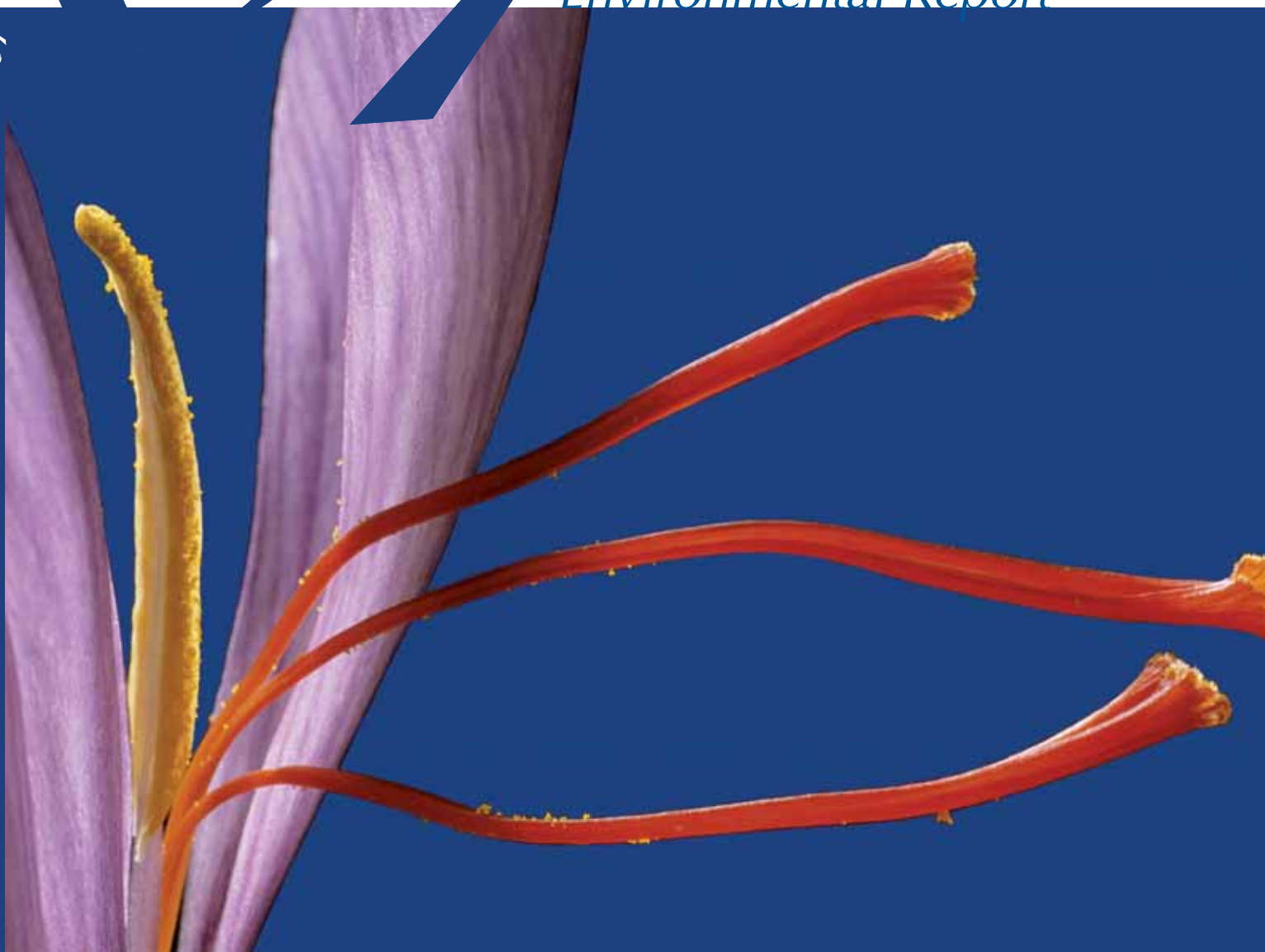
FCC CONSTRUCCION

'07 Environmental Report

'07 Environmental Report



In previous editions of this Environmental Report, the data on the degree to which good practices are applied were relative in that we did not have the number of projects in which the practice in question could be applied.

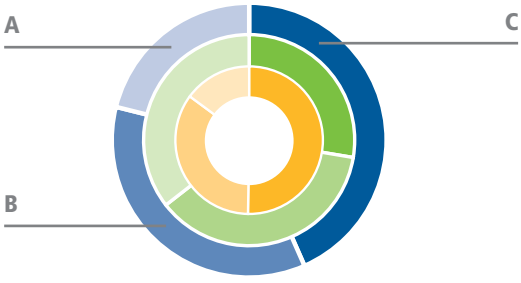
As an example, when in the 2005 Report it was stated that 3 per cent of nests were moved in civil engineering, this percentage referred to the total of projects carried out even when in practice it was adopted only in those projects in which its application was possible.

In this report, the indicators refer to the number of projects in which the good practice is applicable, so that even though they are not comparable with the previous edition, they are more expressive.

GRAPH KEY **(page 28 and following)**

DESCRIPTION OF THE GOOD PRACTISE

Importance: 1 to 3



Note:
A: Percentage graph of projetcts that adopted this good practice to the maximum degree of implementation.
B: The same, intermediate degree of implementation.
C: The same, minimum degree of implementation.

Projets that apply the good practise

TOTAL: X %
ENGINEERING CIVIL: Y %
BUILDING: Z %

Note:
X: Percentage of projects that have adopted the good practice of those in which its application is possible.
Y: The same, for civil engineering projects.
Z: The same, for building projects.

Degree of implementation of the minimum good practise. Goal 1

The same, intermediate. Goal 2

The same, maximum. Goal 3

TOTAL
CIVIL ENGINEERING
EBUILDING

THE ENVIRONMENTAL MANAGEMENT SYSTEM AND GOOD PRACTICES

FCC Construcción's environmental management is based on identifying the environmental aspects that occur most frequently in our projects.

To facilitate the identification and application of the measures to be adopted, the aspects and actions are grouped and classified according to nature and countryside, water, dangerous substances, soil and subsoil, noise and vibration, urban environment and land arrangement, atmosphere, wastes and environmental accidents.

Criteria for evaluating the effect of all of these on our projects have been developed by both magnitude and importance in order to obtain the degree of significance for each aspect which, as part of the integrated planning process, is carried out at the start of each project.

Once the environmental aspects have been selected and their potential impacts are known, and the significant ones identified for the centre, the actions for the project are planned uniformly throughout the organisation.

To minimise the impacts within the planning process, each project identifies the environmental aspects that are present, evaluates their relevance according to the magnitude or amount of pollution or alteration and the importance or sensitivity of the environment that receives the impact.

The following table summarises the data for the projects evaluated with the environmental aspects identified as real or potentially present and those that are considered significant.

GENERAL DATA	IDENTIFYING AND SIGNIFICANT ASPECTS		
	BUILDING	CIVIL ENGINEERING	FCCCO TOTAL
Average number of aspects identified per project	39	56	45
Average number of significant aspects per project	4 (10%)	12 (21%)	7 (16%)

GROUP OF ENVIRONMENTAL ASPECTS	% OF PROJECTS WITH SIGNIFICANT ASPECTS IN EACH GROUP		
	BUILDING	CIVIL ENGINEERING	FCCCO TOTAL
Use of natural resources	39% (83/211)	73% (88/121)	52% (171/332)
Generation of wastes	48% (101/211)	56% (68/121)	51% (169/332)
Land arrangement / urban environment	42% (88/211)	64% (77/121)	50% (165/332)
Emissions to the atmosphere	22% (46/211)	57% (69/121)	35% (115/332)
Environmental accidents	26% (55/211)	50% (60/121)	35% (115/332)
Generation of noise and vibration	16% (34/211)	46% (56/121)	27% (90/332)
Tipping of water	20% (42/211)	25% (30/121)	22% (72/332)
Occupation of watercourses and sea beds	1% (2/211)	35% (42/121)	13% (44/332)
Emission of radiation: use of radioactive sources	0% (0/211)	0% (0/121)	0% (0/332)

FCC Construcción has implemented a system of good practices that adds to the legal, contractual and any other type of requirements, actions that guarantee better real environmental results.

A series of good practices has been prepared which the projects select and implement to the degree to which they are applicable. These good practices are assigned different weightings according to their importance, that is, those that provide a greater benefit for the environment are valued more since they are intrinsically better and also the newest good practices or those that involve greater effort for the projects either because of the investment involved or because of the effort required for research, management or engineering that they involve are also valued more highly.

The valuation also take into account the real scope of the good practice adopted so that the greater the implementation, the more generalised the measure adopted, the higher the number of actions or the greater the scope of the good practice, the higher the value.

Each project may choose the good practices that it considers most suitable or applicable depending on the activities to be carried out. This overcomes the enormous diversity of types of projects which prevents the general use of the same good practices in all of them.

The good practices chosen as the objective are evaluated on the basis of the standardised quantification of the following parameters:

- Importance: Indicates the importance of the good practice, giving a higher value (3) when the importance to the environment or the difficulty of carrying it out is greater and a minimum value (1) when it is smaller.

- Goal: The degree to which it is carried out, giving a higher value (3) when the implementation is more general or the best technologies are applied and a minimum value (1) when the degree of implementation is lower.

The result from the product of the degree of implementation by importance of the good practices required internally, provides a series of points, a true indicator of behaviour/effort (in the application of good practices) carried out by the project. The objective currently set is to achieve a total of 51 points on average in our projects.

Good practices are implemented within the following environmental areas:

- RELATIONSHIP WITH SOCIETY (training/behaviour of persons, communication and recognition)
- EMISSIONS TO THE ATMOSPHERE, GENERATION OF NOISE AND VIBRATION
- TIPPINGS OF WATER, OCCUPATION, POLLUTION OR LOSS OF SOIL
- USE OF NATURAL RESOURCES AND GENERATION OF WASTES
- LAND ARRANGEMENT (biological diversity, urban environment)

A computer program manages the environmental plan of the projects and centres in the company and guarantees the reliability and availability of the data:

- It identifies the environmental aspects using a checklist to choose those parts of the project that may affect the environment and evaluates their relevance in order to intensify the efforts in their most important ones.

- It chooses the environmental legislation that applies to each aspect.

- It prepares a list of actions in order to comply with legal and other requirements.

- It controls the handling of the wastes generated in the projects using the project's waste book and the origin and destination of soil and rubble.

- It helps in the planning, monitoring and control of the good environmental practices applied in the projects.

The information generated in each project and used by it for suitable environmental management becomes part of a database that allows the company's environmental pulse to be taken and actions to be taken to improve and to report to society.

A strict system of internal audits and the controls that the data undergo in the integration processes validate their truthfulness.

