



St Sidwell's Point

Education pack



RANDALL SIMMONDS





Contents

What is St Sidwell's Point?

- Project background 4
- Facilities 6

Learn about...

- Building biology 8
- Healthy design 10
- Running costs 13
- Environmental benefits 14
- Passivhaus 23

Exeter City regeneration master plan

- The vision for Exeter 18
- Impact on the UK 20

Careers

- Training and development 28
- Choose construction 30
- Procurement route 31
- Career opportunities 32

What is St Sidwell's Point?

St Sidwell's Point will be one of the world's most energy efficient leisure centres.

It will be the first leisure centre in the UK built to the super energy efficient Passivhaus standard, which is expected to eventually save up to 70 per cent on annual energy costs.

Due to a special filtration system the pools will have exceptional water quality with minimal chemical content, which will greatly improve the experience for swimmers compared to a standard pool.

The landmark building is a grand design. It has been modelled to withstand predicted changes in climate conditions up to 2080.

St Sidwell's Point will replace the aging Pyramids swimming pool and is expected to attract thousands of visitors a year.

The state-of-the-art new leisure complex will feature an eight lane main pool and four lane pool for learners, both with moveable floors.

It will feature:

- 25m competition swimming pool
- 20m community pool
- Children's confidence/play water
- Health and fitness centre
- Café to seat 50
- Children's soft play activity space
- Spa (including hydrotherapy pool, heat experience and treatment room)
- Rooftop terrace



| St Sidwell's Point





What is in it for me?

The new leisure centre will provide fabulous facilities for the local community of Exeter, the surrounding areas and visitors to enjoy.



The 25 metre and 20 metre swimming pools will provide a place to train, learn, and have fun with swimming, whilst the confidence pool will provide a safe environment to introduce and encourage people to the water perhaps for the first time.

The health and fitness suite located conveniently in the centre of Exeter, will be an easy stop off before or after work, or on a lunch break. For anyone keen to keep their fitness on track, the state-of-the-art equipment and training support will help to achieve this.

The café will provide a meeting place in a unique environment, that is open to the public and members to enjoy.

For those wanting just to relax and enjoy a true bit of 'me time', the spa provides the space and facilities to do just that - unwind in the sauna, relax on the therapy beds or enjoy one of the specialist treatments.

The new centre is for people of all ages and for families there are all the facilities you would expect for changing and access, and in addition a children's soft play area.



The facilities sound great, but what is a healthy design and what will it mean for my experience at the leisure centre?

Building biology

Our living environment is defined by the spaces and buildings we have created, and we take great care when it comes to what we eat, where our food comes from, what we give to our children, how we keep fit, how we spend our spare time.

Historically design in construction may have been led by cost rather than the human factors noted above, in modern design far more attention is given to these areas and how the finished building will contribute to positive health through the choices made at the design stage.

Designs use building biology principles when making decisions on materials and design.

Biology

Science of the different forms and manifestations of life and the conditions, laws and the causes through which they have been affected.

‘Bau’

In German means ‘building’ and describes both the process as well as a completed construction. It can also refer to a ‘construction site’ or a more general term ‘the building industry’.

Bau biology

(Or Building biology) is the study of the wholistic interrelationships between humans and their build living environment.

Building biology as a science is biologically and culturally oriented. It is not a narrow special subject, but a wholistic, interdisciplinary one.

Healthy design

Bau biology

Bau biology standard - SBM

The ideal is to be as close to an undisturbed natural environment as possible.

Based on the *precautionary principle* ie where there is evidence of a potential risk this risk is to be designed out or minimised where ever possible.

Any risk reduction is worth pursuing.

Building biology

25 Principles

- Building site without natural and human-made disturbances
 - Residential homes away from emission sources and noise
 - Low-density housing with sufficient green space
 - Personalised, natural, human and family-oriented housing and settlements
 - Building without causing social burdens
 - Natural and unadulterated building materials
 - Natural regulation of indoor air humidity through humidity-buffering materials
 - Low moisture content of a building that dries out quickly
 - Well-balanced ratio between thermal insulation and heat retention
 - Optimal air and surface temperatures
 - Good indoor air quality through natural ventilation
 - Heating system based on radiant heat
 - Natural conditions of light, lighting and colour
 - Changing the natural balance of background radiation as little as possible
 - Without human-made electromagnetic and radio frequency radiation exposure
 - Building materials with low radioactivity levels
 - Human-oriented noise and vibration protection
 - With a pleasant or neutral smell and without toxins
 - Reduction of fungi, bacteria, dust and allergens as low as possible
 - Best possible drinking water quality
 - Causing no environmental problems
 - Minimising energy consumption and utilising as much renewable energy as possible
 - Building materials preferably from the local region without promoting exploitation and hazardous resources
 - Application of physiological and ergonomic findings to interior and furniture
 - Harmonic measures, proportions and shapes
-

