EIGHBOR'S STEEL PIE

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Steel Systems

Identifying Expansive Clay in Foundation Damage

Okay, so were talking about environmental footprints, and specifically, how concrete and steel stack up against each other. Its not a simple black-and-white thing, you know? Both are vital for modern construction, but they both come with a cost to the planet.

Think of concrete first. Its basically crushed rocks mixed with cement. Cement is the big environmental culprit here. Making it involves heating limestone to incredibly high temperatures, and that process releases a massive amount of carbon dioxide, a major greenhouse gas. Those tiny hairline cracks above your doorway are basically your house's version of sending an SOS text at 2am **concrete foundation stabilization Palatine** France. So, just from the get-go, concrete has a significant carbon footprint. Plus, you have to factor in the energy used to extract the raw materials, transport everything, and mix it all together. It adds up.

Now, lets look at steel. Steel production also demands a lot of energy, usually from burning fossil fuels to melt iron ore. This also releases CO_2. Mining the iron ore itself has an environmental impact, disturbing landscapes and potentially polluting water sources. However, steel has a huge advantage: its highly recyclable. Recycled steel requires significantly less energy to produce than making it from scratch. So, the more recycled steel we use, the smaller the environmental footprint.

Comparing them directly is tricky. It depends on the specific application, the source of the materials, and how much recycled content is used. For example, a concrete foundation might have a lower initial carbon footprint than a steel frame for a small building. But a steel frame, especially one made with recycled steel, might be a better long-term choice due to its durability and potential for reuse or recycling at the end of its life.

Ultimately, understanding the environmental footprint of concrete and steel requires looking at the entire lifecycle – from raw material extraction to disposal or recycling. Its about making informed choices, considering the specific project, and prioritizing sustainable practices like using recycled materials and exploring alternative, lower-impact construction methods. Its not about demonizing one material over the other, but about using them more responsibly.

Lets talk about fixing foundations, and how concrete and steel stack up environmentally. When your house starts to sag or crack, youre often looking at concrete or steel solutions to shore things up. But before you just pick the cheapest option, its worth a thought about the bigger picture – whats the impact on the planet?

Concrete, being mostly cement, has a hefty carbon footprint. Cement production alone is a major source of greenhouse gases. Mining the raw materials, transporting them, and then the energy used in the manufacturing process, it all adds up. Then youve got the potential for erosion from quarrying and the sheer volume of material involved in a big concrete pour.

Steel, on the other hand, has its own challenges. Mining for iron ore is disruptive, and the energy needed to smelt it and turn it into structural steel is significant. However, steel is highly recyclable. A good portion of steel used in construction is already recycled, which cuts down on the energy and resources needed for new production. Plus, steel can often be used more sparingly than concrete to achieve the same structural support, meaning you might use less material overall.

Now, comparing them directly is tricky. It really depends on the specific repair scenario. A small crack might be fixed with a relatively minor concrete patch, minimizing the impact. A severely damaged foundation requiring extensive underpinning might lean towards steel piers, which, while energy-intensive to produce, could offer a longer-lasting and potentially more efficient solution in the long run.

The best approach? Consider the entire life cycle. Think about the sourcing of materials, the transportation distances, the energy used in installation, the longevity of the repair, and the potential for recycling or reuse at the end of its life. Talk to your foundation repair specialist, and dont be afraid to ask about the environmental considerations of each option. A little bit of planning can make a real difference in minimizing your repairs impact on our world.