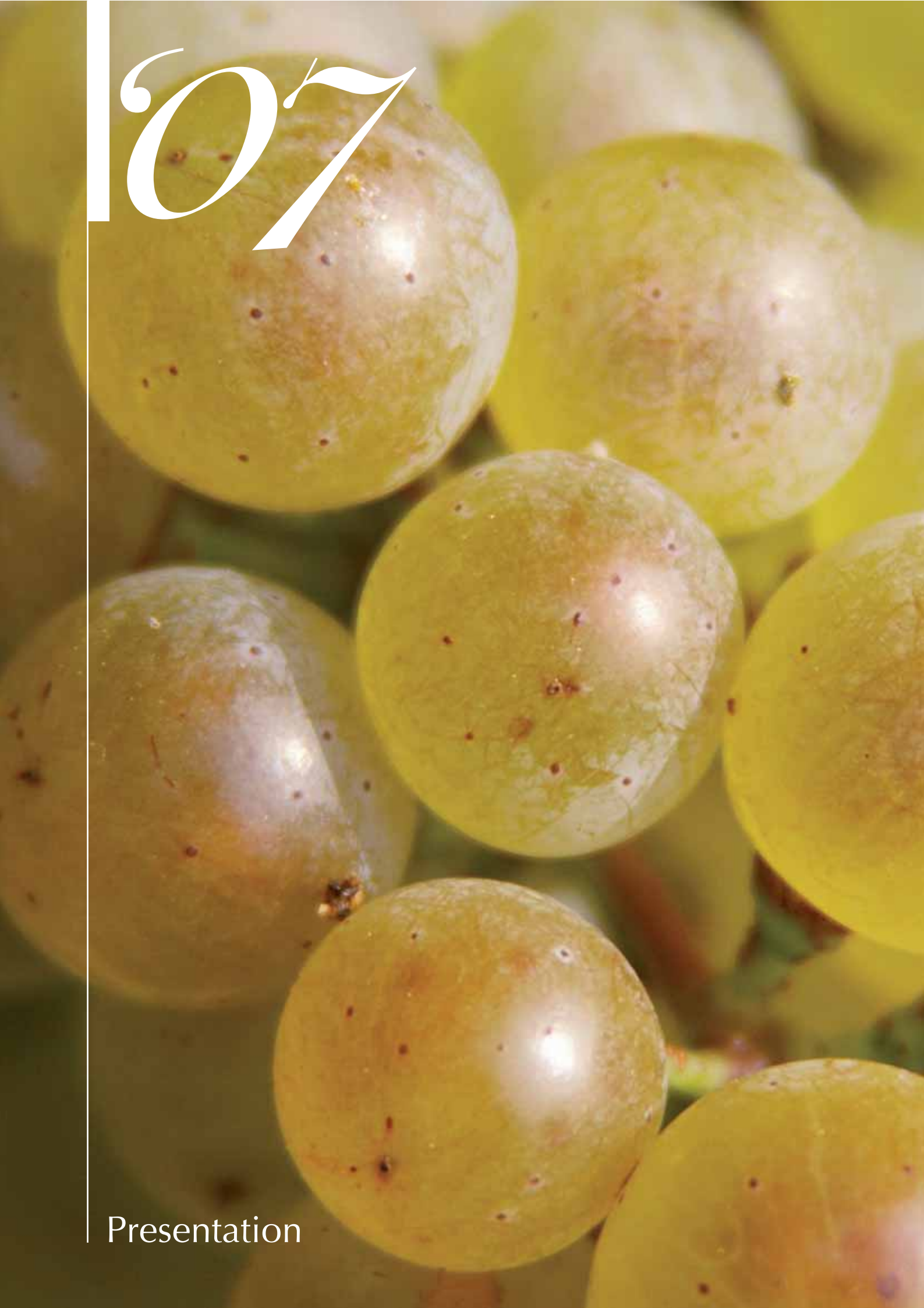
'07

Environmental Report

The economy of the regions
The finger of those who harvest
The flavour of food
Whatever saffron touches
It turns into gold

To enhance the understanding of the text, some day-by-day photographs of works have been included, taken with domestic cameras.

Contents



'07

Presentation

Before the lucky grapes
Led to the New Year,
The vine was the canopy for the siesta
Of those who ate and drank
After the harvest

Since 2000 this report has allowed us to present our progress in the field of environmental management to all interested parties. These reports have become a classic in communications, aware that our activities are carried out entirely within a delicate framework that deserves our greatest care and attention and that it is not possible to grow really isolated from the environment, for reasons of pure survival.

Since in 2000 we became the first Spanish builder to issue a specifically environmental report until the report that we are presenting here, we have grown in matters of social responsibility and as a result have published sustainability reports according to international standards, in order to give quality and reliability to the information offered and its contents which, in the end, is what is really important.

As we publish this report, we have been rewarded with social recognition with the awarding of the Garrigues-Expansión Prize in the sustainability and corporate social responsibility category for the biannual FCC Construcción environmental reports; this fills us with pride and encourages us to continue along this path.

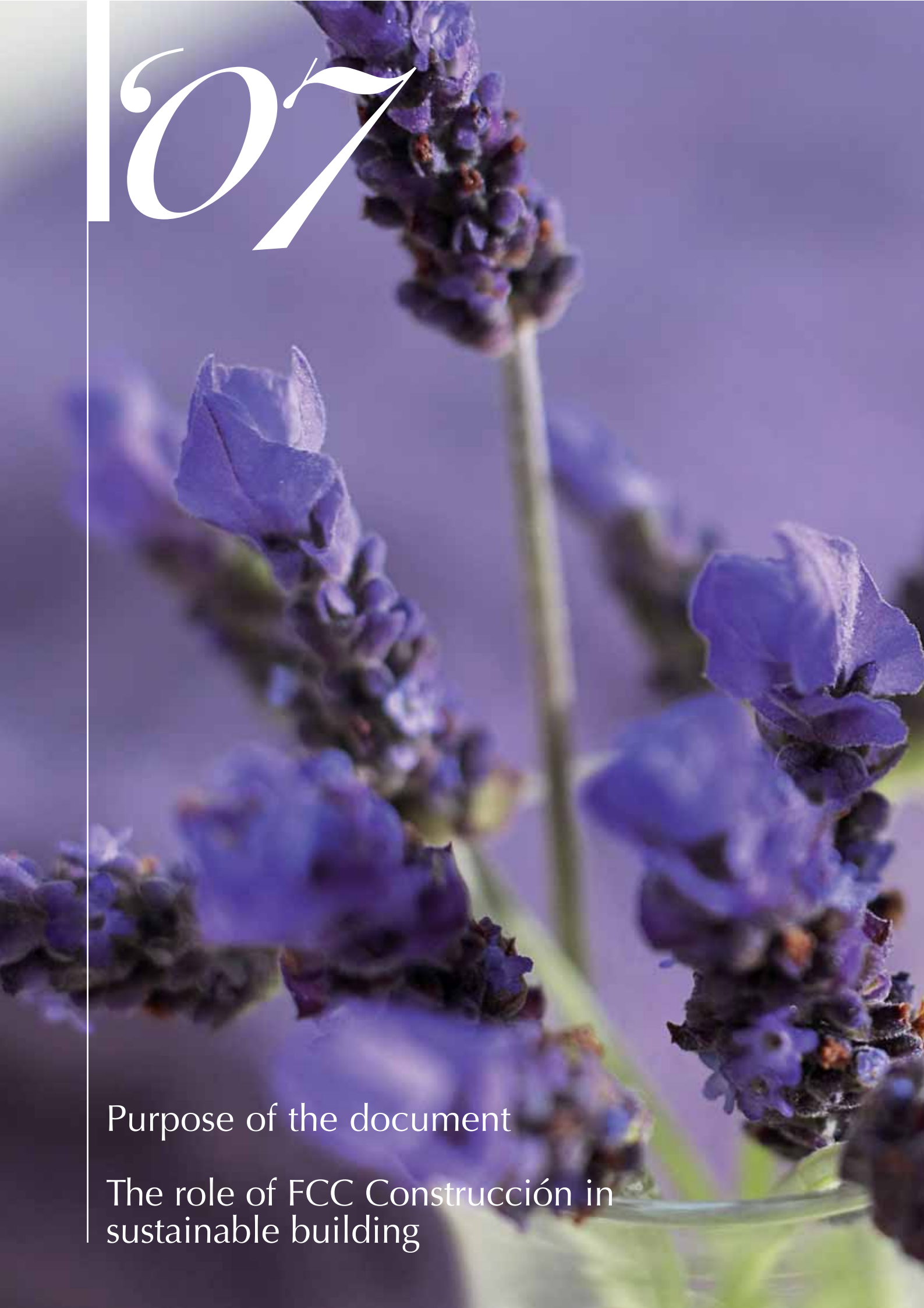
Our challenge continues to be that of offering society the best possible fruits as a result of our activity, which we must do by taking great care of our environment because it is fragile and vulnerable and, since the planet has cared for us in the past, it is now our turn to take care of it so that our descendants find it at least as it is today.

We attempt to give society solutions and proposals that are to the benefit of everyone to increase understanding of the concept of sustainability which gives us the proper point of view of how we must carry out our work, always adding to our objectives the new commitments which were always there but of which we are increasingly aware.

Our good financial results are well known. We have ignored them in this report, which is designed to express our commitment to persons and to the environment. We have written a book, we have planted a tree and our work is there but something is missing: hence this report, with a rendering of accounts of how our commitment is progressing, which we are describing and allowing ourselves to be judged.

José Mayor Oreja
Chairman of FCC CONSTRUCCIÓN

07



Purpose of the document

The role of FCC Construcción in sustainable building

A walk in the countryside
Entering a clean room
The perfume of the family
Everything smells of lavender

PURPOSE OF THE DOCUMENT

This is the fifth Environmental Report that we have published since we became the first company to do so in 2000 with the information available at the time, which we have improved and enlarged in scope each year.

We wish to report to society on the results of our efforts in the area of respect for our environment, describing the successes and failures in our planning, the achievement of our objectives and the points in which improvement is still necessary.

We wish to encourage dialogue with all stakeholders. Their points of view must help us to improve the effectiveness of our actions and in this sense, this self-analysis exercise and declaration of results serves as a meeting point between the demands made on us by society and the efforts with which we respond to those requirements in the continuous search for permanent improvement.

This is not an exercise in self congratulation and some of the data provided could be improved but they are a transparent reflection of the activity carried out and the results obtained.

We have made a great effort to choose information that really provides new knowledge and that throws light on our activities, allowing groups of interest to judge the results of our management with greater discernment.

This is the fifth Environmental Report published by FCC Construcción that continues and increases the scope of the four previous ones.

THE ROLE OF FCC CONSTRUCCIÓN IN SUSTAINABLE BUILDING

For FCC Construcción, sustainability is a basic theme for its activities and is practically unavoidable. It is a vocation and at the same time a market requirement and it is this combination that gives the best results.

We are trying to improve our building continuously to satisfy our groups of interest. Sustainability provides a balance of social, financial and environmental interests in the search for the best result in a co-ordinated and simultaneous manner, the sum of the improvements in the three fields but which, sometimes, must give way to obtain a greater end.