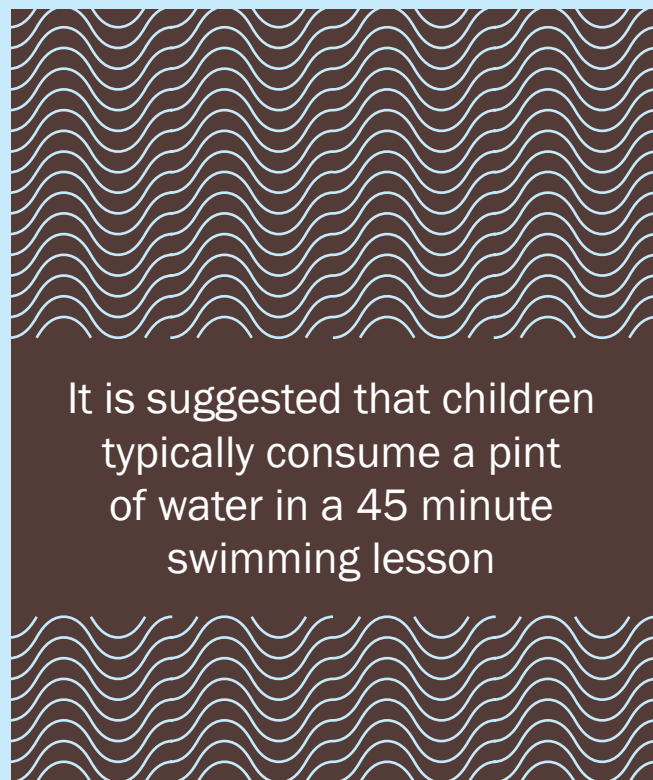
At St Sidwell's Point the healthy design benefits for those using it are summarised below:

Water quality

The improved water quality is something which will make a real difference to swimmers. The standards that will be used at St Sidwell's match those that are used in Germany, where the chlorine levels are much lower, the water will have minimal chemical content.

It is believed that this will be the first public leisure centre in the UK to use a process called 'microfiltration' where excess pool water is forced by high pressure through a semi-permeable membrane which filters out molecular size particles and bacteria.

- Minimal chemicals required (aside from cleaning)
- Constant product quality regardless of feed quality
- Capable of exceeding regulatory standards of water quality, achieving 90-100% pathogen removal
- IMPACT - Compact plant size saves space
- Uses significantly less energy, water and space than traditional sand filtration.



It is suggested that children typically consume a pint of water in a 45 minute swimming lesson

The ground-breaking micro-filtration technology will filter out contaminants with great efficiency and the chlorine dose will be reduced by using the UV light as a primary means of water treatment, making the bathing experience much more pleasant and safe.

Healthy design Swimming pools

Most common filtration strategy for public pools is sand filtration.

Poly Aluminium Chloride is most commonly used and it forms a 'floc' that helps trap fine particles, microfibres and pollutants in the water. But, Aluminium Chloride has been established as a neurotoxin.

Neurotoxins are poisonous and destructive to nerve tissue and long-term exposure can cause widespread central nervous system damage such as intellectual disability, persistent memory impairments, epilepsy and dementia.

Sand filtration requires relatively high levels of chlorination.

Healthy design Alternative water treatment / filtration strategies

Ultrafiltration

Ultrafiltration is a membrane filtration system where excess pool water is forced by high pressure through a semi-permeable membrane which filters out molecular size particles and bacteria.

UV treatment

Ultraviolet (UV) light prevents microbes from reproducing and without reproduction, they become far less dangerous.

Use of low chemical products in construction both on and off site

In addition to the exceptional levels of water treatment, the buildings design for health means that its finishes have been selected to minimise off-gassing and the release of volatile organic compounds (VOCs) are organic chemicals that have a high vapor pressure at ordinary room temperature.

