

## 7.0 Landscape

### 7.2 Landscape Masterplan

#### Site Strategy

The landscape design strategy seeks to define a clear series of external spaces that link the new building to the wider landscape and provide a clear and logical sense of arrival for school visitors.

The new building will be constructed within a 'live' school site. The building location has been positioned to allow both construction access and safe escape routes to the existing building. Minimum dimensions from existing buildings and key boundaries are shown opposite.

Key vehicle and pedestrian entry points have been retained. Parking and access are located to the eastern edge of the site, to maximise safeguarded space available to pupils to the north of the new building.

A new pedestrian and vehicle access extended to the front of the new building to link to the main entrance. ▲

Secure lines define the school safeguarded areas. Refer to **Site Security/Boundary Treatments**.

Existing car parking to the north is relocated to the east, with the current parking area utilised as hardstanding for pupil play activities, linked to the current playground to the NW corner.

The demolished building will be replaced with new playing field capable of supporting a junior grass football pitch and a 50m running track.

Retained playing field to the south will still accommodate space for junior football and summer games.

The existing games courts to the east will be repaired/re-surfaced but no other works are proposed.

No new boundary fences are included, but new weldmesh fences are proposed to provide a 'secure' line between the main vehicle/pedestrian access and playing field (west side) and Garden Nature Space (east side). Gates will provide managed/controlled access to the east of the building for access to the kitchens.







## 7.2 Landscape Masterplan

### Legend

- 01 Primary pedestrian and vehicular site entrance retaining existing vehicle and pedestrian gates
- 02 Retained secondary site/pedestrian entrance
- 03 New tarmac pedestrian footpath to school building
- 04 New car parking - Total numbers **38** (includes **3** accessible spaces)
- 05 New access gates onto retained area of tarmac providing secondary pedestrian route and maintenance access
- 06 New Binstore - located 39m from kitchen
- 07 Delivery vehicle turning head and fire tender access with new concrete defensible planters preventing vehicles over-running
- 08 School arrival space to building main entrance
- 09 Early years hard and soft informal space inc coloured safety surfacing, legacy mud kitchen and legacy growing beds
- 10 Early years shelter/canopy providing cover for outdoor play/teaching
- 11 KS1 hard and soft informal
- 12 Area of existing playground and tarmac car park retained and reused as KS1 hard informal
- 13 Area of new playing field and sport line markings replacing lost playing field to the South
- 14 New cycle and scooter parking, numbers to match existing school allocation to north end of the site
- 15 Existing cycle parking retained
- 16 Classroom breakout spaces
- 17 Retained KS2 MUGA with new accessible access and concrete step unit
- 18 New KS2 garden area inc rain garden, fruit tree orchard, growing space, soft/safety surface to trim trail (equipment not included)
- 19 Weldmesh fencing and mixed species hedge planting
- 20 Existing playing field
- 21 Existing tree habitat enhanced with new plug planting
- 22 EV Charging Bays

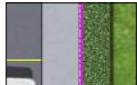




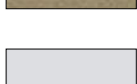



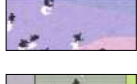
### Fencing and boundary treatments

-  Existing boundary fence
-  2.4m weldmesh fence to secure line
-  1.8m timber fence to bin store
-  1.2m bowtop railing to early years externals





7.3 Landscape Masterplan, Material Key

KEY

	Pedestrian tarmac-paths and maintenance access
	Vehicle tarmac
	Coloured tarmac
	Self binding gravel
	Play bark surface to early years play space and KS2 growing area
	Existing tarmac retained
	Existing Muga Surface made good
	Pre cast concrete step units and handrails
	Rubber crumb safety surface
	Grass matta tile safety surface to trim trail

Soft Landscape

	New tree planting
	New fruit trees
	Existing trees
	Mixed species hedge planting
	Rain Garden
	Flower rich perennial planting
	Amenity grass
	Playing Field
	Wild flower meadow planting



### 7.4 Hard and soft material summary

#### Hard Landscape-Surfaces

Hard surfacing materials have been selected that are simple and robust.

-A tarmac perimeter immediately around the buildings will facilitate easy access for circulation, maintenance, and meets emergency access requirements.

-The proposed car parking bays and access road are surfaced in a vehicular tarmac with coloured tarmac to the school frontage and turning head crossover.

-Coloured tarmac will be used to the school frontage.

-To the existing games court, areas will be re-surfaced in tarmac and include line marking to replicate the existing court arrangement, or any alternative (e.g. tennis).