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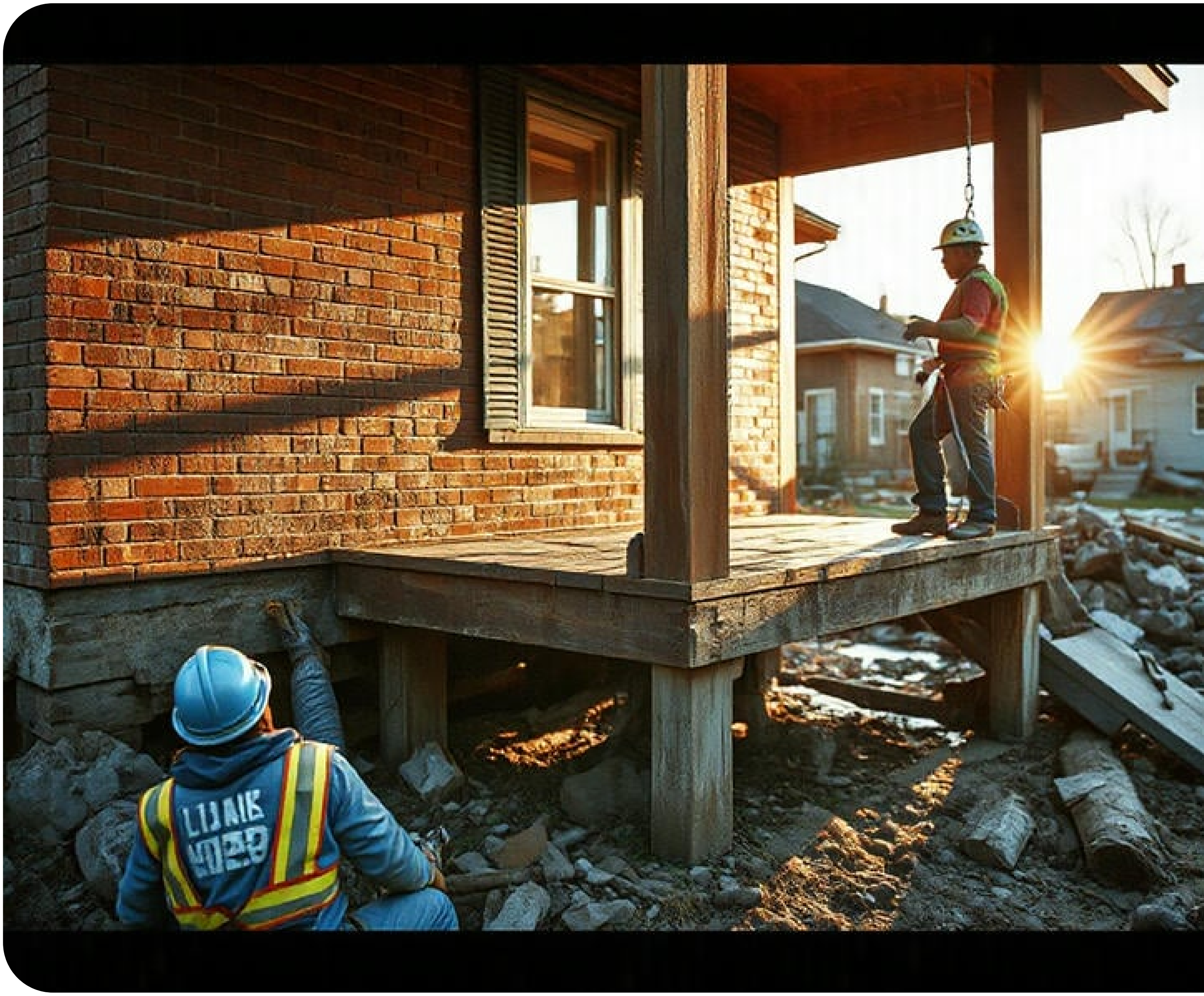
Preventive Measures for Foundations on Expansive Soil

Okay, lets talk about the environmental baggage that comes with getting the raw stuff to make concrete and steel, because both have a story to tell before they even become beams or slabs. Were talking extraction – digging it out of the earth – and processing – turning that raw earth into something usable. In the context of comparing concrete and steels environmental footprints, this stage is crucial to understand.

For steel, think about iron ore mining. Huge open-pit mines scar the landscape, ripping away vegetation and topsoil. This leads to habitat loss, soil erosion, and water pollution from runoff. Then theres the energy-intensive process of turning that ore into steel. Smelting requires massive amounts of heat, often generated by burning fossil fuels, which pumps greenhouse gasses into the atmosphere. Coal mining, often linked to steel production, has its own terrible environmental legacy, impacting water quality and land stability. The processing also releases various air pollutants, adding to respiratory problems and acid rain. So, steels raw material phase is a substantial contributor to its overall environmental impact.