The criteria for searching for the best results are not simple and we do not pretend that our decision is the best one alone and in all cases. There are directives and guides in this route that orient and propose specific guidelines for behaviour for better social, environmental and financial performance. Standards, methods, guides to good practices and criteria for "good building." Global planning from a wide perspective that allows a more weighted decision above local interests.

But global planning must not lose sight of partial focuses and it is necessary to harmonise all perspectives. The building phase involves companies that have unimportant influence on the sustainability of the result and because of this, in FCC Construcción, we have understood that sustainable building must necessarily include our focus as one more and that we cannot isolate our perspective from society which, necessarily, contributes to a better final result of the whole.

We have set up active communications channels with stakeholders and the obtaining of results in matters of occupational safety, the satisfaction of clients and collaborators and other interested parties. This report includes data on the intensity of this relationship for the first time. We have adopted the necessary measures to effectively integrate our activity in the natural environment in which it is carried out. We have obtained very satisfactory financial results, increasing the scope of our activity, diversifying our fields of involvement, growing both locally and abroad. We have obtained this with the classic criteria for searching for a balance between the three components - financial, social and environmental - that allow these parameters to be sustained and improved over time.

But our commitment is not limited to adopting a series of guidelines generated externally; we wish to contribute to the development of standards and recommendations that define the road to be followed. We understand that FCC Construcción has the responsibility to make available its knowledge and experience and to contribute to improving building activity, our activity. Building that is more respectful with the environment, more sustainable, can only be achieved with clear directives in which we builders participate actively, suggesting possibilities, involving ourselves in the process and supplying solutions and perspectives from our area of action.

A sustainable company acts in a sustainable way. But this is only true if the environment, the society in which its activity is carried out, is also sustainable and applies criteria of responsibility. Otherwise, we could find ourselves carrying out unsustainable actions in a sustainable way. Because of this, FCC Construcción also has, and has assumed, responsibility in defining this exterior framework.

In this area, FCC Construcción takes part in multiple working areas to develop these necessary standards for sustainable building. We are currently involved in working groups within the ISO/TC 59/SC 17 committee for sustainable building as well as in the Spanish version, AEN/CTN 41/SC 9, "Sustainable Building."

Mandate M/350 EN of the European Commission to CEN gave rise to the constitution of CEN/TC 350, "Sustainability of Construction Works," programmed for the "development of horizontal methods of standardisation for evaluating the integrated environmental behaviour of buildings" and FCC Construcción is also involved in the work being carried out in this area, within the working groups, "Environmental Performance of Buildings," "Building Life Cycle Description," "Product Level" and the "Task Group: Framework."

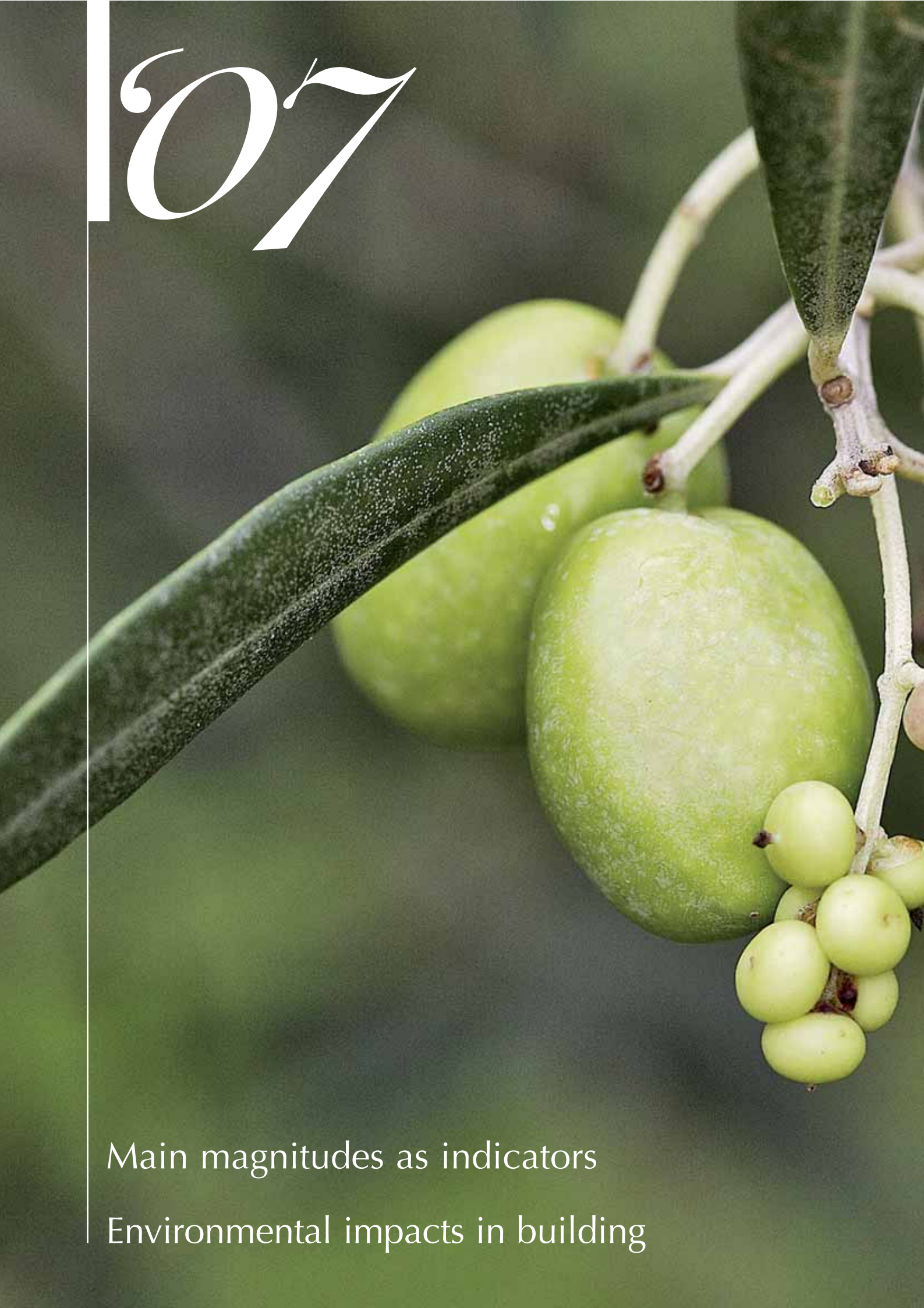
A working group (AEN/CTN 41/SC 9/GT 5, "Sustainability in Infrastructures") was set up within the Sustainable Building sub-committee at the encouragement of FCC Construcción, with the purpose of covering the area of sustainability in civil engineering in general and which is co-ordinated by FCC Construcción. This group, a new feature in the world due to its focus and contents, encouraged the ISO International Committee to propose and approve resolution 98/2007 for the creation of a new "Work Group ISO/TC 59/SC 17: Building Construction/Sustainability in Building Construction / Civil Engineering Works" led by FCC Construcción with the purpose of

defining the significance of sustainability in the creation of infrastructures, the indicators that must be used and the criteria for their evaluation, so that there is the common language in the sector when talking about sustainable building.

Thus we understand that our responsibility goes beyond mere building, that we have a greater responsibility, that includes sharing what we have learned, providing our perspective, promoting the definition of sustainability standards that guarantee a safer framework for everyone. Responsible behaviour from the local point of view is not enough - a perspective of sustainability of the company in a restricted sense is not sufficient. Sustainability implies going out into the world and trying to change it, defining criteria and lines for action, policies that allow this world to become more human, more durable, more sustainable.

Infrastructures are the backbone of the land and allow communication between naturally isolated areas, bringing social and economic progress to the region in which they are developed. The benefit is maximum when all efforts are made in environmental matters, caring for the surrounding plant life, minimising the area occupied and adapting measures to prevent and correct environmental impacts.

07



Main magnitudes as indicators

Environmental impacts in building

The olive is the golden coin hanging from a branch of the olive tree, or is the ray of sunlight that pours onto the bread on our table

MAIN MAGNITUDES AS INDICATORS

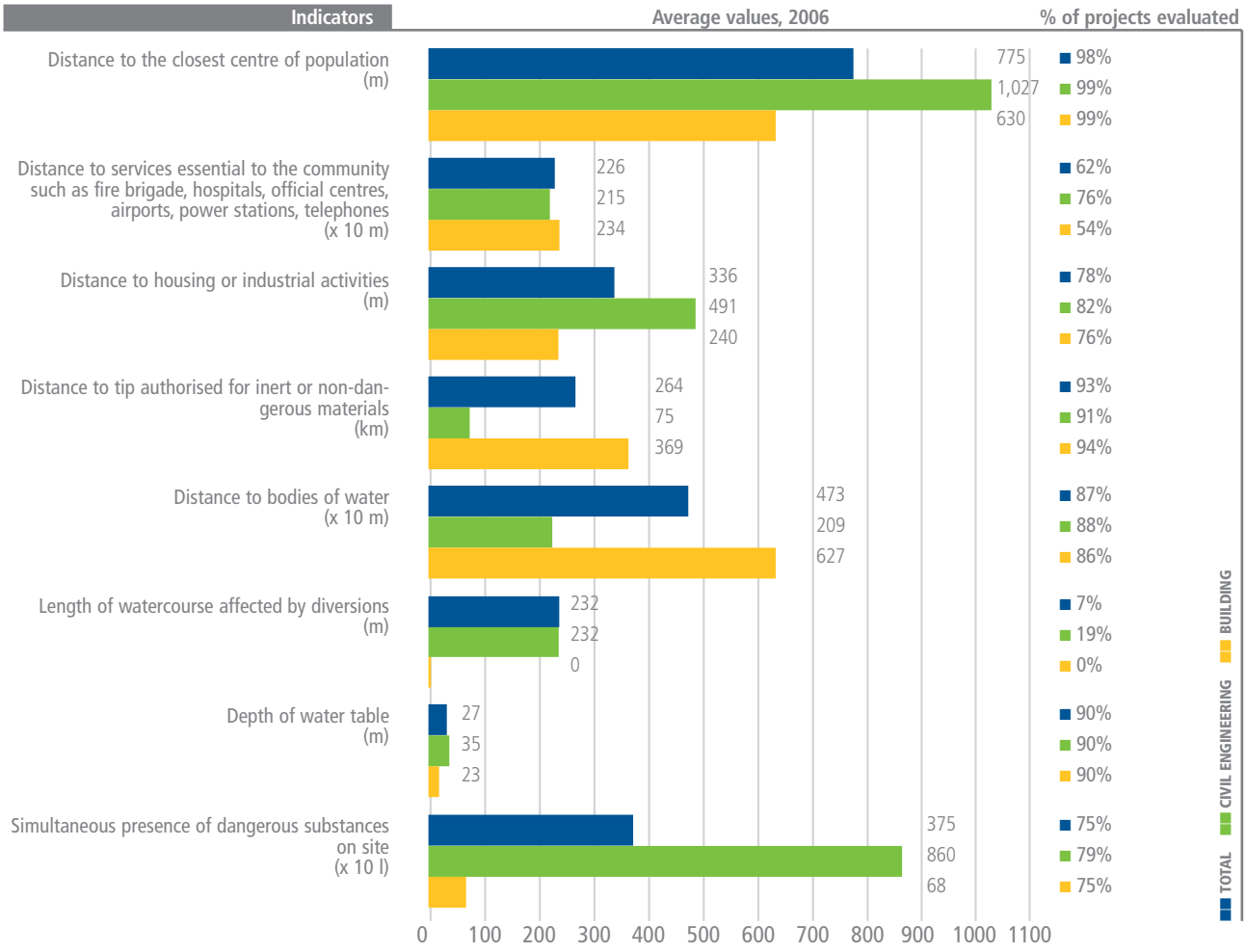
FCC Construcción is aware of the effect of the sector on the natural environment. For this reason, it does not limit itself only to describing the theoretical basis of possible impacts arising from its activities but has put into practice a system of indicators to provide magnitudes in order to evaluate quantitatively the environmental aspects of all projects.

