PAVING WITHOUT ARCHITECTURAL BARRIERS AS SAFE AND ERGONOMIC SOLUTION TO THE PROBLEMS OF MODERN LIVING, IN OLD AND NEW TOWNS.

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1. INTRODUCTION

The different features of block-paving are :

a) material,
b) shape,
c) colour,
d) resistence against wear and tear,
" against cold,rain,ice and heat,
" against loads,

which propose with a wide range of solutions for the many requirements of modern living.
I do not wish to provide solutions at this moment,but only motivations and stimuli for careful planning.
Nowadays as we plan houses with more care and attention,the need is felt to intervene in planning all parts of towns to make them more comfortable,liveable and safer than at present.
In latter years,due to a wrong interpretation of needs and priorities, town planners have only been interested in planning buildings,closed spaces,forgetting open spaces.
So we have lost the organic unity and equilibrium that there are even if a "building" and an "open space" are in correlation.
In old towns,observe the close connection between squares,roads,arcades and the tipology of buildings in front of them and their social use.
How many modern situations have these requirements?
How many modern squares have been built without a unifying and co-ordinated plan and which boast an urban milieu lacking in requisites of aesthetics,comfort and usefulness?

2. BLOCK-PAVING FOR A DISTINCTION IN THE USE OF OPEN-SPACES.

The use of block-paving doesn't offer only good solutions of high aesthetic value and assurance of durability and strength.
It makes possible an immediate distinction of various uses of open spaces such as : footways, cycle-tracks,carriageways,classified according to density and speed of traffic,parking places, green places,play grounds ,..etc.
Each of these spaces must have a precise identity to give not uncertainty or worse, ambiguity.
Indeed,I think sometimes,intervening with a preventive action,we planners,must discourage the possibility of activity in contrast with the foreseen purpose of the area.
At this point,paving assumes an important role because it is an ideal instrument to define clearly and immediately the differentation of the areas according to its colour,shape and design,which can be personalized according to historical and envirovnmental motivations.
Obviously,in order to guarantee the perception of the different areas according to purpose, without confusing the users,the choice of the paving must be logical and part of a global plan in the organisation of a town and not just an isolated event.
By using the paving to distinguish the various purposes of the open spaces,we can save,for example,on road signs with the advantage that there is an immediate perception of the change of use of the area,dispensing with the difficulty of reading signs or at least distinguishing them among the advertisments - process which is longer and not so efficacious.
In synthesis,through the paving,we can and must propose solutions according to the requirements of the envirovment,to the distinction of areas according to their purpose and as a help to the reading of road-signs.

3. BLOCK-PAVING FOR A PREVENTION AND ELIMINATION OF "ARCHITECTURAL BARRIERS" IN THE URBAN CONTEST.

Another very important problem which for many years has been seeking a satisfactory solution is the elimination of the so called "Architectural Barriers" in the urban context.
Briefly,we need an attentive and correct planning of everything man-made,whether it is a building or an open space,in order to satisfy the needs of every citizen (children,old people and the handicapped).
I have conducted studies on how we can help the user for a better mobility,a greater safety and

an immediate orientability in the urban context, by using different types of paving.
For this reason, the meaning which I give to the term Architectural Barrier is not only that which constitutes a physical obstacle to the accessibility of an area and his mobility inside it, but also one which gives a feeling of unease and insecurity in the use of spaces for the single person or for the collectivity.
In the course of this report I shall give you some examples.
It is important to remember that to make the use of an area easier for a person in full possession of his faculties, is indispensable for the person with limited capacities.
For blind and partially sighted, wheelchair users, those with limited walking ability or with limited physical endurance all have problems on the roads. Obstructions to convenient and safe use of the roads include problems in crossing the road, bridging differences in height, the insufficient length of time that traffic lights are at green, obstacles in their path and the lack of direction markings.
For these reasons many people with a mobility handicap do not use the roads at all, whereas research has shown that people do have a considerable need to be mobile.
These problems are, however, not insuperable.
A general aim of government policy is to integrate handicapped and disabled people into society as much as possible.
In order to be able to take an active part in the community, people must be able to come and go between home and work, public buildings and other destinations.
From the above-mentioned general aim, therefore, the following more specific aim has been derived to improve the ability of people with a handicap to use the roads independently and safely.
Road authorities, traffic experts and urban planners are in a position to make a significant contribution to the realization of these subsidiary aims through the provision of a suitable traffic infrastructure.
On the basis of the problems experienced by mobility handicapped people in traffic, the following main groups of handicap can be identified:

a) the blind,
b) the partially sighted,
c) those unable to walk, i.e. wheelchair users,
d) people who have difficulty in walking, walking-stick users, those on crutches, those only able to shuffle, people with disabilities affecting balance and stamina.