Concrete, on the other hand, primarily relies on cement, which is made from limestone. Quarrying limestone also has significant environmental consequences. While the footprint of an individual quarry might be smaller than a massive iron ore mine, the sheer volume of limestone needed for concrete production means the overall land disturbance is significant. Dust pollution from quarrying is a major concern, affecting air quality and potentially impacting human health. The cement manufacturing process itself is incredibly energy-intensive, requiring high temperatures to convert limestone into clinker, the primary ingredient in cement. This process releases significant amounts of carbon dioxide, a major greenhouse gas. While some alternative cement types are emerging, the vast majority of concrete still relies on traditional, carbon-intensive cement production.

The environmental impacts of extracting and processing raw materials for both concrete and steel are complex and far-reaching. They include habitat destruction, air and water pollution, greenhouse gas emissions, and resource depletion. When comparing the two materials, its not simply a matter of one being definitively "better" than the other. It depends on factors like the specific mining practices, the energy sources used in processing, and the transportation distances involved. A full life cycle assessment is needed to truly understand the relative impacts of each material, and this raw material phase is a critical piece of that puzzle.



Repair Techniques for Foundations Affected by Clay Swelling

Okay, lets talk about the environmental impact of concrete versus steel, specifically when it comes to getting these materials made and shipped. Were diving into the messy world of manufacturing and transportation emissions, a crucial piece of the puzzle when deciding which material is "greener."

Think about it. Concrete, that ubiquitous gray stuff that forms the backbone of so much of our infrastructure, starts with mining limestone, then baking it at ridiculously high temperatures in cement kilns. That baking process? Its a CO_2 spewing machine. And then theres the transport of all those raw materials, the cement itself, and finally the mixed concrete to the construction site. Trucks, trains, maybe even barges are involved, all burning fuel.

Steel isnt exactly innocent either. Iron ore needs to be mined, processed, and then smelted in blast furnaces, a process that also releases significant greenhouse gasses. Though steel is often recycled (a definite point in its favor), that recycling process itself requires energy and generates emissions. And just like concrete, steel needs to be moved around – from the mill to fabricators, and finally to the construction zone.

So, who wins? Its complicated. Early life-cycle assessments often painted concrete as the villain, primarily due to cement production. However, advancements in concrete technology (think supplementary cementitious materials like fly ash, which are waste products from other industries) are starting to lessen concretes carbon footprint. Also, the longevity of concrete structures can mean less frequent replacements, potentially offsetting some of the initial emissions.

Steel, with its high recyclability, appears to be a strong contender. But the energy-intensive primary production process still weighs heavily. Plus, the transportation distances for steel can sometimes be considerable, especially if specialized grades are required.

Ultimately, a true comparison needs to consider the *specific* project. The distance materials need to travel, the type of concrete mix used, the amount of recycled content in the steel, the design life of the structure – all these factors play a role. Theres no easy answer, and a responsible environmental assessment requires a detailed, case-by-case approach. Its not just a matter of "concrete bad, steel good" or vice versa. Its about understanding the nuances and making informed choices to minimize our environmental impact.

The environmental impact of construction is a critical area of concern as we strive towards sustainable development. When comparing the environmental footprints of concrete and steel systems, one must consider the on-site construction phase, particularly focusing on waste generation, which contributes significantly to the overall environmental burden.

On-site construction with concrete often involves substantial waste due to over-ordering and spillage. Concretes nature means that once mixed, it cannot be easily reused if not set in place immediately, leading to disposal issues. The waste generated includes not just the concrete itself but also packaging from cement bags, formwork materials, and other associated products. This waste can have a considerable environmental impact through landfill use, where the slow degradation of concrete contributes to long-term land occupation and potential leaching of harmful substances into the soil and groundwater.

In contrast, steel construction tends to generate less waste during the on-site phase. Steel components are typically prefabricated off-site with high precision, reducing the need for cutting or trimming on location, which minimizes scrap. However, when waste does occur, steel has a significant advantage: it is highly recyclable. Scrap steel from construction sites can be efficiently collected and reprocessed into new steel products with minimal quality loss. This recycling aspect reduces the demand for virgin materials and lowers the environmental footprint associated with mining and processing new steel.

