THE USE OF COLOURED CONCRETE IN CREATIVE DESIGN

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In his treatise on colour Johann Wolfgang von Goethe gives us the following definition of colour:
Colours are acts of light, acts and sufferings. It is therefore the existance of light which makes colours possible, because without light there is no colour. The artistic medium which demonstrates this most clearly is stained glass, in which image and light blend into one. The function of the eye is also due to the presence of light so that the perception of colour becomes an interaction between light and the capacity of the object observed to absorb or reflect certain wavelengths.

About 80 % of the information that we normally receive is visual. The eye is continually being inundated with visual impressions. These supply us, on the one hand, with information on shapes and, on the other hand, information on colours.
Is there anyone here who would like to say which is more important?

The colours we perceive depend on the amount of light absorbed or reflected by any given object. When we say, these flowers are yellow, this is not as simple as it seems. What is really happening is the follow ng: the molecular composition of the surface of the flowers is such that all wavelenghts of light with the exception of yellow are absorbed. The flowers - and the apples too - only appear coloured in the presence of light.

"Even up to the present time there have been repeated attempts to investigate and explain the phenomenon of colour - both from a physical as well as a psychic point of view. Scientists and painters have both tried to bring some sense of order into the subjective world of colour perception. Despite their efforts we still have only about 20 names for colours. These have to be used to describe about 10 million shades, which is the number of different shades that can be distinguished by the human eye. This makes it very difficult to talk about colours."
Furthermore the word colour is not only used to determine the shade but also the colouring medium.

In the past, these were obtained from naturally occurring inorganic or organic materials. Cave paintings were made by using mineral oxides, charcoal and animal fat. These prehistoric cave paintings are not only one of the oldest examples of human art, they also bear testimony to the use of naturally occuring occurring products for painting in ancient times - i.e. one of the first applications of colours.
Many natural products were used to make paints, for example, saffron, broom, pomegranates, blueberries, onions, oak bark, olives, mushrooms, snails and even lice.

About 130 years ago William Henry Perkin began to manufacture synthetic colours. The first synthetic pigment - mauvein - was manufactured by oxidising aniline. This discovery paved the way to the extensive range of synthetic pigments available today.
Ever since we crawled out of caves and started building, colour has always played an important role. Colours have been a part of our lives as long as anybody can remember. Human beings surround themselves with colour, wear coloured clothes, use colours as markers, fill their homes with colour, advertise with colours. If there were no colours, the world would be a poorer place.
In 1928 Theo van Doesburg said: "Architectural design without colour is unimaginable. Without colour architecture is devoid of expression and blind." However, some architects disagree. They say: If the form is good, architecture does not need colour. But in actual fact, as well as the form, the construction material and the surface texture, the colour has a decisive influence on the way we see things. Only the interaction between these four components determines the degree of harmony of a building, a square, a town landscape.
And in the town it is not only the coloured façade which plays a major role. Colours are everywhere - in the paving block, in the cobblestones, on paths for cyclists and park benches, in sound-absorbing walls, garden fences and garage doors, in roof tiles and on the Underground wall - also as graffiti. Sparkling ideas spray out in all directions, resulting in an explosion of colour.

Many of the objects I've just mentioned are made of the material of the century - of concrete. Instead of sticking to the monotonous grey version - why don't you brighten it up by using coloured aggregates, white cement and coloured pigments?
Since the architect knows all about colours, he also knows the effect that different colours have on the psyche of the people living with the structures he has created. However, since it's impossible to measure feelings, measurements of the socalled colour stimulus have been made. Colour stimulus is defined as the light which falls onto the eye,

bringing us information.
Every responsible designer will take that into account and at the same time make use of it.

