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- LEGEND
- SITE BOUNDARY
 - - - - - EXISTING FOUL WATER DRAINAGE
 - - - - - EXISTING COMBINED WATER DRAINAGE
 - - - - - EXISTING SURFACE WATER DRAINAGE
 - EXISTING COMBINED WATER MANHOLE
 - EXISTING SURFACE WATER MANHOLE
 - EXISTING FOUL WATER MANHOLE

P01 25/10/19 FOR INFORMATION MB AY
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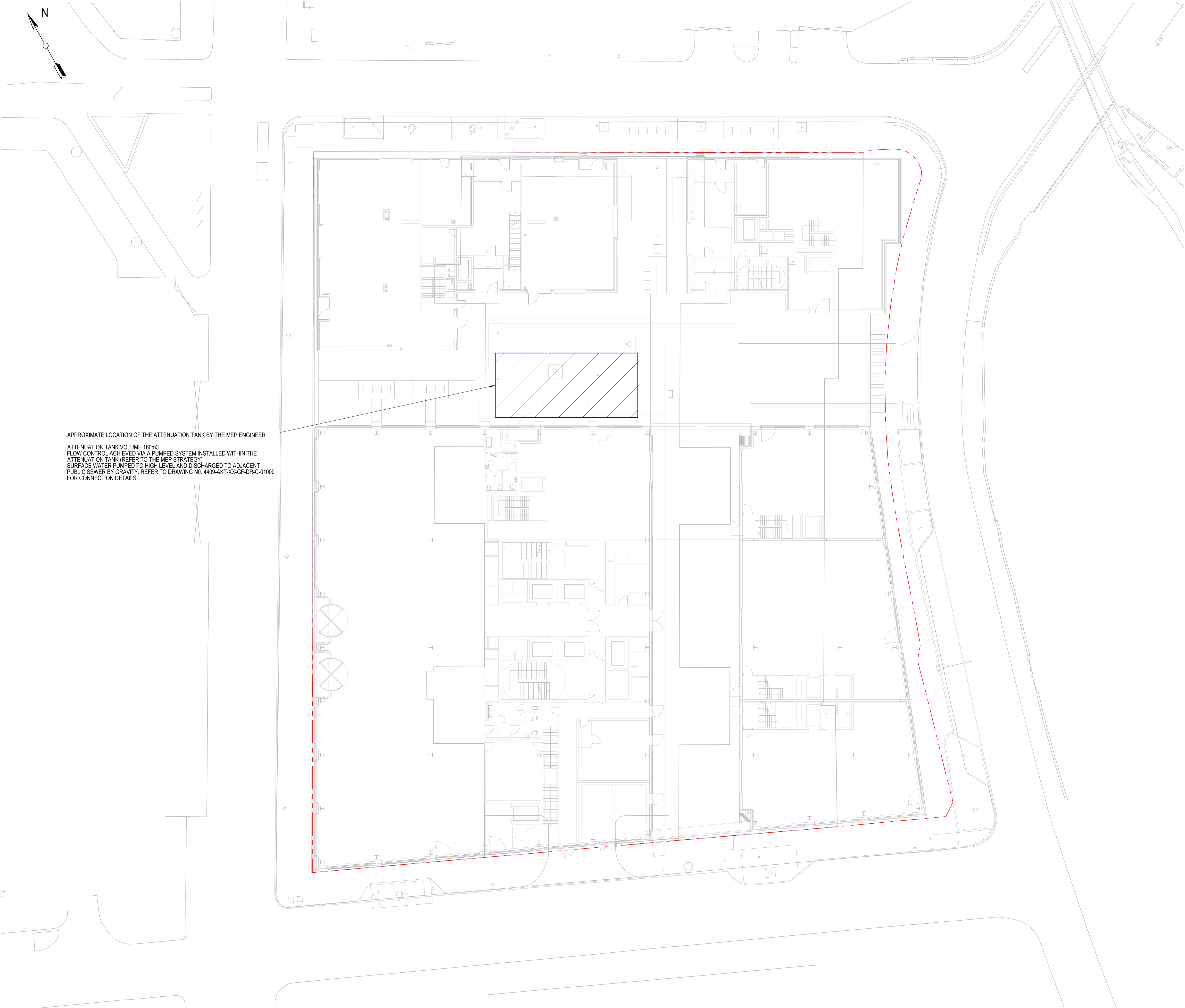
PROJECT