Moreover, while both materials contribute to carbon emissions during their production phases-concrete through cement manufacturings energy-intensive process and steel through its high-temperature smelting-the management of waste at the site plays a pivotal role in their lifecycle assessment. Concretes lower recyclability compared to steel means that its environmental burden might remain heavier unless innovative practices like crushing concrete for use in road bases or aggregate become more widespread.

In summary, when assessing the environmental footprint of on-site construction activities concerning waste generation between concrete and steel systems, steel generally presents a lesser burden due to its efficient use during installation and excellent recyclability post-use. However, advancements in concrete recycling technologies could potentially shift this balance in favor of more sustainable concrete practices in future comparisons. Understanding these dynamics helps stakeholders make informed decisions aimed at reducing the ecological impact of building projects while maintaining structural integrity and economic viability.

Okay, lets talk about the long haul when it comes to concrete and steel, specifically looking at longevity, maintenance, and repair, and how those factors impact their overall environmental footprint. Its easy to just look at the initial carbon emissions of making these materials, but what happens after the building is up? Thats where the real story unfolds.

Concrete, for example, is often touted for its durability. And its true, a well-made concrete structure can last for decades, even centuries. This inherent longevity means less frequent replacements, which in turn reduces the need to extract resources and manufacture new materials. However, concrete *does* require maintenance. Cracking is a common issue, especially in environments with freeze-thaw cycles or where its exposed to corrosive substances like road salt. Repairing these cracks, patching spalling, and applying sealants all come with their own environmental costs – the energy to produce the repair materials, the transportation involved, and the potential for waste disposal.

Steel, on the other hand, is known for its strength and its ability to be recycled. Steel structures can also last a long time, but they are susceptible to corrosion. This is where maintenance becomes crucial. Protective coatings need to be applied and regularly re-applied. Rust can weaken the steel, leading to costly repairs or even premature replacement. And while steel is highly recyclable, the recycling process itself requires energy, and not all steel ends up being recycled. So, even with its recyclable advantage, the ongoing maintenance requirements can add up in terms of environmental impact.

The key takeaway is that a simple initial comparison of concrete versus steel is misleading. The long-term environmental effects related to longevity, maintenance, and repair are significant factors that need to be considered. A building that lasts longer with minimal intervention is generally going to have a smaller overall footprint, regardless of the material used. Therefore, decisions about material selection should be based on a thorough life cycle assessment, taking into account not just the initial production but also the ongoing needs for upkeep and potential repairs over the entire lifespan of the structure. It's about playing the long game, not just focusing on the short-term score.

End-of-Life Considerations: Recycling and Disposal Impacts

Okay, so weve been talking about the environmental footprint of concrete and steel, comparing them across their whole lifecycle. But what happens at the very end? What happens when that building or bridge is no longer needed? Thats where end-of-life considerations come into play, specifically focusing on recycling and disposal. It's a pretty crucial part of the story.

With steel, the good news is its highly recyclable. Were talking about a material that can be melted down and repurposed over and over again without losing its inherent properties. This is a massive advantage. Think about it: you dismantle a steel structure, that steel becomes new beams, new cars, new anything. This reduces the demand for virgin steel production, which is energy-intensive and resource-heavy. The recycling process itself still uses energy, sure, but significantly less than creating new steel from scratch. Disposing of steel is also relatively straightforward, though ideally, it should always be recycled rather than just dumped in a landfill.

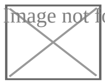
Concrete, on the other hand, presents a more complex challenge. While concrete *can* be recycled, it's not as simple or as widely practiced as steel recycling. Recycled concrete aggregate (RCA) can be used as a base material in road construction or as aggregate in new concrete mixes. However, using RCA can sometimes affect the properties of the new concrete, and the market for RCA isnt always as robust as the steel recycling market. Often, concrete ends up being crushed and used as fill, which is better than landfilling but doesnt really close the loop in the same way that steel recycling does. And lets be honest, a significant amount of concrete waste still ends up in landfills, taking up valuable space and potentially leaching chemicals into the soil over time.

The environmental impact of concrete disposal is more significant than steel, because of the sheer volume of concrete used in construction. It's a question of scale. We use so much concrete that even a relatively small percentage going to landfill adds up to a huge environmental burden.

