



# Structural + Civil Engineering



# Places. Property. People.

Working across numerous specialisms, we are a passionate multi-disciplinary design and property consultancy.

Our team of property specialists and designers provide innovative solutions to make places, properties, and people be the best they can be.

Our Building Design Consultants work collaboratively to achieve a solution that is sustainable, inspirational, and empowers current and future generations. Being considerate and client-focused, we explore the benefits above and beyond your original requirements, delivering your projects to an exceptional standard.

## STRUCTURAL + CIVIL ENGINEERING AT CONCERTUS

Our integrated approach allows us to provide coordinated, sustainable, and efficient solutions for buildings, structures, drainage and paving. With a focus on durability, safety, economy, buildability and aesthetics, our team of Structural and Civil Engineering Consultants deliver design and engineering projects across multiple sectors.

We provide civil and structural engineering design services in all major materials for new builds, extensions and alterations. Working collaboratively with clients, consultants and contractors, we ensure your vision and aspirations are fully understood and delivered for your project.





## OUR STRUCTURAL AND CIVIL ENGINEERING SERVICES INCLUDE:

### **CIVIL ENGINEERING DESIGN**

Our Civil and Structural Engineering Consultants undertake the design of infrastructure projects, including sustainable drainage 'SuDS' schemes, retaining walls, riverbank and bridge works, hard-standings (including car and lorry parks) and site accesses.

We have an excellent success rate in gaining planning approval from Lead Local Flood Authorities for sustainable drainage schemes.

### **CONTAMINATED LAND ASSESSMENTS ADVICE**

Our team can identify potential contaminated land constraints, provide practical advice on the requirements for investigations and offer cost-effective solutions.

### **FEASIBILITY ADVICE**

We regularly provide feasibility advice to our clients, considering the structural and civil constraints of a site in terms of drainage, geotechnics, contamination and existing structures.

Our advice can help you optimise your investment at both pre-purchase and pre-development stages.

### **FLOOD RISK ASSESSMENTS**

Looking at all potential sources of flooding and the site constraints, we identify cost-effective SuDS drainage solutions that enable development and support successful planning applications.

### **GEOTECHNICAL INVESTIGATIONS ADVICE**

We can advise on geotechnical issues and design suitable investigations for structural and infrastructure projects.

### **INVESTIGATION, INSPECTION, ANALYSIS + REPAIR SCHEMES**

We are experienced in delivering investigation, inspection, analysis and repair schemes for structural defects, cracking and subsidence issues.

### **STRUCTURAL DESIGN + ANALYSIS**

We design new build structures, extensions and alterations identifying cost-effective and elegant structural forms. Leading the way in innovative building design and construction, having been accredited BIM Level 2, we work collaboratively with other disciplines to reduce duplication.

Working within a 3D modelling environment, we provide structural analysis of existing buildings to facilitate their change of use and extension.



## PROJECTS

# Sybil Andrews Academy

### Key Information

Location:  
**Bury St Edmunds, Suffolk**

Sector:  
**Education**

Value:  
**£25 million**

Concertus Disciplines:  
**Architecture**  
**Building Service Design**  
**Estates + Development**  
**Management**  
**Interior Architecture**  
**Landscape Architecture**  
**Project Management**  
**Quantity Surveying +**  
**Cost Consultancy**

### SCOPE

Sybil Andrews Academy was designed and constructed so that the building provides flexibility and can be adapted as the Academy grows, and in response to changes in the school curriculum. Designed around the ethos of a central heart space, the building looks to minimise the use of corridors by maximising social and group spaces that can be used flexibly. The building contains large and flexible teaching spaces, which are predominately based around the learning resource and dining areas. The approach is continued within Teaching Block 1 where classrooms break out into a central group teaching and social space. The use of the auditorium staircase provides further smaller presentation and tutoring opportunities. The first phase of works also included a four court

sports hall with a studio, gym, and changing facilities to Sports England standards.