EXISTING SEWER
CONNECTIONS

TITLE

MB	16.09.2019	AY	A1
DRAWN BY	DRAWN DATE	CHECKED BY	SHEET SIZE
4409	STAGE 2	S2	1:250
PROJECT NO.	PROJECT STAGE	SUITABILITY CODE	SCALE

4409 AKT XX XX DR C 00500 P1
PROJECT ID ORIGINATOR ZONE LEVEL TYPE ROLE DRAWING NO. REVISION



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LEGEND

--- SITE BOUNDARY

ATTENUATION TANK

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P01	25/10/19	FOR INFORMATION	MB	AY
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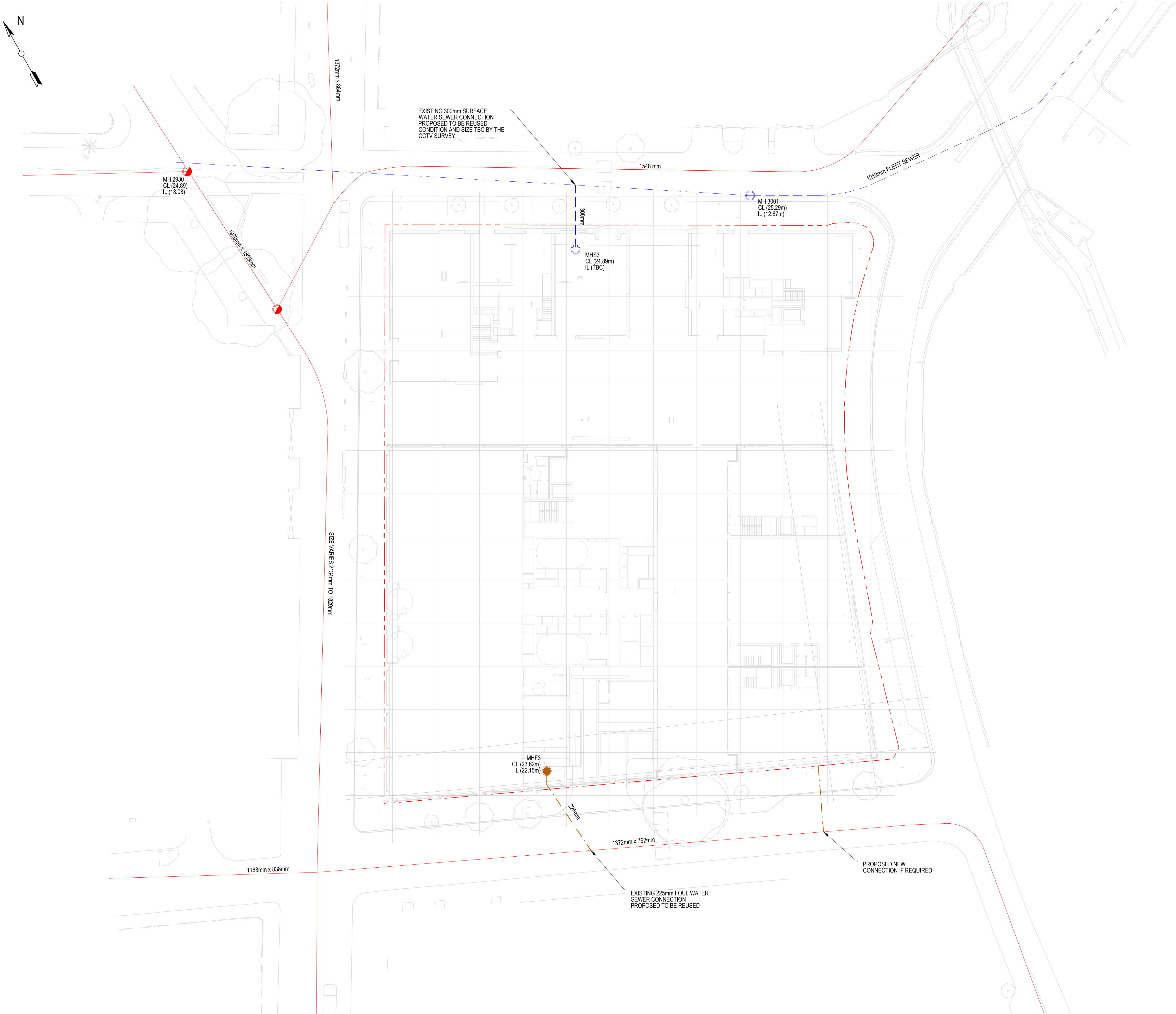
PROJECT

