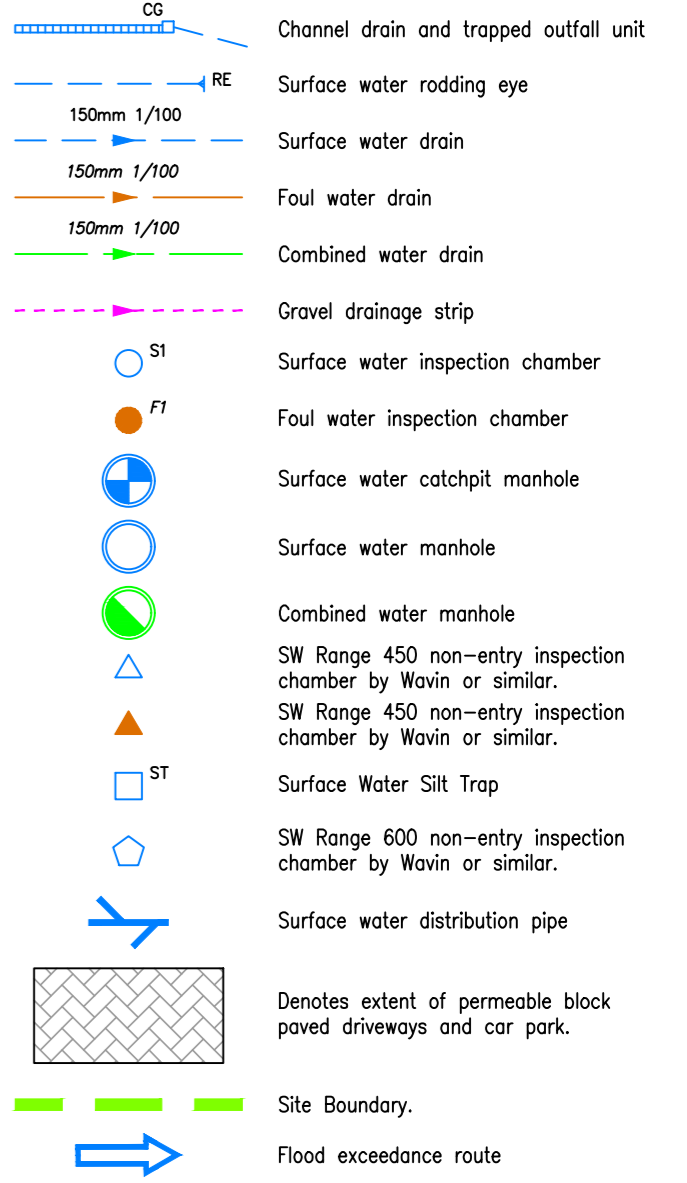


DO NOT SCALE

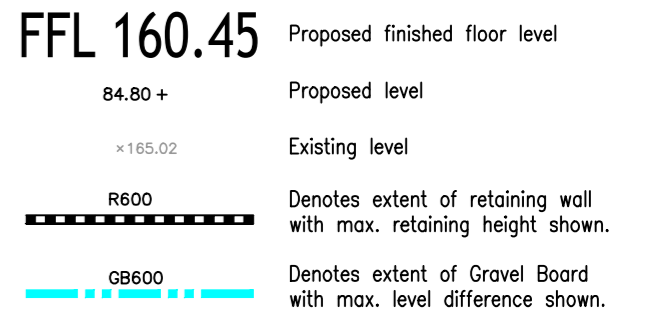
ENGINEERING NOTES

- This drawing is to be read in conjunction with all relevant Architects, Engineers, Subcontractors drawings and details.
- This drawing is based on topographical survey by Monument Geomatics:
Drawing Number MG2070_2D-S1
Date April 2021
- All levels relate to levels given on survey drawing.
- Refer to Architects drawings for details of all paving types & patterns, soft landscaping, fences, gates & bollards.
- For lighting, service supplies & ducting requirements, refer to M&E drawings.
- All works to be carried out in accordance with Design and Construction Guidance, BS EN 752 "Drain and sewer systems outside buildings" and the current edition of The Building Regulations "Approved document H".
- New drainage connections are to be made with appropriate lengths of rocker pipes & couplings.
- All manhole chamber covers to be installed parallel to final kerbs, edgings, paving joints or building lines as appropriate.
- This drawing details all below ground drainage up to finished floor level. For details of drainage above finished floor level, refer to Architects drawings.
- All stack connections under buildings to be minimum 100mm diameter solid PVC-U to BS EN 1401-1/BS4660 & laid at a minimum gradient of 1 in 40 unless otherwise noted. If the stack is greater than 100mm then the diameter of the connection is to be increased to match it.
- All RWP connections to be minimum 100mm diameter solid PVC-U to BS EN 1401-1/BS4660 & laid at a minimum gradient of 1 in 80 unless otherwise noted. If the RWP is greater than 100mm then the diameter of the connection is to be increased to match it.
- All private foul water pipework up to 150mm in diameter to be PVC-U to BS EN 1401-1/BS4660.
- All private surface water pipework up to 150mm in diameter to be solid PVC-U to BS EN 1401-1/BS4660. All private surface water pipework 225mm and above to be structured wall plastic sewer pipe complying with clause 518 of the specification for highway works.
- Concrete manholes shall comply with BS EN 1917 and BS 5911-3.
- Plastic chambers shall comply with BS 7158.
- All adoptable foul water and surface water pipework up to 225mm in diameter to be Kitemark certified Vitriified Clay (VC) with flexible spigot and socket joints and shall comply with the requirements of BS EN 295. All adoptable foul water and surface water pipework 300mm and above to be concrete sewer pipe with flexible spigot and socket joints and shall comply with the requirements of BS EN 1916 and BS 5911-1: Part 1.
- On completion of development all drainage shall be jet cleaned and CCTV surveyed.
- Redundant drainage & services marked to be removed are to be dug out with chambers demolished & void filled with Type 1 material to clause 803 & 806.
- All road gully connections to be minimum 150mm diameter solid PVC-U pipework to BS EN 1401-1/BS4660 and laid at a minimum gradient of 1 in 150.
- All existing services shown are based on topographical survey by Monument Geomatics. Location of all services in close proximity to works should be confirmed by means of trial pits under supervision of statutory undertaker & in accordance with HSE document "Avoiding Danger from Underground Services".