In his standard teaching work - The Art of Colour - Johannes Itten says: "Colours are a source of energy, which has a positive or a negative influence on us, whether we know it or not."
As forms of energy colours are always with us - at their most impressing in nature: as the clear blue of an autumn sky or the heavy life-giving brown of a freshly ploughed field. If you apply these conclusions to concrete products you can understand why dark brown pavers seem so solid whereas light blue steps seem so ethereal.
That is why colours influence our mood. The colour vibrations in your study can release or dry up creative impulse. Or a sunny pedestrian precinct - made even more welcoming by the use of light pavers - encourages the pedestrians to spend more time there, to do some window shopping or to buy something.
If I were a mayor of a town, I would turn the pedestrian zones into living rooms, salons, terraces, dining rooms and gardens! Thank goodness, this is already being done in many areas. At the same time we mustn't forget to thank our neighbours in Southern Europe for the influence they've had on the new-style pedestrian precincts.
As in the Middle Ages everywhere in Europe today people in the South spend most of their time out-of-doors on the streets and the pavements. We first saw that and fell in love with the idea when people in the sixties could afford holidays abroad - especially in the warm Mediterranean countries.
When one at a time little coffee shop tables and chairs started appearing in front of the cafes. Today you see them everywhere - weather permitting probably due to a large extent to the presence of so many people from the south of Europe in our Northern region.
So it's no surprise that the more people started spending a lot of time on the streets, the more designers sat up and took notice.
It wasn't just a case of putting out a few tables and chairs. Asphalt roads had to make way for creative paver designs, using every favour and form you can think of, thus enhancing the quality of life in these areas.
With the help of flowers in tubs and green pavers grey treeless streets can be given back some of the natural green so sorely missed in the most high-rise areas in towns.
Black is used as a contrast in the interplay with other colours; it sets accents, keeps things at a distance, allows for contrasts, reflects and becomes a component in the colour composition with other colours.
Black can also be a functional colour for example when it is used to hide unwanted traces of oil on carparks or to add a touch of colour to a grey surface even when you do not want to spend a lot of money for an entire area of coloured pavers.

Colour is not only used to improve the atmosphere in landscaping. It can also be used to order, sort and to give direction.
A colour expert who knows all about the power and vibrations of colour, will select red, the colour of fire and blood, in a warm unagressive shade or combine it with another colour of paver or use it with other colours to make multicolour blocks.
Ernst Friedrich von Garnier once said of this red school gate: "This is the gate of a school that Boris Becker attended: "It's not surprising that he has such an aggressive serve."
And if I were a film director, I would use this playground as the setting for a scene of hate and murder.

A very good example, on the other hand, is the effect that can be obtained with shadows, with more or less light. For example the use of one and the same pigment with differing levels of addition. Here an example from the precast industry, or here a touch of understatement with rumbled square paving blocks. You could even use alternating layers of concrete made with white and grey cement in order to introduce some more undertones.

As the top surface of a paving block soon weathers away, the aggregates in the block are usually exposed during the first year outdoors. These have a major influence on the appearance of the block. This means that a black block containing basalt as aggregate - regardless of the pigment used to colour the concrete - still seems much darker, years later, than a black paver containing white chips or yellow gravel. I know as well as you do that gravel is cheaper than basalt, but if we are not prepared to pay more for something pleasing to the eye, we will eventually end up manufacturing cheap products which are so ugly that it gives us no sense of satisfaction to have produced them and, what is more, that nobody wants to buy.

Paving block manufacturers must be prepared to fight for their ideas if they are better than those of the architect - not only with words but also with deeds - after all actions speak louder than words. One way to do this is to set up your own weathering stand and lay out your own disply area. Something which we see so rarely!
Choose your aggregates to enhance the colour of the paver. If it's too expensive, well, there's nothing you can do about it, at least you tried. What you should not do is take the easy way out and make any old paver just because that's the only kind of gravel you have available at the moment.

Yet another possibility that is available to street designers is the use of white cement. If you use white cement in your blocks this reduces the grey component in concrete; here again the choice of aggregate plays an important role. White cement is, above all, used to

highlight the lighter colours. This means that by using white cement you can considerably reduce the amount of pigment used.

The third and most important possibility you have to brighten up your grey concrete and put new life into it is the use of pigments.
Pigments can be used for long-term colouring of concrete, that is to give it a colour which does not correspond to the natural colour of the cement or the aggregates. The pigment only colours the cement hydrate gel. Since coloured concrete ages in exactly the same way as grey concrete it is imperative that you add enough pigment to prevent any substantial change in colour when the concrete surface, in the course of time, becomes more of an exposed aggregate surface. Here again, your own weathering stand is useful for checking the changes which may take place in your own products after outdoor exposure.

