	MH2	360 minute 100 year Winter I+40%	111.350	111.341	2.141	0.000
4.000	MH4	15 minute 100 year Winter I+40%	114.700	113.834	-0.016	0.000
4.001	MH5	15 minute 100 year Winter I+40%	114.500	113.676	-0.034	0.000
1.003	MH3	360 minute 100 year Winter I+40%	111.350	111.338	2.407	0.000

Half Drain Pipe

PN	US/MH Name	Time (mins)	Flow (l/s)	Status
1.000	IC1		8.6	FLOOD RISK
2.000	IC3		9.2	FLOOD RISK

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Expedition Engineering		Page 14
4 Maguire Street London SE1 2NQ	Highgate School-Parade Ground SW Drainage Calcs	
Date 20/07/2022 File 404 - HIGHGATE SCHOOL -...	Designed by AK Checked by	
Innovyze	Network 2020.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Half Drain Pipe				
	US/MH	Time	Flow	
PN	Name	(mins)	(l/s)	Status
2.001	IC2		18.4	FLOOD RISK
1.001	MH1		32.3	FLOOD RISK
3.000	IC4		1.0	FLOOD RISK
1.002	MH2		25.0	FLOOD RISK
4.000	MH4		21.4	OK
4.001	MH5		50.7	OK
1.003	MH3	306	6.4	FLOOD RISK

