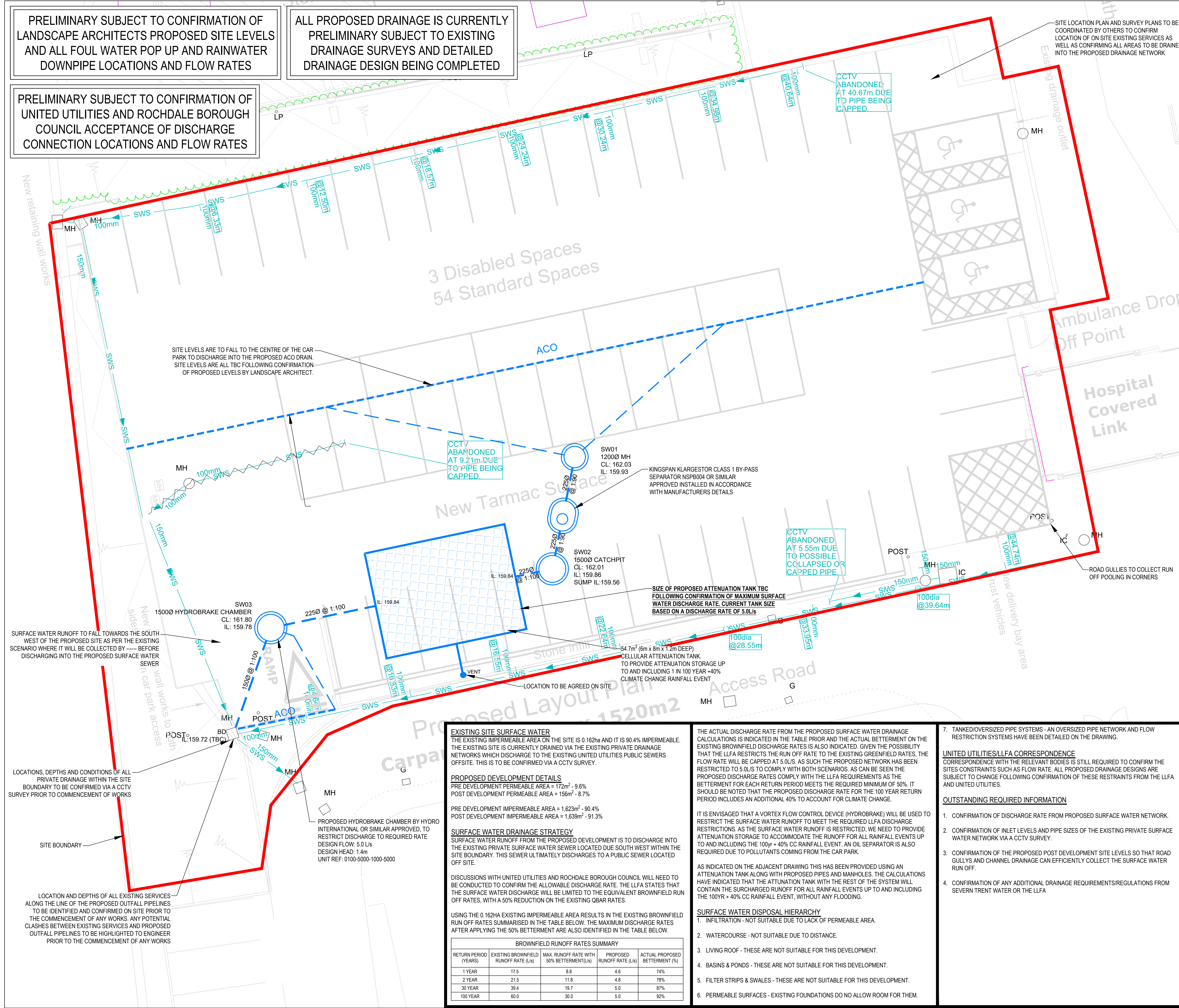


PRELIMINARY SUBJECT TO CONFIRMATION OF LANDSCAPE ARCHITECTS PROPOSED SITE LEVELS AND ALL FOUL WATER POP UP AND RAINWATER DOWNPIPE LOCATIONS AND FLOW RATES

ALL PROPOSED DRAINAGE IS CURRENTLY PRELIMINARY SUBJECT TO EXISTING DRAINAGE SURVEYS AND DETAILED DRAINAGE DESIGN BEING COMPLETED

PRELIMINARY SUBJECT TO CONFIRMATION OF UNITED UTILITIES AND ROCHDALE BOROUGH COUNCIL ACCEPTANCE OF DISCHARGE CONNECTION LOCATIONS AND FLOW RATES



