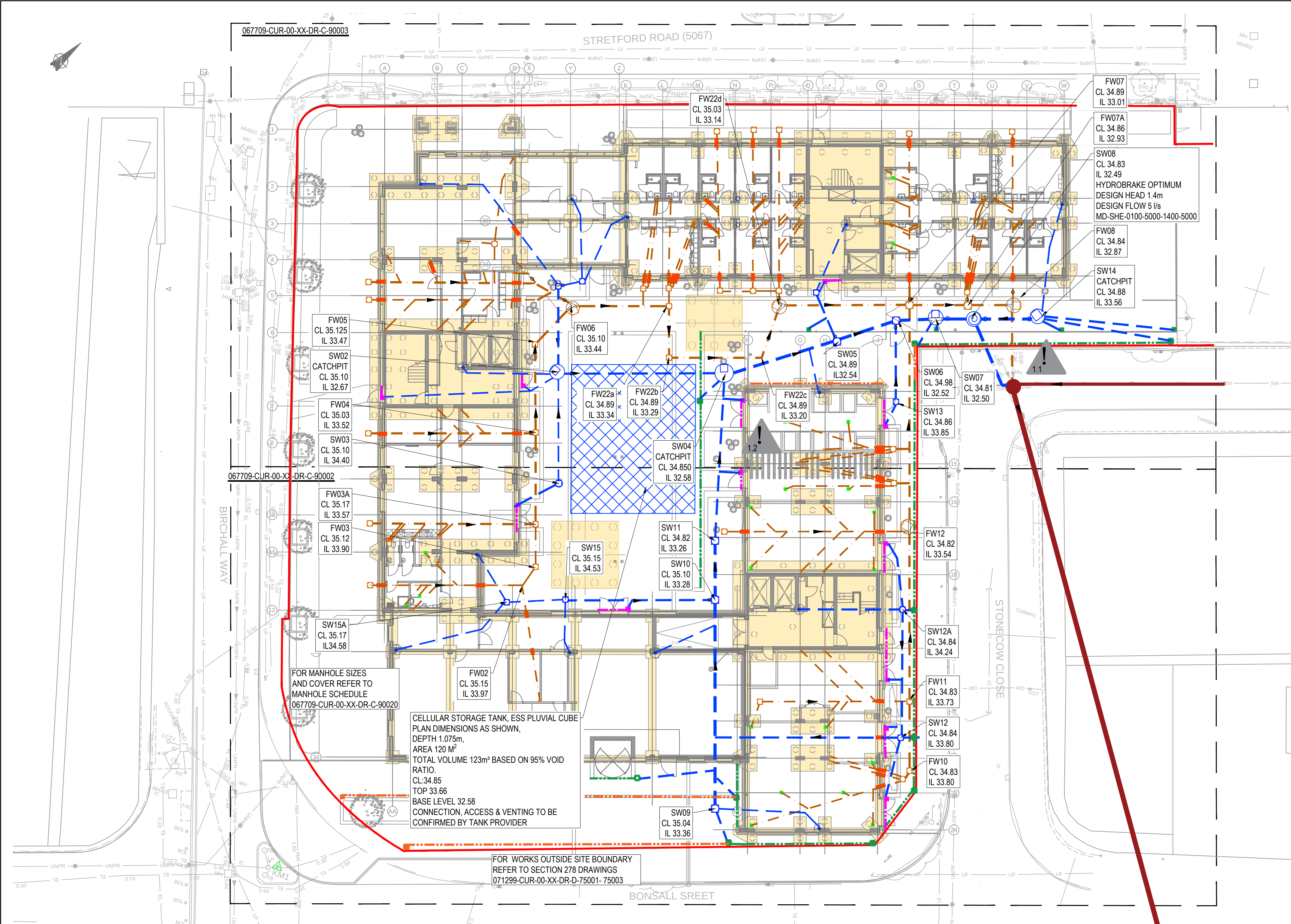




KEY

- PROPOSED HIGHWAY BOUNDARY BASED ON 071299-CUR-00-XX-DR-D-75001
- EXISTING PUBLIC COMBINED SEWER
- PROPOSED FOUL WATER DRAINAGE
- PIPE TO BE ABANDONED
- SS SVP
- SC FG
- RWP
- PROPOSED RWP BASED ON ARCHITECT DRAWING
- PROPOSED SURFACE WATER DRAINAGE
- PIPE THROUGH GROUND BEAM/ PILE CAP
- PROPOSED GATIC SLOT DRAIN - CASTSLOT 150MM - B125
- PROPOSED GATIC SLOT DRAIN - CASTSLOT 150MM - D400
- PROPOSED GATIC FASADE SLOT DRAIN 115MM
- OU
- AB
- PROPOSED CELLULAR ATTENTION TANK
- PROPOSED FLOW CONTROL MANHOLE
- FOUNDATIONS REFER TO STRUCTURES LAYOUTS
- IT
- BD
- YG
- AF
- BL

SLOTS HAVE BEEN ISSUE TO GATIC SOR SIZE CONFIRMATION AND QUOTATION

CONTRACTOR SHOULD PROVIDE TANK DETAIL FOR APPROVAL

FLOW CONTROL SPECIFICATION SHOULD BE PROVIDED FOR APPROVAL

RESIDUAL HAZARD REGISTER
HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS.