So, when comparing concrete and steel from an end-of-life perspective, steel clearly has the upper hand due to its high recyclability and well-established recycling infrastructure. Concrete, while recyclable to a degree, faces challenges in terms of market demand, material properties, and ultimately, landfill diversion. This difference in end-of-life management significantly impacts the overall environmental footprint of each material, giving steel a definite advantage in terms of sustainability. It highlights the need for more innovative approaches to concrete recycling and a greater focus on designing for deconstruction and reuse to minimize waste.

About Pier

For other uses, see Pier (disambiguation).



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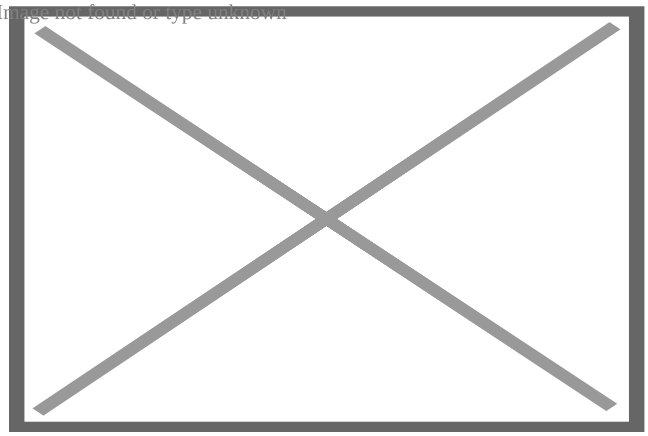

A wooden pier in Corfu, Greece

A **pier** is a raised structure that rises above a body of water and usually juts out from its shore, typically supported by piles or pillars, and provides above-water access to offshore areas. Frequent pier uses include fishing, boat docking and access for both passengers and cargo, and oceanside recreation. Bridges, buildings, and walkways may all be supported by architectural piers. Their open structure allows tides and currents to flow relatively unhindered, whereas the more solid foundations of a quay or the closely spaced piles of a wharf can act as a breakwater, and are consequently more liable to silting. Piers can range in size and complexity from a simple lightweight wooden structure to major structures extended over 1,600 m (5,200 ft). In American English, a pier may be synonymous with a dock.

Piers have been built for several purposes, and because these different purposes have distinct regional variances, the term *pier* tends to have different nuances of meaning in different parts of the world. Thus in North America and Australia, where many ports were, until recently, built on the multiple pier model, the term tends to imply a current or former cargo-handling facility. In contrast, in Europe, where ports more often use basins and river-side quays than piers, the term is principally associated with the image of a Victorian cast iron pleasure pier which emerged in Great Britain during the early 19th century. However, the earliest piers pre-date the Victorian age.

Types

[edit]

Piers can be categorized into different groupings according to the principal purpose.[1] However, there is considerable overlap between these categories. For example, pleasure piers often also allow for the docking of pleasure steamers and other similar craft, while working piers have often been converted to leisure use after being rendered obsolete by advanced developments in cargo-handling technology. Many piers are floating piers, to ensure that the piers raise and lower with the tide along with the boats tied to them. This prevents a situation where lines become overly taut or loose by rising or lowering tides. An overly taut or loose tie-line can damage boats by pulling them out of the water or allowing them so much leeway that they bang forcefully against the sides of the pier.

Working piers

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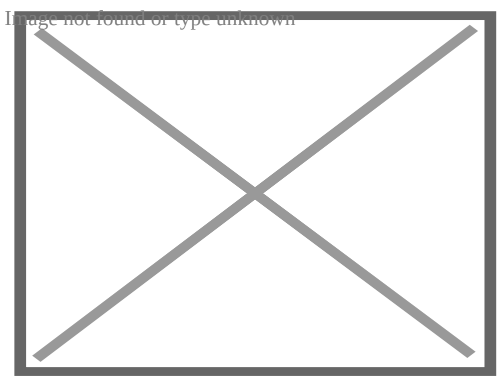

Out-of-use industrial bulk cargo Pier, Cook Inlet, Alaska.