The location of the Heart Building has been carefully considered to provide a strong visual feature to the Academy and its wider environment. It has been positioned along the western boundary to act as an acoustic break and light shield between the school site and the neighbouring residential development. The positioning also provides a strong visual presence to people entering Moreton Hall via the new Eastern Relief Road. The entrance is strongly emphasised through the continuation of structural framing beyond the building line and this draws people into the building whilst blurring the distinction between internal and external space.

### RESULT

The finished project was shortlisted for the RICS Awards 2018 in the Community Benefit and Design Through Innovation categories. Construction was completed mid-November and the children moved into the new school in December 2016. Divided into three key buildings; Heart Building, Teaching Block 1, and the Sports Building, the academy provides a stimulating educational environment.



## PROJECTS

# Sir Bobby Robson School

### SCOPE



This 60-place school provides a first-class support setting and learning facilities for primary and secondary students with social, emotional and, mental health needs.

Leading innovation has resulted in a purpose-built school which includes 10 general classrooms, 3 specialist classrooms, a multi-purpose hall, kitchen, dining space, soft play, and sensory areas. A calming and inspiring environment has been created to allow pupils to develop independence and self-confidence. The internal design considered durability of finishes and health and safety to facilitate safe and functional surroundings.

The school shares a site with multiple users, including a pupil referral unit, Orwell Sexual Health Clinic, and Inspire Suffolk (a charity dedicated to supporting young people). We arranged site user meetings

prior and during construction to accommodate the different needs of these organisations. These meetings influenced our design – for example, the building had to be robust and incorporate pitched roofs to deter roof climbers.

The school was constructed by making use of modern methods of construction (MMC), designed by our Structural and Civil Engineering team. This involved the installation of a timber Structurally Insulated Panel (SIPS) system to form the main structure of the school, followed by the associated brickwork. SIPS allow for multiple benefits to the build, predominantly due to its cost and time effectiveness. The advantage for the construction process includes allowing the scheme to be manufactured off site, which began during the reclamation of the site, saving 12 weeks in the overall programme.

### Key Information

Location:  
Ipswich, Suffolk

Sector:  
Education

Value:  
£6 million

Concertus Disciplines:  
Architecture  
Building Services Design  
Interior Architecture  
Landscape Architecture  
Project Management  
Quantity Surveying  
Structural Engineering



### RESULT

We played a significant role in helping the school obtain funding to make their dream a reality. The previously unused, confined brownfield site has now been transformed. Our collaborative approach allowed for a seamless transition to deliver this specialist school which has surpassed expectations through creative design solutions. We are extremely proud to have been a part of this instrumental project which has provided Suffolk with its first SEMH school.



## PROJECTS

# Phoenix Enterprise Park

### SCOPE

We were commissioned to deliver a master plan on the entire site. Following discussions with the client, we decided to provide a phased option to suit their funding line.

Cost data was presented to the client to allow them to determine the affordability and different phasing options open to them. A full application was submitted for Phase 1 of the project which consisted of 16 units varying in meterage to be leased on completion to local businesses. The business units and external areas were developed with robust, low maintenance materials and components. Producing visuals at an early stage of the project helped with the marketing of the site. The units contained a variety of facilities such as warehouses, storage accommodation, office spaces, and welfare facilities.

### Key Information

Location:  
Lowestoft, Suffolk

Sector:  
Commercial + Industrial

Value:  
£4 million

Concertus Disciplines:  
Architecture  
Building Services Design  
Estates + Development  
Management  
Landscape Architecture  
Quantity Surveying +  
Cost Consultancy  
Structural + Civil  
Engineering

### RESULT

The usable business space we created contributed to the economic development in an area of Lowestoft which was in need of regeneration. Our clients have complimented the efficient delivery of this project.



## PROJECTS

# Lytham Road Waste Transfer Centre

### SCOPE

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Concertus were commissioned to design and project manage the construction of a new waste transfer centre.