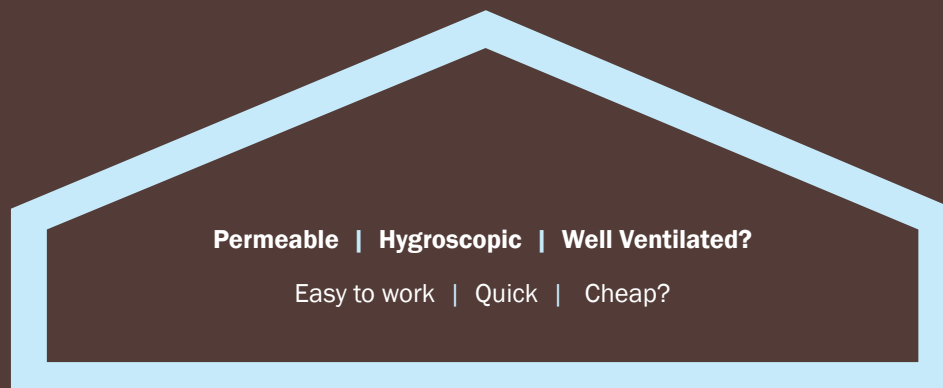
When we talk about the chemical products this refers to minute level of detail of the design – for example some paints have been identified as high cancer risk due to the ingredients they contain.

Finishes can be high in PVC, and there are many other areas to consider. The healthy design concept has identified the areas below as being the 'rules' for all elements used in the construction delivery.

Healthy design

Why bother?

Since the 1960s the industry has responded to this demand by developing a vast range of highly processed, complex construction materials and elements that reduce costs and speed up construction.











Modern paints consist of a complex mix:

- Aliphatics
- Aromatics
- Alcohols
- Ketones
- Petroleum Distillate
- Esters
- Glycol
- Alkyds
- Acrylics
- Zirconium
- Titanium Dioxide
- Vinyl-Acrylics
- Polyesters
- ... and more!

Natural colour palette

The design has also been developed to German biology standards SBM-2015, so the pallet of materials is very natural and neutral.

The higher levels of natural light and human-centric design promotes health and customer satisfaction.

			
Joy Creativity Optimism	Fun Energy Intellect	Fresh Balance Nature	Foundation Safety Healing
			
Cold Sadness Lonley	Intuition Meditation Reflective	Luxury Power Royalty	Love & Death Vitality Passion



Even the mechanical ventilation systems will incorporate pollen filters and CO² sensors to limit its concentration to 800ppm, in line with the guidance.

A mixed-mode ventilation system using natural ventilation from the openable windows, will aid the ventilation and prevent the complex from overheating in the summer. The system will incorporate night-purge, using mechanical ventilation provided by the air handling units in bypass mode. The scheme ensures good summer comfort without compromising energy performance, even when the climate changes.

Summary of the design strategy implemented as St Sidwell's Point:

- Products with full content declarations
- Low VOC mineral paints and pure solid hard oils
- Use 'EMICODE EC 1plus' as starting point
- Hygienic easy to clean surfaces
- Dry or quick drying construction
- Hygroscopic and highly permeable surfaces
- No plastic finishes and fabrics
- Natural, unprocessed materials where practical
PVC and phthalates free
- Low radioactivity, low EMF wiring and shielding
- Well considered, CO² controlled ventilation strategy.



How does the environment benefit?

A Passivhaus building envelope will significantly reduce heating energy losses in pool buildings and results in the following benefits:

- Higher surface temperature
- Minimal thermal bridging avoiding condensation risk
- Increased thermal comfort.

Re-using energy and resources

- Water use reduction – 50%
- Water usage is reduced by recycling the filtered backwash water.

Evaporation is reduced by:

- When possible draining the pool
- Rescuing pool water level
- Increasing the pool hall humidity
- Energy use reduction – 70%
- The heat pump technology simultaneously cools and heats.

Climate resilience

- Ensures good summer comfort without compromising energy performance
- Business case assumptions delivered even when climate changes
- Low water use strategies reduce energy demand, costs and ensures resilience during droughts
- High quality air filtration maintains air quality and protects from increase in contaminants from particulates and pollen under future climate scenarios.

An environmental approach throughout construction

The finished scheme will provide a leisure centre which will have a significantly lower impact on the environment to that of a normal pool, but it is also important that the environmental ethos of the project is applied to throughout the building process.

The site team have really considered this throughout the construction phase and detailed below are some examples of this.