A separate main group comprising several types of handicap can also be identified. As road users, people in this group also benefit from the same adaptations as those in the other main groups, but they have some additional needs.
This special group includes:

- the deaf and partially deaf,
- people with extreme physical proportions (both very small and very large),
- people with disabilities relating to arm or hand functions, but otherwise steady on their feet.

4. USER REQUIREMENTS IN RELATION TO THE ROAD AND TRAFFIC SITUATION.

For those involved in urban plannig, it is important to understand the functional disabilities which cause mobility problems for people with a handicap. Functional disabilities are mainly caused by sickness and/or old age (85%), accidents (10%), and congenital disorders (5%).
For many years people with a mobility handicap have formed a more or less neglected group as far as the traffic infrastructure is concerned. Whereas in fact they are precisely the people who have extra problems on the roads.
Blind people encounter obstacles and have difficulty finding their way, wheelchair users have difficulty getting on and off footways, handicapped motorists are unable to park their special vehicles near their destinations, to mention but a few of the more obvious examples. This puts them among the road users with a more than average chance of being involved in an accident and they also run a greater risk of being injured. People with a handicap, together with children, elderly motorists, cyclists and pedestrians, belong to the category of vulnerable road users.

In the planning of routes (whether or not they are part of a "route plan",intended to be the forerunner of an integrated adaptation of the total traffic infrastructure),the following principles and practical guidelines are of importance:

a) the routes should be located as safely as possible. This means that the routes should be planned as far as possible(depending on the space available)on the cross section of the road in the following order:
   *on the footway,
   *on the cycle-track,
   *on the carriageway.However,plans including the road surface may only be undertaken in the case of streets with a clear residential function.
b) All routes should be capable of being used as much as possible in both directions.
c) More provisions should be made from and to a place where more categories of people with a mobility handicap live close together.
d) The decision to plan a route should in principle be taken irrespective of the extent to which the route will be used. The construction of suitable traffic provisions is of value even when the number of users is small,since it is impossible for the mobility handicapped to travel independently where these provisions have not been created.

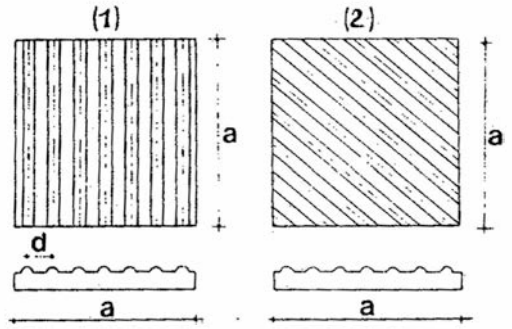
Considerations taken into account in planning measures and provisions,aimed at enabling people with a mobility handicap to use the roads as safely and independently as possible,are:

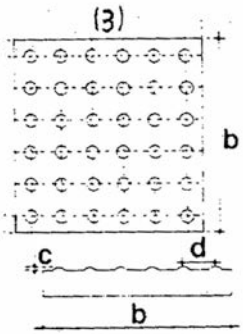
a) Provisions should be logical and recognizable.Contrived measure should be avoided;
b) For the orientation of the visually handicapped,as much use as possible should be made of "natural" means,such as grass verges,the fronts of buildings,raised kerbs. Where this is not feasible,"separate" provisions should be created;
c) At pedestrian crossings,guide strips and warning tiles should be constructed. They should also be constructed where walking routes cross roads with a relatively large amount of motor traffic(even where a pedestrian crossing is not necessary). In shopping streets with a great deal of motor traffic a marked crossing is desirable at least every 100 m.;
d) A pedestrian traffic signal(pelican crossing) should be equipped with an acoustic signal or bleeper;
e) Dropped kerbs should always be constructed at street corners,but also on streets (at least every 100 m.) and at pedestrian crossings;
f) Narrow footways and footpaths with insufficient width for the passage of wheel-chairs should,as far as possible, be widened;
g) Special attention should be paid to easy access of shopping centres and shops,public buildings and public facilities (e.g. telephone boxes);
h) Squares,bus-stations,railway-stations and, where possible,parking areas should be provided with marked guide strips for visually handicapped people;
i) Where a natural guiding line is lacking or changes direction (ir)regularly,guide strips should be constructed of material which for the visually handicapped is recognizable by touching (tactile information),consisting of a 0.60 m. wide line of concrete relief paving slabs.For the benefit of the partially sighted,the guide strips should be of a different colour from their immediate environment (contrasting effect);
j) Street situations vary a great deal.Guiding lines are not always clearly indicated. Consulting handicapped people about their provisions is a permanent necessity.Only then,these provisions can fulfil their aims;
k) It is not enough to improve access to one particular street or building. The entire infrastructure should be accessible and serviceable.In addition,access to public buildings,covered car parks,telephone boxes, etc.,should not be forgotten.
   The design and creation of mobility provision for the handicapped should be approached from a "broad" point of view :
   "HANDICAPPED-INCLUSIVE-DESIGN"

5. EXAMPLES OF PAVING SLABS.

-Use of material for guide strips (textured paving).

Fig.A





Dimensions:

a=30 cm.
b=40 cm.
c(1),(2)=0,5 cm.*
(3) =0,6 cm.*
d(1),(2)=4-5 cm.
(3) =6,6 cm.

*above road surface level.

Area of application :

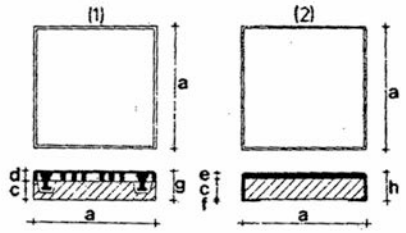
Guide strip:ridge profile parallel to main direction of movement.
Guide strip:square to the axis of the carriageway which is to be crossed with ridges in the direction of the crossing.
The basis level of the guiding ridges should be flush with the top layer of the adjacent road surface.
For the benefit of the partially sighted,the guide strip should be in a colour starkly contrasting with their surroundings.
For guide strip crossing areas,at changes in direction or where an alternative route is possible,an area of rubber tiles should be constructed (dimensions 1.20x1.20m.).
Slight changes in direction of guide strips should be marked by slanding textured paving.

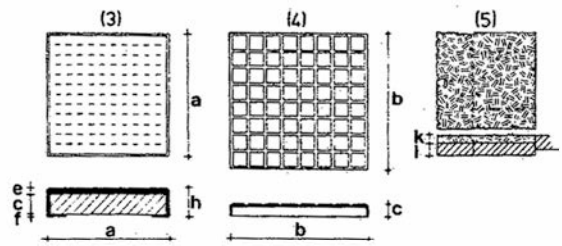
Positive aspects.

Clear intelligible signalling and tactile information for the benefit of the visually handicapped.Type (2) can be applied at turn-offs from the straight walking line.

-Use of materials for warning markings (cautionary paving).

Fig.B





Dimensions:

a=30 cm.
b=60 cm.
c= 5 cm.
d= 3 cm.
e= 1,5 cm.
f= 0,5 cm.
g= 8 cm.
h= 7 cm.
k= 3 cm.
i= 5 cm.(paving slabs or other stable foundation)

Area of application:

In a guide strip where a choice can be made at a change in direction or at a junction/crossing of guide strip.
At pedestrian crossing.
Around obstructions difficult for the visually handicapped to detect.
Type(1)and(4)should only be used as alarm markings at obstructions and not at pedestrian

crossings or in guide strips.

