



>> **JOHN HEWITT**, who was in charge of the team that designed and built the Olympic Stadium pitch and track.

>> **CONSTRUCTION** of Olympic Stadium in London. The grass area was shortened to 90 metres long (by 71 metres wide) as opposed to UEFA-standard football pitches of 105 metres long (by 68 metres wide) to accommodate Olympic officials at either end of the track/pitch.

Designing and building the pitch of Olympic Stadium

Editor's note: Thanks to STMA CEO Kim Heck for securing our coverage of this summer's Olympic Games venues via the CEO of the Institute of Groundsmanship, Geoff Webb. The IOG is STMA's second official International Affiliate Organization.

In a world exclusive interview, specialist sports surface constructor John Hewitt talks to Editor Colin Hoskins of *Groundsman Magazine* about his "once in a lifetime" involvement in the London 2012 Olympic Games—the design and build of the Olympic Stadium's pitch area.

When IOC Athletes' Commission Chairman Frank Fredericks and London 2012 Chair Lord Coe joined others for the photo call on the Olympic Stadium pitch to celebrate the laying of the last of the 360 rolls of turf there, included in the out-of-camera team responsible for delivering the project ahead of schedule and within budget was John Hewitt. While the cameras rolled, John was quietly expressing a similar measure of celebration as the man charged with the design and build of the Sta-

dium's "inner bowl" area, the pitch and the running track; indeed, the complete area within the terracing at the £486 million Stadium (1 Euro = 1.28 US dollar).

For John, the laying of the final turf heralded the end of a complex and, he admits, an exhausting process that began back in 2005 when his company, Hewitt Sportsturf, was commissioned as part of Team Stadium by constructors Sir Robert McAlpine to submit a tender and specification for this show-

case element of the Olympic Delivery Authority's ambitious and exciting Olympic Park project.

"While we are renowned as constructors of football pitches, it was clear from the outset that the Olympic Stadium pitch would focus instead on track and field events, even though in the early stages the original design would have accommodated a full UEFA-size soccer pitch," says John.

"However, what we have today, an iconic venue that everyone involved with can be very proud of, bears little resemblance to the original design," he continues. "This was no surprise, because as each specialist partner imparted their knowledge and expertise to the design and specification there has been an evolu-

The Olympic Stadium: FACTS AND FIGURES

➤ Designed to host the opening and closing ceremonies, as well as athletics track and field events, the Stadium will have the capacity for 80,000 people (in Games mode).

➤ The Stadium site covers 40 acres.

➤ The Stadium, which contains around 10,000 tonnes of steel and is the lightest Olympic Stadium to date - is an ellipse with a long axis of 315 metres and a short axis of 256 metres. It is 60 metres high above the field of play and the perimeter is 860 metres.

➤ More than 5,000 reinforced concrete columns were installed into the ground, up to 20 metres deep, to provide the foundations to support the structure. 112 steel rakers and 12,000 pre-cast concrete terracing units hold the spectator seating in place.

➤ The roof compression truss comprises 28 steel sections, each one being 15 metres high by 30 metres long and weigh 85 tons. A cable net roof provides the correct conditions for the athletes on the field of play and it covers two-thirds of the spectators.

➤ The Stadium is lit by 532 floodlights housed in 14 towers which reach 70 metres above the field of play.

tionary process of refinement and continual improvement. The 400 metres running track has been the only common denominator throughout the process.

“For example, the grass area has been shortened to 90 metres long (by 71 metres wide) as opposed to UEFA-standard football pitches of 105 metres long (by 68 metres wide) to accommodate the Olympic officials et al in the ‘D’ areas at either end of the track/pitch. And there is no undersoil heating (not required on a pitch in London that will be used during the summer months) nor fancy air systems.”

Hewitt Sportsturf’s on-site work began last April and the company has, on average, had a team of eight people on-site during the ensuing 11 months.

The foundation/construction of the pitch, which is based on standard FA guidelines of a fall of 1 in 80 across and along the pitch has, however, followed the established and highly successful Hewitt standards; the company’s renowned design of gravity-based lower, lateral pipe slot drainage, a 125-150 millimetres gravel carpet underneath 200 millimetres of lower rootzone and 100 millimetres of upper rootzone incorporating fibres/loose fibre reinforcement. Pop-up irrigation is also a feature, as are gas vents for the lower foundations.

Because of the specified use, the turf (which was laid over three days) is a “straightforward” blend of perennial ryegrass, smooth stalked meadow and fescue.