HAZARD REF No.	ITEM (FEATURE, ELEMENT OR ACTIVITY)	RESIDUAL HAZARD
1.1	CONSTRUCTION	DEEP EXCAVATION WITHIN HIGHWAYS
1.2	CONSTRUCTION	EXISTING CULVERT FOUND DURING EXCAVATION, ALL CONNECTIONS TO CULVERT NOT CONFIRMED. IF DURING PROPOSE DRAINAGE CONSTRUCTION, PROPOSED DRAINAGE CLASH WITH EXISTING LIVE CONNECTIONS. ENGINEER SHOULD BE INFORMED.

GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN.
- ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
- IT IS ADVISED THAT THE CONTRACTOR SURVEY RETAINED EXISTING DRAINAGE PRIOR TO COMMENCEMENT TO CONFIRM LOCATION AND CONDITION. POTENTIAL PRE-CLEANSING TO BE UNDERTAKEN IN ORDER TO FACILITATE SURVEY IF REQUIRED.
- ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
- ALL EXISTING SERVICES TO BE ABANDONED SHALL BE EITHER REMOVED OR GROUTED UP IF NOT POSSIBLE. GROUTING TO BE PERFORMED BY CAPPING ALL ENDS / CONNECTIONS AND FILLING THE RETAINING VOID WITH GROUT, IN ACCORDANCE WITH CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION (CESWI) 7th EDITION.
- ALL SOFT SPOTS TO BE REMOVED FROM BOTTOM OF EXCAVATIONS AND TO BE FILLED TO FORMATION LEVEL IN ACCORDANCE WITH GROUNDWORKS SPECIFICATIONS.
- RAISED GROUND MUST BE FILLED IN ACCORDANCE WITH GROUNDWORKS SPECIFICATIONS AND CONSOLIDATED BEFORE ANY SEWER WORKS ARE CARRIED OUT.
- ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2008 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
- ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
 - 100mm to 300mm DIA TO BE VITRIFIED CLAY.
- ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
- PIPE MATERIALS IN ACCORDANCE WITH THE FOLLOWING:

- ALL VITRIFIED CLAY PIPES TO BS EN 295-1.
- ALL CONCRETE MANHOLES TO BE TO BS EN1917.

- AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.
- ALL PRIVATE DRAINAGE PIPES WITH A COVER OF LESS THAN 600mm IN NON-TRAFFICKED AREAS AND LESS THAN 900mm IN TRAFFICKED AREAS TO BE BEDDED AND SURROUNDED IN CONCRETE (CLASS Z). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS S. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.
- BACKFILL TO DRAINAGE TRENCHES UNDER HARDSTANDING AREAS TO BE TYPE 1 SUB BASE MATERIAL, ELSEWHERE BACKFILL TO BE FREE DRAINING READILY COMPATIBLE MATERIAL FREE FROM DETRITUS, ORGANIC MATTER, FROZEN SOIL, CLAY LUMPS AND LARGE STONES. TO BE COMPACTED IN LAYERS NOT EXCEEDING 150mm THICK.
- BEDDING AND BACKFILL MATERIALS TO CONFORM TO THE REQUIREMENTS OF WIS 4-08-02 (TABLE A2).
- WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSEOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.
- THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS PRACTICABLE SO AS TO PROVIDE A FLEXIBLE JOINT AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF THE CONCRETE SURROUND AND CONNECTED TO A LENGTH OF ROCKER PIPE.
- ALL CONNECTIONS PASSING THROUGH BASES OR EDGE BEAMS TO BE IN SEALED SLEEVES. ALTERNATIVELY CONNECTIONS MAY BE CAST-IN WITH FLEXIBLE JOINTS NOT GREATER THAN 150mm FROM FACE OF CONCRETE.
- WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS Z). COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE.
- WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS S BEDDING IS ACCEPTABLE.
- SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
- PLASTIC CHANNEL SECTIONS WILL NOT BE PERMITTED WITHIN MANHOLE CHAMBERS. CLAYWARE CHANNELS SHALL BE USED WITHIN MANHOLES FOR PIPE SIZES UP TO AND INCLUDING 300mm DIAMETER.
- ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS LEVEL' UNLESS OTHERWISE NOTED.
- SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A

LABORATORY REPORT PROVIDED TO PROVE THAT SUCH PRECAUTIONS ARE NOT REQUIRED.