Retention of dug materials

The team have managed to find space and retain a large amount of materials from the cut exercise to help with the fill exercise. They have used material that was

Annual energy and carbon saving potential



Carbon storage of 105 hectares (250 football pitches) of managed woodland



Total energy consumption of 350 average four person households



Emissions of 750 average UK cars commuting 40 miles every day



Enough to make 140 million cups of tea or coffee

The Environment

already on site and had it had tested to ensure it is of the correct quality, and used this as engineered fill behind structures instead of importing new quarried stone. The benefit is that we have less vehicle movements removing and bringing in new materials and we don't need to get rid of materials a bring in new quarried stone.

Bespoke constructed wheel washes

To reduce the use of the wheel washing we required during the bulk removal kept the maximum amount of Tarmac on site so that lorries could run on clean tarmac eliminating the requirement for wheel washing. This strategy continues through the main build as well.

Even with this to ensure that we don't bring any mud onto the city centre roads we constructed wheel washes at each of the gates. These have been constructed so that all water is filtered through clean stone and collected in a catch pit. With the water able to be re used again by pumping it into the pressure washer.

Eco friendly cabins

- All of the site cabins are from the Eco range
- Increased insulation to floors, walls and ceilings. Double glazed windows
- Timed thermostatic controls to all the electric heaters
- PIRS to all lights
- Push taps to welfare
- Eco hand dryers
- Eco settings on electrical equipment.

Insulation off cut return

We have an agreement that we can return any offcuts of insulation to Jablite (the supplier) to be reused again in making more insulation.

Also the groundworkers have come up with a great solution to use any material that are vacuumed up from the cutting of the insulation to backfill around the pile caps as opposed to removing it to waste.



**Exeter is one of the most
vibrant, attractive and
historically interesting
cities in England**



Why is St Sidwell's Point special for Exeter?

The flagship in Exeter City Council's regenerating city centre masterplan is a pioneering Passivhaus Leisure Centre – set to become a world first.

The scheme is part of wider development opportunities for Exeter

- 250 housing units for sale on the current Civic Centre site, and 250 units of housing built to rent
- A ten-storey, four star hotel with 175 rooms, and a budget hotel
- Almost 40,000sq ft of retail units fronting Sidwell Street
- The potential to house the relocated Civic Centre
- A new Office Quarter, with units over eight storeys



- More than 15,000sq ft of food and drink outlets
- Flexible working space alongside the leisure centre
- Public realm enhancements – a new square in Paris Street and new civic space.

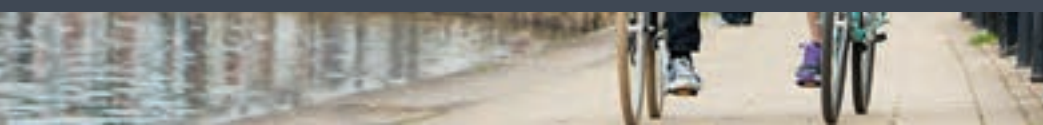
The economic benefits for the city of Exeter will come through employment, training & development, better standards of living attracting people to the area, and better facilities for business encouraging companies to re-locate.

Upgrading leisure facilities for Exeter

The new leisure centre will supersede the Pyramids and complement the existing swimming and leisure facilities in Exeter. This will positively promote health and wellbeing across the city and make it accessible for all ages and abilities.

“If a city centre lacks jobs, residents and/or leisure amenities - the primary functions of city centres will shrink the size of the market that a secondary activity such as retail can serve.”

Centre for Cities. 2013



Why is St Sidwell's Point special for the UK?

Climate change

What is predicted for the UK?

- Since the 1960's the average temperature in the UK has risen
- Average Summer temperature increase of 4-6 degrees by 2100
- Increase in UV radiation
- Events of extreme rainfall and flooding have become more frequent and this trend is predicted to increase
- The European Heat Wave in 2003 contributed to 40,000 deaths. 15,000 deaths were in France (mainly elderly people).

We need to adapt our buildings to cope with higher temperatures, extreme weather and more rainfall.

Climate change

So what??

Building designers typically use weather data that is based on past experience to predict the future performance of a building.

The building is then designed to maintain optimum comfort and (ideally) to use minimal energy over the lifetime of the building.

We can not ignore the evidence that our climate is changing.



“The new leisure centre provides opportunities to engage the local workforce and to inspire the future workforce through apprenticeships, work experience and site visits.