BASEMENT DRAINAGE
GENERAL ARRANGEMENT

TITLE							
MB	16.09.2019	AY	A1				
DRAWN BY	DRAWN DATE	CHECKED BY	SHEET SIZE				
4409	STAGE 2	S2	1:200				
PROJECT NO.	PROJECT STAGE	SUITABILITY CODE	SCALE				

4409	AKT	XX	B1DR	C	00980	P2		
PROJECT ID	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	DRAWING NO.	REVISION	

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PROPOSED SEWER
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4409		STAGE 2		S2		1:250	
PROJECT No.		PROJECT STAGE		SUITABILITY CODE		SCALE	
4409 AKT XX GF DR C 01000 P1							
PROJECT ID		ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	DRAWING No.
		REVISION					

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Appendix J

SuDS Maintenance Statement



5 Maintenance Strategy

Conventional Drainage and Sustainable Urban Drainage Systems (SUDS) require regular maintenance to continue to perform as designed. Recommended maintenance regimes for the systems selected for use on this development are discussed below and will be written into the O&M Manual.

O&M Manual shall contain the following:

- Location of all SUDS facilities on site
- A summary of how the techniques work, their purpose and guidance on the “do’s & don’ts” of daily use.
- A maintenance plan and a maintenance record sheet
- Advice regarding what to do if construction works take place in or on the SUDS features.

Permeable Pavements

Operation and maintenance requirements

Regular inspection and maintenance is important for the effective operation of pervious pavements. Before handing over the facility to the client, it should be inspected for clogging, litter, weeds and water ponding and all failures should be rectified. After handover, the facility should be inspected regularly, preferably during and after heavy rainfall to check effective operation and to identify any areas of ponding.

Pervious surface need to be regularly cleaned of silt and other sediments to preserve their infiltration capability. Experience in the UK is limited, but advice issued with permeable precast paving has suggested a minimum of three surface sweeping per year. Manufacturer’s recommendations should always be followed.

A brush and suction cleaner, which can be a lorry-mounted device or smaller precinct sweeper, should be used and the sweeping regime is as follows:

- End of winter (April) – to collect winter debris.
- Mid-summer (July/August) – to collect dust, flower and grass type deposits.
- After autumn leaf fall (November).

Care should be taken in adjusting vacuuming equipment to avoid removal of joining material. Any lost material should be replaced.

The likely design life (or period before pavement rehabilitation is required) has yet to be established for UK. However, it should be no different from standard paving assuming that an effective maintenance regime is in place to minimise the risk of infiltration clogging.

All silt trapped gullies and drainage channels, silt traps, manholes and catchpits to be regularly inspected every three months and cleared out on a regular frequency for the first nine months. After this period, the frequency can be reduced to every six months.

If reconstruction is necessary, the following procedure should be followed;

- Lift surface layer and laying course.
- Remove any geo-textile filter layer.
- Inspect sub-base and remove, wash and replace if required.
- Renew laying course, joining material and concrete block paving.

The reconstruction of failed areas of concrete block pavement should be less costly and disruptive than the rehabilitation of continuous concrete or asphalt porous surfaces due to the reduced area that is likely to be affected. Material removed from the voids or layers below the surface may contain heavy metals and hydrocarbons and may need to be disposed of as controlled waste. Sediment testing should be carried out before disposal to confirm its classification and appropriate disposal methods.