- IMPORTANT NOTES**
- SETTING OUT SHALL BE UNDERTAKEN USING ONLY THE INFORMATION GIVEN. DISTANCES SHOULD NOT BE SCALED FROM THIS DRAWING.
 - ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SEWERS FOR ADOPTION 7TH EDITION AND UNITED UTILITIES DETAILS & GUIDELINES.
 - THE MINIMUM GRAVITY PIPE DIAMETER UNDER ADOPTABLE HIGHWAYS SHALL BE 150mm.
 - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION GIVEN WITH REGARDS TO EXISTING SERVICES AND DRAINAGE CONNECTIONS ETC. PRIOR TO COMMENCING THE WORKS. THE RATES SHALL INCLUDE FOR HAND DIG AROUND SERVICES WHERE NECESSARY. THE CONTRACTOR SHALL ADHERE TO THE CDM REGULATIONS AT ALL TIMES.
 - THE OUTSIDES OF ALL SEWERS SHALL BE A MINIMUM OF 1.0m FROM KERB LINES AND THE OUTSIDE OF MANHOLES SHALL BE A MINIMUM OF 0.5m FROM KERB LINES.
 - EXISTING FLOWS IN WATERCOURSES, SEWERS AND LAND DRAINS SHALL BE MAINTAINED AT ALL TIMES.
 - ONLY TRAINED PERSONNEL SHALL BE PERMITTED TO ENTER CONFINED SPACES.
 - ALL MATERIALS TO BEAR THE RELEVANT B.S. KITEMARK AND COMPLY FULLY WITH THE SPECIFICATIONS. ALL CONCRETE & CONCRETE PRODUCTS MUST USE SULPHATE RESISTANT CEMENT (UNLESS THE SITE INVESTIGATION REPORT PROVES THAT SULPHATE ATTACK FROM SOILS AND GROUNDWATER WILL NOT OCCUR TO WITHSTAND A CLASS).
 - ALL OPENING NOTICES ETC. AS REQUIRED UNDER HIGHWAYS ACTS ETC. ARE TO BE OBTAINED PRIOR TO COMMENCEMENT OF WORKS. ALL WORKS ARE TO BE INSPECTED BY L.A., NHBC OR THE NETWORK OPERATOR AS APPLICABLE.
 - WHERE "ULTRA RIB" UPVC PIPES (OR SIMILAR APPROVED) ARE USED IN ADOPTABLE DRAINAGE THEY SHALL STILL BE HANDLED AND LAID IN ACCORDANCE WITH THE SPECIFICATION AND GUIDANCE ISSUED BY THE HIGH PERFORMANCE PIPE ASSOCIATION.
 - A CLASS 5 BED AND SURROUND MUST BE USED FOR SUCH PIPES. TRENCH BACKFILL IN HIGHWAYS TO WITHIN 1M OF HIGHWAY SHALL AS DIRECTED BY THE HIGHWAY AUTHORITY BE A SUITABLE GRANULAR MATERIAL ALL IN ACCORDANCE WITH SEWERS FOR ADOPTION CL. 4.3.4.
 - SLAB LEVELS SHALL NOT BE VARIED WITHOUT REFERENCE TO THE ENGINEER FOR GUIDANCE.
 - ALL GULLY CONNECTIONS TO BE 150mm VITRIFIED CLAY UNLESS NOTED OTHERWISE.
 - ALL MANHOLE COVERS TO BE RECESSED TO ACCEPT FINISH AS DETAILED BY LANDSCAPE ARCHITECT.
 - SLOW REST BENDS TO BE USED IN ALL LOCATIONS MADE UP FROM 2No. 45 DEG BENDS (600mm TO INVERT FROM FFL).
 - MANHOLE POSITIONS AND ACCESS COVERS TO BE ACCURATELY SET-OUT BY LANDSCAPE ARCHITECT TO SUIT EXTERNAL FINISHES.
 - ALL DRAINS CAST THROUGH FOUNDATIONS TO HAVE ROCKER PIPES ON BOTH SIDES OF FOUNDATION.
 - ALL POP UP POSITIONS TO BE CONFIRMED SET OUT DIMENSIONS TO BE AGREED & PROVIDED BY OTHERS.
 - ALL DISCHARGE RATES TO BE CONFIRMED BY M&E DESIGNER.
 - ALL SURFACE WATER COLLECTION FEATURES TO BE CONFIRMED BY THE LANDSCAPE ARCHITECT.
 - STORAGE HAS BEEN PROVIDED IN A CELLULAR STORAGE TANK AND UP-SIZED MANHOLES AND PIPES.
 - EXISTING SEWER DEPTHS HAVE BEEN APPROXIMATED FROM LIMITED INFORMATION. NEW CONNECTIONS TO BE CONFIRMED PRIOR TO CONSTRUCTION OF ANY DRAINAGE WORKS.
 - LANDSCAPE ARCHITECT TO CONFIRM GULLY AND DRAINAGE CHANNEL LOCATIONS TO LANDSCAPED AREAS.
 - FOUL NETWORK TO BE CONFIRMED FOLLOWING CONFIRMATION OF BRANCH CONNECTION POINTS FROM BUILDING M&E DESIGNER.
 - CCTV SURVEY OF EXISTING SITE DRAINAGE REQUIRED PRIOR TO THE COMMENCEMENT OF ANY WORKS STARTING ON SITE.