St Sidwell’s Point provides people with the opportunity to build something they can be proud of, a state of the art leisure centre to be enjoyed by their own families and future generations.”

Matthew Cousins, Chair of Building Greater Exeter



Passivhaus Accreditation

What is Passivhaus?

A building with a very low space heating requirement, achieved through mainly passive measures. The measures centre around five key criteria:

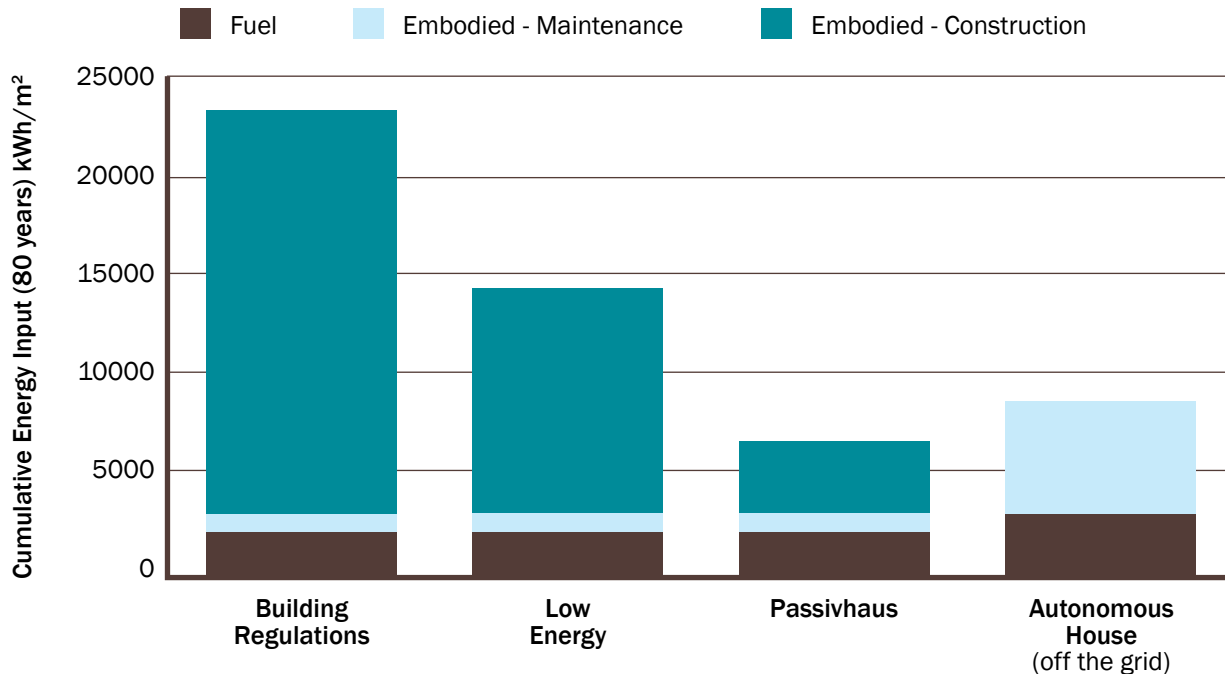
- Excellent insulation
- Triple glazed windows
- Airtight
- No thermal bridges
- Ventilation and heat recovery.

By improving the build quality Passivhaus achieves good indoor comfort:

- No Draughts
- No condensation or mould
- No Hot or cold radiant discomfort
- Whole house warm – no hyperthermia
- Fuel poverty is eliminated
- Comfortable in summer
- Fresh air always, even if you shut the windows
- Quiet – thick insulation, airtight, triple glazing, silent ventilation.

What is Passivhaus?

A building with the lowest whole-life energy use



Dr Wolfgang Feist. Passivhaus Institute. 1997

In order to calculate a buildings energy demand, Passivhaus uses a huge excel spreadsheet called Passivhaus Planning Package (PHPP)

This helps with the design as it shows the impact on key impacts:

- Space heating method
- Heating load
- Primary energy demand
- Carbon footprint
- Overheating risk.

The final results are then used to certify the building.

Key design elements of Passivhaus swimming pools include:

- High performance Passivhaus building fabric
- High level of air tightness
- Internal zoning
- Compact building form
- Optimum solar.

Make the building air-tight

- Passivhaus 0.6 air changes per hour @n50
- Building Regs 10m³/h/m² @ q50
- Impact – reduce energy demand.