Extensive external works were carried out to support the requirements of the facility, including establishing the main yard, access road and associated ground works.

We were involved from stage 3 of the project until completion, during which many of our multidisciplinary teams have contributed towards the completion of the facility. This is a secondary Ipswich based centre to assist the existing Foxhall Road site and would specifically be for commercial waste rather than household waste. The purpose of the new station was to allow waste to be transported to The Energy from Waste Facility and recycling transported to reprocessing facilities more efficiently in fewer larger vehicles. The transfer station also required an office, weighbridge, car parking spaces, a new site access road, and a drainage

and water management system.

The team utilised a 3D modelling system to produce the design for the new station to ensure accuracy and efficiency. This design incorporated several bays sized to cater for the storage of each separately collected waste type, with considerations for vehicle movements and up to two days retention time.

Our Engineers were responsible for the installation of a passive hybrid designed ventilation system. This system included passive ventilation roof wind catchers, which by being predominantly wind powered, helps make the building more sustainable and energy efficient. This was further enhanced by the installation of roof mounted solar panels for the new station. These are features we are conscious to incorporate within our designs to ensure we are making a conscious effort towards achieving Government's Net Zero by 2030 initiative.

### Key Information

Location:  
**Ipswich, Suffolk**

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Sector:  
**Community**

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Value:  
**£3.7 million**

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Concertus Disciplines:  
**Architecture**  
**Building Services Design**  
**Estates + Development**  
**Management**  
**Landscape Architecture**  
**Project Management**  
**Quantity Surveying +**  
**Cost Consultancy**  
**Structural +**  
**Civil Engineering**



### RESULT

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We successfully delivered this important project for the local community, and the new waste transfer station is now complete and in use. The new facility can accommodate the collection and transfer of waste in the Ipswich area more efficiently and in line with demand from population growth.



## PROJECTS

# Magna Carta Primary School

### Key Information

Location:  
**Stansted Mountfitchet,  
Essex**

Sector:  
**Education**

Value:  
**£4 million**

Concertus Disciplines:  
**Architecture  
Building Services  
Carbon + Energy Design +  
Management  
Landscape Architecture  
Structural + Civil  
Engineering  
Quantity Surveying**

### SCOPE

We were commissioned by Morgan Sindall to partner with them in a design and build bid through the Essex County Council Framework. This was for full multidisciplinary design, including all Civil and Structural Engineering services. Our Architects and Landscape Architects provided an alternate design which better met the requirements of the brief and responded to the gradients of the site more sympathetically than the reference design provided.

The scheme presented several engineering challenges, including a significant regrading of the site, constructing the new building on cut and fill and the potential for chalk dissolution voids below

the site. Working closely with the geotechnical site investigation specialists parameters for the potential dissolution voids were agreed. We designed a novel raft foundation to safely bridge any potential dissolution voids and to accommodate the variability in the founding stratum. This avoided the need for costly piles which would otherwise have been required. Above ground, a two-storey braced steel frame was designed. This was coupled with light gauge steel infill panels, with a composite first floor and a metal deck roof to provide ease and speed of construction. The structure featured a double height atrium corridor circulation space framed out by long-span beams, providing an impressive architectural feature. A





secondary fire escape staircase was designed as an independent, relocatable steel structure to allow for potential future extension of the school.

A variety of retaining structures, including reinforced brick walls, kingpost walls and gabions were also designed where they could not be designed-out. These responded to the various level changes on site cost-effectively whilst providing visual interest and taking into account the constraints on access for plant and equipment whilst constructing these features.

A full Sustainable Drainage Scheme (SuDS) was designed at planning stage and approved by the Lead Local

Flood Authority. This featured interception, treatment and infiltration of the surface water to a 100 year plus climate change standard using techniques such as drained permeable paving, french drains and cellular soakaways. In addition, the client awarded an additional separate drainage package to improve drainage to the existing private road outside the school. The highway drainage was designed to the approval of both the Lead Local Flood Authority and the Environment Agency to provide multiple treatment stages appropriate to surface water discharging from a highway to protect the groundwater environment from a range of contaminants.