For each of the company's projects, both building and civil engineering, reports are issued with the most representative magnitudes of the activity carried out. All these data are integrated to provide average values for the civil engineering and building activities and those of the company overall. The data show how building and the environment interact and give an idea of how we affect it.

The following shows average data from our projects during the last year.

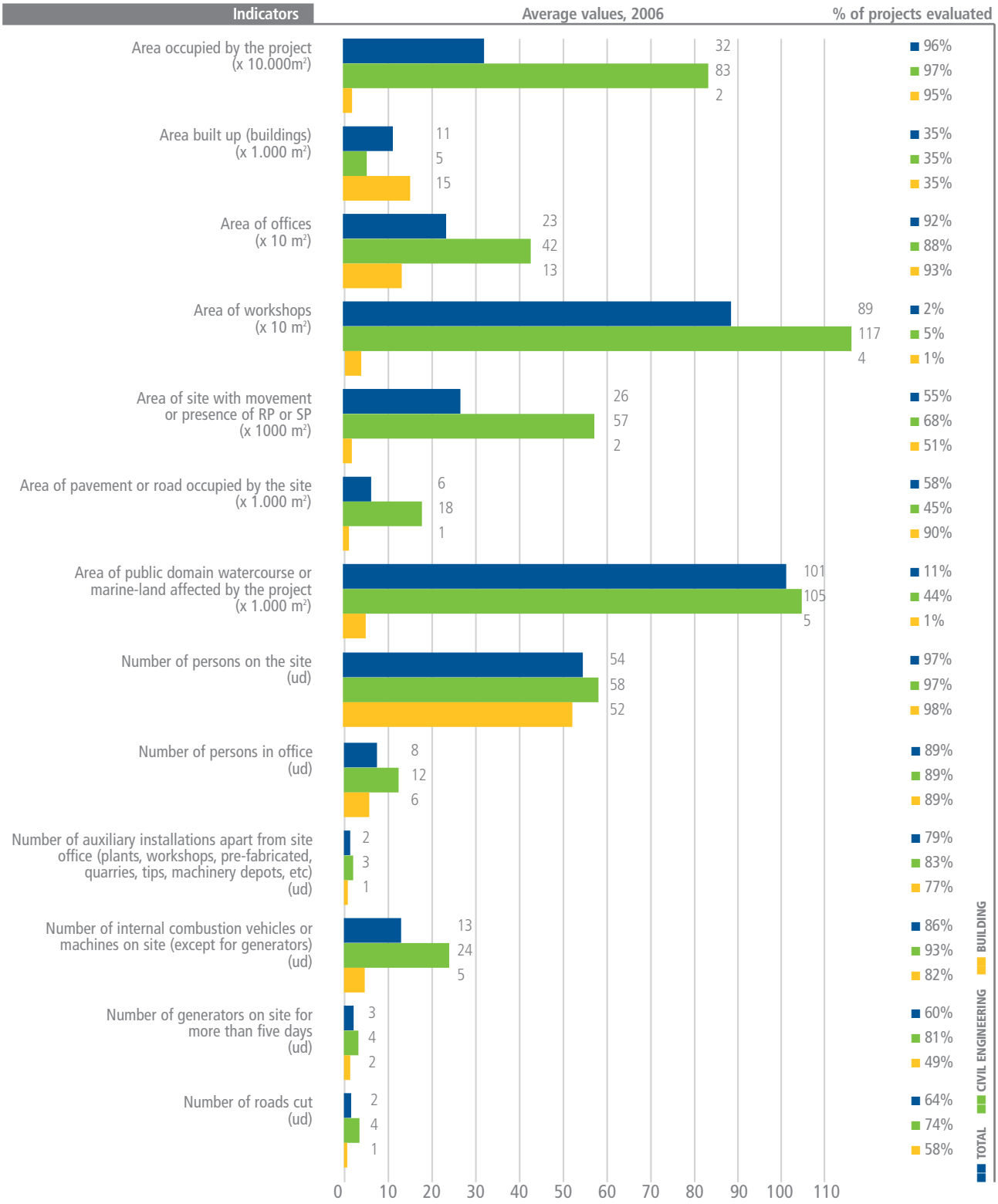
Infrastructures form the backbone of the land and integrate it into a solid means of communication and development that, necessarily, may affect the environment. The purpose must be an overall balance that is as favourable as possible, achieved by minimising also the environmental impacts: integration into the environment, transverse permeability through under- and over-passes, corrective and preventive measured in design and during the undertaking. Planning thinks of the whole, searching for the best result for everyone.

INTERACTION WITH THE ENVIRONMENT



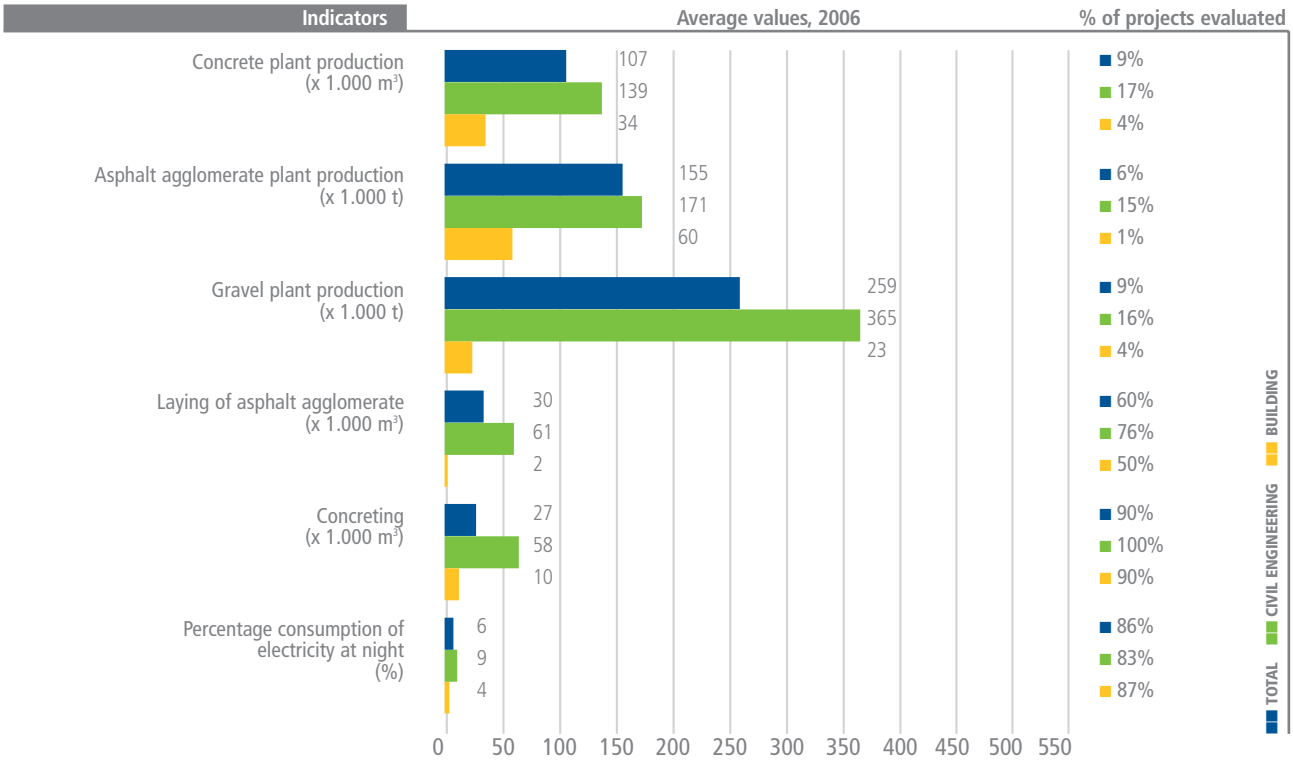
Given the need for infrastructures for social and economic development, it is necessary always to seek the maximum environmental benefit, providing fish ladders, collaborating in the result, caring for the surroundings to prevent their degradation, enhancing both previous and new natural values as far as possible.

