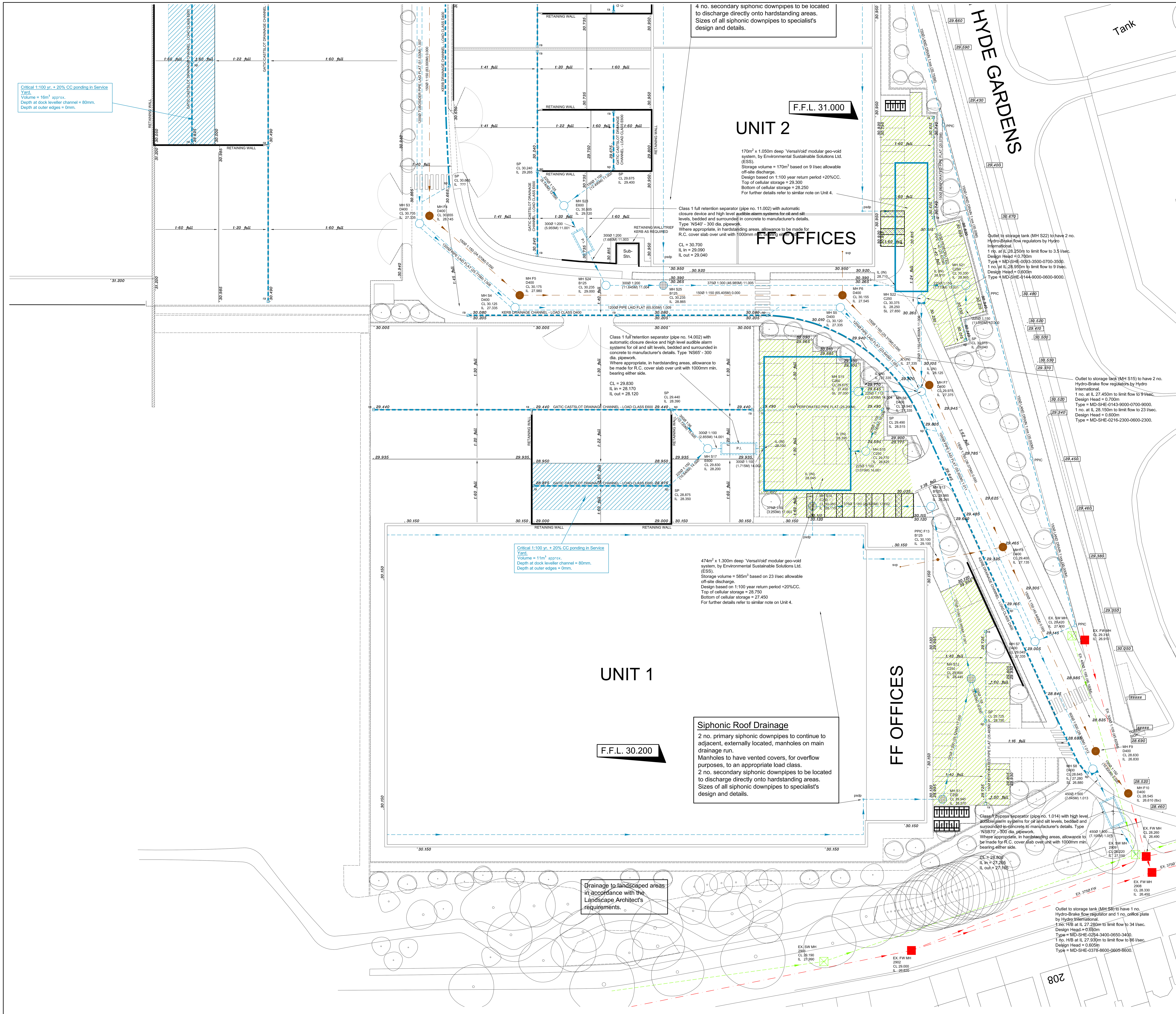

Drainage Notes

1. All private drainage works are to be carried out in accordance with BS EN 752:2008 and Building Regulations Part H.

2. All drainage works within adoptable areas are to comply with the requirements of the Water UK/Water Research Centre publication `Sewers for Adoption' (current edition).

