

**Services for Communities
Flood Prevention**

MEMORANDUM

To: [REDACTED]
Case Officer - Planning

From: [REDACTED]
Flood Prevention

Your Ref: 14/04860/FUL

Date: 11th December 2014

**TOWN AND COUNTRY PLANNING SCOTLAND ACT 1997
RESIDENTIAL DEVELOPMENT (633 UNITS)(WITH SMALL SCALE COMMERCIAL
UNITS) WITH ASSOCIATED ROADS, FOOTPATHS, PARKING, LANDSCAPING
AND OPEN SPACE PLUS SITE FOR NEW PRIMARY SCHOOL. AT LAND 296
METRES SOUTH OF 17, FROGSTON ROAD EAST, EDINBURGH,
REFERENCE NUMBER: 14/04860/FUL
WARD NO: A16**

Please see queries/issues noted below regarding the Flood Risk Appraisal and drainage design for the above application:

Flood Risk Assessment

Comments are as issued to Michael Stewart, Kaya Consulting, 24th September 2014

2 Legislative and Policy Aspects

It is noted that an updated version of SPP was released by the Scottish Government in June this year. Please consider any impacts of the updated SPP for the proposed development.

It is noted that an updated version (version 8) of SEPA's Technical Flood Risk Guidance for Stakeholders was released in February this year. Please consider any impacts of the guidance for the proposed development.

4 Hydrological Analysis

It is acknowledged that industry standard methods have been used to determine flood flows for the Burdiehouse Burn catchment, with comparison between different methods and previous studies presented. The worst case scenario, i.e. highest peak flow derived for the catchment (Halcrow 2008), has been taken forward to use in the mathematical model of the watercourse ensuring a conservative flood levels are calculated. Allowance for climate change has been assessed through application of a 20% increase in peak flows as per the appropriate guidance.

5.1 Model set-up

Industry standard HEC-RAS software has been used to build a 1 dimensional model of the Burdiehouse Burn. All structures (three bridges) and features (railway embankment) have been included in the model appropriately to ensure flow paths are simulated as per the on the ground scenario.

Manning's n roughness coefficients used are considered appropriate.

The model has been run in steady state model using the 1 in 200 year and 1 in 200 year plus climate change peak flows with a normal depth downstream boundary based on the channel gradient from topographic survey. Due to the nature of the watercourse there are no significant flood plain storage areas so a steady state model is adequate in this case.

5.2 Model Results

No comment on model stability has been included in the report. Please provide evidence that the model is stable and therefore producing reliable water levels.

5.3 Model Sensitivity Analysis

It is agreed that the critical model runs in this instance are the blockage scenarios. As noted, the overtopping level of the embankment places a limit on the maximum water level upstream of the pipe bridge and therefore any increased blockage scenario beyond the 60% modelled will only have a small impact on water levels in the channel. The results are considered conservative and appropriate.

It would be welcomed if a flood map showing the extent of the flooding under the 60% blockage scenario, equivalent to Figure 5, was included for completeness as this is the critical result from the study. This is necessary to show the proposed SUDS basing is located outwith the flood extent.

7 Surface Water Drainage Strategy

The outline drainage strategy is welcomed as a first pass at potential solutions to capturing and routing surface water drainage from the site. A detailed surface water management plan should be produced (see comments below) for the proposed development following CEC and other appropriate guidance.

Appendices

Both in the appendices and in the long section profile, Figure 4, the water level at the downstream face of the downstream road bridge is at a level above that is higher than the road level, without the bridge overtopping at its upstream face. Please confirm why this is occurring and that it has no adverse effects on water levels at the upstream cross sections adjacent to the proposed development boundary.

Drainage Design

CEC Flood Prevention request that the discharge to the Burdiehouse Burn is attenuated to the 2 year Greenfield runoff rate of the site, or 4.5 l/s/ha, whichever is smaller. A minimum pipe diameter of 75mm should be used for discharge from the site to prevent blockage.

CEC Flood Prevention request that the drainage system is designed as such that attenuation volume is provided for the 200 year plus 20% climate change allowance event. Please provide calculations to show the detention basin has been sized appropriately.

Please provide MicroDrainage outputs to show that the proposed drainage system can convey the 1 in 200 year plus climate change event to attenuation basin. Results should be provided for each manhole location and reference the drainage plan requested above

Detailed pre and post development flow paths are required to assess any impact the development may have on surrounding areas and also to show flow paths in the event of system blockage or a rainfall event beyond that of the design event. It is acknowledged that flow paths over roads have been provided, but further detail is required for the central area of the site and also from garden areas surrounded by housing.

We would be happy to meet with the applicant to discuss the requirements for the drainage system.

[REDACTED]
Flood Prevention

If you have any queries on the above, please contact [REDACTED] on [REDACTED] or email
[REDACTED]@edinburgh.gov.uk.