Expedition Engineering					Page 1	
4 Maguire Street London SE1 2NQ						
Date 15/07/2022 11:27 File 22 06 17 ISLAND SITE - ...						
Innovyze			Designed by andrew.komarnycky Checked by			
Source Control 2020.1						
Summary of Results for 2 year Return Period						
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status	
15 min Summer	0.119	0.119	0.4	0.6	O K	
30 min Summer	0.129	0.129	0.4	0.6	O K	
60 min Summer	0.126	0.126	0.4	0.6	O K	
120 min Summer	0.135	0.135	0.4	0.6	O K	
180 min Summer	0.127	0.127	0.4	0.6	O K	
240 min Summer	0.116	0.116	0.4	0.6	O K	
360 min Summer	0.094	0.094	0.3	0.5	O K	
480 min Summer	0.077	0.077	0.3	0.4	O K	
600 min Summer	0.065	0.065	0.3	0.3	O K	
720 min Summer	0.055	0.055	0.2	0.3	O K	
960 min Summer	0.043	0.043	0.2	0.2	O K	
1440 min Summer	0.031	0.031	0.2	0.2	O K	
2160 min Summer	0.025	0.025	0.1	0.1	O K	
2880 min Summer	0.022	0.022	0.1	0.1	O K	
4320 min Summer	0.019	0.019	0.1	0.1	O K	
5760 min Summer	0.016	0.016	0.1	0.1	O K	
7200 min Summer	0.015	0.015	0.0	0.1	O K	
8640 min Summer	0.014	0.014	0.0	0.1	O K	
10080 min Summer	0.013	0.013	0.0	0.1	O K	
15 min Winter	0.134	0.134	0.4	0.6	O K	
30 min Winter	0.144	0.144	0.4	0.7	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)		
15 min Summer	36.870	0.0	0.8	15		
30 min Summer	23.321	0.0	1.0	23		
60 min Summer	14.150	0.0	1.2	40		
120 min Summer	10.208	0.0	1.7	74		
180 min Summer	8.076	0.0	2.0	106		
240 min Summer	6.722	0.0	2.2	138		
360 min Summer	5.065	0.0	2.5	198		
480 min Summer	4.084	0.0	2.7	258		
600 min Summer	3.437	0.0	2.8	318		
720 min Summer	2.977	0.0	2.9	376		
960 min Summer	2.365	0.0	3.1	494		
1440 min Summer	1.704	0.0	3.4	734		
2160 min Summer	1.239	0.0	3.7	1100		
2880 min Summer	0.996	0.0	3.9	1464		
4320 min Summer	0.743	0.0	4.4	2196		
5760 min Summer	0.612	0.0	4.8	2936		
7200 min Summer	0.531	0.0	5.3	3568		
8640 min Summer	0.477	0.0	5.7	4320		
10080 min Summer	0.438	0.0	6.1	5048		
15 min Winter	36.870	0.0	0.8	15		
30 min Winter	23.321	0.0	1.1	25		
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4 Maguire Street London SE1 2NQ					
Date 15/07/2022 11:27		Designed by andrew.komarnycky			
File 22 06 17 ISLAND SITE - ...		Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 2 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	0.135	0.135	0.4	0.6	O K
120 min Winter	0.137	0.137	0.4	0.7	O K
180 min Winter	0.121	0.121	0.4	0.6	O K
240 min Winter	0.105	0.105	0.3	0.5	O K
360 min Winter	0.078	0.078	0.3	0.4	O K
480 min Winter	0.060	0.060	0.2	0.3	O K
600 min Winter	0.048	0.048	0.2	0.2	O K
720 min Winter	0.040	0.040	0.2	0.2	O K
960 min Winter	0.032	0.032	0.2	0.2	O K
1440 min Winter	0.025	0.025	0.1	0.1	O K
2160 min Winter	0.021	0.021	0.1	0.1	O K
2880 min Winter	0.018	0.018	0.1	0.1	O K
4320 min Winter	0.015	0.015	0.0	0.1	O K
5760 min Winter	0.013	0.013	0.0	0.1	O K
7200 min Winter	0.013	0.013	0.0	0.1	O K
8640 min Winter	0.012	0.012	0.0	0.1	O K
10080 min Winter	0.012	0.012	0.0	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	14.150	0.0	1.3	42	
120 min Winter	10.208	0.0	1.9	78	
180 min Winter	8.076	0.0	2.2	112	
240 min Winter	6.722	0.0	2.5	144	
360 min Winter	5.065	0.0	2.8	204	
480 min Winter	4.084	0.0	3.0	264	