3. All connections to existing public sewers to be in accordance with and to the satisfaction of the Local Authority.

4. Concrete protection (bedding class `Z') to pipework to be provided as follows;
(i) all pipework within soft areas with a cover of less than 600mm.
(ii) all pipework beneath roads, car parks and all other trafficked hardstanding areas with a cover less than 1200mm.
(iii) all pipework adjacent to existing and proposed trees/dense vegetation in landscaped areas.
An expansion joint shall be provided at all joint locations.

5. All below ground foul drainage from within building footprint to be 100mm dia. unless stated otherwise. Refer to separate note for recommended minimum gradients.
All below ground surface water drainage from RWP locations to main carrier drains to match the diameter of the downpipe (to Architect's and specialist contractor's details) unless stated otherwise.
All below ground drainage from road gullies to be 150mm dia. unless stated otherwise.

6. All pipework in manholes are to be laid soffit to soffit unless noted otherwise. All chamber invert levels, shown on the drawing, are for the outgoing pipe.

7. All internal drainage to be to the Architect's and M & E Engineer's drawings and details.

8. The position and invert levels of all existing drains, sewers and manholes to be confirmed by the contractor prior to the commencement of the proposed works and any discrepancies reported immediately to Capita Property and Infrastructure Ltd.

9. All pipes are to have a class `S' bed and surround unless noted otherwise (see note 4 above).

10. All concrete pipes are to be high strength and to be in accordance with BS EN 1916 and BS 5911.

11. All vitrified clay pipes are to be in accordance with BS EN 295.

12. Refer to drawing nos. xxxxxx-CA-0-GF-DR-S-xxx and xxx for drainage construction details.

13. For setting out of foul and rainwater outlets refer to the Architect's drawings.

14. This drawing to be read in conjunction with all other relevant Engineer's and Architect's drawings, specifications and documentation.

15. The contractor is to allow for grease traps in the kitchen and other appropriate areas.

16. Drainage channels and silt pits to be designed by a specialist manufacturer for critical storms of 1:5 year return period, to suit site conditions and in accordance with load class requirements as shown on the plan.
Design to be submitted for comment to Capita Property and Infrastructure Ltd. prior to ordering.

17. All external finished levels and manhole cover levels shown on this drawing are indicative and subject to adjustment on site to suit the finished ground levels. For final levels refer to the Architect's drawings.

18. All levels are in metres and all dimensions are in millimetres unless noted otherwise.

19. Any coordinates provided for manholes or inspection chambers are relevant to the main drainage run intersection and not the centre of the manhole.

20. Chalk and limestone are not to be used as bedding or backfilling material in soils with a pH value less than 7.

21. A CCTV drainage survey is to be carried out both at the pre-commencement of construction and at the completion of the contract to prove the integrity of the as-built drainage systems. At the completion of the contract this is to be carried out prior to the issue of the practical completion certificate.

22. Sewers, manholes, gullies, drainage channels and silt pits should be inspected at 6 monthly intervals and cleaned out at 12 monthly intervals. A full CCTV survey should also be carried out at 10 yearly intervals. Refer also to specialist drainage channel and petrol interceptor manufacturer's information and maintenance requirements.
In all instances, inspection and cleaning should be carried out only by a specialist contractor and in accordance with the guidelines given in `Safe Working in Sewers and at Sewage Works' published by National Joint Health and Safety Committee for the Water Services.

Important Note:
The Contractor is to exercise extreme care when excavating for drainage pipes and manholes and not to undermine existing or new column bases and/or strip footings already cast. Refer also to note 4 on this drawing and `concreting of drains laid near foundations' detail on drawing xxxxxx-CA-0-GF-DR-S-xxx.

For new construction, column foundations/strip footings must be taken down to below invert level of any nearby, adjacent services (drainage, gas, water, etc.)

Use of Thermoplastic Pipes
If thermoplastic pipes are to be used they are to be of the structured wall type and shall comply with WIS 4-35-01 and BS EN 13476 and must be BSI Kitemarked (e.g. Polysewer/Ridgisewer by Polypipe Civils, UltraRib by Wavin or similar). Pipes are to be installed strictly in accordance with the manufacturer's requirements and recommendations. Note: all installation must be in accordance with Building Regulations Part: H, BS EN 752:2008, Specification for Highway Works and all relevant British and European Codes of Practice.