DRAINAGE LEGEND



LEVELS LEGEND



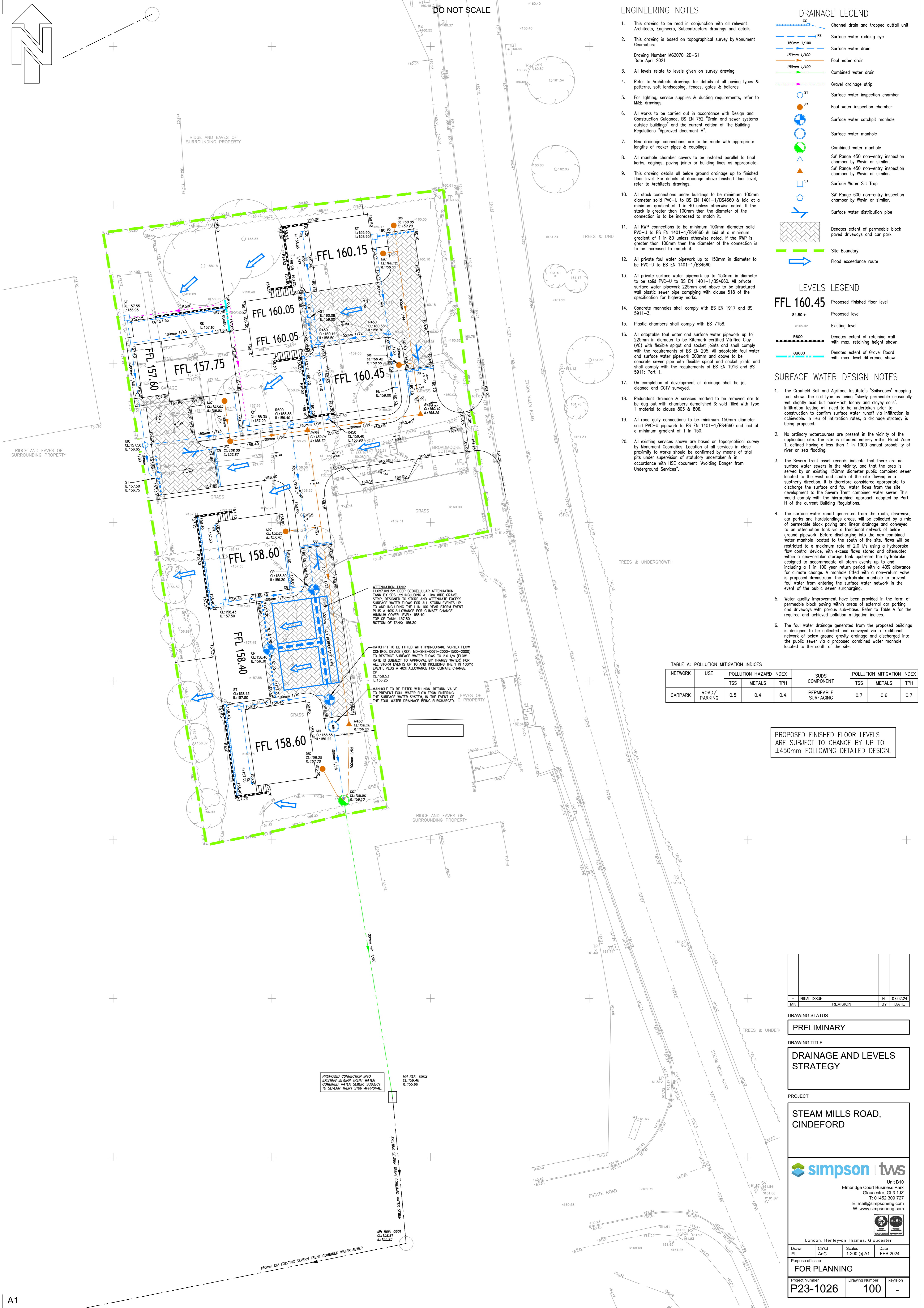
SURFACE WATER DESIGN NOTES

- The Cranfield Soil and Agrifood Institute's "Soilsopes" mapping tool shows the soil type as being "slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils". Infiltration testing will need to be undertaken prior to construction to confirm surface water runoff via infiltration is achievable. In lieu of infiltration rates, a drainage strategy is being proposed.
- No ordinary watercourses are present in the vicinity of the application site. The site is situated entirely within Flood Zone 1, defined having a less than 1 in 1000 annual probability of river or sea flooding.
- The Severn Trent asset records indicate that there are no surface water sewers in the vicinity, and that the area is served by an existing 150mm diameter public combined sewer located to the west and south of the site flowing in a southerly direction. It is therefore considered appropriate to discharge the surface and foul water flows from the site development to the Severn Trent combined water sewer. This would comply with the hierarchical approach adopted by Part H of the current Building Regulations.
- The surface water runoff generated from the roofs, driveways, car parks and hardstandings areas, will be collected by a mix of permeable block paving and linear drainage and conveyed to an attenuation tank via a traditional network of below ground pipework. Before discharging into the new combined water manhole located to the south of the site, flows will be restricted to a maximum rate of 2.0 l/s using a hydrobrake flow control device, with excess flows stored and attenuated within a geo-cellular storage tank upstream of the hydrobrake designed to accommodate all storm events up to and including a 1 in 100 year return period with a 40% allowance for climate change. A manhole fitted with a non-return valve is proposed downstream of the hydrobrake manhole to prevent foul water from entering the surface water network in the event of the public sewer surcharging.
