The East Village in Stratford is London’s newest neighborhood and is a shining example of how Architectural Precast Cladding is the material of choice for delivering high quality homes with a lasting legacy.

The creation of the Olympic Village near Stratford, London, represented the most intense programme of high density housing construction the UK has seen for decades. An incredible 67 housing blocks, with a total of 2,818 apartments, were built in just 18 months - a rate of more than five homes a day.

Inevitably comparisons have been made with post war building booms of the fifties and sixties - but while history has revealed the untested construction techniques used on many of those schemes to have been seriously flawed, the Olympic village was conceived as an exemplar of all that is best about modern construction.
Founded firmly on the promise that 2012 would ‘be the greenest Games ever’, London’s successful bid for the Games had emphasized the long term use and benefits to which the Olympic infrastructure would be put, and ‘Legacy’ was key to London finally getting the nod ahead of its rivals.

“That meant that sustainability was a consideration in everything we did,” says Paul Hartmann, project sponsor for the Olympic village with the Olympic delivery Authority (ODA).

“But with the eyes of the world upon us it was also important that we used high quality and proven materials that would perform well and look great. And they simply had to be reliable as clearly we were working to a very inflexible deadline.”

Most of the athletes’ accommodation has now been converted into homes for rent or sale and East Village, as it is now known, is rapidly becoming the desirable new neighbourhood envisaged by the ODA. Stroll its parks and courtyards today and the part played by pre-cast concrete or reconstituted stone facades is clear to see. The vast majority of the 67 blocks feature reconstituted stone cladding, but it is here in many different forms. In fact, East Village could almost be seen as showcase for the dazzling variety of precast from which designers can now choose. There are different shapes and textures, different colours, window panels, door panels, balconies and even a stunning reproduction of the Elgin marbles – all fashioned from modern, high quality pre-cast. But as Hartmann explains, this was not prescribed by the ODA’s projects design panel.

“We didn’t want a zoo of buildings, but nor did we want all the blocks to look the same, so architects were given a palette of colours and styles to work with,” he says. “They all came up with their own way of working within that – it just happened that precast was the way most chose to go.”

Hartmann adds that speed, economy, and reliability were key reasons for this. Produced under factory-controlled conditions, often with windows or doors already fitted, pre-cast units remove a substantial part of the construction process from the vagaries of the weather and the variable site conditions. And with each panel quality controlled before leaving the factory, contractors could be confident that each would do its job.

Facades were speedily erected, meaning that dry trades started early in the build process.

And the results certainly found favor with the critics. The Financial Times’ architecture correspondent, Edwin Heathcote, commented: “There are many things to cheer (including) ... a material palette of cast concrete panels that eschews whacky colours.” The Observer’s Rowan Moore agreed, noting that the Village was “made of solid, enduring-looking stuff” with no “sicky-tacky cladding”.

Techrete provided more precast to the Olympic village than any other supplier, delivering a grand total of in excess of 8000 units in just 18 months. It was involved on six of the nine housing plots, specifically providing all facade precast to plots N01, N03, N07, N15 and then taking over plots N02 and N04 after suppliers to those sites suffered financial difficulties.

“Techrete were great,” says Hartmann. “Crucially they had the capacity we needed for sites of this scale, with two modern factories, and an early appreciation of what would be required here. They were also ready to learn and respond quickly to our requests for things to be done in a certain way.”

He adds that Techrete’s genuine understanding of sustainability meant that its production process was well set up to reduce the environmental cost of its products. “Add that to the fact that precast is an extremely long-lasting and low maintenance, and you have a product which fitted well into our overall drive for the Village to be sustainable in the longer term,” says Hartmann.

As conversion of the Village to homes nears completion, more housing is being built on the site. It’s no surprise that once again, pre-cast cladding is set to feature strongly in this, the housing of the future.
An Overview of Techrete’s Scale and Scope of Work at the East Village, London

Techrete designed, manufactured and installed the great majority of the architectural precast façade, totaling over 8,000 panels

**N2**
1035 Techrete Panels
Area: 8,866 m²
Architect: Lifschutz Davidson Sandilands Architects and KDS Associates
Main Contractor: Ardmore

**N3 & N4**
2065 Techrete Panels
Area: 17,199 m²
Architect: Patel Taylor Architects
Main Contractor: Lend Lease

**N7**
1757 Techrete Panels
Area: 19,050 m²
Architect: Glenn Howells Architects & Partner Hudspith Architects
Main Contractor: Lend Lease

**N15**
1396 Techrete Panels
Area: 13,680 m²
Architect: Glenn Howells Architects & Niall McLaughlin Architects
Main Contractor: Lend Lease
The Elgin Marbles - Recreated in Stratford

Few aspects of the Olympic Village attracted quite as much media attention or critical acclaim as the stunning reproduction in concrete of reliefs from the renowned Elgin marbles. Precast units measuring up to 6m in length and each depicting one of five of the scenes, which originally graced the Parthenon in Athens, were used to clad two of the residential cores on Plot N15. Designed by Niall McLaughlin Architects, the ‘Elgin panels’ showcase just how adaptable precast concrete can be, and how it can be made to work in an impressive range of aesthetic possibilities.

