

## SURFACE WATER DESIGN PHILOSOPHY

In line with the Flood Risk Assessment prepared by Faber Maunsell, the proposed Primary School site is shown to be located in Flood Zone 1 (Low Risk) according to the EA Flood Maps.

Surface water run off should be controlled to comply with the EA's requirements of Greenfield discharge. Calculations carried out in the FRA and then modified to the same principals at detailed design stage have been carried out by incorporating a restriction to the surface water flows leaving the site to 13/s for the peak 30 year storm event. Geocellular storage units placed beneath the football pitch will then attenuate the restricted flows for the full 30 year event. For the extreme 100 year storm event flood water will surcharge to the surface of the pitch and be retained from leaving site by the inclusion of a small bund around the pitch. Minor flooding of external surfaces around the school may also occur for this extreme event.

## DRAINAGE NOTES

- The contractor shall allow for the protection, temporary and permanent support and diversion works as necessary, to all existing services to the satisfaction of the public utilities.
- The contractor shall allow for dealing with surface water run-off into excavations and from groundwater by means of sumps, pumping and de-watering as appropriate, in order to keep the excavation as reasonably dry as possible during the construction of the works.
- All private drainage within the site is to comply with the requirements of BS EN752 and Building Regulations Part H. All Adopted drainage shall be design and constructed in accordance with Sewers for Adoption 6th Edition and the Adopting Authorities standard requirements.
- All private drainage pipes to be laid in trenches bedded Class 'B' on single sized aggregate and backfilled with approved selected fill (40mm down) reused from excavated material. Under buildings and where cover to invert is less than 1200mm under trafficked areas pipes to be cast in concrete (Class Z Bedding). Class 'S' bed and surround may be required for sewers to be adopted. refer to specific drawings for further information.
- Selected backfill material shall consist of uniform excavated material, free from stones larger than 40mm, clay lumps larger than 75mm, tree roots, contaminated material. Selected backfill material is to be placed in layers not exceeding 150mm thickness. The material shall be compacted to achieve not less than 95% of the maximum dry density as determined in laboratory compaction tests. Sufficient testing shall be carried out, by the Contractor, to demonstrate this is achieved (number and frequency of testing to be agreed with SHD). Where the moisture content of the material prohibits compliance with the above 6f1 or similar imported material shall be used.
- Concrete protection to pipework is to be provided as follows:
  - All pipework within pedestrian/soft areas with less than 600mm cover.
  - All pipework subject to vehicular overrun with less than 1.2m cover.
- All pipework within manholes are to be laid soffit to soffit (U.N.O). All chamber invert levels are for the outgoing pipe levels. Backdrop pipework shall be connected at soffit to soffit with the radding access level specified.
- All drains to be laid accurately to line and level in strict accordance with the manufacturers recommendations.
- Any gradients of drains indicated are indicative only and the Contractor shall install the drains to the specified levels shown for each manhole (U.N.O). Catchpit invert levels are for the outgoing pipe with the sump level specified separately.
- Co-ordinate setting out information for manholes is to the intersection of the drains and not the centre of the manhole.
- Cover levels of the manholes are provisional and subject to adjustment on site to suit the finished ground levels. All external works construction areas to be as located by the architect.
  - Vehicular Areas: Class D400 (E600 in vulnerable service yard locations), double triangular, 150mm deep ductile iron cover and frame with three point cover seating, bridged FW or SW for Foul or Surface Water drainage.
  - Pedestrian Areas: Class B125, 100mm deep, badged FW or SW for Foul or Surface Water drainage.
- Double seal manhole covers and frames are to be used on internal foul water drainage chambers. Surface finish and type of cover to be confirmed by Architect
- Positions and sizes of above ground foul and surface water drainage connections are to be confirmed prior to construction with the Architect and M&E Engineer.
- Gully gratings and steel channel covers are to be in accordance with BS EN124 as follows:
  - Areas subject to vehicular overrun: Class D400 minimum.
  - Areas not subject to regular vehicle overrun (adjacent to kerbs etc.): Class C250.
  - Gully grates adjacent to kerbs shall be hinged on the side of the traffic direction (left hand side).
- Drainage channels are to be Marshalls Birco Linear Drainage System as specified or similar approved. Type and size of channel is to be approved by SHD in writing prior to ordering.
- All brickwork in connection with drainage is to be solid Class B Engineering Brick to BS3921.
- All precast concrete pipes, chamber products and road gullies shall be to BS5911 and be Kitemarked.
- All drainage in situ concrete shall be GEN3 (U.N.O).
- All in situ and concrete products shall comply with the requirements for sulphate exposure in accordance with BRE Special Digest 1, Concrete in Aggressive Ground (2001) Part 1: Table 2.
- All separators shall be in accordance with the environment agency document PPG3.
- Upon completion of the works the contractor shall clean all drainage by jetting, removing all debris from site. no debris shall be permitted to enter the existing drainage system.
- Construction joints in concrete surround must not be within 150mm of chamber/shaft ring joints.
- Rocker pipes to be surrounded with concrete located 150mm minimum 200mm maximum from the first flexible joint to the manhole wall.
- Soft spots in the trench formation shall be removed and replaced with granular bedding unless instructed otherwise.
- Lateral Connections in between manhole runs shall be formed by using purpose made junction fittings. Bend fittings shall be provided where appropriate to direct the flow into main runs.
- The Contractor shall be responsible for all traffic management issues relating to works in the public highway.
- It shall be the Contractors responsibility to liaise with the Highway and Sewerage Authorities for approvals, interim inspection, snagging and final inspections of their work.
- The Contractor shall confirm the location of all existing statutory undertakers apparatus and service connections adjacent to and crossing the works by trial pits prior to commencing machine dig.
- At the conclusion of the works the Contractor shall provide a marked up drawing to record any as built variations not shown on the drawings.
- The drainage system is not designed to accept untreated effluent from a commercial kitchen containing grease and oils. Removal of grease and oil should be made at source using a floor mounted above ground grease removal system. It is recommended that a mechanical grease removal system be employed for this purpose not a passive system.
- Pipework to be of the following manufacturer: 100 / 150 / 225mm diameter heparth supersew vitrified clay pipes (40kn/mm crushing strength), 300mm + to be Concrete Class M.