PROJECT PROPERTIES



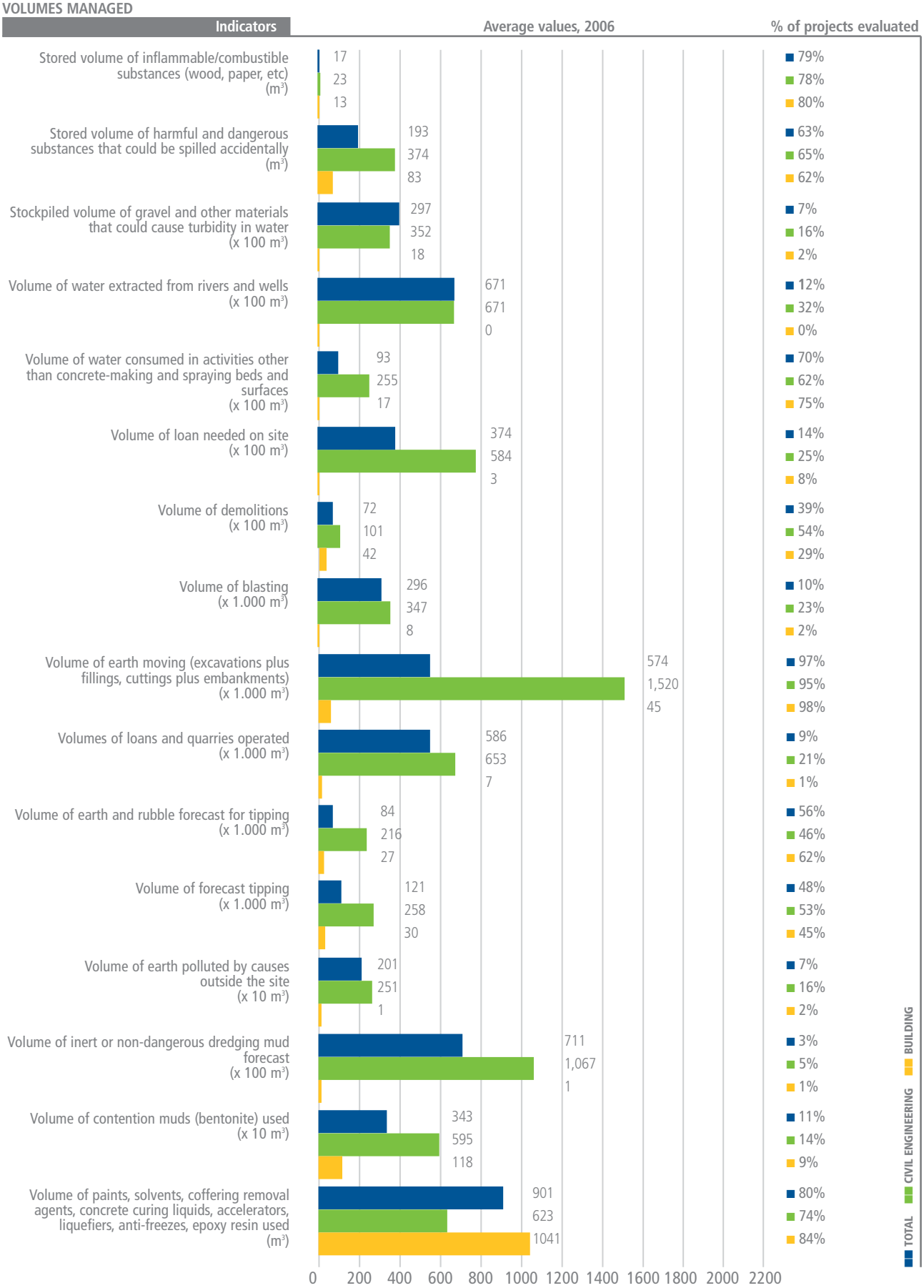
The care and maintenance of machinery, the use of silencers, the EC seal and the indication of the guaranteed noise level and all measures to control impacts, minimise CO_2 emissions and the generation of noise and vibration that could annoy the fauna and neighbours in the area. All sites report information on these aspects such as the number of vehicles and machines present, the fuel used and the hours worked, with the measures they have adopted to correct and prevent environmental impacts.

PRODUCTION OF MATERIALS



Because of the importance of the basic materials used in the sector, FCC Construcción has identified and quantified the consumption, manufacture and use on site of these, since these data allow the evaluation of whether the emissions, tipping, consumption of raw materials and generation of wastes are significant or not and the measures that need to be adopted

VOLUMES MANAGED



FCC Construcción quantifies and records the volume of polluted earth, both its own, accidentally generated, and that outside the site and found during building, controlling it and ensuring it is managed correctly, from its removal to the decontamination of these areas, always within the terms and schedules set by the regional authorities.

Firstly, it is noteworthy that the percentage of projects in which the magnitudes have been evaluated has increased over the previous year so that the average data are more exact and more closely match the current scenarios. This situation is the result of FCC Construcción's policy of continuous improvement on which it continues to work to obtain increasingly more representative and reliable data on the state of our projects and their interaction with the natural environment in which they are carried out.

As well as the indicator magnitudes, another series of environmental indicators are monitored that directly affect the natural environment in which the building projects are carried out.

Thus we can conclude that in 90 per cent of projects, the percentage of plant cover in a radius of 10 km is less than 50 per cent and the catalogued or protected plant and animal species that have been identified have not been significantly affected by them.

The area in which FCC Construcción carries out its activities is predominantly semi-urban in which 90 per cent of the affected landscape is catalogued as not relevant and away from historical or artistic buildings. Attempts are also made to integrate the project within the landscape with low visibility in 60 per cent of cases.

FCC Construcción monitors the parameters of its effluents using various treatments and good environmental practices but these actions must be planned beforehand, work which implies knowing and recording the nature of the watercourses or coastline that might be affected. In view of the reports from projects, we conclude that they are mostly close to natural watercourses in unprotected areas and to built-up natural coastlines.

Our company uses technologically optimal equipment that reduces the level of noise. However, there are some activities in building that are inevitably noisy, such as blasting, the sound level of which is difficult to reduce. In these cases, other measures are adopted such as the use of silencers, the choice of location for the noisiest activities, the use of temporary or definitive barriers or limiting the work to times of the day when they cause less nuisance in the case of some 20 per cent of projects with activities that must be continued at night.

Operations such as hydro seeding allow the restoration of areas whose environmental value may have been reduced by the project's installations and activities, adapting the affected terrain whose shape and landscape has been affected and integrating it into the surrounding environment.

It is important to know the situation and main properties of water courses close to the undertaking of projects in order to prevent their possible pollution from the start. Once the nature of the environment in which the work will be carried out has been evaluated, FCC Construcción plans suitable good practices to affect the dynamics of the ecosystem in which the work is carried out as little as possible.

ENVIRONMENTAL IMPACTS IN BUILDING

Building activities interact with environments temporarily and not especially dangerously: air, water, soil, atmosphere, etc. Thus the environmental aspects associated with these activities, products or services of the company that have a significant impact on the environment are identified, particularly with regard to:

- Alteration of nature and landscape.
- Pollution of the atmosphere and emissions of noise and vibrations.
- Effects on water.
- Alteration of the soil and subsoil and the handling of dangerous substances.
- Interaction with the urban medium and territorial arrangement.
- Consumption of energy, materials and generation of wastes.
- Possibility of environmental accidents.

In order to minimise the significant effects to the environment that could be caused by the company's activities, the planning process for each project identifies the environmental aspects present and evaluates their relevance according to the magnitude or amount of pollution or alteration and the importance or sensitivity of the medium that receives the impact. This includes the following groups of environmental aspects:

- Emissions to the atmosphere.
- Generation of noise and vibration.
- Tipping of water.
- Occupation of watercourses or sea beds and water capturing.
- Operations that involve pollution, occupation and loss of soil.
- Consumption of natural resources (water, fuels, and raw materials, energy, etc).
- Generation and handling of wastes (dangerous, inert and urban).
- Emission of radiations.
- Arrangement of territory/environment.
- Environmental accidents.

The following gives a summary of the data from the 332 projects whose information has been processed this year showing the number of environmental aspects identified as real or potentially present in the projects and which of those are significant.

When analysing the 332 work projects, the environmental aspects that were significant in a greater percentage of the projects have been prioritised. The following table shows those that are significant in more than 10 per cent of the total, considering building and civil engineering projects.

Code	DESCRIPTION OF ENVIRONMENTAL ASPECT	% of projects in which the environmental aspect is significant		
		BUILDING	CIVIL ENGINEERING	TOTAL FCCCO
U-06	Operations that involve dirt at the site entrance and exit. Mud and loose materials.	36% (75/211)	54% (65/121)	42% (140/332)
N-41	Consumption of electricity.	37% (78/211)	45% (55/121)	40% (133/332)
U-07	Falling of granular material during its transport.	31% (65/211)	46% (56/121)	36% (121/332)
M-02	Fire in the area for storing inflammable/combustible substances (wood, paper, etc).	18% (37/211)	30% (36/121)	22% (73/332)
R-28	Generation of dangerous wastes of empty polluted packaging (paints, solvents, oil, glue, stripper, coffering removal agent, silicone, aerosols, explosives, etc).	21% (44/211)	17% (20/121)	19% (64/332)
N-02	Consumption of water for spraying beds and surfaces.	3% (6/211)	47% (57/121)	19% (63/332)
V-03	Tipping of sewage.	18% (38/211)	17% (20/121)	17% (58/332)
A-09	Emissions of dust due to movement of machinery.	6% (13/211)	32% (39/121)	16% (52/332)
R-62	Recovery and cleaning of installations/site.	6% (13/211)	29% (35/121)	14% (48/332)
R-22	Generation of dangerous wastes from paint, solvents, strippers, polishes, epoxy resins, accelerators, liquefiers, plasticisers, anti-freeze, coffering removal agents and concrete curing liquids outside of specifications.	15% (31/211)	13% (16/121)	14% (47/332)
A-06	Earth-moving: excavations and fillings, cuttings and embankments.	3% (6/211)	32% (39/121)	14% (45/332)
A-10	Transport of soil and rubble.	3% (6/211)	31% (38/121)	13% (44/332)
R-05	Non-dangerous packaging.	16% (34/211)	7% (8/121)	13% (42/332)
N-21	Consumption of Diesel oil, petrol, fuel oil, carbons.	0% (1/211)	33% (40/121)	12% (41/332)
A-04	Emissions produced by demolition.	9% (19/211)	17% (21/121)	12% (40/332)
W-02	Noise produced by demolition.	10% (22/211)	15% (18/121)	12% (40/332)
W-05	Noise produced by earth moving: excavations and fillings, cuttings and embankments.	3% (7/211)	24% (29/121)	11% (36/332)

In 42 per cent of all of FCC Construcción's projects, the environmental aspect, "operations that involve dirt at the site entrance and exit" have been significant, this percentage increasing to half (54 per cent) in civil engineering projects. The most common actions carried out in centres to minimise the impact to the land of this environmental aspect are the maintenance of the site accesses in a suitable state of cleanliness and by covering all of the transported materials that produce dust to prevent the accumulation of dirt in these areas and the consequent reduction of their ecological and landscape value.

Another environmental aspect associated with the territorial arrangement group that is significant in 36 per cent of centres is the "falling of granular material during its transport." Preventive measures are taken in over 90 per cent of our projects to prevent the falling and the collection or sweeping of fallen material on public roads to minimise the impact arising from this aspect.

To prevent dirt at the site entrance and exit, it is usual practice to clean the vehicles' wheels before they join the public road.

FCC has identified potential emergency and accident risk situations that may affect the environment and has developed an entire procedural dynamic to respond to them.

Although the necessary precautions are taken at all sites to ensure the maximum levels of safety and environmental accidents occur only rarely, FCC Construcción considers important to identify all environmental aspects associated with possible accidents, for which environmental emergency plans are prepared, for example, for fires in 97 per cent of sites, and the site is equipped with the appropriate protection measures.

Within the consumption of resources there are three significant environmental aspects in over 10 per cent of FCC Construcción's projects. These are the "consumption of electricity" (40 per cent), "consumption of water for spraying beds and surfaces" (47 per cent of civil engineering) and the "consumption of fuels" (30 per cent in civil engineering projects).