- SEWERS MUST HAVE 5m CLEARANCE FROM TREES AND HEDGES OR TO HAVE SUITABLE ROOT PROTECTION IN ACCORDANCE WITH SFA REQUIREMENTS.
- THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
- ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.
- RAINWATER AND FOUL WATER POP UP LOCATIONS AND SIZES TO BE CONFIRMED BY ARCHITECT AND M&E ENGINEER.
- ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.
- ALL ACCESS FITTINGS, STACKS, RWP'S AND GULLIES TO BE RODDABLE. ALL TO HAVE LOW LEVEL RODDING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.
- LARGE ACCESS FITTING REQUIRED ABOVE GROUND WHERE GREATER THAN 12M UP TO 22M TO A JUNCTION. SMALL ACCESS FITTING REQUIRED UP TO 12M TO A JUNCTION.
- ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND RODDABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.
- ALL BRANCH CONNECTIONS TO BE MADE WITH SWEEP BENDS IN THE DIRECTION OF FLOW IN THE MAIN SEWER.
- ALL FOUL CONNECTIONS TO BE 1000 UNLESS NOTED OTHERWISE. WHERE NO WC'S ARE CONNECTED UPSTREAM, UNDERSLAB FW DRAINAGE TO BE LAID AT 1:40 MIN. AFTER THE CONNECTION OF AT LEAST 1 No. WC, A MIN. FALL OF 1:80 APPLIES.
- ALL SURFACE WATER CONNECTIONS TO BE 1500 UNLESS NOTED OTHERWISE, AT A MIN FALL OF 1:100.
- ALL INTERNAL COVERS TO HAVE MECHANICALLY JOINTED CORNERS AND DOUBLE SEALED WITH RECESSED 53. TRAY TO ALLOW FOR FINISHES.
- ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL.
- UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
 - B125 LOAD CLASS IN PEDESTRIAN AREAS
 - D400 LOAD CLASS IN VEHICULAR AREAS.

- COVER LEVELS, GULLY POSITIONS, AND BUILDING LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
- OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
- THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING:-
 - (I). ALL OPERATIONS SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE GENERAL HEALTH AND SAFETY POLICY OF THE DEVELOPER AS REQUIRED BY SECTIONS 2 OF THE HEALTH AND SAFETY AT WORK ACT 1974 AND IN PARTICULAR THE CONSTRUCTION (GENERAL PROVISIONS) REGULATIONS.
 - (II). THE LOCAL AUTHORITY AND UTILITIES COMPANIES ARE TO BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK ON SITE.
 - (III). PRIOR TO CONSTRUCTION THE ACTUAL POSITIONS AND DEPTHS OF SERVICES LIKELY TO BE AFFECTED BY THE WORKS SHOULD BE ESTABLISHED BY MEANS OF HAND DIG IN CLOSE LIAISON WITH THE UTILITY COMPANIES. THE CONTRACTOR SHALL IMMEDIATELY ADVISE THE ENGINEER OF ANY SERVICES EXPOSED WHICH MAY AFFECT THE DESIGN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT PIPES ARE ADEQUATELY PROTECTED FROM CONCENTRATED LOADING BY CONSTRUCTION TRAFFIC DURING THE CONSTRUCTION PERIOD.
- THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT, AND TEMPORARY AND PERMANENT DIVERSION WORKS, AS NECESSARY TO ALL EXISTING SERVICES.
- THE CONTRACTOR SHALL ALLOW FOR KEEPING TRENCHES AND EXCAVATIONS AS DRY AS PRACTICABLE BY PUMPING FROM TEMPORARY SUMPS AND DE-WATERING AS APPROPRIATE. THE POINT AND METHOD OF DISCHARGE TO BE AGREED WITH THE DRAINAGE AUTHORITY & LLFA AND ENVIRONMENT AGENCY.
- IT IS ADVISED THAT DRAINAGE WORKS ARE TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED.
- ALL DRAINS TO BE CCTV SURVEYED ON COMPLETION OF THE WORKS.
- PIPES SLOPES ARE SHOWN INDICATIVELY, DRAINAGE SHOULD BE BUILT TO INVERT LEVELS
- IT IS RECOMMENDED CONSTANT GRADIENT BETWEEN POPUP AND INSPECTION CHAMBER, IF IT IS NOT POSSIBLE TO ACHIEVE IT CAUSE OF FOUNDATION, REFER TO DETAILS FOR POSSIBLE SOLUTION