“But the pitch is effectively one relatively small element of our inner bowl work,” adds John. “For example, we faced a number of massive and very complex challenges, not least designing in and installing the ductwork to accommodate all the drainage and broadcast media utility chambers; the drainage system is much more involved than a conventional construction project for football and the Olympic Stadium is certainly much more media-orientated.”

With the chambers measuring 1,800 mm by 1,800 mm, a network of them populate the inner bowl like a spider’s web: the drainage systems not only look after the pitch and permeable areas but they also accommodate water run-off from the non-grass D areas and track, 16,000 m² in total, which includes the track maintenance wash-down areas. This expanse is drained via the network of slot and surface drains and while initial guesstimates pointed to around 2,200 linear metres of ducting being required, the result is 12,500 linear metres!

Of course, the D areas and track—Mondo “tarmac” surfacing—had to be constructed to IAAF Class 1 Design Specification, which includes a maximum gradient cross fall of 1% with zero gradient fall to the running length and a maximum 0.4% gradient fall in any direction on the D areas.

Indeed, when these highly exacting angles and the track’s “continual concave contour” are considered, John Hewitt makes complete sense when he says that the inner bowl work was very complex and exacting compared with the “fairly simple” pitch construction.

The construction of these areas underwent regular checks and inspections by the IAAF-accredited test house and, comments John proudly, “to operate and construct at such precise tolerances given the complex inner bowl layout and obstacles is without doubt a very demanding and difficult task. I am pleased to report and confirm that all checks and testing have achieved the requirements for IAAF Class 1 certification as far as tested to date.

“The London 2012 project entailed an immense amount of communication, for instance on average two meetings a week for the past year alone with the Team Stadium consortium, and the site conditions proffered a number of challenges.

“It must have been a logistical nightmare for Team Stadium/the Olympic Delivery Authority to manage all the different contractors



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THE "GOOD TO GO" GAMES

The 2012 London Games' quest for sustainability will deliver an intriguing blend of permanent legacy and temporary structures that aims to create memorable venues within the context of historic and iconic backdrops and settings.

Temporary structures, the "overlay" are vital for the Games organisers to deliver this key vision and Tom Jones, Associate Principal at Populous, the official architectural and overlay design services provider to the London 2012 Olympic and Paralympic Games, has lived and breathed them for several years now.

Given that the Games will provide no fewer than 275,000 temporary seats – part of an overlay that also include 165,000 m2 of tents, 2,500 cabins, 140 kms of fencing and 250 kms of crowd barriers, this aspect of provision will prove crucial to the spectator experience.

"We're trying to move away from the standard scaffold and seat arrangement," says Tom, "and provide plenty of seat width and leg room to ensure levels of comfort."

Moving along the sustainability timeline, what's to become of the London Games' temporary structures after the medals have been won? The 2014 Commonwealth Games is one obvious application for some of them, he says. "It's an easy move. The Rugby World Cup will be staged here in 2015 too, but some structures may well find new uses abroad."

and trades. I understand that the Stadium build involved over 240 businesses and more than 5,250 operatives over the past three years, and it goes without saying there were never any compromises on health and safety.

Hewitt Sportsturf's involvement with the Stadium does not end, however, now that the pitch and inner bowl is complete. "We are commissioned to maintain the pitch until after the Games," he says, "and as part of that contract we are employing a full-time groundsman."

43-YEAR GROUNDS VETERAN PREPARES FOR OLYMPIC ARCHERY ON HIS CRICKET PITCHES

Mick Hunt, head groundsman at Lord's Cricket Ground, explains to Colin Hoskins how he will cope with Olympic archery in a busy summer schedule of events at the "home of cricket."

Mick Hunt's pragmatism has earned him a reputation as being one of the country's top groundsmen. Now enjoying his 43rd year at Lord's, Mick consistently produces flawless top-class wickets at the "home of cricket" and all without a day's formal training in pitch maintenance and management, but rather by applying his natural ability and his knack of knowing what needs to be done to the pitch and when.

"Every day is different [because] you never know what Mother Nature is going to dish out, so, you have to be ready and able to instantly adapt to the weather conditions in relation to what's happening on the pitch," he says. Each ground is unique; here it is the slope of the square, the high sand content on the outfield and our heavy usage; sometimes we have to use the same pitch for three games!

"We therefore have to adapt to the demands on a daily, even hourly basis. Whether that involves cutting, rolling the square, watering or using the covers (sometimes we're constantly pulling these on and off on daily), it is governed by the circumstances of the day."

Even though Mick says he "has learned as I've gone along," behind that sentiment is an obvious wealth of knowledge and experience that is revered by cricket groundsmen the world over. Why else, indeed, would Australian groundsmen every year spend a 6-month "sabbatical" as part of Mick's team? "They get a good view of another side of [cricket pitch] life," Mick quips, "especially in terms of the number of games we have to accommodate in a typical season."