-Wherever possible existing paving has been retained and integrated into the new scheme. Where existing surfaces are retained, a clean break line will be provided between retained and new areas of hard landscaping.

-Generally, hard surfaces are edged with pin kerbs or road kerbs/flush kerbs depending on location.

-The existing cycle shelter will be retained and new hard surfaces will link to it.

-New cycle shelter/hoops and racks will be located to the north of the site and will be on a new in-situ concrete base allowing the facility to be bolted directly.

-Informal paths will be gritstone with timber edgings.

-Safety surfacing to the Early Years space is proposed, this will consist of wet-pour rubber crumb 40mm depth surface over a prepared /compacted type 3 stone base.

-Rubber tile grass mats are proposed to wider trim trails. These are 25mm thickness minimum laid over 150mm depth topsoil/grass seed. They will provide a 2.5m CFH.

Pre cast concrete step units, tactile paving and handrails are provided to steps between the

#### Boundary Treatments

-Proposed boundary/secure line fencing and gates will be weldmesh type, 2.4m high, colour: black. Gates to be manually operated, secured with mortice deadlocks and to have drop bolts allowing them to be secured in the open position if needed.

-Low railing to the Early Years space will be 1.2m hoop top fence specified with anti-trap top. Gates to match, as above.

-Existing boundary fence/gates are to be retained. No works are proposed to these.

-1.8m timber close board fence/gates to match are included to the binstore area.

#### External Furniture

-Cycle shelter and cycle racks are to be provided to replicate existing provision. The cycle shelter will be a metal frame with curved perspex roof. Cycle racks will be Sheffield type. Trike/scooter racks will be similar type and allow multiple trikes/scooters to be parked/secured.

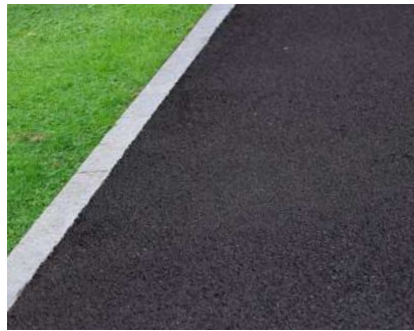
-Door guards will be provided where there is a risk of collision with outward opening doors.

-A combination of bollards, removable bollards and planters will be located at the front of the school to prevent vehicles from overrunning footways. Removable bollards will be utilised where occasional maintenance and emergency access is required.

-A new early years canopy is proposed, this will consist of timber/metal framing with a polycarbonate roof, all to meet 20yr service requirements.

### 7.4 Hard and soft material summary

1 Tarmac with flush pin kerb



2 Coloured tarmac to (school frontage and overrun across turning head)



3 Line marking to car parking



4 Gritstone path /surface with timber edgings



5 Safety surface-rubber crumb to early years space



6 Safety surface-safety rubber tiles/grass to trim trails



### 7.4 Hard and soft material summary

7 Bark Chip to Key stage 2 garden



8 Timber edgings to planting, bark chip and gritstone



9 PCC edgings to tarmac footpaths



10 PCC kerbs to access road and car park



11 Sheffield style cycle racks



12 Door guards (with tapping rail)



### 7.4 Hard and soft material summary

13 Covered space to early years outdoor play



14 Scooter racks to match existing



15 Cycle shelter



16 Bollards/planter-building protection



17 Weldmesh Fence-secure line



18 1.2m anti-trap bow top railing



19 Binstore screen fence



## 7.5 Soft landscape

### Soft Landscape

Existing trees will be retained throughout the site where ever possible. These will be enhanced by introducing mulch surrounds to their trunks to prevent mower damage, and be better managed to contribute to habitat.

Retained trees will be protected during the works where construction activities are planned nearby.

New trees are proposed throughout the site. Stock sizes will be 12-14cm girth with a clear stem of a minimum of 2.2m high. Trees will be planted in 1 cubic m prepared pits set in soft landscape with single stake supports. New trees will be either native or varieties of native species.

Smaller/fruit trees are proposed to the Key Stage 2 garden space, these will be half standards with a clear stem of 1.5m, specified with M106 (semi-dwarfing) rootstock and be sourced locally. Exact type to be agreed at detail design stage.

A watering tube will be provided per tree pit. A topsoil mix & 150mm depth free-draining layer will be applied to the bottom of each pit.