## RESULT

Due to the site constraints, we worked closely with Morgan Sindall to develop a two-storey design supported by some innovative structural and civil engineering. The two-storey solution maximised the external space, increased accessibility and complimented the sensitive setting of the Grade II Listed St. John's Church. Split level play areas linked by a series of gently sloping paths (avoiding steps) were designed to make the best use of the site topography and can also be used as an outdoor amphitheatre space.

This project features teaching accommodation and core facilities for 210 students. Specialist classrooms, practical areas, external learning zones and other facilities are also incorporated in accordance with BB103 guidance. The school is designed to allow flexibility of use so that it can be adapted as the school grows and in response to changes in the school curriculum. A full height atrium space in the heart of the building creates a naturally lit area, used as a library and display space, as well as a bright and airy corridor. This minimised the overall floor area within the building.





## PROJECTS

# Lavenham Road

### Key Information

Location:

**Ipswich, Suffolk**

Sector:

**Community + Residential**

Value:

**£1.8 million**

Concertus Disciplines:

**Architecture**

**Building Services Design**

**Interior Architecture**

**Landscape Architecture**

**Project Management**

**Quantity Surveying +**

**Cost Consultancy**

**Structural + Civil**

**Engineering**

### SCOPE

The requirements of the brief were to provide a new respite and supported living care home to replace the existing building which was outdated and no longer suitable for the intended use. The project was planned to improve efficiencies within the service provision by enabling on-site management and save on revenue costs. Concertus, along with the client, worked to a brief incorporating strict guidelines from NHS England who funded the project.

Initially we were instructed to complete a feasibility study, support with the funding bid, prepare information, and submit a

planning application. The site posed several complexities such as being steeply sloping and experiencing a possible contamination which had to be investigated by a series of site investigations. It was also of interest to archaeologists due to being in the vicinity of a Bronze Age cremation site, as well as Roman and Iron Age finds. Following receipt of planning consent, we carried out the full design and project management through to completion. Our collaborative approach to project delivery included continued client and stakeholder engagement during design and construction phases of the project.

### RESULT

To meet the client's requirements and make sure the building works efficiently, we worked closely with a number of statutory bodies and advisors including NHS England, occupational therapists, the end user/service provider, the local planning authority building control, the fire service and acoustic engineers.





## PROJECTS

# Claydon Primary School

### SCOPE

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This project's brief was to design and build a two-storey standalone block, which would facilitate the expansion of the oversubscribed school from a 210-place to a 420-place primary school. Our team of Structural and Civil Engineers carried out the structural design of the new block, the car park extension, and a drainage strategy.

A flexible space with a split-level ground floor was required. Therefore, a steel frame with masonry infill panels was selected. The panels accommodated the large openings and presented the mixed exterior cladding finishes specified by our Architectural team.

By using ArchiCAD we were able to produce co-ordinated steel drawings. These drawings were then used to export the 3D model into our design and analysis software. Designed to the relevant Eurocode and British Standards, we were able to analyse each member to maximise efficiency in our design. Providing detailed sections and plans (including connection details) in a universal format allowed us to share files with fabricators for a quick turnaround with a reduced risk of errors.

Through continuous review and proactive engagement with the contractor we were able to complete the project two weeks early.

### Key Information

Location:  
**Claydon, Suffolk**

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Sector:  
**Education**

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Value:  
**£2.2 million**

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Concertus Disciplines:  
**Architecture**  
**Building Services Design**  
**Interior Architecture**  
**Landscape Architecture**  
**Quantity Surveying +**  
**Cost Consultancy**  
**Structural + Civil**  
**Engineering**



### RESULT

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Working in a multi-disciplinary capacity, we created an extension which provided an exceptional learning environment, whilst also delivering a building which architecturally sets itself apart from other buildings.




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