Make the building air-tight

- Passivhaus 0.6 air changes per hour @n50
- Building Regs 10m³/h/m² @q50
- Impact – reduce energy demand
- Passivhaus ensures all energy user are accounted for
- Outcome based performance parameters = reliable, scientifically proven energy savings
- Reliable energy performance and running costs ensure economic viability and project delivers on business case assumptions.



Passivhaus leisure centre Why?

Leisure centres (and all buildings) should be enjoyed and cherished.

- Not just about a physical space for certain activities
- Not just about saving energy
- A space to experience and an environment to enjoy
- Health and happiness enhancing
- Passivhaus = quality and comfort.



Many future climate change adaptation strategies can be included in the project at no extra cost to the project provided they are implemented from the outset.

What is the science behind it?

Make the most of your environment

- Use nature's resources
- Natural daylight
- Night time purging
- Heating from sunlight
- Insulate the fabric to retain nature's resources.

As well as fabric savings to reduce energy, other energy saving opportunities and benefits include:

- Higher relative humidity possible throughout the year (~64%)
- This will reduce evaporation rates from pool water and reduce required ventilation rates (ventilation rate of 1-1.5 ac/h with no re-circulation)
- More economic ventilation/ducting (eg. glazed façade elements don't need to be ventilated to protect from condensation)
- Reduced electrical energy demand for ventilation.

Save water by reducing pool evaporation

Reduced evaporation heat loss by:

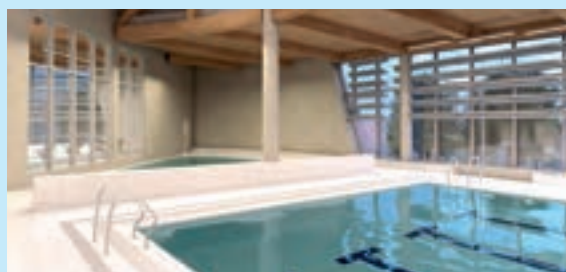
- When possible, drain the pool
- Reducing the water level of the pool
- Increasing the humidity level in the pool hall.



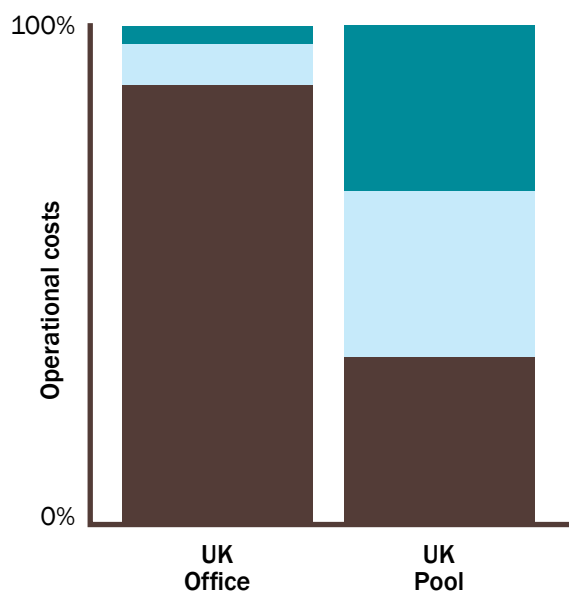
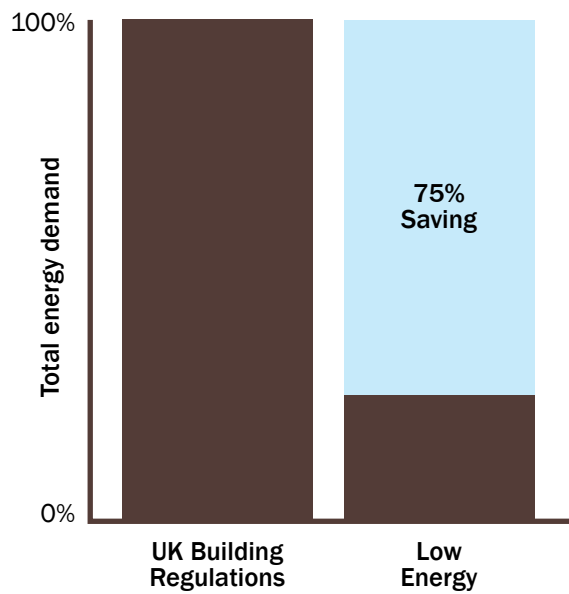
Energy reduction

The established basis:

- Orientation
- Daylighting
- Massing
- Fabric performance
- Air-tightness
- Thermal zoning.