New native hedge planting will be 80-100cm bare root plants, set in staggered rows of 5 plants per linear m in a 450mm depth topsoil trench 900mm width. Each plant will be staked and be protected with biodegradable vermin guards. To include 1m high post and wire support fence, (where not adjacent to boundary fences).

Perennial flowering beds and rain garden planting will consist of 1L pot plants planted at 7 plants per sqm.

Shrub and ground cover planting will be 2L pots and planted between 3-5 plants per sqm.

Typical species to provide ground cover, tolerance to dry north facing conditions, to provide a long /varied flowering season and have low maintenance requirements.

Shrub and perennial planting will be planted in prepared beds of 450mm settled depth topsoil and topped with 50-75mm depth PAS100 compost mulch. All trees will have a 1m diameter mulch surround.

All planting stock (except wildflower) will be inoculated with mycorrhizal root improver to aid establishment.

To site edges wildflower meadow will be established by seed or plug planting. Wildflower planting areas are specified on the next two pages.

### Additional measures to assist BNG

- 01 Additional 150m2 of woodland planting to the western boundary
- 02 Install two bat boxes to chosen existing trees
- 03 180m2 Additional woodland meadow understorey ( no new trees due to location of sewer)





7.5 Soft landscape

- 1 Native avenue tree planting (semi-natural vegetation UGF score=0.6)  
1-Tree species *Alnus glutinosa*  
*Malus sylvestris*



- 1a Native avenue tree planting (semi-natural vegetation UGF score=0.6)



1a-Tree species list  
*Acer campestre*  
'Streetwise'

- 2 Fruit trees to ks2 garden  
Breaburn Hillwell - Apple  
Williams Bon Chrétien Pear Tree  
Concorde Pear Tree



- 3 Wildflower meadow (semi-natural vegetation UGF score=1)



- 3a Wildflower plug planting under existing trees (semi-natural vegetation UGF score=1)



3-Bespoke perennial seed mix sown over wildflower growing medium min 25mm depth. <https://wildflowerturf.co.uk/products/meadowscape/> or similar.

3a-Plug planting min 65cc size. 10 plants per sqm



## 7.0 Landscape

### 7.5 Soft landscape

- 4 Mixed species hedge UGF=0.6.  
beech/hornbeam



- 5 Plug planting-under trees  
UGF=1



- 6 North facing sensory planting  
UGF=0.7

Sarcococca  
tiarella  
Astilbes  
Erythroniums  
Pulmonaria  
Heuchera  
Brunnera  
Hardy Geraniums  
Vinca