The best pigments for colouring concrete are alkali, light and weather resistant inorganic pigments - iron oxides and certain types of carbon pigment. The main colours up to now have been yellow, orange, light red, dark red, all the browns ranging from very light brown to chocolate brown and black, but gradually more and more white and green and blue have found favour with the street planners.
Depending on the type of cement used, it is necessary to add 4 - 7 kg pigment per 100 kg (hundred kilo) cement for a reasonable level of colouring. Higher levels of addition hardly change the final colour once the level of saturation has been reached.
It is very important that the pigment be well dispersed and that the water/cement ratio be held constant. The higher the water/cement ratio, the lighter in colour the block becomes, due to an increase in capillary pore volume.
The increasing use of fly ash which is normally quite dark in colour has meant that it has become more and more difficult for the pigment to cancel out the effect of the fly ash and prevent the block appearing dingy.
We therefore recommend that you only use very light fly ash when making light coloured pavers.

And lastly a few words on efflorescence - the nightmare of every concrete manufacturer and in particular of the block producers. Although it is most noticeable on dark concrete, it also appears on light coloured or grey concrete. It can only be avoided or at least reduced by better or longer compaction. After all, Rome wasn't built in a day.
You should remember that when plant manufacturers offer you a new machine with a higher capacity and a shorter production time. However, you must monitor the quality of your concrete.
Do not go looking for extra problems.
Efflorescence has nothing to do with pigments.
A manufacturer once asked me - do you sell pigments without efflorescence as well? Once again - efflorescence has nothing to do with pigments, nothing to do with the aggregates and nothing to do with the sand.

I would now like to make a few suggestions how the block manufacturer can ensure that our towns and villages, market places and streets be transformed and embellished with concrete products which are really pleasing to the eye.

The possibilities which the use of colour opens up should be considered by the manufacturer and not left to the poor architect or planner who then wanders around looking in vain for a colour which he has already designed in his imagination.
Widen your range of standard colours - don't be satisfied with just three or four colours. Your pigment supplier has everything there - even if he doesn't have all the 10 million shades I mentioned earlier.
It's up to you.

One day, a famous scientist who had a reputation for giving lavish dinner parties, invited the cream of society to a dinner party in his country hall. The guests started arriving, all very fashionable dressed, the women in evening dresses, the men in dinner jackets.
The hall was very festive. Lights shone out from every windows. The guests entered and took their places at the table. Everybody was laughing and talking and shaking hands. The dining room blazed with fantastic colour. The silver shone, the glasses sparkled, bunches of yellow tulips in silver bowls filled the room with sunlight.
Suddenly the doors swung open and admitted the waiters, bearing shining silver trays piled high with every kind of hors d'oeures you can imagine - a genuine delight to the eye.
The host rose, the tinkle of his little silver spoon against a wine glass rang through the hall. The conversation gradually tailed off and he spoke to his guests:
My dear friends, I've invited you here today, because I would like you to take part in an experiment. Don't worry, nobody's going to be hurt - it's quite harmless.
Then he gave a sign to the waiter, who switched over to red light. As if by magic the scene changed, the hall seemed grey and lifeless. It was as if someone had wiped out the brilliance of the jewels and the splendid dresses, the fresh colours of the hors d'oeuvres on their golden plates, the happy smiling faces of the guests. The guests cried out in surprise, then the Ahs and Ohs died down, the laughter trailed away and finally ceased all together. There followed a complete and death-like silence. They all stared at one another, speechless. No-one smiled. Someone rose and left the hall. As the silence became unbearable, the host got up again.

The experiment was a success. The colours had a significance which was all their own.

Without them the food had lost its attraction for the eye, no-one wanted to eat. This was not what they had expected. Everyone had lost their appetite, because the food had lost its attraction for the eye. Silent, and seized with a feeling of uneasiness the guests stumbled out of the hall.

If you don't want our fellow citizens to stumble through our grey and lifeless cities, silent and seized with a feeling of uneasiness, then you must help to ensure that our cities be filled with colour. It's up to you to make sure that people feel happy and relaxed in their environment.

Transfer the cozy feeling of your living room to the city centres, so that a cup of coffee there tastes just as good as at home.
It's up to you.