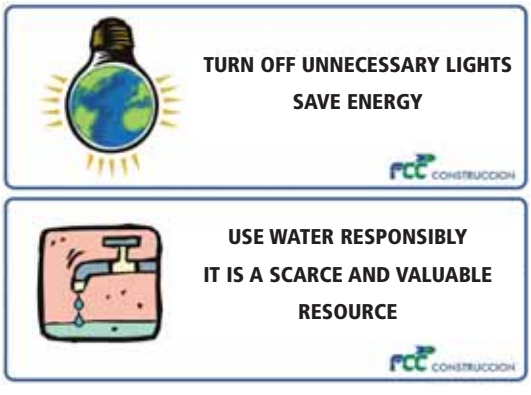
The consumption of electricity is necessary but so is its saving in absolute terms such as that of efficiency. Therefore measures are adopted such as making maximum use of natural lighting and adapting working hours as well as information and awareness campaigns for all the personnel on the assumption that the first step towards energy efficiency is the reduction of the use of resources at origin. Other actions carried out are the use of fluorescent lamps in place of incandescent bulbs and the installation of automatic economisers.

Water consumption also reaches significant magnitudes especially in civil engineering projects (where this aspect is significant in 47 per cent of projects compared to three per cent in building). Most of the water returns to the environment, given that it is used on embankments to compact them and it is also used in spraying tracks to minimise emissions of dust and particles to the atmosphere, which forms the main source of atmospheric pollution in building. Measures to inform the personnel are taken in 22 per cent of projects as well as measures to reduce the consumption of water such as the re-use of effluents and waste process water.

The fundamental environmental actions that are carried out to reduce the consumption of fuel are the use of modern, more efficient machinery as well as the fuel used, the suitable maintenance of these and the use of less polluting fuels.

Four environmental aspects relating to the generation of wastes are significant in over 10 per cent of FCC Construcción projects. These are the "generation of dangerous waste from polluted empty packaging" (19 per cent), the "generation of urban waste from the recovery and cleaning of installations/sites" (14 per cent), the "generation of dangerous wastes from paints, solvents, strippers and polishes, resins, etc" (14 per cent) and the "generation of non-dangerous packaging waste" (13 per cent).

Actions are taken for the correct operational monitoring of each waste depending on its nature (urban, dangerous or non-dangerous). For dangerous wastes, and according to current legislation for RPs, temporary storage is used (never more than six months and with clear identification of the containers and their contents using standardised labelling) and suitable handling, the main actions being the periodic monitoring to ensure that wastes are not mixed and that



Through environmental signposting, information and awareness of personnel, both in offices and on sites, we set up the basis for reducing the use of resources such as water and energy

The arrangement of tubs, preferably compartmented, for storing dangerous substances and products centralises their storage in a single point and prevents their accidental tipping or spilling.

the containers' capacities are not exceeded, the impermeability of the storage area and the setting up of a location plan for the wastes disposal points.

Because of the machinery and materials used, emissions of dust to the atmosphere are the main source of pollution in building. Four environmental aspects have been identified relating to these as being significant and a high percentage of projects, basically civil engineering and not so much in building. These aspects are, "emissions of dust due to movement of machinery" (32 per cent in civil engineering), "emissions of dust due to earth moving" (32 per cent in civil engineering), "emissions of dust by transport of soil and rubble" (31 per cent in civil engineering) and "emissions of dust due to demolition" (12 per cent).

Operations relating to building and civil engineering inevitably generate amounts of dust which we attempt to minimise as far as possible with actions such as spraying the tracks, rubble and stockpiles, reducing the tipping height of material, the use of tubes for pouring rubble from heights, covering the surface of blastings and using screens to prevent the dispersion of dust, among others.

Given the nature of the above aspects, it can be deduced that, as well as specific operations such as demolition and earth moving, transport is the main source of dust emissions, generated by the movement of trucks on access tracks and ramps or when exiting to roads because of particles in the tyre treads. Obviously it is impossible to eliminate the cause of dust emission but in FCC Construcción various actions have been implemented on sites to reduce the generation of dust to the minimum. One of the methods most used is spraying the tracks and stockpiles when and where necessary as well as spraying nearby plants that could be affected. The materials carried are also covered totally when they may produce dust, the vehicles' speed on the site is controlled and the area for machinery movement is delimited.

Finally, the list includes two aspects of the generation of noise and vibrations group, such as "noise produced by demolition" and "noise produced by earth moving," significant in 12 and 11 per cent of all projects, respectively. To prevent nuisance, in over 92 per cent of projects this type of noisy activity is carried out at times

that are compatible with the activity of the area and all the machinery used in the open air, both acquired and used, is checked to ensure it has the EC mark and the indication of the guaranteed noise level.

Large infrastructures necessarily have an impact on the natural environment but it is possible to reduce certain effects, such as the barrier effect using underpasses that make the route permeable and facilitate communication between the resulting areas.

07

Good environmental practices

From all apples we obtain
health and good flavour,
And from the skill of the cook
The best of dishes.

GOOD ENVIRONMENTAL PRACTICES

FCC Construcción set up the system of good practices for defining its environmental objectives for the first time in 2000. This system involves the implementation in all its projects of a series of environmental practices that include requirements that are greater than those set by legislation.

Depending on the results from the previous year, the experience in the various projects and the progress in research and development into the best available techniques, each year the list of good practices is revised, adding new measures or modifying existing ones, and varying the range set to achieve the goals, all always aimed at preventing pollution and at continuous improvement.

There is an overall list of good practices from which the most suitable ones are selected for each project according to its properties. Thus the project achieves a greater or lesser rating as a function of the voluntary good practices it decides to adopt. Greater value is given to those that have a more significant affect on the final environmental quality as well as those that involve a greater effort in their implementation, whether financial, technical, logistic or for any other reason.

Within each good practice, the degree of implementation is graded from one to three with three being the greatest effort or maximum scope in the implementation and one the minimum in order to rate in the specific good practice. All projects are required to achieve a minimum total of 51 points (the objective set for this year) on the basis of carrying out good practices.

The good practices fall within the following environmental areas:

When necessary, filtering barriers are used to protect watercourses from surface run off, preventing the transport of fine material from the environment and an increase in the water's turbidity.

- Relationship with society.
- Emissions to the atmosphere.
- Generation of noise and vibrations.
- Tipping of water.
- Occupation, pollution or loss of soil.
- Use of natural resources.
- Generation of wastes.
- Arrangement of land (biological diversity, urban environment).

The monitoring carried out in 2006 allows especially significant conclusions to be reached.

- In 2006, 100 per cent of the projects had planned a set of voluntary good practices with a value equal to or greater than the 51 points set as the original objective.

- In 100 per cent of projects, the FCC Construcción production personnel had undergone the scheduled environmental training course and 98 per cent of them plus 60 per cent of subcontractors have received environmental talks.

- To inform and increase awareness among site personnel, in 98 per cent of sites environmental signposting is used to remind them of their responsibilities towards our nearest environment.

- In 98 per cent of sites, water is used to spray tracks and stockpiles to reduce the amounts of dust and particles generated by the actions of building and the movement of machinery.

- In 98 per cent of FCC Construcción projects, the areas affected by the site installations are restored, carrying out at least a cleaning and removal of elements foreign to the environment or without later use in all of them, up to raking the land and reforming it suitably for the surroundings in more than 35 per cent of cases.

- In order to prevent accidental spillages, tubs are provided to store dangerous substances and wastes in 97 per cent of FCC Construcción projects.

- In 96 per cent of our projects, the inert materials taken to the tip have been reduced with respect to the volume forecast in the project. Loans have also been reduced with respect to the volume forecast in the project in 93 per cent of cases.

- In almost all FCC Construcción projects (99 per cent) means are used to prevent dirt at the site entrance and exit, either sweeping the entrances and exits systematically or cleaning the wheels of all the trucks before they join the public road.

- The good practices for limiting the areas of access and the areas occupied by the sites are applied in 95 per cent of them, with written/graphical documentation of accesses, tracks and areas that the machinery and personnel may occupy.

- In 93 per cent of sites, inert wastes are classified into three or more categories for individual handling.

- 93 per cent of FCC Construcción sites consider the conditions of the surroundings in the work schedule, restricting noisy activities to less annoying hours, even limiting them to less annoying times of the year on occasions when this is necessary due to the reproductive and breeding seasons of certain animal species.

The RPs are deposited in tubs that are suitably impermeable, separated and labelled.

The delimiting of areas of access and occupation is important, signposting the entrance and exit for vehicles in the project and external to it. Preferably, existing tracks are used before new ones are created and in cases in which this is not possible, they are created so that they cause the minimum visual impact and so that they may have an alternative use in the future, as a forest track, for example.

As well as the number of projects that apply good practices, it is important to stress the degree of implementation, that is, the intensity of the adoption of the measure, reaching the goal of three, which is the maximum set. Thus, for example:

- In 55.9 per cent of projects, absolutely all FCC Construcción production personnel had carried out the scheduled two-day environmental training course.

- In 83.6 per cent of projects that re-used water from washing concrete tubs, it was re-used in the concrete plant itself in the manufacturing process, thus minimising the consumption of this very valuable resource on the one hand and significant tipping of water on the other.

- In 62.5 per cent of all projects likely to affect an animal species, generalised movements were carried out of nests or individuals, together with the tracking of the affected individuals for more than six months.

The following gives data from the projects during 2006.

One simple and very effective measure to reduce emissions of combustion and sound levels, is speed limits for vehicles moving during the undertaking of the project.

The water from cleaning concrete tubs or other washing has a very basic pH level and must be neutralised before being tipped.
An eco-efficient alternative is to use the washing water in the process for manufacturing new concrete, minimising water consumption at the same time.

The new lock in the port of Seville

Client: Seville Port Authority

Environmental technical assistance: port environmental survey INERCO - TECNOAMBIENTE Y ECOIMSA

Description of the environmental action

- Problem detected:

  The project has been the subject of complaints from groups of ecologists regarding the environmental impacts caused by the building of the lock.

- Solutions adopted:

  In order to respond to the groups of ecologists, a document was prepared for the EU with the actions to be carried out to minimise the environmental impact.

  Because the project was of public interest, visits were organised for the media to keep society informed of the latest progress and new aspects of the project.

  In order to comply with the above mentioned documents, the actions carried out in relation to the environmental impacts were the preparation of four ponds to deposit water from dredging together with the extracted material for decanting before being tipped to the river, the creation and signposting of areas of nesting, breeding and reproduction for bird life as well as their monitoring and movement to the centre for the recovery of threatened species if necessary, the prevention of the cutting of more than 150,000 cedars which are kept as a lung within the site, the transplanting of willows, poplars and mulberry trees and the recovery of some pieces of historical and cultural value.

- Results:

  After the efforts made to ensure that each action interfered with the environment as little as possible, the results have been satisfactory in all the checks made, both in sediments and in water quality, air quality and regarding the biodiversity, it being significant that bird life in the area has been maintained and even increased. This project has not received any further environmental complaint or claim.