Maintenance plans and schedules should be prepared during the design phase. Specific maintenance needs of pervious pavement should be monitored and maintenance schedules adjusted to suit requirements.

Maintenance Schedule	Required action	Frequency
Regular maintenance	Brushing and vacuuming	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site specific observations of clogging or or manufacturers' recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required.
	Removal of weeds.	As required.
	Remediate any landscaping which , through the vegetation maintenance or soil slip, has been raised to within 50mm of the level of paving	As required.
Remedial actions	Remedial works to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users.	As required.
	Rehabilitation of surface and upper sub-structure.	As required (if infiltration performance is reduced as a result of significant clogging).
	Initial inspection.	Monthly for 3 months after installation.
Monitoring	Inspect for evidence of poor operation and/or weed growth. If required take remedial action.	3 monthly. 48h after large storms.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually.
	Monitor inspection chamber.	Annually.

Table 1 - Pervious pavements maintenance schedule

Hydrobrakes

Operation and maintenance requirements

Chamber is to be regularly inspected once a year and any debris and silt are to be removed from the sump

Blue / Green Roofs

Ensure safe access can be gained to the roof and that relevant Health and Safety procedures are followed when working at roof level. It is advised that the contractor should always seek proof of current maintenance for any roof access, fall arrest / restraint systems prior to proceeding with the work on site.

The level of maintenance required is dependent on the final finish. Paved podium decks and extensive green roofs are relatively low maintenance where as intensive green roofs require maintenance like any garden.

Remove all dead vegetation and debris from the roof and ensuring all outlets, gutters and downpipes are clear. Where the species mix incorporates wild flowers and grasses it is recommended that all dead vegetation is mown / strimmed down and the waste is removed from the roof and disposed off.

Any vegetation which has encroached into drainage outlets, walkways and the vegetation barriers (pebbles) should be

removed. Weeding an extensive green roof is necessary to maintain a healthy roof and all aggressive species of shrub sapling and undesirable plants should be removed. Some weeds however are helpful to the biodiversity of the roof and considered as a problem only of aesthetics. If considered excessive, they can be removed ensuring that care is taken to follow specific instructions as to the type and species of vegetation removed. All extensive green roof installations will at times include some moss and grass.

Areas of dead vegetation / bare patches can be easily repaired and this is best done during the main growing seasons of March/ April or from late August until the end of September. Take plug plants (new) or vegetation cuttings from surrounding areas of healthy mature plants and place on bare patches, pressing gently into the soil. A light sprinkling of sand mixed with compost should then be dressed over the affected area and watered to improve the uptake of the cuttings. If the vegetation is showing signs of distress, but has received regular rainfall, then the most likely problem is a lack of nutrient and a fertiliser should be applied.

Remove the lids of all Inspection chambers, ensure that all rainwater outlets and downpipes are free from blockages and that water can flow freely away, clean filters to outlets twice yearly and replace every three years. Ensure that any protective metal flashings and termination bars remain securely fixed in place.

Examine all mastic sealant and mortar pointing for signs of degradation. Check that all promenade tiles and paving slabs are securely fixed to the roof surface and in good condition.

Advise the client of the need to repair or renew any defects as necessary.

Ensure that any new items of plant/equipment on the roof are mounted on suitable isolated slabs and that any fixings used to secure the plant/equipment in place do not penetrate the waterproofing. Report signs of damage or degradation to the waterproofing to ABG immediately, in order that arrangements can be made for remedial work to be carried out if necessary. It is recommended that a record is kept of the findings of the inspection to avoid confusion and provide an on-going record of roof performance. Plants suitable for an extensive green roof which will colonise in partial and full shade will generally be greener in colour and grow “taller” in these locations. There will be a significant variance in the growth and colour between the plants growing in full or partial shade and those exposed to full sunlight and this should be recognised as a feature of the biodiversity of each individual roof.

Outlets from blue roof

Inspection chambers containing orifice plates to be inspected regularly in accordance with the manufacturer recommendations (minimum twice annually):

- Remove litter and blockages as required
- Records of inspections and maintenance undertaken should be kept by the client.
- Check orifice plate for any sign of blockages

