DESIGN NOTE

SUBJECT
Surface Water Drainage Strategy at Warrender Primary School

DATE
13 January 2017

COPIES TO
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CLIENT
London Borough of Hillingdon

OUR REF
35311100 / DN001

PROJECT NUMBER
35311100

1 Introduction

This is a Design Note outlining the proposal and strategy for Drainage for the Warrender Primary School Project. A draft Flood Risk Assessment (FRA) and Drainage Strategy was previously produced by Waterco in October 2016.

This document is to be read in conjunction with the Flood Risk Assessment and is based upon Architectural and Landscape drawings of RIBA Stage 3 information and the CCTV survey of the existing drainage network.

The proposed development is for the expansion of the existing Warrender Primary School with the erection of an additional building, associated external works, hard and soft play areas and landscaping.

The Waterco FRA outlined the potential flood risk to the site, the impact of the proposed development on flood risk elsewhere, and the proposed measures that could be incorporated.

In the report, the proposed measures were discussed, which were outlined as follows:

- Local storage attenuation of 162 m^3
- Controlled discharge via connection to a surface water sewer (Thames Water) at 5 l/s

2 Existing conditions

Ground conditions

The local Ground Conditions consist of underlain bedrock comprising the Lambeth group clay silt and sand with no superficial deposits (Waterco Warrender FRA report, page 2).

Local Drainage

Local drainage information was considered through the Waterco FRA report (based on Thames Water public sewer records).

It should be noted that surface water runoff from the existing school development causes flooding to the residential housing to the north of the site.

Flood Zone Categorisation

The Waterco FRA report mentions on page 3 that "The Environment Agency (EA) 'Flood Map for Planning (Rivers and Sea)' […] shows that the site is located within an area considered to be outside of the extreme flood extent (Flood Zone 1), meaning it has a less than 1 in 1000 (0.1%) annual probability of flooding".

Site Conditions

Warrender School has also identified significant surface runoff from the existing site, including the courts and field areas courts. This travels north, across the site, and can result in surface flooding of the surrounding properties to the North of the site.

3 Surface Water Management Proposal

Subject to Thames Water agreement, surface water from the site will discharge into the adopted 225mm diameter surface water sewer to the North of the site in Eastcote Road. This has been confirmed via a drainage survey of the site which shows the existing system falling to the north of the site.

The Waterco report, identified on page 8 the following rates:

- Qbar rural runoff rate for the existing proposed development area: 1.4 l/s
- 1 in 100 year runoff rate: 4.4 l/s
- Maximum discharge rate: 5 l/s
- Estimated storage volume: 162 m3

The Estimated storage volume was calculated by Waterco to accommodate the 1:100 year runoff rate plus a 40% Climate Change factor.

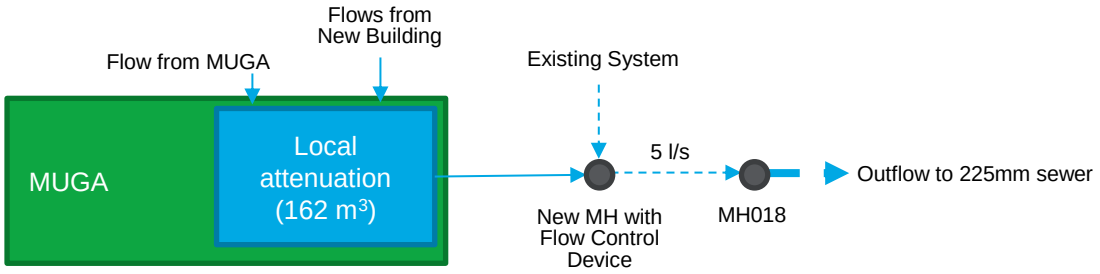
Considerations for discharge method

The hierarchy of drainage options was considered in the Waterco report, taking into consideration paragraph 80 of the NPPG and are as follows:

Method	Comments (from Waterco report)	Feasibility
1. Inflation to a surface water body via a soakaway	The first consideration for the disposal of surface water is infiltration (soakaways and permeable surfaces). As described above the site is underlain by Clays, Silts and Sands. Therefore, the use of infiltration techniques may be a feasible option for the site. Infiltration testing should be undertaken in accordance with BRE365 specification, to determine the suitability of infiltration techniques.	Not feasible
2. Connection to a watercourse	Where soakaways are not suitable a connection to watercourse is the preferred option. The nearest watercourse is River Pinn, located approximately 410m north of the site. The site is separated from this watercourse by third party urbanised land; therefore a connection to this watercourse will not be feasible. There are no other suitable watercourses within the vicinity of the site. Therefore disposal of surface water to a watercourse will not be a feasible option.	Not Feasible
3. Connection to a surface water sewer	A connection to the public sewer system is the final consideration. There is a 225mm public surface water sewer located north of the site in Eastcote Road. It is assumed that surface water runoff from the existing site discharges to this sewer. It is proposed to utilise the existing drainage outfall from the site. The exact location of this will be confirmed via a drainage survey. Runoff from the proposed impermeable areas should be restricted to 5 l/s to comply with LLFA and London Plan requirements. A gravity connection appears feasible, however this will need to be confirmed through conversion of site levels to an Ordnance Datum.	Feasible

4 Design and strategy

The recommendations of the FRA report have been taken into account, and the strategy has been designed to fulfil those recommendations.