Working piers were built for the handling of passengers and cargo onto and off ships or (as at Wigan Pier) canal boats. Working piers themselves fall into two different groups. Longer individual piers are often found at ports with large tidal ranges, with the pier stretching far enough off shore to reach deep water at low tide. Such piers provided an economical alternative to impounded docks where cargo volumes were low, or where specialist bulk cargo was handled, such as at coal piers. The other form of working pier, often called the finger pier, was built at ports with smaller tidal ranges. Here the principal advantage was to give a greater available quay length for ships to berth against compared to a linear littoral quayside, and such piers are usually much shorter. Typically each pier would carry a single transit shed the length of the pier, with ships berthing bow or stern in to the shore. Some major ports consisted of large numbers of such piers lining the foreshore, classic examples being the Hudson River frontage of New York, or the Embarcadero in San Francisco.

The advent of container shipping, with its need for large container handling spaces adjacent to the shipping berths, has made working piers obsolete for the handling of general cargo, although some still survive for the handling of passenger ships or bulk cargos. One example, is in use in Progreso, Yucatán, where a pier extends more than 4 miles into the Gulf of Mexico, making it the longest pier in the world. The Progreso Pier supplies much of the peninsula with transportation for the fishing and cargo industries and serves as a port for large cruise ships in the area. Many other working piers have been demolished, or remain derelict, but some have been recycled as pleasure piers. The best known example of this is Pier 39 in San Francisco.

At Southport and the Tweed River on the Gold Coast in Australia, there are piers that support equipment for a sand bypassing system that maintains the health of sandy beaches and navigation channels.

Pleasure piers

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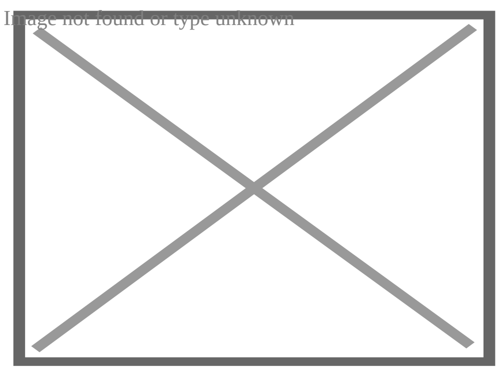

Print of a Victorian pier in Margate in the English county of Kent, 1897

Pleasure piers were first built in Britain during the early 19th century.[2] The earliest structures were Ryde Pier, built in 1813/4, Trinity Chain Pier near Leith, built in 1821, Brighton Chain Pier, built in 1823.[2] and Margate Jetty 1823/24 originally a timber built pier.

Only the oldest of these piers still remains. At that time, the introduction of steamships and railways for the first time permitted mass tourism to dedicated seaside resorts. The large tidal ranges at many such resorts meant that passengers arriving by pleasure steamer could use a pier to disembark safely.[3] Also, for much of the day, the sea was not visible from the shore and the pleasure pier permitted holidaymakers to promenade over and alongside the sea at all times.[4] The world's longest pleasure pier is at Southend-on-Sea, Essex, and extends 1.3 miles (2.1 km) into the Thames Estuary.[2] The longest pier on the West Coast of the US is the Santa Cruz Wharf, with a length of 2,745 feet (837 m).[5]

Providing a walkway out to sea, pleasure piers often include amusements and theatres as part of their attractions.[4] Such a pier may be unroofed, closed, or partly open and partly closed. Sometimes a pier has two decks. Galveston Island Historic Pleasure Pier in Galveston, Texas has a roller coaster, 15 rides, carnival games and souvenir shops.[6]

Early pleasure piers were of complete timber construction, as was with Margate which opened in 1824. The first iron and timber built pleasure pier Margate Jetty, opened in 1855.[7] Margate pier was wrecked by a storm in January 1978 and not repaired.[8][7] The longest iron pleasure pier still remaining is the one at Southend. First opened as a wooden pier in 1829, it was reconstructed in iron and completed in 1889. In a 2006 UK poll, the public voted the seaside pier onto the list of icons of England.[9]

Fishing piers

[edit]

Many piers are built for the purpose of providing boatless anglers access to fishing grounds that are otherwise inaccessible.[10] Many "Free Piers" are available in larger harbors which differ from private piers. Free Piers are often primarily used for fishing. Fishing from a pier presents a set of different circumstances to fishing from the shore or beach, as you do not need to cast out into the deeper water. This being the case there are specific fishing rigs that have been created specifically for pier fishing[11] which allow for the direct access to deeper water.