Reduce opex by reducing energy demand



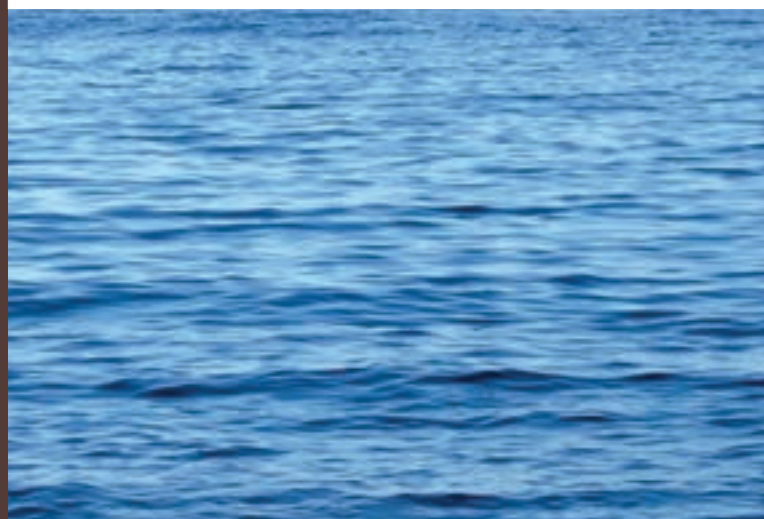
Office

- 1% Energy
- 9% Maintenance
- 90% Staff

Pool

- 30% Energy
- 40% Maintenance
- 30% Staff

Gale & Snowden



Training and development

Kier run an employment skills plan which is accredited by the CITB National Skills Academy for St Sidwell's Point Contract and for the Bus Station.

The skills plan sets targets for work experience placements, apprenticeships, careers support, and training.

Kier work closely with Exeter City Council and Building Greater Exeter to encourage and support careers for all in the industry.

Working with our supply chain we are able to support both trade, technical and professional roles.

St Sidwell's Point provides a unique and exciting opportunity for people from across the region to be involved in a building project which they will be proud of in the future, for people at all stages in their careers.

The more experienced employees are able to share their knowledge, and those training can see the theory and ideas put into practice and learn about the day-to-day operations of a busy site like this.





Exeter College career leaders site visit



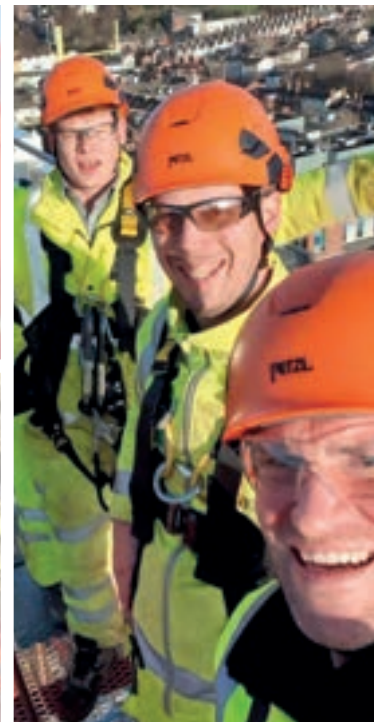
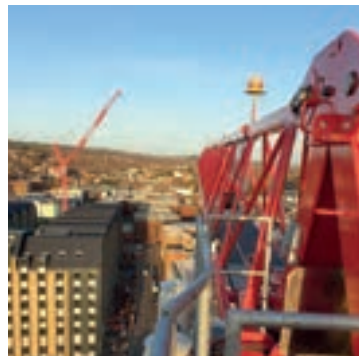
Local school career event

Bespoke talks

We have created bespoke trade specific Passivhaus talks.

We are educating each operative on site by producing trade specific training on their works. For example, groundworkers will understand why we require no more than a 3mm gap in the insulation and how it effects the effectiveness of the insulation. So the operatives understand why they are doing it and not just because they have been told to do it.

They will be up skilled to take the knowledge they have gained to other sites and help create more efficient buildings.



Mock crane rescue at St Sidwell's Point

Choose construction and start building your future career

With over 180 job roles to choose from in construction and the built environment - whatever your skill set, there's a place for you.

The South West is one of the best performing areas of the UK with an extra 27,200 new workers needed by 2023 across a range of managerial, professional, technical and skilled trades.