The diagram above demonstrates schematically the method by which drainage will take place at Warrender, in alignment with the FRA report.

Surface water will be held locally at a local attenuation storage unit, provided in the ground under the proposed MUGA. The tank will accommodate the 1:100 year plus 40% Climate Change event, in a minimum volume of 162 m^3.

The topography of the site flows from south to north towards Eastcote Road. It is recommended the drainage flows in this direction. Two 225mm diameter public sewers, one surface and one foul have been identified in Eastcote road. The surface water drainage design is to feed into the relevant sewer via manhole MH018.

It is considered that land drainage will discharge to long-term storage (LTS) will be provided above the MUGA or above the soft sports pitches by retention bunding. Stone filled cut-off trenches will run either side of the proposed sports pitches with water discharging by limited percolation or evaporation.

An overflow will drain exceedance flows to the 225mm sewer in Eastcote Road during extreme storm events.

A drainage design around the periphery of the existing building is preferable, providing an independent system, rather than utilising the existing drains. This is preferred due to a number of factors including:

- ease of maintenance
- avoidance of drains in poor condition in the existing building, and
- sizing of pipework to suit drainage requirements accordingly
- This approach will also enable the effective replacement of existing drain runs which are buried beneath the existing retained building but which are broken or split – therefore the new system will also address some of the local flooding issues experienced on site.

In accordance with the recommendations of the Waterco FRA report, storage will be provided for the 1 in 100 year plus 40% CC event. Storm events in excess of the 1 in 100 year plus 40% CC event will be permitted to produce shallow depth flooding within landscaped areas or car parking adjacent to an attenuation feature. Site levels have been designed to ensure that exceedance flooding is contained on site to eventually drain back into the drainage system.

Enc. Drawing showing the route and connections of surface and foul drainage strategy

NOTES:

1. THIS DRAWING IS TO BE USED FOR THE PURPOSE INTENDED ONLY.
2. DO NOT SCALE FROM THIS DRAWING.
3. DRAWING TO BE READ IN CONJUNCTION WITH WATERCO FRA AND DRAINAGE STRATEGY, OCTOBER 2016.
4. DRAWING TO BE READ IN CONJUNCTION WITH LATEST ARCHITECTS PLAN.
5. ALL PIPES SIZES, LEVELS AND STORAGE VOLUMES TO BE VALIDATED DURING DETAILED DESIGN.
6. COVER TO PIPES TO BE MINIMUM 0.6M IN FOOTWAYS , 0.9M IN LANDSCAPED AREAS AND 1.2M IN HIGHWAYS AND PARKING AREAS.
7. ALL SVP AND RWP LOCATIONS ARE TO BE CONFIRMED BY THE M&E ENGINEER/ARCHITECT PRIOR TO DETAILED DESIGN.
8. ALL DRAINAGE TO BE IN ACCORDANCE WITH BUILDING REGULATIONS 2010, APPROVED DOCUMENT PART H.
9. ALL ADOPTED DRAINAGE TO BE IN ACCORDANCE WITH SEWERS FOR ADOPTION 7TH EDITION.

LEGEND

- NEW FOUL SEWER
- EXISTING FOUL SEWER
- NEW SURFACE SEWER
- EXISTING SURFACE SEWER

THIS DRAWING IS FOR INFORMATION ONLY AND IS UNVERIFIED.

NOT TO BE USED FOR PRICING

Rev	Date	Description	Drawn	Check	Approv
P2	16JAN17	GENERAL UPDATE	TB		
P1	13JAN17	DRAINAGE STRATEGY	TB		

Client

London Borough of Hillingdon Council

PROJECT:
Extra Form of Entry Expansions

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Warrender Primary School

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TITLE:

WARRENDER PROPOSED DRAINAGE STRATEGY

Designed	M.JOHNSON	Signed	Date 13JAN17
Drawn	T.BAKER	Signed	Date 13JAN17
Checked		Signed	Date 13JAN17
Approved		Signed	Date 13JAN17
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FOR CONSTRUCTION

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