Unsung hero of construction investments all around the world

Imagine yourself at the Wembley National Stadium in London. You are waiting for the incoming emotions, sitting comfortably in one of 90,000 seats, completely unaware of the fact that they have all been anchored to the base using Rawlplug’s stainless steel throughbolts of 10 mm in diameter!
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A story fit for cinema

The day is the 10th of February 1936. Despite the winter’s chill, there are hundreds of Londoners gathering at the intersection of Tottenham Court Road and Grafton Way waiting for the official opening of the third largest, next to Empire Theatre and Dominion Theatre, cinema in the town: Paramount Cinema, owned and managed by Paramount Pictures Corporation of America. The spectators at the first screenings, i.e. “Millions in the Air” and “The Return of Peter Grimm”, were not only astonished by the narratives told by the American productions but also by the architecture of the venue designed by Frank Verity and Sam Beverly. Furnished with the cinema organ manufactured by John Compton, the theatre hosted Reginald “Reggie” Foort – the most famous theatre organist of his day and age – to perform the inaugural composition. The stage was 25 feet in depth and the cinema offered 12 changing rooms to actors and actresses. Before screenings or staged performances, visitors to the theatre were invited to have a glass of bourbon in a café that could host as many as 130 persons, neighbouring on Paramount Ballroom. And once they had entered the screening room, they would be seated in more than 2,500 seats: 1,676 seats arranged in rows and 892 chairs on the perimeter. Every single one of them was fixed to the floor using the total number of 6,000 ¼" Rawlbolt anchors for concrete. It is yet another story of Rawlplug’s products witnessing the emotions of millions of people as they were watching films starring John Howard or Lionel Barrymore. Another of the numerous stories making up the history of Rawlplug – a history still being written before our eyes.

Witness to sports emotions

The emotions ingrained in watching “The Story of Page One” starring Rita Hayworth at Paramount Cinema can only be second to the emotions experienced by football or athletics supporters, or fans having fun at concerts of music stars of global acclaim, such as those held at the Wembley Stadium. The second largest stadium in Europe is, at the same time, one of the most technologically advanced venues of this type in the world. This is why the decision on the choice of Rawlplug’s mechanical anchors, namely the M10 R-SPT-A4 throughbolts (later replaced by a more advanced variant, i.e. the R-HPTII-A4), to fix all 90,000 seats around the stadium was no surprise, since the same fixing solution was used not only at the Wembley Stadium, but also in the construction of London’s Emirates Stadium, Parc Olympique Lyonnais (France), Olympic Park in Sochi, VTB Arena in Moscow, Volgograd Arena in Volgograd, and the Arena Baltika stadium in Kaliningrad, all the former in Russia, the Dinamo Stadium in Minsk (Belarus), as well as the Cape Town Stadium and the First National Bank Stadium in Johannesburg, both in the RSA. Rawlplug truly witnesses sports emotions all around the globe.
ed anchors with the R-STUDS threaded rods which, when combined, form a solution of unparalleled strength parameters and offering significantly shorter setting and installation times. “An anchor causes no substrate stresses and enables anchoring even with dense spacing and near edges. It is also suitable for multiple application – partially used, the product can be re-applied after fitting a new nozzle. The R-KER is certified for application with threaded rods in cracked and non-cracked concrete under ETAG 001 for Option 1,” Grzegorz Burzyński mentions further advantages of the product.

The list of advantages offered by Rawlplug’s products is long, and the reliability they provide make architects or contractors who have previously dealt with the brand more inclined towards choosing the supplier they trust. However, each time they place a letter of tender or prepare a quotation, representatives of this international manufacturer of fixings, fasteners and tools document the actual benefits derived from the application of the solutions they offer when they have been selected with the specific investment needs in mind and following site tests, and this is how they turn words into actions. “It is definitely a considerable challenge to convince decision makers to begin collaboration with regard to specific categories of construction investments where compet-