- 7 Rain Garden Planting UGF=0.7



- 8 Ground cover planting  
UGF=0.5



- 9 Flower Rich perennial  
planting UGF=0.7



7.5 Soft landscape

4-Low dense shrub planting palette

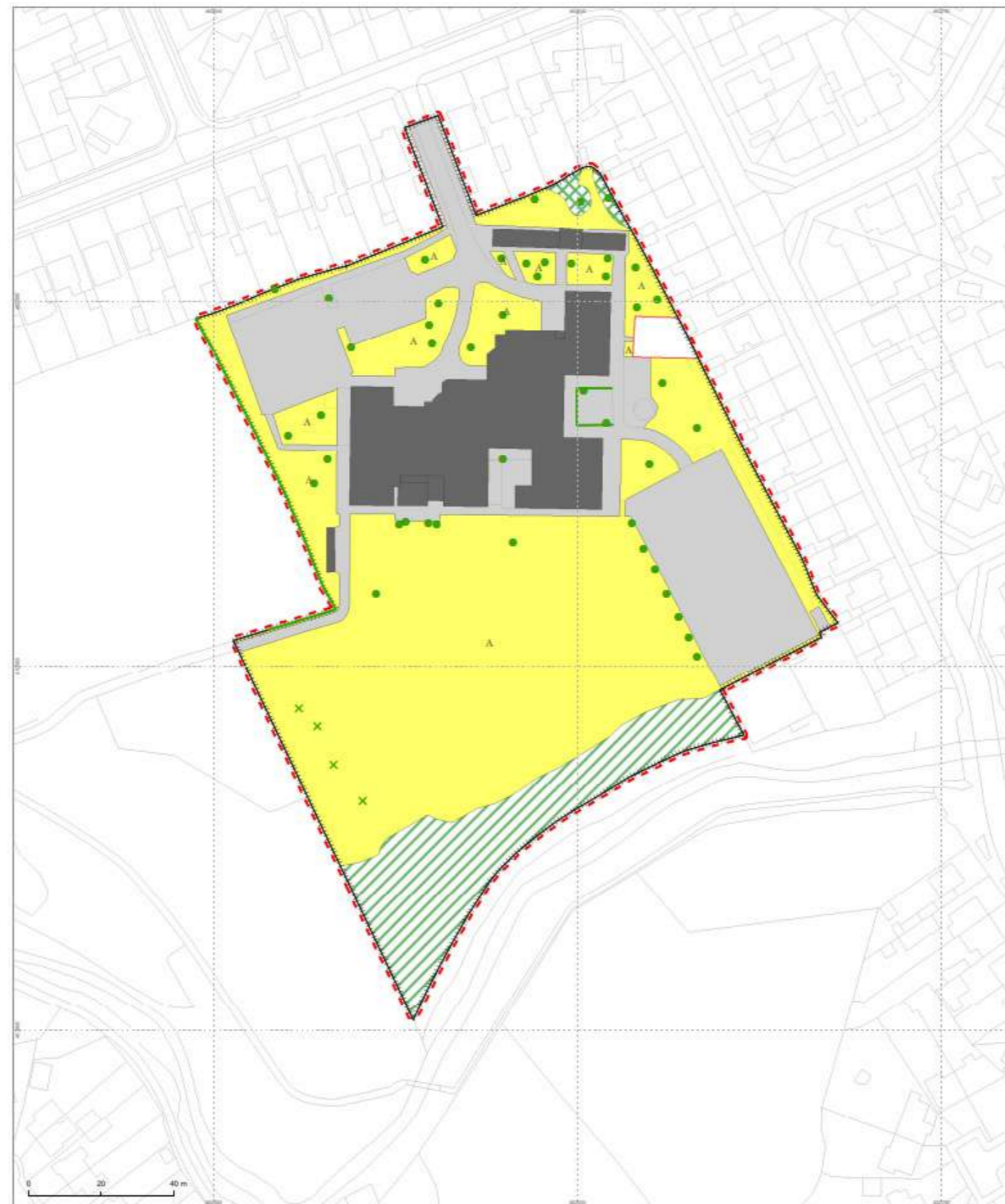
- BERGENIA 'SILBERLICHT'
- CHOISYA TERNATA
- CORNUS ALBA 'SIBIRICA'
- CORNUS SANGUINEA 'MID-WINTER FIRE'
- DRYOPTERIS FILIX-MAS
- EUONYMOUS FORTUNEI 'EMERALD & GOLD'
- HEBE ALBICANS
- HYDRANGEA MACROPHYLLA
- 'HOKOMAREVO' to be planted as specimens within areas of groundcover
- HYPERICUM CALY CINUM
- LAVANDULA ANGUSTIFLOIA 'HIDCOTE'
- MAHONIA AQUIFOLIUM 'APOLLO'
- MAHONIA EURYBRACTEATA 'SOFT CARESS'
- SARCOCOCCA HOOKERIANA 'HUMILIS'
- SKIMMIA JAPONICA 'RUBELLA'
- VINCA MAJOR
- VINCA MINOR



## 7.6 Ecology

### Project Background

Middlemarch Environmental Ltd was commissioned by Mott Macdonald to undertake a Preliminary Ecological Appraisal of the site of a proposed development at Hempland Primary School, Whitby Avenue, York. This assessment is required to inform a planning application associated with the demolition of the existing school building and the construction of a new school on the same site. A copy of this report is submitted with the planning application.



Phase 1 Habitat Map

### Legend

- |                              |                                  |
|------------------------------|----------------------------------|
| Site boundary                | Broad-leaved plantation woodland |
| Scattered scrub              | Building                         |
| Scattered tree               | Dense scrub                      |
| Fence                        | Hardstanding                     |
| Species-poor intact hedgerow | Introduced shrub                 |
| Amenity grassland            | Other habitat: vegetable garden  |