600 min Winter	3.437	0.0	3.2	322	
720 min Winter	2.977	0.0	3.3	378	
960 min Winter	2.365	0.0	3.5	486	
1440 min Winter	1.704	0.0	3.8	736	
2160 min Winter	1.239	0.0	4.1	1108	
2880 min Winter	0.996	0.0	4.4	1468	
4320 min Winter	0.743	0.0	4.9	2204	
5760 min Winter	0.612	0.0	5.4	2904	
7200 min Winter	0.531	0.0	5.9	3664	
8640 min Winter	0.477	0.0	6.3	4352	
10080 min Winter	0.438	0.0	6.8	5128	
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4 Maguire Street London SE1 2NQ																																			
Date 15/07/2022 11:27	Designed by andrew.komarnycky																																		
File 22 06 17 ISLAND SITE - ...	Checked by																																		
Innovyze		Source Control 2020.1																																	
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FEH</td> </tr> <tr> <td>Return Period (years)</td> <td>2</td> </tr> <tr> <td>FEH Rainfall Version</td> <td>2013</td> </tr> <tr> <td>Site Location</td> <td>GB 528373 187529 TQ 28373 87529</td> </tr> <tr> <td>Data Type</td> <td>Point</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> </tr> <tr> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Climate Change %</td> <td>+0</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.011 <table> <thead> <tr> <th colspan="2">Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>4</td> <td>0.011</td> </tr> </tbody> </table>			Rainfall Model	FEH	Return Period (years)	2	FEH Rainfall Version	2013	Site Location	GB 528373 187529 TQ 28373 87529	Data Type	Point	Summer Storms	Yes	Winter Storms	Yes	Cv (Summer)	0.750	Cv (Winter)	0.840	Shortest Storm (mins)	15	Longest Storm (mins)	10080	Climate Change %	+0	Time (mins)		Area	From:	To:	(ha)	0	4	0.011
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Climate Change %	+0																																		
Time (mins)		Area																																	
From:	To:	(ha)																																	
0	4	0.011																																	
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4 Maguire Street London SE1 2NQ																		
Date 15/07/2022 11:27	Designed by andrew.komarnycky																	
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Innovyze		Source Control 2020.1																
<u>Model Details</u> Storage is Online Cover Level (m) 0.650 <u>Tank or Pond Structure</u> Invert Level (m) 0.000 <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>4.8</td> <td>0.500</td> <td>4.8</td> <td>0.501</td> <td>16.0</td> <td>0.650</td> <td>16.0</td> </tr> </tbody> </table> <u>Orifice Outflow Control</u> Diameter (m) 0.023 Discharge Coefficient 0.600 Invert Level (m) 0.000			Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	0.000	4.8	0.500	4.8	0.501	16.0	0.650	16.0
Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)											
0.000	4.8	0.500	4.8	0.501	16.0	0.650	16.0											
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Date 20/07/2022 15:23 File 22 06 17 ISLAND SITE - ...		Designed by andrew.komarnycky Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 30 year Return Period (+35%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	0.465	0.465	0.7	2.2	Flood Risk
30 min Summer	0.508	0.508	0.8	2.5	Flood Risk