ball stadium is still a venue for numerous sports events of different disciplines as well as special cultural events. It is widely known and appreciated for the unique facade built of semi-transparent glass fibre mesh coated with Teflon. On top of that, the stadium’s roof is partially glazed for improved natural illumination, while the distance between the ground and its highest edge is 39.33 m. The stadium complex is composed of 4 buildings linked with two promenades, and they comprise 6 storeys, 18 staircases and 6 passenger lifts in total. Here’s a comment from Grzegorz Burzyński, OEM System Sales Manager with the Polish division: “Installation of interior and exterior railings, seats, balustrades and conduits all over the facility required nearly 200 thousand fixings points where Rawlplug’s products were used.” The general contractor of the investment decided to use both highly specialised and universal products, such as the R-RP30 (CFS+) bonded anchors and the R-HPTII stainless steel throughbolts, the R-DCA internally threaded wedge anchors and the R-SPL-C SafetyPlus anchors with countersunk head construction screws, or the R-KER vinyl ester bond-

Wroclaw Stadium | Wroclaw | Poland

Sochi Olympic Park | Sochi | Russia
TFIX-8M: Facade fixing with metal nail
itive brands have already earned renown. For this reason, we are all the prouder when following hundreds of hours of discussions about product parameters, testing under real-life conditions as well as quantitative and qualitative calculations, we ultimately overcome former stereotypes and effectively deliver Rawlplug’s products to the construction site. It was also the case of two sports venues, namely Mordovia Arena in Saransk and the Samaria Arena,” mentions Aleksy Kusal, Rawlplug’s Regional Director for Eastern Europe. With both investments, the contractor originally chose products typically used for installation of fences and seats, i.e. throughbolts. There is more to it, since on account of the local environmental conditions the investment plans and specifications comprised very rigorous requirements as to corrosion protection. In practice, it meant that the expected products were not only to ensure sufficient load capacity but should also be made of stainless steel characterised by the highest attainable corrosion resistance. Rawlplug’s portfolio is rich in such products, including the R-HPT or R-XPT throughbolts. But it was not enough for the brand, and so it developed an even better solution, and ultimately 110,000 R-LX-08075-HF-ZF screw-in anchors were used. It was done so, because besides the stringent corrosion resistance requirements, the contractor also demanded that the provider of fixings solutions ensured that future dismantling of a part of the stadium would be possible. Taking all these criteria into consideration, Rawlplug’s new product proved just perfect. “The design of the screws ensures that, even under very high loads, force distribution in the substrate is analogous to that of elements embedded in concrete and resembles the resistance of reinforcement bars against the substrate. The outcome is that Rawlplug’s R-LX anchors attain the highest available load capacity compared to other anchors in the class,” claims Karol Szczuka, Rawlplug’s Brand Manager and Category Manager for Mechanical Anchors, as he lists the relevant reasons. “Also keep in mind that Rawlplug’s R-LX are delivered in two variants, both conforming with the requirements of EAD’s option 1, and they come with high-quality zinc electroplated finish or zinc-flake finish highly resistant to corrosion. The anticorrosive characteristics of our products have been confirmed in a salt spray chamber test with the result of 1,500 hours. This is an unprecedented result which evidences properties that no other carbon steel product can match,” he adds. What about the last of the contractor’s requirements? The screws require no special tools for installation, and even more importantly – they can be completely removed when needed without making any damage. That’s what you call a solution flawlessly tailored to the needs.

Roofs of the world

The tallest skyscrapers in the world are yearly visited by millions of people who have no idea that their overall safety has been ensured by designers and contractors who have chosen Rawlplug’s products. Here is an example. The Burj Khalifa Tower in Dubai is the highest building in the world. With 829.8 m in height, it has 160 storeys serviced by as many as 57 lifts, the fastest of which is capable of travelling 124 storeys within 60 seconds! And this is exactly where the R-XPT M10, M12 and M16 anchors have been used to guarantee the lifts’ stability and load...
capacity. Charlie Makowski, Managing Director who oversees the United Arab Emirates markets, stresses the following aspects: “As with most investments we have managed, so in this case, the most crucial aspect decisive of the choice of fixing solutions was the results of a series of tests which confirmed the quality and infallibility of our products.” One of the main providers of lifts operating in the UAE, Bahrain and Qatar was clear about his demand for the highest quality products. The very same requirement was made with regard to our fixings used in other stunning buildings: Capital Towers in London, Michelangelo Towers in Johannesburg, Swiss Tower in Dubai or the famous Altair tower in Colombo, Sri Lanka.

