

# Building for the future



For over 150 years John Sisk & Son has been developing the strength, diversity & experience that has made it Ireland's leading construction business. We are proud to have been involved, as Main Contractor, in the successful completion of the new Brewhouse & the associated works in St. James Gate. Working with Diageo Engineering Excellence in a collaborative & innovative way, the project has been to the forefront of the Construction Industry on what it has achieved.

This is evident on a number of fronts, including Health & Safety, Construction Logistics, Quality, Schedule & Sustainability.

Having worked on many other iconic projects such as the Dun Laoghaire Library, the Aviva Stadium, the Convention Centre, the Bord Gáis Energy Theatre, the Mater Hospital, the new science block at UCD as well as the Olympic Games Athletes Village, the London Crossrail & Energy from Waste Facilities in Liverpool & Leeds, SISK Group has built a diversified, international business with the support of our customers & partners.

We are very proud of our history & our long standing reputation for providing top class service delivery & quality. We wish Diageo every success with the operation of Brewhouse no. 4.



# Brewing up a storm!

**It can produce more than 2 billion pints a year and it's the biggest stout brewery in the world. The €169m 'Brewhouse No 4' opened by Diageo at St James's Gate is also one of the most technologically advanced and environmentally sustainable in the world. Irish Building magazine was invited to visit the brewery and look up close at what makes this facility one of the finest of it's type in the world.**

The largest construction project in Ireland in 2012, covering 10,000 sq m, the new brewery brings together all Diageo's Irish brewing operations to St James' Gate, one of the oldest industrial sites in Ireland. Guinness flavour essence is also produced there, which enables the brewing of Guinness in 50 countries around the world. A massive proportion of Diageo's global beer (35%) is produced at the site, with a staggering 3 million pints produced there every day. In addition, over €1 billion in product is exported from the site to over 130 countries.

So it's clear that the new Brewhouse had a lot to live up to. From the very beginning, an ambitious mission statement from Diageo and the key stakeholders outlined an extremely high level of quality and safety that was carried through the entire build. "If you want to achieve something that's unique and outstanding you have to start planning long before you actually commence construction. In order to deliver what we eventually handed over, we sat back at the start and said we need to do this in a short period of time, at the lowest possible cost to the highest possible standard," says Dave O'Leary, Engineering Excellence Strategy Director at Diageo. For an industrial facility, the new Brewhouse displays a remarkably high standard of construction. In terms of environmental impact and health and safety, extraordinarily high standards were implemented and adhered to throughout. "The accident frequency rate was at one tenth the average for the industry on this particular site which is an amazing achievement. Most people didn't believe it was achievable. From the start, we developed a strategy that would

underline these principles, really they formed the basis of the build," says David O'Leary.

An extremely tight deadline of 14 months called for a bit of strategic thinking. "How do we go about getting planning permission in the absolute minimum legal time? With a development of this kind it would be most unusual for it to get planning permission in a short time but we started working on it very early on." Some areas of the site had been zoned as commercial or multi-use as opposed to industrial, leading to the site having to be rezoned. Once this was achieved, the next challenge was design. "You can't really put a creaky tin industrial building in this location. If we were to get planning without objections the building has to look the part." Planning was obtained with only one objection holding up proceedings for two weeks. "We respected everyone's view and didn't try to have a singular opinion as to how we went about it."

John Sisk & Son were the main contractor on the project. The



Dave O'Leary, Engineering Excellence Strategy Director, Diageo



# SISK GROUP



# KSSL

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Delighted to have worked on the  
Brewhouse Project



firm weren't strangers to St James' Gate, having worked on several projects at the site over the years. "Over the years, we've built up quite a good rapport with Diageo. I think our excellent safety implementation scheme and record of consistent and safe delivery of projects has helped us secure work there over the years and certainly led to us doing the new Brewhouse," according to Dave Cotter, Senior Contracts Manager. Sisk acted as main civil contractors on the project, with responsibility of managing the project on behalf of Diageo when it came to logistics. "We were engaged as their principal contractor. We managed the specialist contractors from a logistical perspective, from an overall schedule perspective and from a health and safety and environmental point of view."

Building the facility around the process vendors meant Sisk and the team had to be innovative when it came to the actual construction process. "A critical aspect was the fact that a lot of the vessels that were installed were very big and had to be installed into the heart of the building. We had to facilitate that so we left the roof off while we were building it. Essentially we built the structure around it. Once the key elements of equipment and vessels were installed, we then built the roof." It wouldn't be your conventional way of building a facility but it worked for Sisk. "Otherwise it would have cost a lot more. A lot of planning went into this 'roof-off' system but it was very successful."

The biggest challenge on site, says Dave Cotter at Sisk, was health and safety. "We wanted to ensure a first class safety record on site. At peak, we had 950 men working on the project on a very tight footprint. That included a lot of different contractors from different backgrounds who would have been used to different standards of safety." Ensuring workers gelled together and coordinated the work in an efficient manner was key. So how was this achieved? "Over the years, Sisk have been improving the standards of welfare facilities on our sites, which historically have been poor in our industry. We created a proper site entrance with turnstiles. Workers arrived to a reception area with walls clad in a white plastic material with a Diageo logo and were then led to the induction area. This is unusual so from the very first minute when people arrived at the site, they knew it was something different," says Dave O'Leary at Diageo. All workers were required to undergo a safety induction. Fingerprints and a unique individual pin were used by the workers to access the site. "Some people thought we were just being very controlling in terms of who we let onto the site. We were and we weren't. What we were saying was if you want to come onto our site you have to be fully safety inducted, you have to have signed the wall in reception and understand all the risks." Concrete walkways meant nobody was forced to walk across rubble to get from A to B. The culture of Zero Harm was maintained by Sisk who implemented the 'Golden Month' system. "Every month we'd set ourselves a target and if we got through the month without any