RELATIONSHIP WITH SOCIETY

		Training of personnel in environmental matters	Contracting of environmentally committed sub-contractors	Communication and transparency with society	Attention to complaints, claims and suggestions	Involvement of client in management	Actions-opportunities: Environmental improvements introduced in project	Actions-opportunities: Environmental signposting
Risks	Deficiencies in relations with persons	✔		✔	✔	✔		✔
	Wasting of resources and high generation of wastes	✔					✔	✔
	Insufficient segregation of wastes	✔						✔
	Lack of awareness	✔	✔	✔				✔
	Insufficient environmental training	✔	✔					✔
	Limited communication with affected parties			✔	✔	✔		
	Projects that respect the environment						✔	

Relationships with persons are the key to good building. The training of our employees and their degree of satisfaction, attention to the needs of persons around us with whom we inevitably interact and are affected by our activities, the publishing of findings, outside experiences from which we can learn, the involvement of all parties, a just retribution, the requirement of the same level of responsibility from all our collaborators, are elements that form our way of being and are present in our surroundings and are key pieces in the final result of our activities.

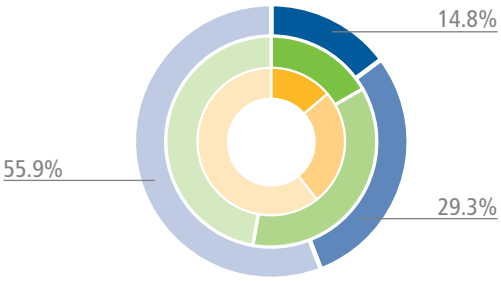
Because Spain has seen a variety of cultural influences, excavation and earth moving work frequently reveals archaeological remains; these are always respected and reported to the relevant authorities.

Consequently, aspects such as the necessary training so that the company's personnel carry out their work effectively with maximum respect for the environment, dialogue with interested parties and the incorporation of sub-contractors into the dynamic of protecting the environment, making them responsible and aware of the role that they can and must play, are some good practices to which a higher weighting has been given.

The good practices carried out in this area and their degree of implementation, differentiating between building, civil engineering and all of FCC Construcción's projects, are shown below.

FCC PRODUCTION PERSONNEL (UP TO FOREMEN) WHO HAVE TAKEN THE FCC TWO-DAYS SCHEDULED ENVIRONMENTAL TRAINING COURSE

Importance: 3



Projects that apply the good practice

TOTAL:	100%
CIVIL ENGINEERING:	99%
BUILDING:	100%

> 30 % of project personnel

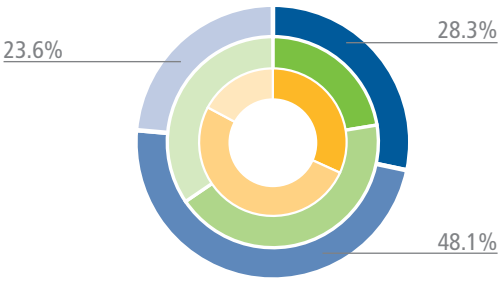
> 60 % of personnel

100 % of personnel

TOTAL CIVIL ENGINEERING BUILDING

SUB-CONTRACTORS WHO HAVE RECEIVED ENVIRONMENTAL AWARENESS AND TRAINING TALKS FROM FCC OF AT LEAST ONE HOUR IN RELATION TO THE SUB-CONTRACTED ACTIVITIES.

Importance: 3



Projects that apply the good practice

TOTAL:	98%
CIVIL ENGINEERING:	99%
BUILDING:	98%

> 30 % of sub-contractors

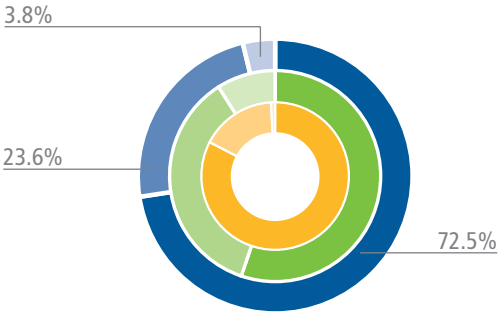
> 60 % of sub-contractors

> 90 % of sub-contractors

TOTAL CIVIL ENGINEERING BUILDING

SUB-CONTRACTORS WHO APPLY AN ENVIRONMENTAL MANAGEMENT SYSTEM

Importance: 2



Projects that apply the good practice

TOTAL:	90%
CIVIL ENGINEERING:	95%
BUILDING:	88%

At least one sub-contractor has ISO 14001 or EMAS certification

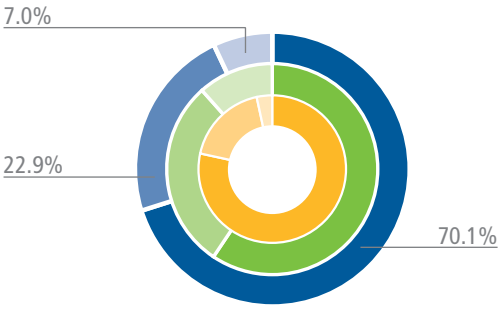
The same, > 10 %

The same, > 25 %

TOTAL CIVIL ENGINEERING BUILDING

ENVIRONMENTAL BEHAVIOUR OF SUB-CONTRACTORS

Importance: 3



Projects that apply the good practice

TOTAL:	84%
CIVIL ENGINEERING:	90%
BUILDING:	80%

> 30% of sub-contractors carry out actions related to the optimisation of wastes, with the relevant permits and licences, and have contractual environmental requirements with which they comply.

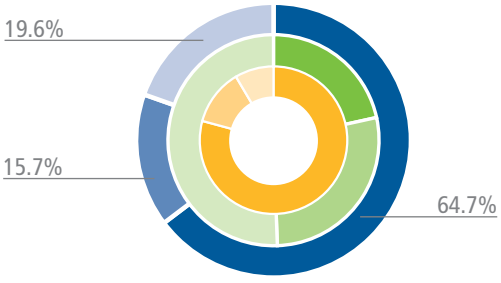
> 75% of sub-contractors carry out actions related to the optimisation of wastes, with the relevant permits and licences, and have contractual environmental requirements with which they comply
or
> 30 % of sub-contractors carry out actions related to the optimisation of wastes, with the relevant permits and licences, and have contractual environmental requirements with which they comply and any non-conformities as a result of their actions either do not occur or are identified and reported by them.

> 75% of sub-contractors carry out actions related to the optimisation of wastes, with the relevant permits and licences, and have contractual environmental requirements with which they comply and any non-conformities as a result of their actions either do not occur or are identified and reported by them.

TOTAL CIVIL ENGINEERING BUILDING

RELATIONSHIP WITH INTERESTED PARTIES

Importance: 3



Projects that apply the good practice

TOTAL:	91%
CIVIL ENGINEERING:	94%
BUILDING:	89%

All the aspects that could give rise to important relevant impacts have been handled with the client and the solution to be adopted has been agreed.

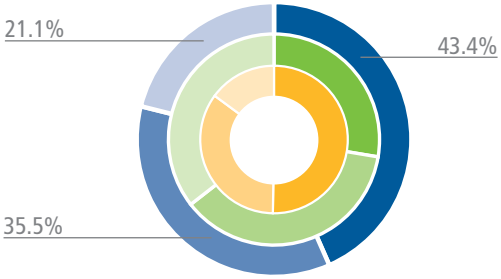
Those that most affect society have been handled with the authorities or with the potentially affected associations and individuals.

Those that most affect society have been handled with the authorities or with the potentially affected associations and individuals.

TOTAL CIVIL ENGINEERING BUILDING

COMPLAINTS AND CLAIMS

Importance: 3



Projects that apply the good practice

TOTAL:	93%
CIVIL ENGINEERING:	94%
BUILDING:	92%

All the complaints and claims received have been settled with the affected individuals.

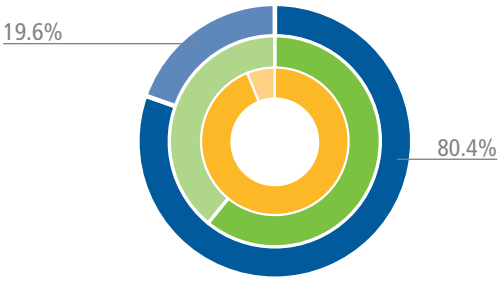
The solutions to be adopted have been agreed with them.

These actions have been carried out and there is written acceptance in at least 50 per cent of cases.

TOTAL CIVIL ENGINEERING BUILDING

OBTAINING OF SOCIAL RECOGNITION

Importance: 3



Projects that apply the good practice

TOTAL:	80%
CIVIL ENGINEERING:	86%
BUILDING:	75%

Written congratulations have been received from the client or local authorities regarding the environmental behaviour.

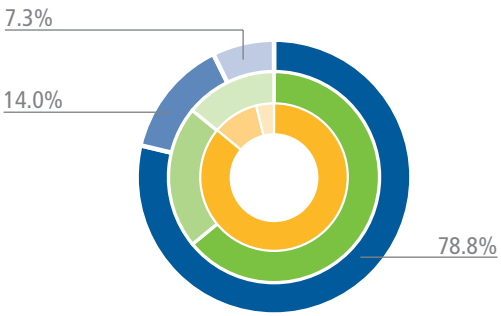
A publication outside the company has praised the environmental behaviour.

An award has been received with specific mention of the environmental behaviour.

TOTAL CIVIL ENGINEERING BUILDING

INVOLVEMENT OF THE OWNER IN THE ENVIRONMENTAL MANAGEMENT

Importance: 3



Projects that apply the good practice

TOTAL:	93%
CIVIL ENGINEERING:	94%
BUILDING:	92%

The owner knows of the implementation of the environmental management system in the project.

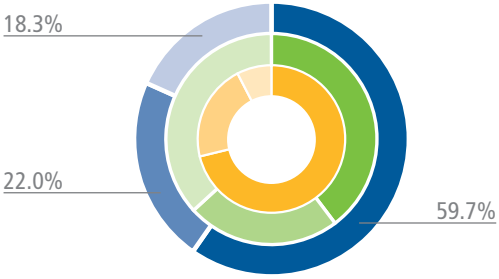
The owner has participated actively in some aspects of the development of the environmental management system.

A formal presentation of the environmental management system has been made in a specific session with slides and other audiovisual media.

TOTAL CIVIL ENGINEERING BUILDING

ENVIRONMENTAL TRAINING OF AT LEAST FOUR HOURS FOR PRODUCTION PERSONNEL FROM FOREMEN TO LABOURERS

Importance: 3



Projects that apply the good practice

TOTAL:	86%
CIVIL ENGINEERING:	90%
BUILDING:	84%

100% of foremen

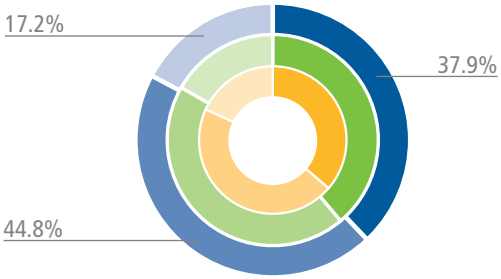
100% of foremen and
> 20% of operators and labourers

100% of foremen and
> 50% of operators and labourers

TOTAL CIVIL ENGINEERING BUILDING

ENVIRONMENTAL IMPROVEMENTS INTRODUCED INTO THE ORIGINAL PROJECT

Importance: 3



Projects that apply the good practice

TOTAL:	65%
CIVIL ENGINEERING:	76%
BUILDING:	55%

An environmental improvement was proposed for the original project but was not admitted in the end.