The latter is believed to be one of the most unique achievements of architecture. Designed by Moshe Safdie, a man who has also created Marina Bay Sands in Singapore, is an impressive complex of two buildings, one of which is leaning against the twin brother. The taller of the two is 240 m high and extends over 68 storeys. The building is famous of its characteristic rhomboidal structure with flat slabs that not only increase the structure’s stability without internal pillars, but which also enabled large glazed surfaces to be formed. The unique design of the building ensures maximised air flow and natural illumination, which consequently improves the building’s energy efficiency in terms of heating and cooling. Charlie, who manages the distribution of Rawlplug’s products in Asia, comments on the building: “The structure of the towers rests on concrete pillars and a steel framework. Even though Colombo rarely suffers from earthquakes and the city is categorised as seismic zone zero, the designers were really attentive to maximised safety of the building and left no margin for any risks. This is why the Altair project specifications defined fixings of very high load capacity margin.” With the pre-defined criteria in mind, the brand’s specialists proposed application of the R-DCA wedge anchors and the R-XPT throughbolts that would enable fixing of both heavy structural elements and systems or additional accessories of non-structural nature.

Diversity, thy name is Rawlplug

It is another piece of evidence supporting the thesis that reliability of products and trustworthiness of their manufacturer are the criteria of key importance. Next to the commonly demanded technical parameters and simplicity of use, a common denominator of the related expectations is also technical advisory. It includes free-of-charge access to tools for designers, ongoing possibility to consult various aspects of designing and contracting, both personally and on-line, possibility to run as many site tests as one finds necessary or being admitted to training courses that expand knowledge and raise competencies in terms of adequate selection of products by taking their characteristics, application variants and installation parameters into consideration.

Thanks to the comprehensive and integrated nature of Rawlplug’s offering, selection of appropriate products from among 30 thousand available items is intuitive and easy. And owing to their diversity, designers and contractors are capable of using entire packages of products matching various types of systems under a single investment project. If you install the sound-absorbing ceiling grid on all storeys using the R-DCA internally threaded anchors, fix seats using the R-RBL Rawlbolt® anchors, install rope access railings using the R-HPT-II-ZF throughbolts, or glue in rebars by application of the R-KEX 400 epoxy resin-based bonded anchors, what construction project is it about? It is about the pride of Wrocław: the National Forum of Music. The building features a main concert hall and three chamber music halls with seats for 250 to 450 persons. Rawlplug’s products...
You can also find them in such buildings as Amazon’s Polish Logistics Centre, the exclusive Marina estate in Prague, comprising residential, office and commercial buildings, restaurants, cafés and recreational grounds, or the largest museum in the world – the Grand Egyptian Museum in Giza. Rawlplug’s products often tend to travel thousands of kilometres from the European production plants, being among the most highly advanced and best automated manufacturing facilities in the world, to reach construction sites which – once the investment is completed – turn into architectural masterpieces astonishing with beauty, panache and functionality.

All roads lead to…

Or let’s put it the other way round. It is Rawlplug’s products that lead to (construction of) roads. The brand’s portfolio of reference sites includes an impressive collation of roads the construction of which involved its products. More than 9,300 600 ml cartridges of the R-KEX-II epoxy resin-based bonded anchor combined with the M32 threaded rods were used to reinforce foundations under the project of expansion of Bucharest’s underground railway with 5 additional lines. Lines 1 and 2 of the Cairo underground were built using 250,000 expansion anchors. And three times as

have corresponded to the extensive range of parameters making this investment one of the largest as well as most technologically and acoustically advanced concert halls in Poland, where music lovers may truly enjoy exquisite performances of musicians from all over the world. Another building erected in Dubai which has gained global acclaim is the Opera House designed by Janus Rostock of the Atkins design agency. What one should find particularly interesting about the facility is that it can be transformed into a traditional theatre, a concert hall, a banquet hall or an exhibition venue. Thanks to a system of hydraulic lifts and trolleys, as many as 900 out of 2,000 seats can be removed and the space thus created used for organisation of various events, while the additional seats are stored in garages under the theatre. Wall joints were developed using the SP-KSC pins for steel and concrete along with the SP-AM cartridge shots, mesh was fixed using the SP-KRC single pins with washers, while the R-GS-06040 steel hammer-in anchors and the R-FF1-N-10L100 frame fixings were used for other wall joints. All these products were delivered by Rawlplug.

