Red Colour & Light in Architecture

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ABSTRACT
In the paper author presents use of red colour in architectural space – in history as well as in contemporary design, considering its symbolic, functional and decorative aspects.
Red hue has been used in architecture since ancient times. Rich symbolism has always been connected with it - association with blood, fire, sexuality and love survived even till now. In some countries red has special meaning, in religious sense as well as in architecture. Red is also traditional colour for roofing, according to wide use of ceramic roof tiles. It is also very popular as façade colour due to another red material – brick.
Red colour has also very strong influence on human's psyche. Its use – on façades, in interiors as well as in urban space – always evokes intensive emotional and aesthetical feelings. Due to its strong optical impact, red plays also important part of city visual communication system.
Keywords: Red colour, red pigments, red in architecture

1. INTRODUCTION
Today, it's almost impossible even to imagine architecture without red colour. Probably, there is any civilization, which would not used this colour in its buildings. Red colour impact is as unique as its essence. Blood, fire, love, life, courage, power as well as anger, hate, danger, martyrdom, death, anarchy and prostitution – that are only some, apparently opposite, associations with red colour. Word “red” means reach spectrum of tones - among others: bright fire engine red, cinnabar, scarlet, carmine, noble crimson, multilayered burgundy or bordo, brownish ochre and umber, orangish brick. Obviously, optical impact of red may vary according to the hue intensity and material used. However, bright, saturated red always strongly influences and emphasizes the space. Its use in architecture usually combines both practical, informative and decorative function as well as symbolical and mystical ones.

2. RED PIGMENTS AND MATERIALS IN ARCHITECTURE
Red is present in architecture as inherent material colour, layer of paint or plaster, colour of plastics as well as light e.g. in media-facades.
Materials “naturally” available in red hues include every product based on sun-dried or burnt clay – that is: brick,
ceramic roof tiles or terracotta (“terra cotta” means “burnt soil”).

Its colours fluctuates from bright yellowish to dark red hues, according to firing temperature as well as number and type of additional components (e.g. iron or manganese).

Most commonly used red colourants belong to, so called, Iron oxide pigments. Hue scale of this pigments is wide and includes bright and dark reds as well as brownish and even purplish tones.

Iron oxide reds are very durable paints. They are also weather resistant and don’t fade under sunlight. That’s why these pigments are frequently used as plasters and cement dyers.

Natural iron oxide reds, consist mostly of clay coloured with anhydrous iron oxide. Clay earth pigments are naturally occurring minerals, that have been used since prehistoric times as pigments. The primary types are ochre (red ochres), sienna (short of terra di Siena, “earth of Siena”) and umber (burnt umber). In case of burnt earths, its appearance has depended on firing temperature and purity of material.

In synthetic red iron pigments, Fe2O3 is obtained artificially e.g. by calcination of ferrous salts.

Some of the well known natural red pigments derived their names from places they were mined (e.g. puccola) or where they were commonly used e.g. Pompeian, Indian, Venetian, Persian or English reds.

Another well known pigment is red lead (Pb3O4). Lead tetroxide, also called minium, is a bright red to orange pigment. In combination with linseed oil, red lead has in the past been the standard anti-corrosive primer for iron and steel constructions all over the world. Due to its toxicity, its use is today being limited.

3. RED COLOUR TRADITIONS ALL OVER THE WORLD

Many traditions are connected with red colour use in architecture. Some of them have symbolic or philosophical connotations, some are based on popularity of local pigments, others originated from functional reasons. Colour traditions are sometimes connected with the building function e.g. red doors or facades of firehouses, according to red association with fire or red of lighthouses (often with white stripes) due to its good visibility against sea and sky blue.

Some of this traditions are still alive today, other have only historical value.

3.1 „Red“ names of cities, places and buildings

Many places all over the world derived their names or nicknames from prevailing use of red colour.

Marrakesh (Morocco) is also known as „Red City“ or „Rose City“, due to dominating material of architecture, which is local Red Earth in enchanting salmon pink hue.

“Purple City” means Forbidden City in Beijing (XV cent.), which red brick walls symbolized eternity and power. Chinese original name “Zijin Cheng” refers to Zi, or “Purple”, associated to North Star, which in traditional Chinese astrology was the abode of the Celestial Emperor.

The name of the City Rothenburg ob der Tauber (Germany, Bavaria) comes out of German words Rot (Red) and Burg (medieval fortified town), referring to the prevailing red colour of the ceramic roof tiles – type of roofing colour having long tradition in many European countries.