DRAWING REFERENCES

THE FOLLOWING DRAWINGS HAVE BEEN USED AS A BASIS FOR THE DESIGN SHOWN ON THIS DRAWING:

ARCHITECT DRAWING
6306-JMA-01-ZZ-M3-A-XX-0001 P10 ISSUED 02.09.19

LANDSCAPE DRAWING
BIR-DEP-00-00-DR-L-0001 T3 ISSUED 29.05.19

M&E INFORMATION
FOUL POP-UP LOCATIONS
6366-TAC-01-GF-DR-M-4001 Rev P2 ISSUED 26.11.18
6366-TAC-02-GF-DR-M-4001 Rev P3 ISSUED 26.11.18
6366-TAC-01-GF-DR-M-4001 Rev P2 ISSUED 26.11.18
6366-TAC-04-GF-DR-M-4001 Rev P2 ISSUED 26.11.18

DISCHARGE UNITS CALCULATED BASED ON M&E DRAWINGS.

RWPS LOCATION BASED ON
6306-JMA-01-ZZ-M3-A-XX-0001 P10 ISSUED 02.09.19
AREA FOR EACH RWPS BASED
ON6366-JMA-01-RF-DR-A-00-0001-S4-P04, ROOFPAN-MARKED AND HARMER
BUILDING DRAINAGE CALCULATION SP96570-DC2 08.04.19

PROPOSED EXTERNAL SERVICES
PROPOSED EXTERNAL SERVICES SKETCH PROVIDED 12.09.19

FOUNDATIONS DRAWINGS - CURTINS
1180B-CUR-00-FM-DR-S-170001-C4 20.06.19

TOPO SURVEY - SURVEY SOLUTION
18H081/001 ISSUED 09.18

ASSUMPTIONS

DISCHARGE UNITS AND SVP/SS POSITION
STAGES POPUP LOCATION NOT PROVIDED
POPUPS LOCATION AND DISCHARGE UNITS CALCULATED BASED ON STAGE 4
M&E DRAWINGS. CURTINS ENGINEER SHOULD BE CONTACTED IF ANY LAYOUT
CHANGES OR MORE FACILITIES CONNECTED TO DOWNPIPE TO CHECK IF
PROPOSED DRAINAGE HAS SUFFICIENT CAPACITY.

EXTERNAL LEVELS
DRAINAGE COVER LEVELS HAVE BEEN INTERPOLATED BETWEEN THE LEVELS
SHOWN ON LANDSCAPE ARCHITECT DRAWING

EXTERNAL SERVICES
SKETCH PROVIDED, PROPOSED EXTERNAL SERVICES SHOULD BE BUILT
AROUND PROPOSED DRAINAGE

DESIGN PHILOSOPHY

SW FLOW RATES

THE ALLOWABLE MAX. DISCHARGE RATE IS 5l/s AS APPROVED BY THE LLFA,
REFER TO FRA FOR DETAILS.

IMPERMEABLE ARE HAS BEEN CALCULATED AS APPROX. 0.26 Ha.

THE DRAINAGE MODEL HAS BEEN MODELLED WITH A SURCHARGED OUTFALL,
SET AT 32.18m AOD. THIS IS SET 1m ABOVE THE ASSUMED SOFFIT LEVEL OF
THE EXISTING PUBLIC COMBINED SEWER.

WATER TREATMENT

GREEN ROOFS ARE TO BE CONSTRICTED ON THE SECTIONS OF SINGLE
STOREY BUILDINGS.

FW PEAK FLOWS:

FOUL DRAINAGE HAS BEEN DESIGNED TO DISCHARGE UNITS CALCULATED
BASED ON STAGE 4 M&E DRAWINGS.

THE PEAK FOUL FLOW OF 19l/s HAS BEEN CALCULATED BASED ON
DISCHARGE UNIT METHOD, DU 1388

C02	TANK TYPE UPDATED	11/10/19	MW	MW
C01	ISSUED FOR CONSTRUCTION	19/09/19	MW	CG
Rev:	Description:	Date:	By:	Chk:



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Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kentish • Leeds • Liverpool • London • Manchester • Nottingham

Status:

CONSTRUCTION

Project:

MMU BIRLEY FIELDS STUDENT ACCOMMODATION

Orig Title:

PROPOSED DRAINAGE LAYOUT

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
067709	A1	24/09/18	MW	MW	CG
Scale:	1:200				
Project Code:	Originator:	Zone:	Level:	Type:	Discipline:
					Category/Number:

BF - CUR - XX - OG - DR - C - 90001 -C02