## 7.7 Drainage

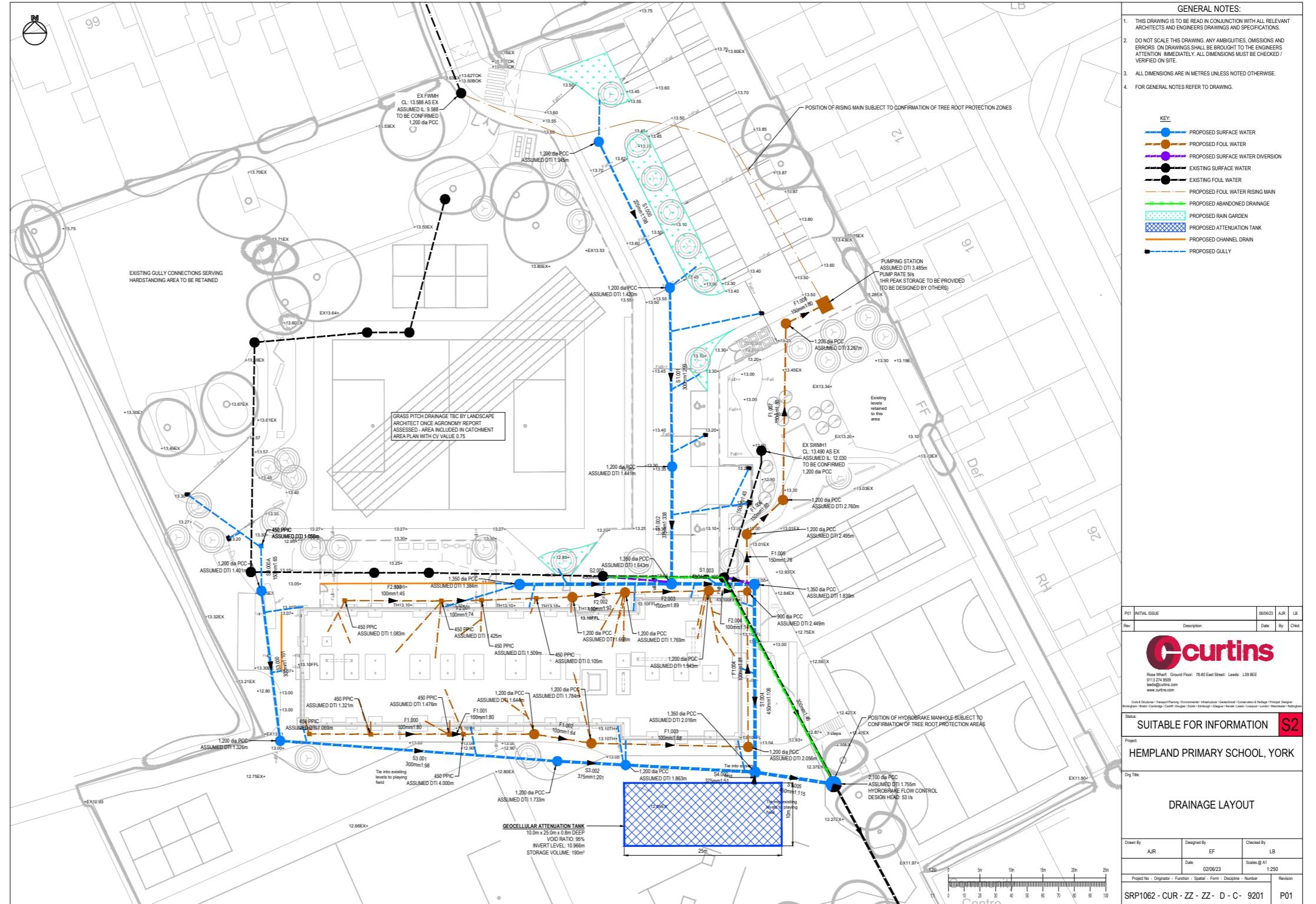
The drainage strategy has been developed to meet the DfE requirements as well as the Lead Local Flood Authority (LLFA) requirements.

The LLFA, Internal Drainage Board and Yorkshire Water have been consulted on the drainage strategy.

The surface water discharge is to be restricted to 70% of the existing brownfield discharge rate from the site and is proposed to discharge to Tang Hall Beck utilising the existing connection.

Rain gardens have been proposed across the site to provide water quality and amenity benefits as well as attenuation in the short rainfall events. A geocellular attenuation tank is proposed to provide the additional attenuation storage required to meet the discharge rate.