Implementation:

(1)-(3):concrete with rubber top layer.
(4):rubber.
(5):rubber fibre tile.
Type(3):small grooves as far as possible square to the direction of movement.
Where types(4)and(5) are applied:stable foundation is not necessary as an alarm marking for obstructions.
At pedestrians crossing a 60 cm. wide strip over the full length of the crossing section.
At obstructions a 60 cm.wide strip as a warning marking.
Preferably not in bends at street corner crossings because of joint openings(discomfort as a result of curling - up rubber tiles).
Junctions in guide strips should not be too close to drains and drain hole covers because of possible confusion for the visually handicapped.
Cautionary paving should be detectable underfoot because guide dogs and long canes are searching for obstruction rather than for changes in the surface;it should be reliably detectable even to people wearing thick soled shoes or those who suffer from reduced sensitivity in their feet.
It should be simple and cheap to install and maintain.

Positive aspects:

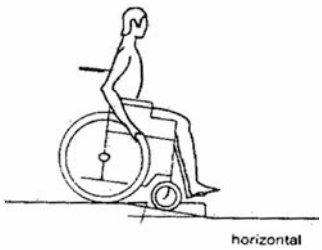
Because of differences in acoustic reflection between rubber tile and surrounding road surface,audible as well as tactile information is provided for the visually handicapped at possible danger points on the walking route (cautionary paving).
In view of the reduction in the risk of slipperiness during frost,type(3) is preferable.
Type(5) can be cut in every size (for use in bends).

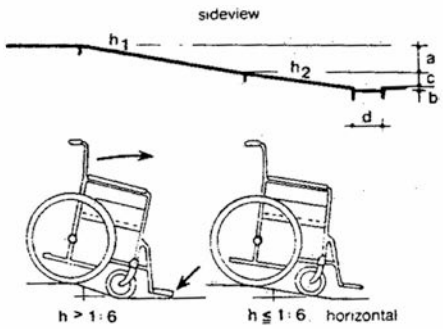
Negative aspects:

Types(1°and(4):corners of the tile may curl up, resulting in an uneven road surface.
Types (1),(2),(4)and(5):increased risk of slipperiness.
Type(5):increases in cost of foundation construction as a result of elasticity of fibre tile.
Types(4)and(5):hard and difficult to detect.
Type(4):expensive.

-Differences in level.Ramps.

Fig.C





Dimensions:

h=gradient
h1=1:6
h2=1:12
a ≥10 cm.
b ≤ 2 cm.
c =remnant difference in height
d ≥20 cm.

Area of application:

Difference in level >10 cm.

Implementation:

Concrete paving slabs with returned kerbs or by means of dropped kerbs.
Difference in height along the road:should be overcome,if possible,with 1:20 slope by gradual

kerb dropping.
Drain channel construction along the carriageway.
Crossfall of carriageway almost nil.
Stepped ramps should be avoided.

Positive aspects:

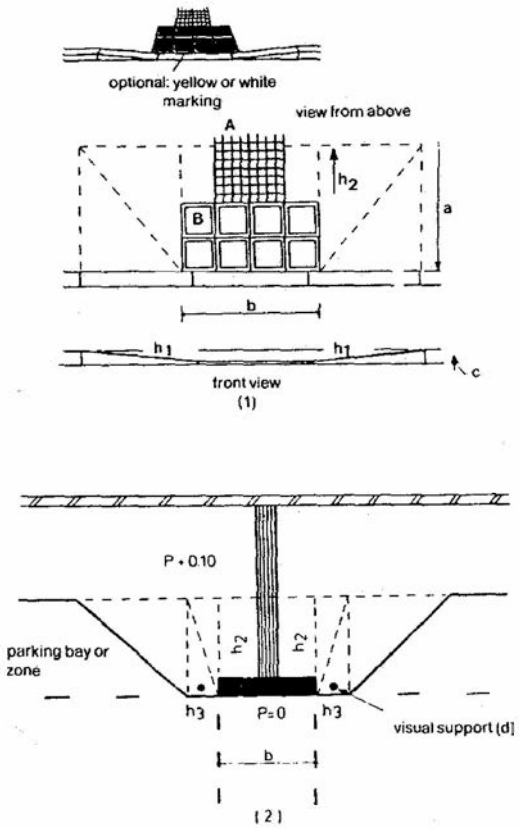
Cheap to install and maintain.