“The Elgin marble panels were technically quite demanding, both for ourselves and for Techrete,” says Simon Bishop, associate with architect Niall McLaughlin. “Our first job was to visit the British Museum and use 3D scanning technology to create a digital image of the marbles from the originals. It was then over to Techrete to turn that information into solid cladding panels.”

A key challenge for Techrete was that the reliefs involved undercuts - details which cut back on themselves and prevent the use of straightforward rigid moulds. “Shapes like this require flexible rubber moulds that can be peeled off once the concrete has set,” says Bishop. It also means that especially sophisticated machinery is required to make “The ‘positives’ for the mould.”

To create these, Techrete teamed up with London Metropolitan University, possessor of one of the largest 5-axis C&C machines in the UK. Replicas of the marbles were then machined from fibre-board. Some of the largest pieces had to be made in two or three sections with each part taking up to 21 hours to make. Taking up the story, Techrete’s construction director, Henry Clifford, says: “The five images were made in five different sizes - so in fact we had 25 different moulds each made from rubber and supported by a fiberglass backing.

“Aggregate and sand were carefully chosen to produce the creamy sandstone finish required by the architect, and the panels were then manufactured under factory-controlled conditions at our plant in Lincolnshire.”

Finally, the Elgin units were set into larger timber moulds to create the final ‘sculpted’ facade panels. Says Clifford: “These varied in size from depending on their function on the building - but many were quite substantial, weighing up to four tons each.”

The results are quite spectacular - winning plaudits from diverse sources including London Mayor, Boris Johnson, as well as an award from the Concrete Society. Says Bishop: “We were really pleased with the way the project went. Techrete performed a difficult job very efficiently and based on the relationship we forged at the Olympic Village we continue to work with them on a range of projects.”
Olympic Village Exhibits a Range of Finishes

Multicoloured Panels
With precast concrete facades it is possible to have a number of colours within one panel. This was demonstrated on plot N03 by Denton Corker Marshall Architects. The intent was to break up the façade with both a change in colour but also a change in texture and change in plane all within one panel. Techrete were able to develop a panel system that allowed all of this to happen within one wall panel. If one looks at the detail, the base colour of the panel is a clean white, using a white limestone from Northern Ireland. This is complemented by a recessed panel of a different colour, texture and depth to play with light and shadow. As you move around the building the colour changes in the inset panel. The texture is changed to a ribbed finish to add interest. The colours were developed for the Architect by a process of preparing samples using our knowledge of stone, aggregate and pigments to achieve the desired colours. Techrete have a large selection of standard samples that have a proven track record in use and cover all colours. Sometimes these standard colours can be tweaked to meet an individual taste. Here a warm buff and a clean grey were selected as well as using white in a vertical rib on some panels. We can offer developers and their design teams our years of experience in creating a façade of consistent colour through our expert knowledge of our materials and strict control of the manufacture process.

These effects can create a striking façade without adding considerable cost to the project.

Roach Bed and Textured Panels
N03 by Patel Taylor Architects had a wide range of colours and finishes on the plot to distinguish between the different elements of the plot.

For the plinth the Architect wanted to use natural stone and had selected Portland Roach bed which is known for its deep shelly texture. Techrete have previously used this stone on numerous buildings including the BBC, headquarter in London and the House of Fraser anchor store in Bristol prestigious Cabot Circus retail centre. During the value engineering process, familiar to all projects, the cost of natural stone was deemed prohibitive and the Roach stone was challenged by the PQS. Techrete, with our knowledge of using detailed rubber form liners stepped in and offered to develop an alternative to natural stone by using reconstituted stone. Techrete has significant experience of working with various types of rubber moulds and we set about a programme of development to produce samples for presentation to the Architects and ODA.

As is seen in the attached photographs, natural stone samples were taken and the rubber moulds were produced to give a random pattern to the stone as would happen in the case of natural stone being used. The results surprised the architect in terms of their quality and consistency and were adopted for use in the project. Significant challenges were presented by the jointing which was an expressed type of joint which required very delicate production techniques and subsequent handling to prevent any damage. The results as seen on the attached photographs and is stunning and gives a very viable cost effective alternative for buildings of this type where the budget will simply not stretch to the use of natural stone. The innovation and experience shown by Techrete in developing this system is evident on this project.