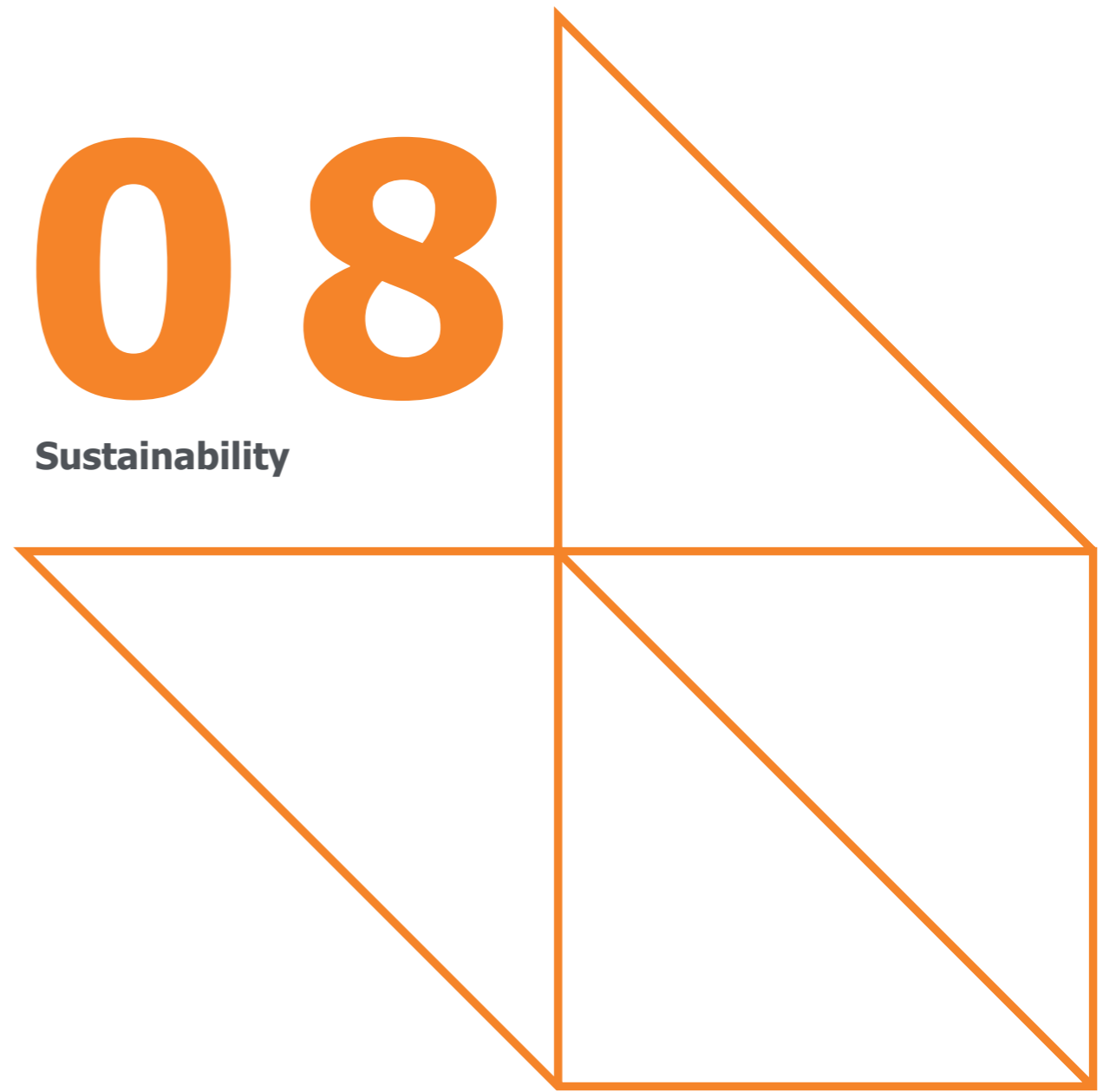
The foul water drainage is proposed to discharge to the Yorkshire Water Sewer in Whitby Avenue utilising the existing connection. Due to site levels the foul water will require pumping. A pump station is proposed south of the proposed carpark.



Drainage Strategy Plan

08

Sustainability





Ariel View from the North East

## 8.0 Sustainability

### 8.1 NZCIO

#### 1. INTRODUCTION

The following section outlines how our proposed design has developed to support the school's requirements to be sustainable and Net Zero Carbon in Operation (NZCiO), and demonstrate compliance with the City of Yorks planning requirements in relation to sustainability and carbon reduction.

#### 2. SUMMARY OF REQUIREMENTS

##### 2.1. City of York planning policy

The local planning requirements identify specific policies in relation to sustainability and carbon reduction. A summary of the relevant policies is detailed below:

##### Policy CC1

New buildings must achieve a reasonable reduction in carbon emissions of at least 28% unless it can be demonstrated that this is not viable. This should be achieved through the provision of renewable and low carbon technologies in the locality of the development or through energy efficiency measures. Proposals for how this will be achieved, and any viability issues should be set out in an energy statement. Renewable and low carbon energy generation developments will be encouraged and supported in York. We will work with developers to ensure that suitable sites are identified, and projects developed, working with local communities to ensure developments have their support. Developments on brownfield land will be encouraged.