## NOTES

- Drawings are to be read in conjunction with all relevant Specifications, Engineers, Architects & Services drawings, including approved builders work drawings. Contractor to notify Engineer of discrepancies between structural drawings and specifications or other drawings.
- All dimensions are in millimetres unless noted otherwise.
- For drainage standard details see SHD Dwg. Nos 2076/C/012, 013 & 015. For manhole schedule refer to dwg 2062/C/014.
- The position, size and levels of all drains are to be confirmed on site prior to the commencement of the works and any discrepancies reported immediately to the Engineer.
- Do not scale from this drawing, work to dimensions or co-ordinates provided. All levels are in metres and all dimensions are in millimetres, unless otherwise noted. Any ambiguities, omissions and errors on drawings, shall be brought to the Engineers attention immediately.

## Key

- Existing Surface Water Drainage
- Existing Foul Water Drainage
- Existing Land Drainage
- Proposed Surface Water Drainage
- Proposed Foul Water Drainage
- Proposed Concrete Dished Channel
- RWP Rainwater pipe
- WPC Waste Point Connection
- IG Internal Gully - Cast Iron Vari-Level body (ref GC144) with Cast Iron circular grating (ref K2103) by Wade Products or similar approved.
- RG Road Gully
- YG Yard Gully (Hepworth Paved Area Gully)
- TD Threshold Drain (Hepworth or Similar)
- CDG Channel Drain Gully - Marshalls Birco Linear Drainage System
- Proposed Marshalls Birco Linear Drainage channel with heavy duty ductile iron & heel guard grating (detailed configuration and design by supplier).

C5	16.09.10	PG	PG	Attenuation tank rotated 45 degrees. Internal gully added to sprinkler room.
C4	12.07.10	PG	PG	Pipe lengths down eastern and western sides moved away from building. Foul gradients amended to suit new inverts
C3	28.06.10	PG	PG	layout updated to suit new SW design. MH Schedule moved to drawing 2062-c-014
C2	14.05.10	PG	PG	Amended outfall location to public sewer
C1	12.03.10	PG	KC	Construction Issue
No	DATE	DRAWN	REV'D ENG.	AMENDMENT



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CLIENT	BAM CONSTRUCTION LTD			
PROJECT	REDDISH NORTH PRIMARY SCHOOL AND CHILDRENS CENTRE			
DRAFTER	PG		ENGINEER	KC
TITLE	PROPOSED DRAINAGE			
SCALE	1:500 (A1)	DRAWING No	2062/C/010	DATE
				Sept 09
				AMDT
				C5

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