In adding further detail to the façade the Architect wanted to add depth to the upper panels adding a vertical emphasis. A system was developed of setting out vertical lines or the panels through the use of curved timber batons laid in the mould. These were moved around to give different patterns with the same language giving a subtle but effective feature economically.

Unlike many developments, some of the most striking panels are reserved for the courtyards. On N07 Panter Hudspith Architects developed the idea of having large windows with the facade representing curtains being drawn across them. Using precast allowed the Architect to have heavily recessed, fluted panels of a red finish with integral white surrounds. This gives a very effective façade appreciated by all that see it.

In Summary, a precast façade can offer in terms of finish:
- Natural colours with a depth of finish
- An almost endless variety of textures
- Complicated shapes
- A wide selection of bricks and mortar colours
- Complicated Brick Coursing including stack bonding and vertical coursing
- Near, controlled movement joints

Replication of Roach Natural Portland Stone in Architectural Precast
A challenge was set for Techrete to produce Architectural Precast equivalent to Roach & Portland Stone.

Techrete has significant experience of working with various types of rubber moulds and set about a programme of development to produce samples for presentation to the Architects and the ODA for the Building N3.

As is seen in the attached photographs natural stone samples were taken and the rubber moulds were produced to give a random pattern to the stone as would happen in the natural case. The results surprised the Architect in terms of their quality and consistency and were adopted for use in the project. Significant challenges were presented by the jointing which was an expressed type of joint which required very delicate production techniques and subsequent handling to prevent any damage. The result as seen on the attached photographs is stunning and gives a very viable cost effective alternative for buildings of this type where the budget simply will not stretch to the full use of natural stone. The innovation shown by Techrete in developing was noted by all.
Design
The challenge of engaging with a large number of multi disciplined Architectural practices was immense. Techrete approached this by setting up individual project teams to deal with each of the block developments. Computer modelling via Tekla software was used which made the interfacing with the groups of Architects very efficient. Maintaining consistency across all the blocks was difficult but it found that when any differences were explained to the various teams everybody came to the party in engaging with the need for an integrated consistent approach.

Logistic
The logistic challenge of delivering on an on time basis to each of the Plots proved difficult. Eventually through discussion with Lendlease and the ODA it was agreed that an on site Reception facility for loaded trailers was going to be necessary to achieve the project objectives. The deliveries to site peaked at 70 loads of architectural precast per week which were delivered to a central area on site. This Reception area was equipped with its own shunting facilities which allowed for the delivery of the loads which were delivered on a drop and pick basis to be subsequently re-delivered to each of the project plots on a just in time basis.

As familiarity grew amongst the teams and with no change of drivers on the shunting vehicles the operation quickly settled down to a very smooth flow. The central facility facilitated the offloading and consolidation of transport frames for return journeys which had a significant impact on reducing the carbon footprint for the job. It also reduced waste by the consolidation of all of the packing timbers and transport straps and their return efficiently for reuse. The engagement of Lendlease in this revised approach was total and without that simply the objective would not have been achieved. The Lendlease personnel proved extraordinarily professional and efficient in their engagement with this process as they foresaw the benefits and then saw them play out in actual execution.

Construction
One advantage of the fact that all of the plots were relatively close together emerged very quickly in that it allowed the Construction Director to be site based and have easy access to each of his individual plot teams. The coordination of the construction between the various plots probably proved one of the most challenging aspects of the whole job as the demands ebbed and flowed on each of the plots with craneage, road access, access for other trades constantly changing. It is testimony to the onsite client teams and to the in house erectors that the process ran so smoothly.

Safety also the Environment
The challenges in relation to safety and the environment were immense. The targets set were at an all time industry worldwide high. The resulting performance has set world standards for the achievement of outputs on this type of project. Outputs of 200 panels per week were achieved taking all factors into account such as weather, congestion etc. These were achieved within a very strict safety regime on the plots. The exemplary results achieved speak for themselves.

Handover
Probably one of the most challenging aspects of this project was the need to complete apartments in a totally sequential manner and hand them over ready for occupation. The logistics challenge presented by this to Lendlease was of massive proportions. The introduction of a Directors weekly meeting over a working lunch to make sure that all significant issues got aired and that all of the project teams at Director level knew one another proved to be hugely significant. The vision of Chris Howcroft, Project Director for Lendlease in setting this up and then sticking with it through some very difficult periods is to be highly commended. His achievements in welding the team together have set a new standard for approaching large scale multidisciplinary construction projects.