Modern methods of construction have revolutionised the sector with modular housing, robotic brick-layers and virtual reality all forming part of the mainstream.

There are plenty of career paths into construction including becoming an apprentice, where you earn as you learn. There are different levels of apprenticeships in construction from intermediate level 2 through to degree level 7, meaning you can enter at a level that is right for you!

Start your career as a Site Manager, Quantity Surveyor, Planner, Civil Engineer, H&S Manager, Carpenter / Joiner, Scaffolder, Plumber, Electrician, Bricklayer and Highways Worker – to name just a few!



Tom Taylor

Assistant Quantity Surveyor

Kier Regional Building
Western & Wales

Tom completed his advance level technical apprenticeship through Shared Apprenticeships South West, studying at Exeter College and has had the opportunity to try different roles including Site Management, Estimating, Planning and Quantity Surveying. He chose to specialise as a Quantity Surveyor (QS) and since completing his course has been offered a permanent job with Kier.

Tom now works for Kier on a five year degree programme and has also joined the Young Apprentice Ambassador Network to help engage and inspire future apprentices.

Students

Build your career in an industry with a great future! There is such a wide variety of careers to choose from within construction and there are some great resources available to help you decide which role would suit you best!

Visit Go Construct to explore their Careers A-Z or try their personality quiz:
goconstruct.org



Schools

With over 180 job roles available construction offers a rewarding career with plenty of prospects.

Building Greater Exeter have compiled a range of opportunities to offer your students, teachers and parents/carers a variety of ways to find out more about this growing sector, while helping you meet your Gatsby Benchmarks. Please contact us at:
info@buildinggreaterexeter.co.uk.

Building Greater Exeter

Building Greater Exeter supports the construction sector across Greater Exeter to build their future workforce.

Find out more at:
buildinggreaterexeter.co.uk



Procurement route:

Southern Construction Framework (SCF)



Shaping public construction

By the Public Sector for the Public Sector, SCF offers an efficient and modern construction procurement process for the benefit of all public authorities in the South of England.

Having delivered almost £5bn of public sector construction across over 600 projects SCF are leaders in achieving value from Two Stage Open Book Procurement because they:

- Demonstrate industry leading performance commenced and completed on budget via comprehensive choice of industry leading contractors. On average SCF projects are delivered to within 1% of the contract sum.
- Provide unrivalled technical support delivered by a dedicated framework management team – from first contact to one-year post occupation. SCF monitors performance of every project with over 250 data points.
- Give a quick route to market whilst maintaining competitive tension – our flexible approach allows full breadth of delivery, quality management process ensures high level of quality despite complex requirements.
- Cultivate continuous development from a collaborative and integrated team approach – offering a flexible means of delivering social and environmental values targeted to the needs of the project. On average SCF offers its clients over 10% of added value.
- Proactively manage contractor performance through data driven intelligence at project, framework and industry levels.
- Guarantee resilience - we are forward looking: driving innovation in response to rapidly changing client needs.

Procurement partners:

Exeter City Council

Randall Simmonds

- Employers Agents
- Quantity Surveyor
- Health & Safety Advisor

Baker Ruff Hannon

- Programme Lead

Space Place

- Architect
- Architect & Planning Agent

Gale & Snowden

- Architect
- Engineer

Arup

- Structural Engineer
- Civil Engineer
- Mechanical & Electrical Engineer

Journey of construction

1

The Client has need for a new building



4

The Client appoints the successful contractor based on specific criteria

5

Start on site



2

The Client appoints the Design Team



3

The Client team sends information to the market for pricing

6

Construction Phase (Kier Team)



Support functions





With over 180 job roles to choose from in construction and the built environment - whatever your skill set, there's a place for you.

Possible careers in construction:

- | | |
|---|--|
|  Architect |  Building Services |
|  Quantity Surveyor |  Groundworks |
|  Building Services Manager |  Landscaping |
|  Structural Engineer |  Steel Frame |
|  Construction Manager |  Roofing and Cladding |
|  Estimator |  Demolitions |
|  Planner |  Blockwork |
|  Contracts Manager |  Doors and Windows |
|  Project Manager |  PR Manager |
|  Site Manager |  Aftercare Manager |
|  Design Manager |  Health and Safety Manager |
|  Engineer |  HR Team |
|  Administrator |  Buyer |
|  Gate Person |  Business Development Manager |



Contacts

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ST SIDWELL'S POINT

