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Wayne Barron  
Sunderland City Council  
Commercial Road  
Hendon  
Sunderland  
Tyne and Wear  
SR2 8QR

Our Ref.: D10341/SA  
Date: 14<sup>th</sup> June 2021

Dear Wayne,

### **Proposed Dining Hall, Barnes Junior and Infant School, Sunderland– Soakaway Testing**

Dunelm Geotechnical and Environmental Limited (Dunelm) have been appointed by Sunderland City Council (the Client) to undertake a review of the feasibility of soakaway testing for a new dining hall at Barnes Junior and Infant School.

Dunelm have previously undertaken a Preliminary Geoenvironmental Appraisal for the site, Ref. D10341/0, dated March 2021, reference should be made to this report for details of the historical, geological and environmental setting.

#### **1.0 Anticipated Ground Conditions**

The site is shown to be underlain by drift deposits comprising glacial clay.

The solid geology underlying the site comprises the Ford Formation of the Magnesian Limestone. No faults are shown in the vicinity of the site.

There is a BGS borehole located 10m north of the site at the former laundry. The log records clay and gravel underlain by hard stony clay to 6.0m bgl underlain by limestone. The limestone is interbedded with marl to a depth of 32.3m bgl where shale was recorded.

BGS report, "Surface Collapse Features in the Magnesian Limestone of the Seaham Area, County Durham, report number CR/06/225" undertaken on behalf of District of Easington Council indicates evidence of ground dissolution features in the surrounding area of the site however, the site itself appears to fall out of the areas of concern identified within the report.

#### **2.0 Solution Features.**

Solution features can be caused by several factors which can act separately or cumulatively including:

- Magnesium Limestone strata are naturally more susceptible to solution features due to its chemical compositions,
- The infiltration of acid rain, dissolving the rock and the by the action of CO<sub>2</sub> and humic acids in association with a cover of soils and vegetation,

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- Faulted rocks will commonly be heavily fractured, making them more susceptible to dissolution, and the formation of solution features.
- Where rock is shallow, it will be more susceptible to dissolution by acid rain.
- Solution features can also be increased by rising mine waters. When pumping of groundwater from deep mines has stopped the groundwater level can rise, leading to dissolution of the overlying rock at depth. In addition collapse of mine workings at depth may also cause the rock strata above to collapse thereby allowing greater infiltration/movement of water through broken strata and subsequent possible dissolution of the strata.
- Shallow mobile groundwater may also be a contributing factor to the formation of solution features.

Although no surface evidence of existing solution features in the form of collapsed strata was present at the time of the site walkover, the possibility of solution features forming cannot be ruled out. It is therefore recommended that no surface water should be taken into soakaway drainage. In addition, all new drainage should be a closed system with flexible jointing or should contain impervious linings to prevent infiltration of water onto the underlying deposits and loose or completely weathered limestone should be inspected by a suitably competent person prior to construction.

Kind Regards,



Katie Dresser

For and behalf of Dunelm Geotechnical and Environmental

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