Those demands seem to increase year-on-year, he reflects, with Lord's facing a relentless schedule of Test matches and County, Pro 40 and Twenty20 games, as well as corporate events. And this year, Mick also has the Olympic archery competition to contend with.

"We'll be shut for cricket for 6 weeks, and after the last arrow is fired we'll have just 10 days to get the pitch ready for a Test with South Africa."

"We topdressed and seeded in September, as usual with a Rigby Taylor dwarf ryegrass R 9 mixture," he continues, "and, of course, we've had a relatively mild winter." Typically, Mick adds that "in many ways, the quality of the pitch is arrived at "on a wing and a prayer," depending on the weather," but his tongue-in-cheek comment doesn't hide the fact that there is obviously much, much more to his pitch preparation.

"Of course," he continues, "rolling will consolidate the pitch, but you need to ensure it is irrigated, to a sufficient depth, to accommodate this and to create a consistency of "plasticity" to achieve maximum consolidation and a clean surface, while the sun effectively bakes and hardens the surface. While the recent weather (very hot for the time of year and lit-



>> MICK HUNT, 43-year veteran groundsman at Lord's Cricket Ground, will see the Olympic archery competition on his turf.

>> LORD'S CRICKET GROUND is hallowed territory for the game. The earliest known match played on the current ground was in June 1814.

tle/no rain) hasn't hindered us I am conscious that three or four hot/dry days do stress the grass and that our outfield, being 90% sand, is very thirsty."

Being based in north London (St John's Wood), Lord's is situated in the country's drought region, and Mick and his team use a series of pop-up sprinklers on the outfield, complemented by hand watering of the square, when appropriate, to achieve the necessary hardness for ball pace and bounce. "We're on metered water, which we obviously monitor," adds Mick, "and during the past couple of seasons we've actually used more water in April/May than in July/August."

This year, like every year, Mick says he'll have to react to the situation as it occurs. "You can't have a fixed plan; neither nature nor cricket squares don't work that way."

The Olympic archery will put a new set of problems in Mick's way, as the outfield accommodates an array of stands, umpire boxes and electronic display screens, for example, while the competitors will fire across the square. "Nobody will be allowed to actually walk on the square," adds Mick, who is also assured that no arrows will fall short. The adjacent nursery ground, traditionally home to several squares and practice nets, will be used for the qualifying rounds.

But the Olympic tournament will not interrupt Lord's busy cricket schedule: the packed June programme list includes a game on practically every day. And once the archery is complete, Mick and his five-man team (supplemented each season by the two groundsmen from Australia) will have just 10 days before the first ball of another Test.

"While we'll try to salvage as much of the original outfield as possible, we're having an amount of 'tile turf' grown by County Turf, which

LORD'S, THE HOME OF CRICKET

Named after its founder, Thomas Lord, Lord's Cricket Ground is owned by Marylebone Cricket Club (MCC) and is the home of Middlesex County Cricket Club, the England and Wales Cricket Board (ECB) and the European Cricket Council (ECC).

Lord's today is not on its original site, being the third of three grounds that Lord established between 1787 and 1814. His first ground, now referred to as Lord's Old Ground, was where Dorset Square now stands. His second ground, Lord's Middle Ground, was used from 1811 to 1813 before being abandoned to make way for the construction through its outfield of the Regent's Canal. The present Lord's ground is about 230 metres north-west of the site of the Middle Ground.

The earliest known match played on the current ground was MCC v Hertfordshire in June 1814. The oldest cricket fixture (ie, one that continues to this day) is the annual Eton v Harrow match, which was first played on the Old Ground in 1805 and on the present ground in July 1818.

we'll use in the worst areas." Contractor Steven Pask ("I wouldn't use anyone else") has already been booked for this work, says Mick, "and we'll look after the square ourselves."