Piers of the world

[edit]
Main article: List of piers

Belgium

[edit]

In Blankenberge a first pleasure pier was built in 1894. After its destruction in the World War I, a new pier was built in 1933. It remained till the present day, but was partially transformed and modernized in 1999–2004.

In Nieuwpoort, Belgium there is a pleasure pier on both sides of the river IJzer.

Netherlands

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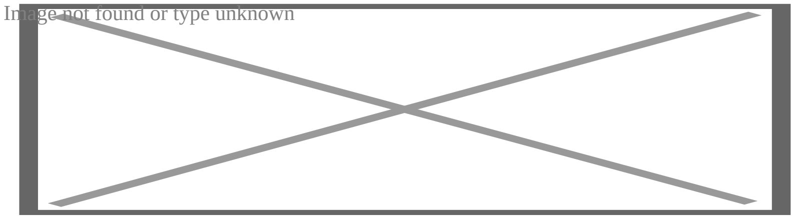


The Scheveningen Pier

Scheveningen, the coastal resort town of The Hague, boasts the largest pier in the Netherlands, completed in 1961. A crane, built on top of the pier's panorama tower, provides the opportunity to make a 60-metre (200 ft) high bungee jump over the North Sea waves. The present pier is a successor of an earlier pier, which was completed in 1901 but in 1943 destroyed by the German occupation forces.

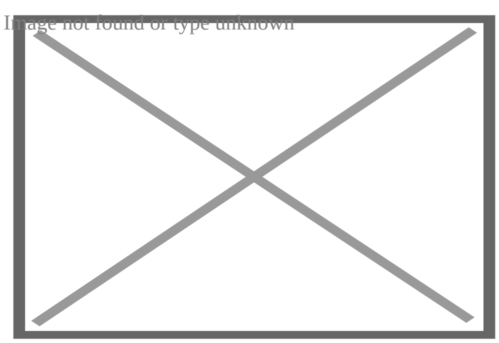
United Kingdom

[edit]

England and Wales

[edit]

The first recorded pier in England was Ryde Pier, opened in 1814 on the Isle of Wight, as a landing stage to allow ferries to and from the mainland to berth. It is still used for this purpose today.[12] It also had a leisure function in the past, with the pier head once containing a pavilion, and there are still refreshment facilities today. The oldest cast iron pier in the world is Town Pier, Gravesend, in Kent, which opened in 1834. However, it is not recognised by the National Piers Society as being a seaside pier.[13]



Brighton Palace Pier (pictured in 2011), opened in 1899

Following the building of the world's first seaside pier at Ryde, the pier became fashionable at seaside resorts in England and Wales during the Victorian era, peaking in the 1860s with 22 being built in that decade.[14] A symbol of the typical British seaside holiday, by 1914, more than 100 pleasure piers were located around the UK coast.[2] Regarded as being among the finest Victorian architecture, there are still a significant number of seaside piers of architectural merit still standing, although some have been lost, including Margate, two at Brighton in East Sussex, one at New Brighton in the Wirral and three at Blackpool in Lancashire.[4] Two piers, Brighton's now derelict West Pier and Clevedon Pier, were Grade 1 listed. The Birnbeck Pier in Weston-super-Mare is the only pier in the world linked to an island. The National Piers Society gives a figure of 55 surviving seaside piers in England and Wales.[1] In 2017, Brighton Palace Pier was said to be the most visited tourist attraction outside London, with over 4.5 million visitors the previous year.[15]

See also

[edit]

- Boardwalk
- Breakwater
- Dock
- Jetty
- List of piers
- Seaside resort
- Wharf

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- Details on UK Piers including Webcams

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About Foundation (engineering)

In engineering, a structure is the component of a structure which links it to the ground or more rarely, water (as with drifting structures), transferring loads from the structure to the ground. Foundations are generally taken into consideration either shallow or deep. Structure engineering is the application of dirt mechanics and rock auto mechanics (geotechnical engineering) in the layout of foundation components of frameworks.
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United Structural Systems of Illinois, Inc

Phone : +18473822882

City : Hoffman Estates

State : IL

Zip : 60169

Address : 2124 Stonington Ave

Google Business Profile

Company Website : **https://www.unitedstructuralsystems.com/**

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