Also London could be nicknamed “Red City”. Red buses, red telephone boxes, mailboxes (painted red since 1874), red main underground line, red guards uniforms as well as numerous brick or painted red facades, all this creates special “atmosphere of red“ all over the cityscape.
The name of the Red Square - Красная площадь (Moscow, Russia) could possibly derive from the colour of the buildings around it (e.g. History Museum or Kazan Temple) or from the well known linkage between the colour red and communism. The name came however from old Slavic adjective красный (krasn), which meant either “red” or “beautiful”.

Not only cities, but also single buildings are often named according to its red colour. Some of them are: Red Fort in New Delhi (India), Red House (brick house in Kent, England, designed by Philip Webb for William Morris in 1859), Big Red – lighthouse on Holland Michigan Harbour (Michigan, US., 1907) or more recent examples: two residential complexes in Nethereids: De Rooie Donders (literally: Red thunders) in Almere (arch. Liesbeth van der Pol, 1998), or Red Apple in Rotterdam (arch. KCAP Architects & Planners, 2009).

3.2 Red in ancient times – symbolism and religion. [3,6]
Functions of colour in antique architecture were mostly symbolic, deeply rooted in religion, mysticism and culture. Red colour was used according to astrological symbolic connections, being symbol of Red Planet – Mars. In terms of cardinal points symbolism - Red was reserved for walls facing West. In the architectural polychromy of Egyptian temples red colour – symbol of perpetuity and authority – was reserved mostly for Spinxs face as well as vertical elements and reliefs.

Red was also preferably used in architecture of Antique Greece and Rome, both for symbolic and decorative purposes. Red of columns in King Minos Palace in Knossoss, together with black capitals, visually emphasized stability and safeness of
the construction.

One of the most popular ancient pigments: Pompeian Red, dominated Pompeii’s wall paintings 2,000 years ago, being natural cinnabar pigment in shiny and intense colour, processed with particular care. Cities in the ancient world were built mostly from soil, clay or sand. With regard to this dominating material inherent colour, many African or Indian ancient cities seem to be almost monochromatic – more reddish, brownish or pinkish, depending on local earth hues and components added.

3.3 Chinese Red – more than just colour

Colour red in Chinese culture has exceptional position, being regarded as extremely fortunate, associated with happiness, success and longevity. Red means also high social dignity. Red, colour of the Chinese New Year, distinguishes interiors of Chinese restaurants as well as so called Chinese districts all over the world. Colour red is also recommended for front doors, according to philosophy Feng-shui, thus being “entrance for prosperity”.

Tradition of “Chinese red” is found in design of the China Pavilion on World Expo Shanghai 2010. Seven shades of red are used on different levels of the building to make the pavilion look a uniform colour under the sun. The main colour is “Gugong (Forbidden City) red”, which represents the spirit of traditional Chinese culture.

3.4 Swedish “Falun red” and American red barns

Tradition of colour red in Swedish architecture has been common since the end of the 18th century. Red coloured timber buildings are as common in Sweden, that they almost became national symbol of the country. [2] Originally red pigment was used to enhance brick facades and later became also prevailed on timber buildings. So called “Falun Red”, is not just one tone – its hue comes between Y65R and Y85R – a range of warm, dark red colours, having matte surface and being intensified under warm evening light. Besides its aesthetical value, it provides also a protective coating for timber, according to rare composition of iron ochre, silicon dioxide and zinc in addition to copper.[1] Another red colour tradition is connected with red barns, which are common sight throughout rural America, brought together with European settlers. Centuries ago, European farmers would seal the wood on their barns with

Fig.4
Traditional “Falun Red” timber building in Stockholm, Sweden

Fig.5
Red colour of ceramic roofing tiles dominates in panoramic view of Dubrovnik (Croatia)
linseed oil - a tawny-coloured oil derived from the seed of the flax plant. In historically accurate terms, “barn red” is not the bright, fire-engine red that we often see today, but more of a burnt-orange red. More recent reference to this tradition could be found in Y House in the Catskill mountains (NY, US. 1999), designed in by Steven Holl, which red-painted wood cladding is clearly a nod to the colour of local dairy barns.