- LEGEND**
- PROPOSED SURFACE WATER MANHOLE
 - PROPOSED SURFACE WATER PPIC
 - PROPOSED SURFACE WATER DRAINAGE
 - PROPOSED BELOW GROUND CELLULAR ATTENUATION TANK
 - PROPOSED ACO CHANNEL DRAIN
 - PROPOSED ROAD GULLY
 - DRAINAGE TO BE ABANDONED
 - Existing private surface water drainage

P02	13.02.2023	UPDATED TO SUIT COMMENTS	JJR	JRS	PB
P01	03.02.2023	RIBA STAGE 3 - PRELIMINARY ISSUE	JJR	JRS	PB
REV	DATE	DESCRIPTION	BY	CHK	APP

DRAWING STATUS:

PRELIMINARY

CLIENT: NORTHERN CARE ALLIANCE NHS FOUNDATION TRUST

ARCHITECT: CPC LIMITED

PROJECT: ROCHDALE INFIRMARY CAR PARK

TITLE: BELOW GROUND DRAINAGE OUTLINE DRAINAGE STRATEGY

STATUS:	PROJECT No.	PROJECT	ORIGINATOR	VOL/ISSUE/LEVEL	TYPE	ROLE	DRAWING No.	REV.
S2	222-146	CPC267 - AJP - XX - 00 - DR - C - 0001	P02					

SCALE @ A1: 1:100

DESIGNED:	DRAWN:	CHECKED:	APPROVED:	DATE:
JJR	JJR	JRS	PB	FEB 2023

AJP consulting engineers

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EXISTING SITE SURFACE WATER

THE EXISTING IMPERMEABLE AREA ON THE SITE IS 0.162ha AND IT IS 90.4% IMPERMEABLE. THE EXISTING SITE IS CURRENTLY DRAINED VIA THE EXISTING PRIVATE DRAINAGE NETWORKS WHICH DISCHARGE TO THE EXISTING UNITED UTILITIES PUBLIC SEWERS OFFSITE. THIS IS TO BE CONFIRMED VIA A CCTV SURVEY.

PROPOSED DEVELOPMENT DETAILS

PRE DEVELOPMENT PERMEABLE AREA = 172m² - 9.6%
POST DEVELOPMENT PERMEABLE AREA = 156m² - 8.7%

PRE DEVELOPMENT IMPERMEABLE AREA = 1,623m² - 90.4%
POST DEVELOPMENT IMPERMEABLE AREA = 1,639m² - 91.3%

SURFACE WATER DRAINAGE STRATEGY

SURFACE WATER RUNOFF FROM THE PROPOSED DEVELOPMENT IS TO DISCHARGE INTO THE EXISTING PRIVATE SURFACE WATER SEWER LOCATED DUE SOUTH WEST WITHIN THE SITE BOUNDARY. THIS SEWER ULTIMATELY DISCHARGES TO A PUBLIC SEWER LOCATED OFF SITE.

DISCUSSIONS WITH UNITED UTILITIES AND ROCHDALE BOROUGH COUNCIL WILL NEED TO BE CONDUCTED TO CONFIRM THE ALLOWABLE DISCHARGE RATE. THE LLFA STATES THAT THE SURFACE WATER DISCHARGE WILL BE LIMITED TO THE EQUIVALENT BROWNFIELD RUN OFF RATES, WITH A 50% REDUCTION ON THE EXISTING QBAR RATES.

USING THE 0.162HA EXISTING IMPERMEABLE AREA RESULTS IN THE EXISTING BROWNFIELD RUN OFF RATES SUMMARISED IN THE TABLE BELOW. THE MAXIMUM DISCHARGE RATES AFTER APPLYING THE 50% BETTERMENT ARE ALSO IDENTIFIED IN THE TABLE BELOW.

