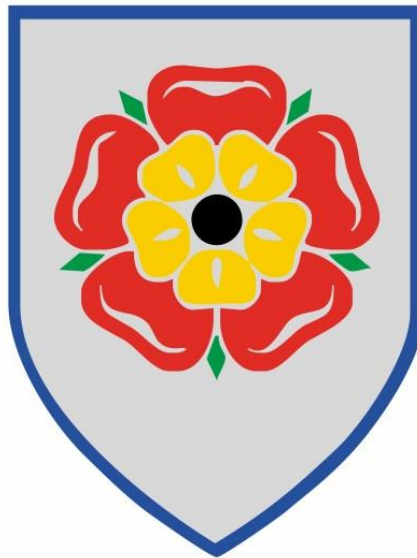


CLIENT:
MARKET BOSWORTH SCHOOL



TECHNICAL NOTE
on the
DRAINAGE STRATEGY:
PROPOSED MUGA & ASSOCIATED WORK

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Report Ref: TMBS_DS_22-7-24

TECHNICAL NOTE

DRAINAGE STRATEGY:

PROPOSED MUGA & ASSOCIATED WORK

1.0 BACKGROUND

1.1 PROJECT OVERVIEW

- 1) The Client, The Market Bosworth School (TMBS), has submitted a planning application for a new Multi-use Games Area (MUGA), car park extension and renovation of an adjacent grass pitch, reference 24/00403/FUL.
- 2) Leicestershire County Council, as the 'LEAD LOCAL FLOOD AUTHORITY TO CONSULTATION BY HINCKLEY & BOSWORTH BOROUGH COUNCIL' have requested further information on the drainage strategy for the new facilities (Ref: 2024/0403/04/F, dated 3/7/2024).
- 3) As requested, TMBS have commissioned a Flood Risk Assessment from Hydrologist Alan Corner of Corner Water Consulting, which is submitted along with this covering technical note by Hemstock Design Ltd, Lead Consultant David Hemstock, BSc.DipAgrEng.IEng, a qualified Soil & Water Engineer.
- 4) LCC have requested the following supporting information, covered in the FRA and sections below:
 - a) *A site-specific flood risk assessment.*
 - b) *A drainage strategy plan showing proposed SuDS, scale indicative pipe sizes, gradients, flow directions, cover and invert levels; with sufficient detail to allow fixing of the SuDS layout.*
 - c) *Pitch drainage details.*
 - d) *Consideration of climate change.*
 - e) *Proposed discharge rate.*
 - f) *Identifications and levels of the surface water outfall and the surface water receptor.*
 - g) *Consideration of management and maintenance plan for the drainage system.*

1.2 THE SCHOOL PLAYING FIELD AREA

- 1) The site is located to the west of the town centre, off address:

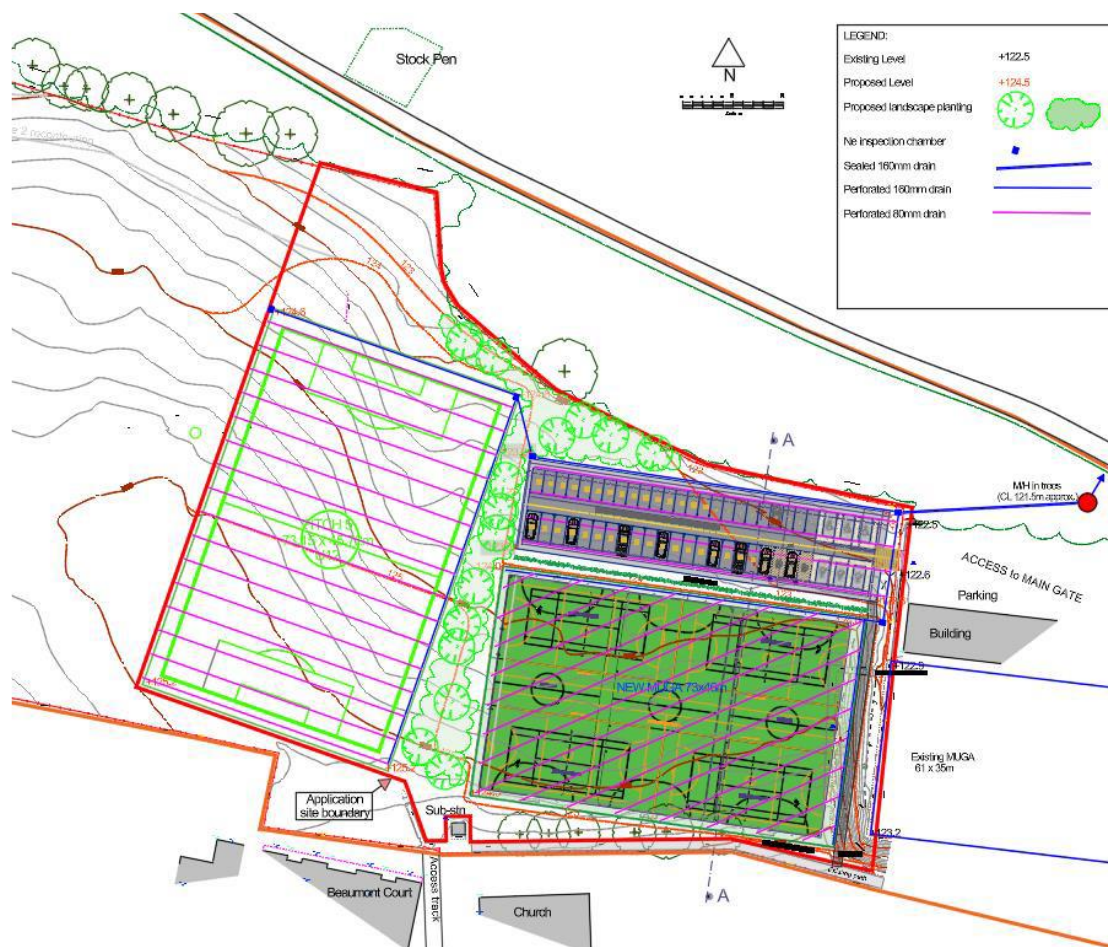
The Market Bosworth School
Station Road
Market Bosworth
Warwickshire
CV13 0JT



Existing site with red line boundary, proposed MUGA eastern playing field area



View of the MUGA site and parking extension site from the west, Pitch 5



The proposed development with MUGA, parking and renovated grass pitch, showing proposed drainage for each

2.0 SITE ASSESSMENT

2.1 Soil Profile Investigation

- 1) The topsoil was found to be variable in depth, between 100mm on the filled zones to over 200mm on the unfilled areas, being a wet to waterlogged clay-loam, no water table, the wetness was from surface water only. The topsoil varied from a dark-brown to a light brown clay loam.
- 2) Subsoil was of a firm, yellow-brown clay loam with observed limited drainage capacity

NB - The majority of the ground in which the new MUGA and car park extension are due to cover has been filled in the past with a mixture of rubble and clay, finished with sub and topsoil.

- 3) Photos of the trial pits excavated are shown below:



Trial Pit 3 – 150mm topsoil over compact clay loam subsoil, very wet surface

2.2 Existing Drainage

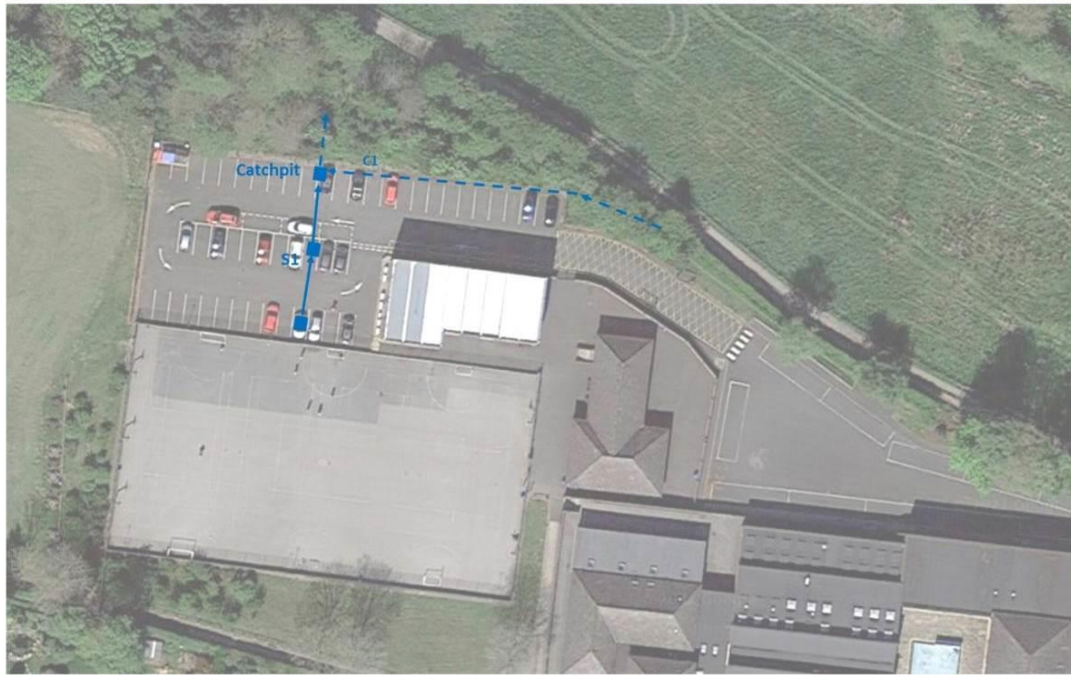
- 1) Existing Drainage & Outfalls – Attempts were made to locate outfall points along the northern site boundary at the three low-points, north-west corner, north centre and north eastern (car-park) corner. On site there are two identified outfalls, one in the car park immediately adjacent to the playing fields and one further along near the coach parking area. See below.

There were signs of old pipe drainage in the playing field area, but it appears that these systems are well over 25 years of age and beyond this 'rule-of-thumb' lifespan for such systems.

- 2) A thorough condition survey of the proposed outfall to the north-east of the development area has been carried out by County Drains, using CCTV equipment, dye-testing, etc.



Central area, north – signs of lateral pipes and a main drain heading towards the northern track then presumably to the watercourse to the north. 2006 imagery. Grass Pitch 5 to the east (bottom right corner of the image).



Inspection chamber in the woodland, nearest located outfall for the new MUGA and car-park. County Drains Ltd dye-tested to the watercourse and checked for condition, pre-construction of the new building (white roof).



***Potential existing outfall for playing fields, pasture land to the north.
NB – an earthworks platform for stock gathering has been constructed over the point where an outfall from the playing field system may have run.***



Blue dashed line (eastern side) shows the approximate route of the outfall pipe from school boundary to the watercourse, over grazing land.

3.0 PROPOSED DRAINAGE STRATEGY

3.1 Attenuation

- 1) The proposed MUGA and car parking extension are to act as the primary peak flow attenuation structures, with runoff to be stored in the 35% void ratio permeable fill layer forming the construction profile of each.

Sub-grade of the 2,000 sq.m surface area car park extension set at 121.9m, surface level 122.5m with a 0.55m permeable fill layer of 35% void ratio. Hydrobrake fitted with 500mm head and a 1.9l/s flow rate.