##### Policy CC2

Sustainable Design and Construction of New Development. Proposals will be supported where they meet the following:

All new residential buildings should achieve:

- at least a 19% reduction in Dwelling Emission Rate compared to the Target Emission Rate (calculated using Standard Assessment Procedure methodology

as per Part L1A of the Building Regulations 2013); and

- a water consumption rate of 110 litres per person per day (calculated as per Part G of the Building Regulations).

All new non-residential buildings with a total internal floor area of 100m<sup>2</sup> or greater should achieve BREEAM 'Excellent' (or equivalent).

Strategic site developments should undertake a BREEAM Communities assessment (or equivalent). All new residential and non-residential developments will be required to submit an energy statement which demonstrates how these requirements will be met. This should include a sustainability checklist, which shows how principles for sustainable design, construction and operation will be achieved.

##### 2.2. School specific sustainable estates strategy

The school specific Sustainable Estates Strategy identifies the key interventions to demonstrate a climate resilient school and be NZCiO.

- Fabric first approach with very low U-Values and air permeability
- Ventilation strategy – likely to be a mixed mode ventilation strategy with Mechanical Ventilation with Heat Recovery (MVHR) in winter and natural ventilation (non-attenuated cross or side ventilation) in summer.
- Heating – to be ultra-low temperature hot water system via electric heat sources such as ground source or air source heat pumps
- Cooling – Passive means through ventilation strategy and potential for ground source heat pump to be put in reverse without activation of the compressors, enabling for 'passive' cooling through circulation of ground water. Ground source heat pumps provide the potential to adapt to the 4 degrees overheating risk.
- Domestic hot water – ASHP and direct point of use
- HVAC controls – Zoned systems, with smart controllers and easily interrogated and managed Building Energy Management System (BEMS)

- Electric systems – Very efficient systems, inclusive of LED lighting and smart controls
- Renewable technology – Solar PV offsetting demand through roof and canopy arrays
- Monitoring and metering – Ensuring transparent access to energy and water data for monitoring and behavioural change programmes

The strategy also identifies key opportunities to address wider climate issues:

- Climate change resilience – Adaptation for a 4oC global warning scenario by retro fitting equipment through the life cycle of the school.
- Flooding – Potential additional geo cellular attenuation or formation of safe and secure water bodies to minimise future flood risk.
- Biodiversity net gain- Additional provision beyond the current proposals by increased planning and other features to improve biodiversity across the estate.

#### 3. DESIGN RESPONSE

##### 3.1. Building form and location.

The proposed design has been developed to provide an efficient form and footprint to minimise heat loss and maximise benefit for capturing solar energy for both heating and energy generation via the use of a photo voltaic array at roof level.

The orientation and form of the concept and proposed building provide an efficient building form reducing heat loss but allowing good access to daylight and beneficial solar gain to the South facing spaces in winter. The smaller elevations to the West also minimise unwanted glare and solar gain to teaching spaces.

The masterplan also exceeds the current provision of green and planted area such as playing fields and combined with the proposed bio solar roof will enhance the biodiversity of the site.

##### 3.2. General principles adopted as part of the building design.

As a response to the strategy the principles adopted for the school will be to adopt the following:

- Lean – Main aim is to reduce the buildings energy demand through "passive measures".
- Clean – Meet the reduced energy demand in the most efficient way possible using "active measures"
- Green – Assess the technical feasibility of incorporating a low or zero carbon technology to further reduce the CO<sub>2</sub> emissions and achieve a NZCiO solution.
- Provision of bio solar roof to offset the annual energy demand and provide further biodiversity.

The energy strategy has been developed using the above principles to demonstrate compliance with the school's requirement to be NZCiO. To offset the energy demand for the school a proposal for the bio solar roof has been included in the design,

The school will not utilise fossil fuels i.e., all electric therefore the heat source and catering equipment will be electric. The most efficient equipment will be utilised where viable to support a reduction in energy consumption and carbon emissions.