Negative aspects:

When construction is poor (out-of-level construction),and there is a step crossfall, wheelchairs with foot supports may get stuck or turn over.
The concrete block channel can merge visually with the adjacent footway and a strong colour contrast should be considered.

-Differences in level.Dropped kerb construction at pedestrian crossings.

Fig.D



Dimensions:

a(1) ≥ 1.50 m.
(2) ≥ 1.20(0.90)m.
b = 1.50(1.20)m.
c ≤ 2 cm.(drainage gutter)
d = guiding post with contrast marking (visual support),height 0.75 (o.60)m.
h1 = 1:20
h2 = 1:12
h3 = 1:10

Area of application:

Footway width≥1.50 m. excluding the kerb.
(2)Enlarged slope construction when there is a parking place.

Implementation:

Tactile information optional:

* guide strip (A)
* warning markings(B)

If a dropped kerb is provided on one side of the road,another should be provided on the opposite side.

Positive aspects:

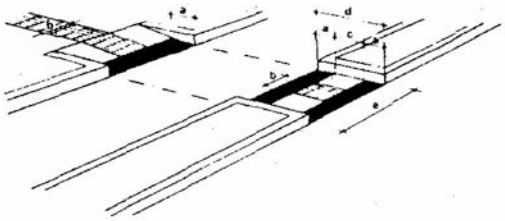
Clear and intellegible tactile information for people with a visual handicap.
Convenient for elderly road users and for people with limited walking ability.
Simple and cheap to install and maintain.
In case of(2)redution of road crossing length mutual view and visibility of pedestrians and other traffic is improved.
Facilitation of safe and independent use of the roads by people with a mobility handicap.

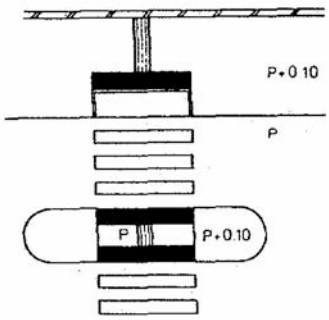
Negative aspects:

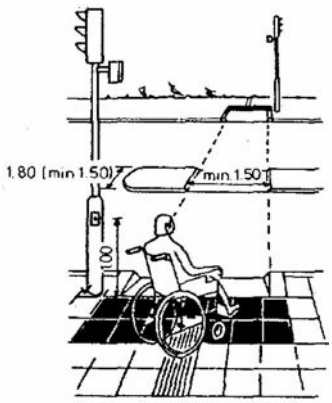
(1):in case of narrow footways inconvenient for wheelchair users.

- Safety measures at pedestrian crossings. Traffic island and refuges.

Fig.E







Dimensions:

a=0.60 m. warning tiles
b=0.60 m. guide strips
c≥0.90 m.
d≥1.80(1.50)m.;in case d=2.10 m. dropped pedestrian crossing at carriageway level completely constructed in warning tiles (rubber slabs).
e≥1.50(1.80 m. in case of mutual passing

possibilities).

Area of application:

At pedestrian crossings,zebra crossings and pelican crossings.
On roads with a traffic volume less than 4000 or 5000 vehicles/daily.

Implementation:

Dropped kerbs at carriageway level should be carried out over the complete width of the crossing.
Guide strip and warning tiles.
For visually handicapped people it should be made clear where the traffic island starts and ends(white or yellow marking line can be provided-optional).
Implementation is also optional for use in green verges adjacent to the carriageway where cycle track and carriageway are separated.
Optional:a yellow marking line at pedestrian crossings in road sections where parking is prohibited.

Positive aspects:

Crossing in two stages improves road safety.
Traffic islands and refuges themselves can affect traffic speed,and they increase the level of attention of drivers approaching the pedestrian crossing.
Facilitation of the safe and independent use of the roads by disabled people.

Negative aspects:

Wheelchair users have difficulty in coping with traffic islands or refuges which are not dropped flush with the carriageway;however visually handicapped persons prefer raised kerbs to orientate themselves.

6. CONCLUSION

The above-mentioned proposals show as concrete-block-paving can be used in various situations to aid both the normal and handicap road users.