3.5 European tradition of red ceramic roof tiles and brick walls
In many European countries red is commonly present in architecture because of two materials – ceramic roofing tiles and brick. Brick architecture is primarily found in areas that lack sufficient natural supplies of building stone. In Middle Ages two architectural styles characterized by the use of brick as the main material developed - so called Gothic Brick (in Northern European Lowlands) and the Mudéjar style (on the Iberian peninsula). Brick was so popular building material, that even today, its unique reddish, brownish or purplish hues dominates in building facades of many European cities e.g. Amsterdam or Copenhagen.
Red is also considering classic colour of clay roofing tiles. In many cities in Europe, especially in Italy, Spain but also in Germany this tradition is still alive, guarantying uniform and harmonized view of the whole unit.

3.6 Red door - tradition and meaning
A red door is a significant symbol in many countries. In China, some say a door is painted red before the New Year, to invite good luck and happiness.
In Ireland, front doors are painted red to ward-off ghosts and evil spirits.
The scarlet entry also has deep religious undertones.
In Catholicism, the red door of the chapel or church symbolized the blood of Christ and other martyrs, to signify that the ground beyond the door is holy and sacred, where anyone is safe from danger and protected against physical and spiritual evils.
For Protestants, and especially Lutherans, the red door harkens back to the time of Martin Luther, who posted his 95 Theses on the red doors of the Wittenberg Cathedral, Germany – so, by tradition, the crimson colour of the doors, symbolizes such church as Reformed one.
Also in Tibetan culture red gate means entrance to the sacred place. Red is also colour of Buddha Amitabha and symbolizes vital forces, protection and fire.

4.RED IN CONTEMPORARY BUILT ENVIRONMENT
In contemporary design, red architectural colour is often used in urban spaces composition as dynamic mean of expression, underlining the forms and enticing the observer’s sight. In this use colour has to fulfill not only aesthetical functions, but also symbolic and informative ones.
One of the most of well-known examples of such colour use are red follies in Parisian Parc de la Villette, desiged by Bernard Tschumi. 26 steel pavilions, referred formally to Soviet constructivists and their colour links to so called “revolutionary red “ applied by W. Tatlin in his Monument for the Third International (1920). In this case, colour is used more for expression of ideological contents than for achievement of special spatial effect. However, red of the follies,
contrasting with the plants’ green very strongly, is one of the most characteristic elements of park, constituting unambiguous identification of the place. [4]

Also vivid red Serpentine Pavilion, designed by Jean Nouvel, promises to make a startling contrast with the greenery of Hyde Park. (NY, US. 2010)

Another example of colour red used as mean of visual expression and communication is arrangement of river-front Tanghe River Park w Qinhuangdao in China (arch. Turenscape, 2008) which features a new installation of a red steel bench, that runs through the park against the background of green vegetation and blue water. This “red ribbon” - made of fiber steel, stretches for 500 meters along the riverbank, integrating a boardwalk, lighting, seating, environmental interpretation, and environmental orientation.

One of the most unusual and extravagant use of red, is demonstrated in public space designed by Carlos Martinez and artist - performer Pipilotti Rist in Swiss St. Gallen (2005). The space, being named Stadtlounge (City Lounge), is covered with grainy gum surface in bright red colour, remindful of elegant carpet, which integrates separate interiors and backstreets in indivisible whole. Also the elements of space furniture - the seats, the sofas and tables are formed from the same material, giving to the whole character of amazing, outdoor red lounge. Strong associations with “red carpet” drop-down on special occasions, also adds elegance and refinement to the space. [5]

5. RED LIGHT

Although red light is commonly present in media facades, as one of three main colour in RGB - LED structure, its main connotation is made with, so called, “red light district”.

This name, meaning part of the city, where prostitution and other prohibited, usually erotic entertainments are
commonly accessible and even legal, is known since XIXth c. Though, red colour was associated with prostitution since ancient times. According to Old Testament: “Purple line was hanging at the windows of harlot (called also scarlet woman!) Rehab’s home”. Red, paper lanterns were distinctive sign of Chinese public houses actually in ancient times. Name “red light district” came however from red lanterns of railwaymen, which they usually left in front of the bordel, to make rail workers easy to find in case of the problems or accidents. In Japanese culture world “aksen”, used for such district, means literally “red line”.

6. CONCLUSIONS
Red colour is one of the most important architectural colours, whether used for religious or symbolic reasons, in traditional or contemporary way, as colour of the brick or bright cover material. Red used in architecture is always granting special character both to space as well as single building. Red colour also guarantees good visibility and attracts observer.
Red buildings are mostly remembered due to its colour nor form or function. Similarly to red Ferrari among other cars it is hard to pass red building inactively.

REFERENCES