##### 3.3. Heat Source

As part of the decarbonisation of the school it is proposed to use air source heat pumps to generate low carbon heat for heating and hot water throughout the school. The fabric and glazing have been optimised to reduce heat losses to the building. The air source heat pumps will be in a plant well at roof level on the new school so will be unobtrusive in terms of noise and visual impact.



## 8.0 Sustainability

### 8.1 NZCio cont..

#### 3.4. Photovoltaic arrays proposed for the school

It is proposed to install a bio solar roof for the school to support the NZCio requirement and enhance the biodiversity for the site. The proposed extent and location of the photovoltaic panels are shown in the figure below:



The proposal is to provide 110KW peak array comprising of 271 PV panels, each rated at 410Wp. The panels are orientated on an East West configuration to maximise the yield. The annual energy yield from the PV installation is estimated to be 94,649KWh per year (accounting for system losses).

As noted above the proposed PV arrays can provide 94,649KWh energy per annum. The area of school is 2200m<sup>2</sup>. Therefore, as proposed, the PV system will be able to offset 43KWh/m<sup>2</sup> which provides the basis for the school to be NZCio.

#### 4. PART L ASSESSMENT AND COMPLIANCE WITH PLANNING POLICY

To demonstrate compliance with the City of York planning policies and the school's sustainable estates strategy an assessment of the buildings performance has been undertaken using dynamic thermal modelling to demonstrate compliance in terms of Part L.

The performance of the building in terms of Carbon Emissions is tabulated in the figure below:

Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> . annum	3.66
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> . annum	-2.62
Target primary energy rate (TPER), kWh/m <sup>2</sup>	37.82
Building primary energy rate (BPER), kWh/m <sup>2</sup> /yr	-30.77
Do the buildings emission and primary energy rates exceed the targets?	BER < TER    BPER < TPER

The adoption of lean, green and clean design has resulted in negative carbon emissions for the new school resulting in a 240% reduction in emissions from the target rate.

Therefore, the design performance of the building exceeds the City of Yorks planning policies and aligns with the school's aspiration to be NZCio.

#### 5. WIDER CLIMATE ISSUES

##### 5.1. Climate change resilience

Initial studies have been undertaken to assess the impact of an increase in temperatures for the proposed life cycle of the building.

Key teaching and assembly spaces have been assessed for current 2020, future 2050 and 2080 weather scenarios to see how the building performs in increasing temperatures due to climate.

The results demonstrate that the current design complies with 2020 and 2050 climate scenarios with only two spaces not complying with the 2080 weather files.

The use of hybrid ventilation and heating systems would likely be replaced up to 3 times from the initial installation so it is considered that either additional or larger hybrid units could be provided, or ceiling fans utilised to demonstrate compliance for the spaces in 2080 without significant interventions to the current school design and footprint.

The floor to ceiling height is 3600m so low speed ceiling fans could easily be accommodated to provide additional air movement to reduce the perceived room temperature.

Furthermore, the hybrid units could provide cooling via the ASHP (if bivalent), with additional or more powerful PV required to offset the increase in annual energy. Canopies to the south could be introduced but this would impact on daylighting within the adjacent teaching spaces but could be utilised.

##### 5.2. 5.2. Flooding

The current design utilises a combination of above and below ground surface water attenuation (SWA) measures as soakaways are not viable for the site due to the presence of clay. The proposal is to reduce surface water run off from site to 70% of existing. The increase in playing field area (new northern field on the site of the existing school and the retention of a significant proportion of the Southern playing field present an opportunity to incorporate additional measures for SWA due to increase and more intense rainfall scenarios.

Therefore, it is considered that the proposed drainage strategy and site align with the current Estates strategy and planning policy.

#### 5.3. Biodiversity net gain.

The current scheme improves the current biodiversity across the site using the following measures.

- Enhanced planting to promote biodiversity in new and existing landscape features.
- Retention and replacement of as many trees possible during phase 1 works.
- Proposed bio solar roof
- New northern playing field (albeit species poor as regularly mown)

#### 6. BREEAM COMPLIANCE

The schools design and performance from an energy and carbon perspective significantly exceed the City of Yorks planning requirements (Policy CC1 and CC2).

In summary Policy CC1 requires 28% reduction in emissions, while CC2 requires BREEAM Excellent for non-residential schemes.

The performance of the building is exemplary in terms of carbon reduction and other sustainability measures.

It is understood that BREEAM will not be a specific requirement for the school as the school's sustainability strategy and associated Department for Education requirements exceed the requirements of BREEAM for the relevant areas noted above.



Ariel view showing bio solar roof

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