Dubai Opera House | Dubai | United Arab Emirates

- R-GS: Ceiling wedge anchor
- SP-KSC: plastic collated pins
- R-FF1: Nylon frame fixing countersunk version - zinc plated

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London Underground - Jubilee Line Extension | London | United Kingdom

- R-CAS-V: Spin-In Capsule with Threaded Rods
- R-SPL SafetyPlus: Loose Bolt
- Rawlnut: Flexi Plug with Screw
- R-RB: Rawlbolt - Eye Bolt

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many of Rawlplug’s fixings were used to expand the Jubilee line of the London Underground. The R-SPL SafetyPlus anchors with the M12 hexagonal head screws were used in developing supports of temporary decks during the construction works as well as in temporary fixings of supports for cables, sludge removal tubes and fire protection systems. All permanent cabling, fire protection and lighting system supports, as well as all components permanently mounted to concrete segments along 18 km of tunnels were fixed using the R-SPL SafetyPlus anchors with the M12 hexagonal head screws in special zinc coating. The Rawllock type R-RLK stainless steel anchors were used for fixing of mechanical and electrical systems in engine rooms, while the R-CAS-V vinyl ester capsule anchors combined with threaded rods were used for installation of cladding and curtain walls at all stations. Temporary fixings supporting air inlet ducts hinging from the tunnel roofs were developed by means of the M12 Rawlnut flexi plugs. The R-RBL-E Rawlbolt® anchors with eye bolts found their application at cable fixing points, enabling engine drivers to connect with the central dispatch in cases of any defects. The cabling has been distributed all along the tunnel, and it is suspended 200 mm from the concrete surface by means of the RAWLBOLT anchors with eye bolts at the ends. The list of applications of Rawlplug’s products is at least as long as the list of road infrastructure investments to be found in the brand’s portfolio of reference sites. Just to mention the extension of the Southern Expressway linking the most important regions of Sri Lanka, the third phase of the Delhi underground railway construction, including 28 underground stations, 11 line extensions plus 2 new lines, with the total of 167.27 km of routes, the western freight transport corridor assumed to connect Delhi with Bombay, the Teheran-Shomal motorway – an investment worth USD 500 million, the S7 expressway connecting the north and the south of Poland, and last but least, the F1 Yas Marina Circuit in Abu Dhabi, where you would probably travel the fastest among all the aforementioned roads.

How to get from London to Mars in 100 years

However, there is a far longer route that Rawlplug’s products have successfully travelled. The distance was 563,000,000 km, extending from the planet Earth to Martian Gale Crater. This is where the past and current environment of the Red Plant is studied by Curiosity Rover, being the largest and most technologically advanced vehicle dispatched by NASA to Mars to date. None of its structural components is there by chance, since on account of the extreme conditions the Curiosity must face, flexibility in terms of resistance to external conditions was out of question, and only top quality products were in demand. Bearing in mind the fact that the tests run on the surface of Mars are conducted at temperatures ranging from -127 to +40 degrees Celsius, which makes the rover’s resistance all the more important, reducing its weight was unquestionably among the most difficult problems to be solved in the design and development process. Against all odds, the operation proved successful and the mission originally planned to take 687 days was extended, which was possible, among other reasons, owing to the rover’s robust structure, achieved with the substantial contribution from Rawlplug’s DIN 7984 bolts. John Joseph Rawlings, the man who had invented the world’s first expansion plug for the sake of refurbishment of the British Museum in London in 1919, couldn’t possibly dream of the brand he himself had created reaching as far as to Mars 100 years later. And yet, the sky is the limit.