BROWNFIELD RUNOFF RATES SUMMARY				
RETURN PERIOD (YEARS)	EXISTING BROWNFIELD RUNOFF RATE (L/s)	MAX. RUNOFF RATE WITH 50% BETTERMENT (L/s)	PROPOSED RUNOFF RATE (L/s)	ACTUAL PROPOSED BETTERMENT (%)
1 YEAR	17.5	8.8	4.6	74%
2 YEAR	21.5	11.8	4.8	78%
30 YEAR	39.4	19.7	5.0	87%
100 YEAR	60.0	30.0	5.0	92%

THE ACTUAL DISCHARGE RATE FROM THE PROPOSED SURFACE WATER DRAINAGE CALCULATIONS IS INDICATED IN THE TABLE PRIOR AND THE ACTUAL BETTERMENT ON THE EXISTING BROWNFIELD DISCHARGE RATES IS ALSO INDICATED. GIVEN THE POSSIBILITY THAT THE LLFA RESTRICTS THE RUN OFF RATE TO THE EXISTING GREENFIELD RATES, THE FLOW RATE WILL BE CAPPED AT 5.0 L/S. AS SUCH THE PROPOSED NETWORK HAS BEEN RESTRICTED TO 5.0 L/S TO COMPLY WITH BOTH SCENARIOS. AS CAN BE SEEN THE PROPOSED DISCHARGE RATES COMPLY WITH THE LLFA REQUIREMENTS AS THE BETTERMENT FOR EACH RETURN PERIOD MEETS THE REQUIRED MINIMUM OF 50%. IT SHOULD BE NOTED THAT THE PROPOSED DISCHARGE RATE FOR THE 100 YEAR RETURN PERIOD INCLUDES AN ADDITIONAL 40% TO ACCOUNT FOR CLIMATE CHANGE.

IT IS ENVISAGED THAT A VORTEX FLOW CONTROL DEVICE (HYDROBRAKE) WILL BE USED TO RESTRICT THE SURFACE WATER RUNOFF TO MEET THE REQUIRED LLFA DISCHARGE RESTRICTIONS. AS THE SURFACE WATER RUNOFF IS RESTRICTED, WE NEED TO PROVIDE ATTENUATION STORAGE TO ACCOMMODATE THE RUNOFF FOR ALL RAINFALL EVENTS UP TO AND INCLUDING THE 100yr + 40% CC RAINFALL EVENT. AN OIL SEPARATOR IS ALSO REQUIRED DUE TO POLLUTANTS COMING FROM THE CAR PARK.

AS INDICATED ON THE ADJACENT DRAWING THIS HAS BEEN PROVIDED USING AN ATTENUATION TANK ALONG WITH PROPOSED PIPES AND MANHOLES. THE CALCULATIONS HAVE INDICATED THAT THE ATTENUATION TANK WITH THE REST OF THE SYSTEM WILL CONTAIN THE SURCHARGED RUNOFF FOR ALL RAINFALL EVENTS UP TO AND INCLUDING THE 100yr + 40% CC RAINFALL EVENT, WITHOUT ANY FLOODING.

SURFACE WATER DISPOSAL HIERARCHY

- INFILTRATION - NOT SUITABLE DUE TO LACK OF PERMEABLE AREA.
- WATERCOURSE - NOT SUITABLE DUE TO DISTANCE.
- LIVING ROOF - THESE ARE NOT SUITABLE FOR THIS DEVELOPMENT.
- BASINS & PONDS - THESE ARE NOT SUITABLE FOR THIS DEVELOPMENT.
- FILTER STRIPS & SWALES - THESE ARE NOT SUITABLE FOR THIS DEVELOPMENT.
- PERMEABLE SURFACES - EXISTING FOUNDATIONS DO NOT ALLOW ROOM FOR THEM.

7. TANKED/OVER-SIZED PIPE SYSTEMS - AN OVER-SIZED PIPE NETWORK AND FLOW RESTRICTION SYSTEMS HAVE BEEN DETAILED ON THE DRAWING.

UNITED UTILITIES/LLFA CORRESPONDENCE

CORRESPONDENCE WITH THE RELEVANT BODIES IS STILL REQUIRED TO CONFIRM THE SITES CONSTRAINTS SUCH AS FLOW RATE. ALL PROPOSED DRAINAGE DESIGNS ARE SUBJECT TO CHANGE FOLLOWING CONFIRMATION OF THESE RESTRAINTS FROM THE LLFA AND UNITED UTILITIES.

OUTSTANDING REQUIRED INFORMATION

- CONFIRMATION OF DISCHARGE RATE FROM PROPOSED SURFACE WATER NETWORK.
- CONFIRMATION OF INLET LEVELS AND PIPE SIZES OF THE EXISTING PRIVATE SURFACE WATER NETWORK VIA A CCTV SURVEY.
- CONFIRMATION OF THE PROPOSED POST DEVELOPMENT SITE LEVELS SO THAT ROAD GULLYS AND CHANNEL DRAINAGE CAN EFFICIENTLY COLLECT THE SURFACE WATER RUN OFF.
- CONFIRMATION OF ANY ADDITIONAL DRAINAGE REQUIREMENTS/REGULATIONS FROM SEVERN TRENT WATER OR THE LLFA.