Refer to the Architect's details for the internal, above ground, drainage layout.
Recommended minimum gradients for below ground foul drainage connections:
100 dia. at 1:40,
100 dia. at 1:80 with min 1 no. wc connection,
150 dia. at 1:150 with min 5 no. wc connections.
Final foul drainage connections to be coordinated with the Architect's internal drainage layout plans.

All other design team elements, where indicated, have been imported from the consultant's drawings and reference should be made to the individual consultant's drawings for exact setting out, size and type of component.

Discrepancies and / or ambiguities within this drawing, between it and information given elsewhere, must be reported immediately to the architect for clarification before proceeding.

All works are to be carried out in accordance with the latest British Standards and Codes of Practice unless specifically directed otherwise in the specification.

All setting out to be in accordance with the Architect's details. (the Architect's drawings to take precedence over any setting out shown on this drawing).

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

Refer to the relevant Construction (Design and Management) documentation where applicable.

It is assumed that all works on this drawing will be carried out by a competent contractor, working where appropriate to an approved method statement.

LEGEND

Symbol	Description
	existing foul water drain with manhole
	existing surface water drain with manhole
	new foul water drain with manhole
	new surface water drain with manhole
	new surface water manhole with vented cover
	linear drainage channel
	permeable paving
	flow regulator
162.095	spot level
162.095	existing spot level
	concrete protection to pipework adjacent to tree roots
CL	Cover Level
IL	Invert level
SL	Sump level
S/A	Soakaway
RAI	Reverse Action Interceptor
bd	backdrop
re	rodding eye
svp	soil & vent pipe (rodable)
wvp	waste and vent pipe (rodable)
ss	stub stack (rodable)
sg	shower gully (rodable)
sp	silt pit (rodable)
ra	rodding access
rg	450Ø x 900 deep precast concrete trapped, rodable, road gully with grating area greater than 900cm²
fg	floor gully (rodable)
rwp	rainwater downpipe (rodable)
psdp	primary siphonic downpipe
ssdp	secondary siphonic downpipe
vp	vent pipe (oil separator)
aav	air admittance valve
TOB	Top of base level
CI	Cast Iron
VC	Vitrified Clay
R	Flexible `Rocker' joint
PPIC	Polypropylene inspection chamber

Note: Final setting out of all drainage points at ground level to the Architect's and M and E Engineer's details.

Rev	Date	By	Description	Rev' check
P05	20.03.18	GM	Surface water pipe sizes, pipe gradients and storage volumes upgraded to cater for HBC's requirement of Cv of 0.925. Modular geo-void storage tanks replace Tubosider. Flow control details updated to suit and sumps added to flow control manholes. Layout of siphonic drainage updated.	WFG
P04	20.03.17	GM	Site layout updated in accordance with the Architect's latest requirements (MSA model MS101-D2-Site Layout Plan dated 10.03.2017) and drainage layout and external levels updated to suit. All car parking areas now permeable paving in accordance with the Architect's latest requirements. By-pass separator removed from Unit 4 car park.	WFG
P03	23.02.17	GM	Site layout updated in accordance with the Architect's latest requirements (MSA model MS101-Site Layout Plan dated 20.02.2017) and drainage layout and external levels updated to suit. Vented manhole covers indicated.	WFG
P02	24.01.17	GM	Pipe 1.005 (Unit 4) increased from 225Ø to 300Ø. Surface water storage tank for Unit 1 increased in length by 1.000m. Details of surface water flow controls updated in line with Planning requirements.	WFG
P01	21.06.16	GM	Pipe design numbers added. Ponding volumes updated following further design.	WFG

Drawing status
PRELIMINARY

Client
SEGRO
WHERE BUSINESS WORKS

Project
FORMER NESTLE SITE
HAYES

Drawing
DRAINAGE LAYOUT
AND EXTERNAL LEVELS

SHEET 1 OF 2

Scale @ A0	Drawn	Checked
1:250	G. Males	NRB
Project No.	**Date**	**Office**
CS/075666	Apr 2016	WATFORD

Drawing Identifier — BS1192:2007 / Avanti Compliant

project	origin	zone	level	file type	role	number	revision
075666	CA	0	GF	DR	S	010	P05

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