STRI SETS THE STANDARD

STRI business development manager Lee Penrose explains to Colin Hoskins how the world-leading sports surface consultancy is helping to



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>> BECAUSE OF THE SPECIFIED USE, the turf, laid over 3 days, is a “straightforward” blend of perennial ryegrass, smooth stalked meadow and fescue.

ensure the standard of the Olympic football training pitches, among other things

Consulting on equestrian ground and surface preparations is not something you’d immediately associate with STRI, a leading consultancy for the design, research and management of natural and artificial sports surfaces. STRI not only works with governing bodies like the FA and FIFA, but it also counts an impressive list of groundsmen and premier sports venues among its clients. But, in fact, the Bingley-based organisation has an impressive track record of successful projects at racecourses such as Ayr, Leopardstown, Royal Ascot and Wetherby, as well as Hickstead, and for the past 3 years or so has been heavily involved in helping LOCOG, the London 2012 Organising Committee,

deliver the Olympic equestrian competitions that will take place this summer in Greenwich Park, south east London (the site will also host the combined running and shooting events of the modern pentathlon)

As Lee Penrose, STRI’s head of key projects, explains: “LOCOG approached us in early 2009, before planning consent was given for the park’s use as an Olympic venue, to help investigate the ecological impact of the proposed equestrian events. This was a major concern not only for LOCOG but also certainly for the local residents and The Royal Parks. The park, which is situated in one of the most driest and free-draining parts of the UK, is a highly sensitive site containing internationally protected archaeological features, veteran trees and endangered habitats and species, and LOCOG needed to know if it was feasible to develop it as a fit-for-purpose venue for the equestrian events.

“My background as an ecologist combined with turf science skills made the project a perfect fit for STRI, and we worked closely with LOCOG in the ensuing months to develop what started as a very loose plan into a 200-page tome embracing:

- Site appraisal – ground conditions, drainage, topography
- Detailed design and method statement for the implementation of the project
- Details of the provision of specialist staff, equipment and machinery including construction, irrigation, surface preparation and restoration post-2012 - including the re-establishment of the sensitive acid grassland habitats and amenity areas.”

He continues: “The project also involved STRI working with equipment manufacturers to design and construct certain bespoke machinery suited to work within the unique conditions of the park, and in partnership with our contractual sub-partners we are retaining a portfolio of equipment and team of highly trained staff who are based at the park.

“We used GPS mapping to ensure certain areas would not be disturbed/encroached upon, effectively creating ‘no-go’ areas that the contractors should avoid. Developed in close conjunction with Trimble,

STRI

STRI (originally the Sports Turf Research Institute) was established in 1929 in association with the UK Golf Unions and The R&A (Royal and Ancient Golf Club of St Andrews), to provide research and advisory services for golf clubs on their golf greens and courses. By the 1950s, it had established a reputation as the leading company for providing advice and research on new products and techniques for managing sports turf, not just for golf, but for all types of sports surfaces and amenity grass areas.

STRI works with clients - from village clubs to international governing bodies - to provide quality, bespoke and cost-effective solutions for the design, construction and management of sports surfaces:

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- School sports pitches
- Local authority playing fields and recreation grounds

The last two decades have seen rapid growth within STRI, currently with 75 staff, delivering services across an international client base of around 2,100 sports clubs and facilities each year. www.stri.co.uk

the specialists in vehicle tracking systems, we have created a system that works rather like Tom-Tom and 'directs' drivers by showing in red the hotspots to avoid. The system is accurate to within two centimetres!

"The system can of course, be used to track the route of every vehicle; it can even record when, where and how much fertiliser, for example, has been applied or, indeed, how much vertidrainage has been carried out. This is a very interesting technology which we will use post-Games to restore the site and, going forwards, could well prove useful for other projects."

LOCOG is 'renting' the sites and where appropriate also paying for any upgrading after selecting them using criteria that included their location (to the Olympic tournament venues) and available facilities. Between them the sites boast 24 pitches and the quality of these is being 'overseen' by the STRI team, which includes Lee Penrose.

Explaining that each pitch is being regularly assessed (at least once each month) to STRI's industry-recognised standards in terms of, for instance, strength of turf, firmness of ground, amount of grass cover, and ball bounce and roll, Lee highlights how the standard is being applied at these existing facilities "that are largely based on natural soil pitches [the exception is the Long Lane FC site, which had been completely refurbished by Speedcut Contractors. These are not professional football stadia, so LOCOG, STRI and the grounds teams at each location are striving to achieve the best possible playing surfaces under the circumstances and within budget."

He continues: "We started work at each ground last autumn 2011, beginning the process by assessing each site and its playing regimes, then bringing the groundsmen and LOCOG together here at STRI's Bingley headquarters, for two days 'training'. This included a visit to Burnley FC's stadium and training grounds where our visitors could put their Olympic training pitches into perspective against Burnley's superb surfaces."

"Some of the eight sites needed upgrades to the irrigation systems (one had no ability to irrigate) and this included, at one site, the installation of a fully automated system (by MJ Abbott) and at another the installation of a temporary, travelling system. Other sites needed basic adjustment to drainage, while others needed general surface upgrading/renovation."

In April each pitch underwent a full renovation program of scarification, aeration, seeding and fertilisation. ■

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