- Water quality improvement have been provided in the form of permeable block paving within areas of external car parking and driveways with porous sub-base. Refer to Table A for the required and achieved pollution mitigation indices.
- The foul water drainage generated from the proposed buildings is designed to be collected and conveyed via a traditional network of below ground gravity drainage and discharged into the public sewer via a proposed combined water manhole located to the south of the site.

TABLE A: POLLUTION MITIGATION INDICES

NETWORK	USE	POLLUTION HAZARD INDEX			SUDS COMPONENT	POLLUTION MITIGATION INDEX		
		TSS	METALS	TPH		TSS	METALS	TPH
CARPARK	ROAD/PARKING	0.5	0.4	0.4	PERMEABLE SURFACING	0.7	0.6	0.7

PROPOSED FINISHED FLOOR LEVELS ARE SUBJECT TO CHANGE BY UP TO ±450mm FOLLOWING DETAILED DESIGN.



ATTENUATION TANK
11.0m x 6.5m DEEP GEOCELLULAR ATTENUATION TANK BY SUDS 114 INCLUDING A 1.0m WIDE GRAVEL STRIP, DESIGNED TO STORE AND ATTENUATE EXCESS SURFACE WATER FLOWS FOR ALL STORM EVENTS UP TO AND INCLUDING THE 1 IN 100 YEAR STORM EVENT PLUS A 40% ALLOWANCE FOR CLIMATE CHANGE. MINIMUM COVER LEVEL: 158.40 TOP OF TANK: 157.80 BOTTOM OF TANK: 156.30

CATCHPIT TO BE FITTED WITH HYDROBRAKE VORTEX FLOW CONTROL DEVICE (REF: MD-SHE-0061-2000-1500-2000) TO RESTRICT SURFACE WATER FLOWS TO 2.0 l/s (FLOW RATE IS SUBJECT TO APPROVAL BY THAMES WATER) FOR ALL STORM EVENTS UP TO AND INCLUDING THE 1 IN 100R EVENT PLUS A 40% ALLOWANCE FOR CLIMATE CHANGE. CL:158.53 IL:156.25

MANHOLE TO BE FITTED WITH NON-RETURN VALVE TO PREVENT FOUL WATER FLOW FROM ENTERING THE SURFACE WATER SYSTEM IN THE EVENT OF THE FOUL WATER DRAINAGE BEING SURCHARGED.

PROPOSED CONNECTION INTO EXISTING SEVERN TRENT WATER COMBINED WATER SEWER, SUBJECT TO SEVERN TRENT SUDS APPROVAL.

MH REF: 0902
CL:159.40
IL:155.60

MH REF: 0901
CL:158.81
IL:156.23

-	INITIAL ISSUE	EL	07.02.24
MK	REVISION	BY	DATE

DRAWING STATUS
PRELIMINARY

DRAWING TITLE
DRAINAGE AND LEVELS STRATEGY

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Drawn: EL, Chkd: AdC, Scales: 1:200 @ A1, Date: FEB 2024

Purpose of Issue
FOR PLANNING

Project Number	Drawing Number	Revision
P23-1026	100	-