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accidents, without any environmental incidents or major business interruptions, workers would get rewards. It's a way of giving back to the men and getting them to realise there's a target here and a bonus in it for them. It worked extremely well," says Dave Cotter. Getting people to think for themselves about what they're doing is key to high health and safety standards. "We don't lecture people anymore, we find out what people are thinking themselves which gets them thinking about their actions. We also advocate pre-conditioning, which is when all the key sub-contractors would have come on site for a week or two (depending on their size) prior to starting on site to soak up the whole culture of the site." This way, workers become familiar with site rules so when they actually did start, they would have already been immersed in the culture. "A lot of accidents in construction happen in the first week or two. By implementing pre conditioning, people were familiar with their environment and with the people they were dealing with. It benefitted them as well in that they could hit the ground running from the very start." Having trialled them at St James' Gate, Sisk has implemented behavioural based safety programmes across all its sites. "It goes beyond legal requirements and best practice and tries to get people to understand why they have bad habits. Workers are encouraged to adopt the '20 second scan' when they get into work in the morning, just to spend a few seconds looking around at their environment and maybe trying to see what's changed since yesterday. Is there someone working above me that could drop something, is there a hole next to me that wasn't there yesterday? These programmes help people understand their own behaviour and provides awareness training and tools to work safer."

A zero defects programme was followed from the start. "I think

there's still a belief in the industry that minor defects are fine, we can fix them afterwards. This wasn't an attitude we wanted to adopt." Diageo took the validation process used by the pharmaceutical industry to ensure zero defects. The process starts with user requirements specification, followed by design qualification. The design is checked against the user requirements and when it's installed, an installation qualification is followed to find out if it been installed in accordance with that design. "Operational qualification asks does it operate the same way it was designed. One year after its operational, performance qualification finds out if it does what it was supposed to do on day one and is it still doing it a year later."

A sample room in an adjacent building became the 'zero defect' room where live mock ups of all the key elements were constructed. "This room had three functions; it got the contractor to achieve what was required, it showed the client what he was getting and also served to train contractors as to what was needed," says Dave Cotter. The project was started with zero waste to landfill and finished the same. "People said at the start it couldn't be done. We very much at all times set the standard and found ways around it," says Dave O'Leary.

In terms of sustainability and environmental practice, the project achieved Platinum Status on LEED and Outstanding on BREEAM. "I remember being told we needed the best part of an acre of photovoltaic cells on the roof to get the LEED Platinum cert. I couldn't believe that was what required. That was one of the points where people just got it and believed we were setting the highest possible standards on this project. We're told it's very expensive to get the cert but you have to challenge each individual item and ask who can do that well," says Dave O'Leary. "My role was definitely

as agitator, to be the person who came in and banged the table and said right lads, we're not going with the photovoltaics but we are going to get the cert. Can you go away and come back and tell me how we're going to do that."

Every possible risk that could arise, along with its solution, was considered. The teams worked with the National Museum (a prehistoric fish trap was found on the site) and CIE, who wanted to put two tunnels under the site for the rail interconnector. "This determined the location of the Brewhouse as we needed to stay away from the tunnels. Transparency with all stakeholders throughout the entire build was key to meeting the tight deadline," says Dave O'Leary.

An army of specialist contractors and suppliers worked to deliver the project, Irish Building spoke with a few to discuss their role.

**Kierman Structural Steel Ltd**

One firm that's reaping the rewards of working on such a high profile, prestigious site like St James' Gate is Kierman Structural Steel Ltd (KSSL) in Carriglas, Co Longford. A family business, that was established in 1989 by Frank Kierman, the firm provides a wide range of services to the steel construction industry. On Brewhouse no 4, the firm supplied 1500 tonnes of structural steel, 3000m2 of roof and floor metal decking, welded and shot fixed shear studs and fire protection painting. "During our time on site, the brewery remained operational 24/7. It was also an extremely confined site; good logistical planning by the key stakeholders involved kept everything moving," says Frank. Project completion in phases also helped to minimise disruption the busy, live site.

Key to the whole project was a whiteboard meeting every morning. "All contractors would meet on site and Sisk would oversee the meeting. Everyone would be aware of their timeframes and how



long they'd have to complete that particular job on that particular day."

With 14m diameter vessels to be installed into the Brewhouse, only 50% of the roof could be constructed initially. "If the roof had been erect, they simply wouldn't have been able to place the vessels where they belonged. It was difficult lifting the main roof after the vessels were installed; we did so by using a 250 ton crane." But this wasn't the main challenge for KSSL on the site. "It was a very tight programme, it had to be completed on a certain date and that was that. We made it through."

KSSL also supplied structural steel in the cold block area. "The cold block was also part of the live area, around ammonia tanks. It was very difficult to work there for safety reasons. But again, operations ran very smoothly." The firm also built a large quantity of bridges for carrying services around the site.

Frank says the firm has benefitted hugely from their involvement on the project. "We're very thankful to have been involved, it really has put us to the forefront in Ireland and the UK. We've gone from strength to strength since completion and have won a lot of large projects." □

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