60 min Summer	0.513	0.513	0.8	2.6	Flood Risk
120 min Summer	0.516	0.516	0.8	2.7	Flood Risk
180 min Summer	0.506	0.506	0.8	2.5	Flood Risk
240 min Summer	0.479	0.479	0.8	2.3	Flood Risk
360 min Summer	0.400	0.400	0.7	1.9	Flood Risk
480 min Summer	0.335	0.335	0.6	1.6	O K
600 min Summer	0.284	0.284	0.6	1.4	O K
720 min Summer	0.243	0.243	0.5	1.2	O K
960 min Summer	0.184	0.184	0.5	0.9	O K
1440 min Summer	0.117	0.117	0.4	0.6	O K
2160 min Summer	0.072	0.072	0.3	0.3	O K
2880 min Summer	0.051	0.051	0.2	0.2	O K
4320 min Summer	0.033	0.033	0.2	0.2	O K
5760 min Summer	0.028	0.028	0.1	0.1	O K
7200 min Summer	0.025	0.025	0.1	0.1	O K
8640 min Summer	0.023	0.023	0.1	0.1	O K
10080 min Summer	0.022	0.022	0.1	0.1	O K
15 min Winter	0.508	0.508	0.8	2.5	Flood Risk
30 min Winter	0.531	0.531	0.8	2.9	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	130.285	0.0	2.7	16	
30 min Summer	82.647	0.0	3.4	27	
60 min Summer	50.317	0.0	4.1	44	
120 min Summer	32.168	0.0	5.3	78	
180 min Summer	24.272	0.0	6.0	112	
240 min Summer	19.665	0.0	6.5	146	
360 min Summer	14.368	0.0	7.1	208	
480 min Summer	11.379	0.0	7.5	270	
600 min Summer	9.456	0.0	7.8	332	
720 min Summer	8.110	0.0	8.0	390	
960 min Summer	6.343	0.0	8.4	510	
1440 min Summer	4.470	0.0	8.8	750	
2160 min Summer	3.154	0.0	9.4	1104	
2880 min Summer	2.473	0.0	9.8	1468	
4320 min Summer	1.776	0.0	10.5	2164	
5760 min Summer	1.417	0.0	11.2	2936	
7200 min Summer	1.197	0.0	11.9	3584	
8640 min Summer	1.049	0.0	12.5	4384	
10080 min Summer	0.941	0.0	13.0	5016	
15 min Winter	130.285	0.0	3.0	16	
30 min Winter	82.647	0.0	3.8	29	
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Innovyze		Source Control 2020.1			
<u>Summary of Results for 30 year Return Period (+35%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	0.534	0.534	0.8	2.9	Flood Risk
120 min Winter	0.533	0.533	0.8	2.9	Flood Risk
180 min Winter	0.515	0.515	0.8	2.6	Flood Risk
240 min Winter	0.485	0.485	0.8	2.3	Flood Risk
360 min Winter	0.377	0.377	0.7	1.8	Flood Risk
480 min Winter	0.296	0.296	0.6	1.4	O K
600 min Winter	0.236	0.236	0.5	1.1	O K
720 min Winter	0.192	0.192	0.5	0.9	O K
960 min Winter	0.134	0.134	0.4	0.6	O K
1440 min Winter	0.077	0.077	0.3	0.4	O K
2160 min Winter	0.045	0.045	0.2	0.2	O K
2880 min Winter	0.033	0.033	0.2	0.2	O K
4320 min Winter	0.026	0.026	0.1	0.1	O K
5760 min Winter	0.023	0.023	0.1	0.1	O K
7200 min Winter	0.021	0.021	0.1	0.1	O K
8640 min Winter	0.019	0.019	0.1	0.1	O K
10080 min Winter	0.018	0.018	0.1	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	50.317	0.0	4.6	48	
120 min Winter	32.168	0.0	5.9	86	
180 min Winter	24.272	0.0	6.7	120	
240 min Winter	19.665	0.0	7.3	154	
360 min Winter	14.368	0.0	8.0	218	
480 min Winter	11.379	0.0	8.4	280	
600 min Winter	9.456	0.0	8.7	342	
720 min Winter	8.110	0.0	9.0	400	
960 min Winter	6.343	0.0	9.4	520	
1440 min Winter	4.470	0.0	9.9	752	
2160 min Winter	3.154	0.0	10.5	1104	
2880 min Winter	2.473	0.0	11.0	1424	
4320 min Winter	1.776	0.0	11.8	2140	
5760 min Winter	1.417	0.0	12.6	2840	
7200 min Winter	1.197	0.0	13.3	3616	
8640 min Winter	1.049	0.0	13.9	4312	
10080 min Winter	0.941	0.0	14.6	5136	
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Innovyze Source Control 2020.1		

Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 528373 187529 TQ 28373 87529
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+35

Time Area Diagram

Total Area (ha) 0.011

	Time (mins)	Area
From:	To:	(ha)
	0	4 0.011

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Model Details

Storage is Online Cover Level (m) 0.650

Tank or Pond Structure

Invert Level (m) 0.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	4.8	0.500	4.8	0.501	16.0	0.650	16.0

Orifice Outflow Control

Diameter (m) 0.023 Discharge Coefficient 0.600 Invert Level (m) 0.000

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Innovyze			Source Control 2020.1		
Summary of Results for 100 year Return Period (+40%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	0.548	0.548	0.8	3.2	Flood Risk
30 min Summer	0.582	0.582	0.8	3.7	Flood Risk
60 min Summer	0.591	0.591	0.8	3.9	Flood Risk
120 min Summer	0.606	0.606	0.9	4.1	Flood Risk
180 min Summer	0.599	0.599	0.8	4.0	Flood Risk
240 min Summer	0.586	0.586	0.8	3.8	Flood Risk
360 min Summer	0.554	0.554	0.8	3.3	Flood Risk
480 min Summer	0.522	0.522	0.8	2.8	Flood Risk
600 min Summer	0.490	0.490	0.8	2.4	Flood Risk
720 min Summer	0.426	0.426	0.7	2.0	Flood Risk
960 min Summer	0.329	0.329	0.6	1.6	O K
1440 min Summer	0.212	0.212	0.5	1.0	O K
2160 min Summer	0.126	0.126	0.4	0.6	O K
2880 min Summer	0.086	0.086	0.3	0.4	O K
4320 min Summer	0.050	0.050	0.2	0.2	O K
5760 min Summer	0.035	0.035	0.2	0.2	O K
7200 min Summer	0.030	0.030	0.1	0.1	O K
8640 min Summer	0.027	0.027	0.1	0.1	O K
10080 min Summer	0.025	0.025	0.1	0.1	O K
15 min Winter	0.574	0.574	0.8	3.6	Flood Risk
30 min Winter	0.615	0.615	0.9	4.2	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	178.926	0.0	3.7	17	
30 min Summer	114.595	0.0	4.7	30	
60 min Summer	69.825	0.0	5.8	48	
120 min Summer	44.902	0.0	7.4	82	
180 min Summer	34.183	0.0	8.5	116	
240 min Summer	27.908	0.0	9.2	150	
360 min Summer	20.620	0.0	10.2	216	
480 min Summer	16.439	0.0	10.8	278	
600 min Summer	13.706	0.0	11.3	338	
720 min Summer	11.774	0.0	11.7	398	
960 min Summer	9.210	0.0	12.2	518	
1440 min Summer	6.458	0.0	12.8	752	
2160 min Summer	4.494	0.0	13.3	1108	
2880 min Summer	3.474	0.0	13.8	1468	
4320 min Summer	2.423	0.0	14.4	2200	
5760 min Summer	1.885	0.0	14.9	2936	
7200 min Summer	1.560	0.0	15.4	3672	
8640 min Summer	1.343	0.0	16.0	4320	
10080 min Summer	1.188	0.0	16.5	4968	
15 min Winter	178.926	0.0	4.1	17	
30 min Winter	114.595	0.0	5.3	30	
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Innovyze		Source Control 2020.1			
Summary of Results for 100 year Return Period (+40%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	0.626	0.626	0.9	4.4	Flood Risk
120 min Winter	0.637	0.637	0.9	4.6	Flood Risk
180 min Winter	0.623	0.623	0.9	4.4	Flood Risk
240 min Winter	0.601	0.601	0.8	4.0	Flood Risk
360 min Winter	0.551	0.551	0.8	3.2	Flood Risk
480 min Winter	0.508	0.508	0.8	2.5	Flood Risk
600 min Winter	0.430	0.430	0.7	2.1	Flood Risk
720 min Winter	0.356	0.356	0.6	1.7	Flood Risk
960 min Winter	0.253	0.253	0.5	1.2	O K
1440 min Winter	0.145	0.145	0.4	0.7	O K
2160 min Winter	0.080	0.080	0.3	0.4	O K
2880 min Winter	0.053	0.053	0.2	0.3	O K
4320 min Winter	0.032	0.032	0.2	0.2	O K
5760 min Winter	0.027	0.027	0.1	0.1	O K
7200 min Winter	0.024	0.024	0.1	0.1	O K
8640 min Winter	0.022	0.022	0.1	0.1	O K
10080 min Winter	0.020	0.020	0.1	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	69.825	0.0	6.4	50	
120 min Winter	44.902	0.0	8.3	88	
180 min Winter	34.183	0.0	9.5	126	
240 min Winter	27.908	0.0	10.3	162	
360 min Winter	20.620	0.0	11.4	228	
480 min Winter	16.439	0.0	12.1	290	
600 min Winter	13.706	0.0	12.7	350	
720 min Winter	11.774	0.0	13.1	410	
960 min Winter	9.210	0.0	13.6	530	
1440 min Winter	6.458	0.0	14.3	764	
2160 min Winter	4.494	0.0	14.9	1116	
2880 min Winter	3.474	0.0	15.4	1468	
4320 min Winter	2.423	0.0	16.1	2196	
5760 min Winter	1.885	0.0	16.7	2848	
7200 min Winter	1.560	0.0	17.3	3592	
8640 min Winter	1.343	0.0	17.9	4384	
10080 min Winter	1.188	0.0	18.4	5064	
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0.000	4.8	0.500	4.8	0.501	16.0	0.650	16.0											
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Appendix K – Maintenance Schedule

Attenuation Tanks (if required)

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Drainage Pipes

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Remove sediment and debris from inspection chambers	Annually
	Cleaning of gutters and any filters on downpipes	Annually
	Remove any root ingress	As required
Occasional Maintenance	CCTV survey of drains to check alignment, cracking and joint displacement	10 year intervals

Podium system/Green roofs

Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability.	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment, replace dead plants as required	Monthly
	Post establishment, replace dead plants as required	Annually
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting as required	Six monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

The Clove Building
4 Maguire Street
London SE1 2NQ
+44 (0)20 7307 1000
www.expedition.uk.com
info@expedition.uk.com