Financial Failure
A further challenge arose during the project when a number of specialist contractors got into financial difficulties. These were not only contractors involved in Architectural Precast but the one that impacted on Techrete most was the failure of a significant Architectural Precaster. This had a downstream effect on some of the common suppliers to Techrete such as for fixings and erection.

Lendlease and ODA approached Techrete about the completion of some of the partially completed works. In addition Ardmore needed a contractor to complete the work on N2. This proved particularly challenging in coming in at a halfway point and having to try and match samples on a building which was at that stage one third erected. Techrete rose to the challenge developing equivalent mixes and ensuring that the completion date originally intended was not impacted. The loss of traditional skills and year of experience in these failed companies is very much to be regretted and it is hoped that the skills can be retained in the industry by the remaining players ensuring that they are not lost.
A new approach

The completion of the Village also demonstrates the long-term legacy the Games will deliver when beds for athletes become essential new homes for Londoners.

The completed structures accommodated 17,000 Olympic and 6,000 Paralympic athletes and officials during the games. The designs also feature shops, restaurants, medical, media and leisure facilities, in addition to large areas of open space.

Inspecting the site, culture secretary Jeremy Hunt said: ‘The Olympic Village looks fantastic. It is yet another example of how we continue to deliver on our promise to leave behind real and lasting benefits from London 2012.’

LOCOG chair Seb Coe said: ‘The completion of the Village also demonstrates the long-term legacy the Games will deliver when beds for athletes become essential new homes for Londoners after the Games, creating a vibrant new neighbourhood on the doorstep of the Olympic Park.’

The Olympic Delivery Authority (ODA) agreed to sell the village to Delancey and Qatari Diar for £557 million. The site is being transformed into housing following the games. As many as 1,379 of the units are owned by Triathlon Homes.


New Homes for Londoners

Source: ODA

Some Facts
• A complete neighbourhood of 2,818 properties, including 1,379 affordable homes
• Family housing with nearly 1,000 three and four bed homes
• New homes spread across 11 individually designed residential plots in one of the best connected parts of the capital, providing neighbourhood character and choice
• New homes built around private courtyards with car parking
• New homes built to Code for Sustainable Homes Level 4 and designed for modern, sustainable living, with fittings and finishes of the highest standard
• Six future development plots with existing outline planning consent and the potential for 2,000 open market homes to be developed, together with retail floor space and associated uses
Olympic Village investor announced with plans for a new neighbourhood for London, £557m deal secures significant public sector returns and world-class legacy owner for Village

The Olympic Delivery Authority (ODA) announced that contracts have been signed with the joint venture of Delancey and Qatari Diar for the purchase and long-term management of the Olympic Village. The joint venture will work alongside Triathlon Homes who will manage the affordable housing in the Village.

Architects

The Village, which lies adjacent to the Olympic Park, will create a new neighbourhood for east London, delivering the best of city living all in one place - high-quality new homes, education and healthcare facilities, new parklands, public squares and open space, with transport links making it one of the best connected parts of the capital.

The Village will deliver 2,818 new homes, including 1,379 already purchased by joint venture Triathlon Homes to become high-quality affordable housing. Delancey and Qatari Diar will now acquire the ODA’s interests in the remaining 1,439 homes which will become private housing, along with six adjacent future development plots with the potential for a further 2,000 new homes. Delancey and Qatari Diar will invest around £557 million for the purchase and long-term management of the Olympic Village. The deal also includes arrangements to provide a future profit-share for the public sector.

The majority of the 1,439 private homes in the Village are to be let on a rental basis, instead of being sold, with the ownership remaining with the Delancey and Qatari Diar joint venture. This will create the first UK private sector residential fund of over 1,000 homes to be owned and directly managed as an investment.

ODA Chief Executive Dennis Hone said: “This deal will deliver a significant return to the public purse and a first-class owner for the Olympic Village. It secures two leading property investors with the experience and expertise needed to make the Village one of the strongest legacies from the Games. The Village will deliver the best of city living all in one place with high-quality new homes, education and healthcare facilities, new parklands, great transport links, public squares and open space.”

Secretary of State for Culture, Olympics, Media and Sport Jeremy Hunt said: “This is a fantastic deal that will give taxpayers a great return and shows how we are securing a legacy from London’s Games. The Village will be the centrepiece of a new vibrant East London community and I am confident that these experienced property investors will deliver a modern, spacious

By John Doe an architect and professor at the University of London, UK

The Village has delivered 2,818 new homes to become high-quality affordable housing