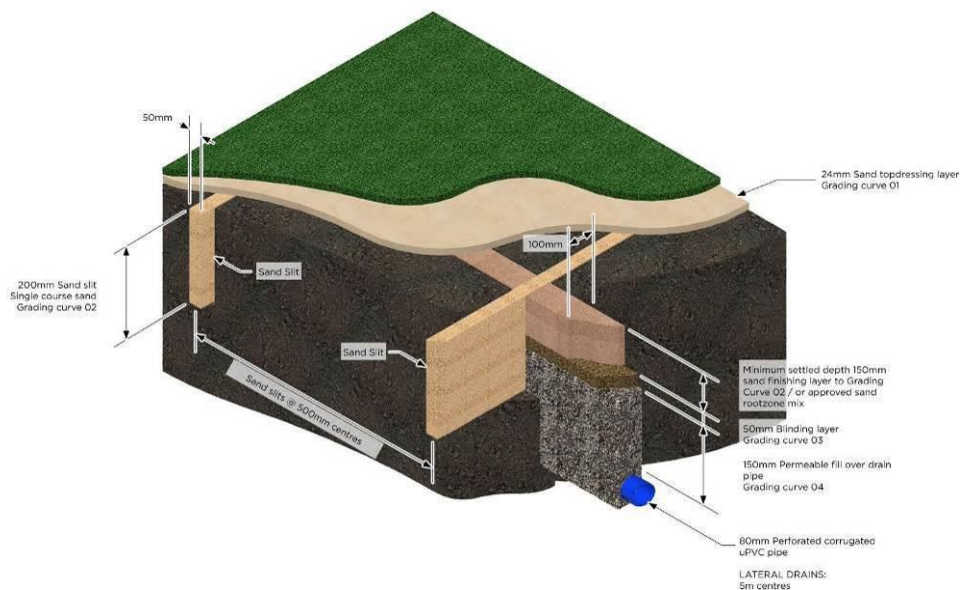
- 2) Total water storage, MUGA and car park is 212 and 253 cu.m respectively. Both storage elements are 100% full in the worst 1 in 100-year event. The car park and the MUGA storage are both assumed to be level in the hydraulic model, but with only part of the MUGA used to account for the slope. In effect, the stone layers fill up (to 100% full) and then empty slowly via the restricted outlet. The car park drains at 1.9 l/s and the MUGA at 2.4 l/s.
- 3) Grass Pitch 5 is to have a new drainage system installed after releveling, of 160mm main drains and 5-metre spaced lateral pipes at an average of 450mm depth of cover, backfilled with clean permeable stone and a sand topping, with sand slits installed at right angles. This system also has a storage capacity through the voids within the permeable backfill and restricted outflow rate.
- 4) The outfall point is proposed to be the existing chamber to the north-east of the car park extension, which is verified as outfalling into the brook north of the site.

3.2 Construction Proposals

- 1) **MUGA Drainage** – to be a 5-metre spaced drainage system under the MUGA
- 2) **MUGA construction** – a porous macadam base with an infiltration rate of minimum 100mm/hour is to be installed with a synthetic (needle-punch) carpet surfacing.
- 3) **The car-park** is also to have a porous bitmac finish. The grass pitch will require levelling, draining, cultivation and grassing.



***MUGA profile; bitmac over permeable fill finished with a synthetic carpet/shockpad.
Typical depth of construction 300-400mm plus drain trenching of 300-400mm***



Grass Pitch 5 - Pipe drains & sand-slit drained pitch; 'minimum school standard'

3.3 Operation & Maintenance

- 1) An operation and maintenance manual is to be produced as part of the handover documentation for the new facilities. This will cover the periodic maintenance operations required to keep the drainage system working efficiently into the future. Aspects to be covered include:
 - Annual check on the outfall point, watercourse.
 - Annual cleaning of silt chambers
 - Periodic checks on pipe and hydrobrake condition
 - Maintenance of the surface infiltration rates by:
 - Jet-washing of the car park surface.
 - Cleaning and replacement of the carpet on the MUGA
 - Decompaction and sand topdressing on the grass pitch
 - Replacement of the drainage system on the grass pitch after approximately 25 years.
- 2) The balance between levels of use versus maintenance requirement is particularly important for a synthetic carpet finish; the more play, the more maintenance in order to preserve a longest lifespan of the MUGA. A sinking-fund is to be set-up to cover the eventual replacement of the carpet.
- 3) NB - Re-drainage of the other grass pitch is expected to be via other existing outfall points, partly identified at this stage but not verified.

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