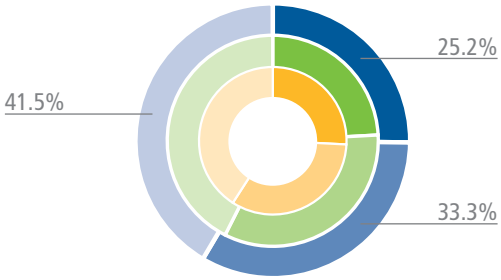
An environmental improvement was admitted in the original project.

More than one environmental improvement was admitted in the original project.

TOTAL CIVIL ENGINEERING BUILDING

ADOPTION OF ENVIRONMENTAL SIGNPOSTING ON THE SITE TO HELP TO INFORM AND MAKE AWARE THE PERSONNEL WORKING ON THE SITE

Importance: 2



Projects that apply the good practice

TOTAL:	98%
CIVIL ENGINEERING:	97%
BUILDING:	98%

Standard environmental signposting used on the entire site for wastes.

Complete standard environmental signposting used on the entire site.

Complete standard environmental signposting used on the entire site.

TOTAL CIVIL ENGINEERING BUILDING

Environmental training

Considering that training is essential to make our activity more respectful to the environment, FCC Construcción has set up an ambitious training plan which, year after year, increases in scope. During the last year, 100 per cent of the production personnel involved in over 55 per cent of projects had attended the main course, of 20 hours' duration, called "Environmental awareness and training."

This course, given to site managers, is key since its role is fundamental in the organisational and functional structure of projects given that it involves the person who forms the link between the company, the promoter and the project management on the one hand, and, on the other, between the company's own and outside personnel. Therefore, if the site managers have a favourable attitude, the application of the good environmental practices will be more than practicable.

Complementing this course, 4 hours' environmental training is given in 86% of projects to set the basic principles for managing activities that affect the environment.

As well as company personnel, environmental awareness and training talks are also given to those of sub-contractors relating to the sub-contracted activity, given that according to ISO 14001, the company must identify the training needs and provide it to any person carrying out tasks for the organisation who may potentially cause environmental impacts. This good practice of bringing awareness and technological training to sub-contractors' personnel whose activity has clear effects on the environment has been carried out in 98 per cent of sub-contracts.

The involvement and awareness of everyone involved facilitates the integration of three key factors, achieving the satisfaction of clients, collaborators, employees and society in general in surroundings that respect the environment and within a favourable financial context.

Involvement of suppliers

Another factor of special weight is the incorporation of suppliers and sub-contractors into the environmental management.
Thus preference is given to contracting those sub-contractors who apply some system of environmental management, whether SO 14001 or EMAS certified, considering preferably those who accredit good environmental behaviour or who have demonstrated in previous relationships that are evaluated on the basis of the following criteria set by FCC Construcción:

- The carrying out of environmental activities relating to the efficient optimisation of wastes, use of advanced technologies that respect the environment, recovery of spaces occupied by their installations, implementation of preventive actions, etc.

- The provision of the necessary permits and licences for carrying out their work: activity licence, producer/ handler of toxic and dangerous wastes, quarry and loans operation, tipping and tips, etc.

- Absence of environmental non-conformities generated by the supplier's actions or, if they have occurred, that have been identified by him before anyone else and who maintains a positive attitude towards carrying out repairs or corrective actions.

- Degree of attention and application to the indications and stan-

Site offices also require a system for the correct handling of wastes complemented with signposting which tells the personal where to deposit the wastes that they generate.

dards for environmental behaviour set by FCC Construcción in previous actions.

- Degree of compliance in previous actions with the environmental requirements in the project documents: purchasing specifications, building procedures, working instructions, inspection points programmes, etc.

These criteria are communicated to the sub-contractors and suppliers who are required to comply with them and which are evaluated over time.

As well as informing them of the procedures and requirements, they also provided with the necessary training in environmental matters, as described above.

Communication

As part of its policy, FCC Construcción considers that communication with society is a priority, in three ways:

- By setting up a relationship with the interested parties.
- Internal information flow (upwards and downwards).
- Image of FCC Construcción in society.

Mechanisms have been set up for the information flow that resolve both the inputs and outputs of information to and from FCC Construcción as well as the possibility of transmitting and receiving information within the company

Although legislation has directives and regulations regarding relations-

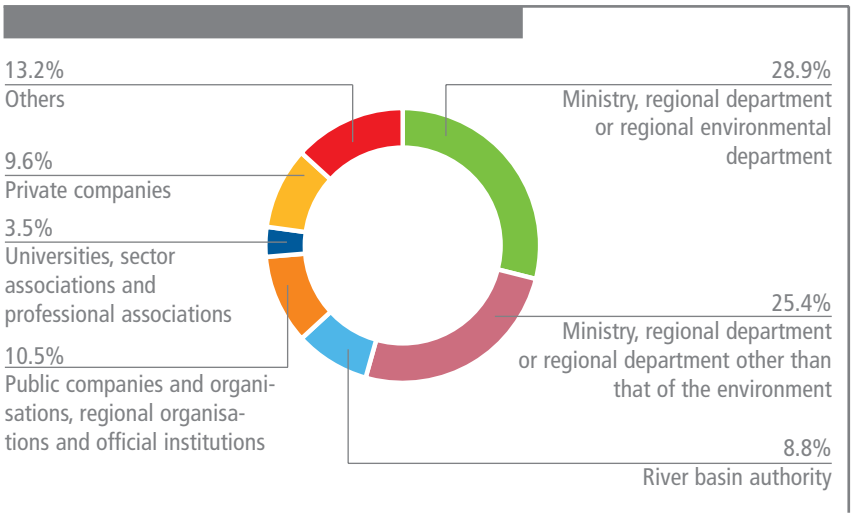
The suitable signposting of the natural values of the project's environment and of the environmentally correct actions, in matters of segregating waste, for example, encourage the awareness of the personnel involved, this fact being reflected in greater consideration and attention to the environment and facilitating suitable behaviour by everyone.

hips with clients in periods after the end of the project, it is considered interesting, from the point of view of setting up continuous improvement of the company's actions, to internally develop and generally form a system of relationships with clients based on the following types of actions:

- Measurement of the client's satisfaction using surveys at the end of the project.
- Handling of complaints and claims.
- The naming of intermediaries.

Throughout 2006, communication with interested parties has been carried out according to the specifications in the graph regarding the number of environmental relationships set up in one or other direction.

RELATIONSHIPS WITH INSTITUTIONS AND INTERESTED PARTIES



[illegible]

		Actions - opportunities						
		Spraying of tracks and stockpiles	Use of screens	Use of dust control systems	Use of tubes for dumping rubble	Proper maintenance of machinery	Speed limits	Control and limiting of night lighting
Risks	Climate change					✔	✔	
	Increased index of suspended particles (dust)	✔	✔	✔	✔		✔	
	Increase of COVs					✔		
	Reduction of environmental quality	✔	✔	✔	✔	✔	✔	✔
	Light pollution							✔

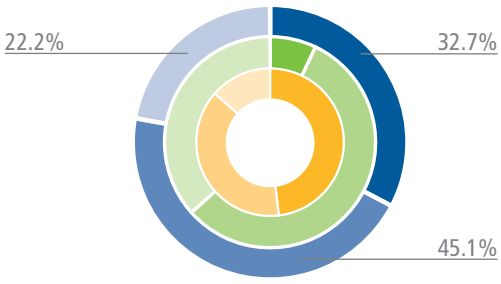
Building is a sector that does not exactly feature high atmospheric emissions although, naturally, they do occur. The generation of dust is the type of omission that forms the greatest significant problem on sites, as has been described in previous sections.

To prevent and minimise atmospheric pollution, the following good practices have been planned and implemented:

A simple but extraordinarily effective measure to control dust emissions generated by moving machinery is to spray tracks and stockpiles, which can be reinforced with the addition of agents or hygroscopic salts to increase its effectiveness.

DUST REDUCTION BY SPRAYING TRACKS AND STOCKPILES WITH WATER

Importance: 2



Projects that apply the good practice

TOTAL:	98%
CIVIL ENGINEERING:	100%
BUILDING:	97%

Sporadic application.

Frequent application.

Systematic application.

TOTAL CIVIL ENGINEERING BUILDING

Pajares tunnel

Client: Railway Infrastructures Administration

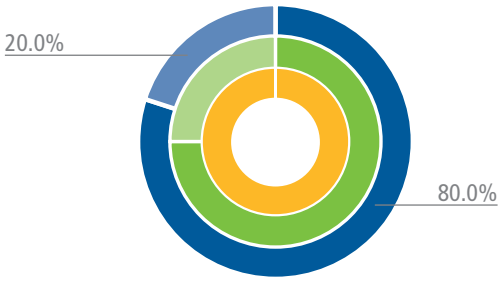
Description of the environmental action

- Problem detected:
  There was a cloud of dust at the point at which the conveyor belts removing excavation material unloaded, especially when the excavation crossed dry limestone areas. The crushed dry material produced a column of dust that was visible from the road as it fell from the belt onto the intermediate stockpiles for loading and transporting to the tip, although it did not affect the nearby residential areas.
- Solutions adopted:
  The solution adopted was to build a sheet roof and folding sides for access for trucks and shovels that was kept closed when not loading. Tipping was made into a hopper at the end of the belt inside this enclosure, equipped with water sprays.
- Results:
  An optimum result was obtained at the disappearance of the dust cloud.

Covering conveyor belts reduces noise and, above all, prevents material from falling and the appearance of dust, resulting in a clean and environmentally more respectful installation.

USE OF ADDITIVES IN THE SPRAYING WATER TO CREATE A SURFACE CRUST, PAVING OF TRACKS AND OTHER LASTING DUST CONTROL PRACTICES

Importance: 1



Projects that apply the good practice

TOTAL:	45%
CIVIL ENGINEERING:	53%
BUILDING:	41%

Sporadic application.

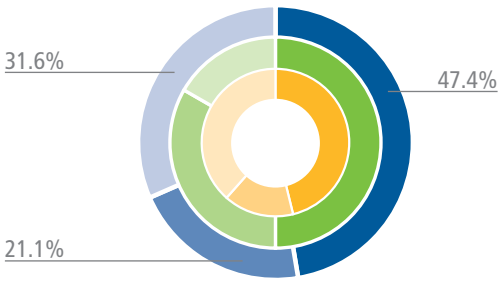
Frequent application.

Systematic application.

TOTAL CIVIL ENGINEERING BUILDING

USE OF SCREENS TO PREVENT DUST DISPERSION

Importance: 1



Projects that apply the good practice

TOTAL:	58%
CIVIL ENGINEERING:	52%
BUILDING:	62%

In more than 30 per cent of the perimeter of the area in which the dust is generated.

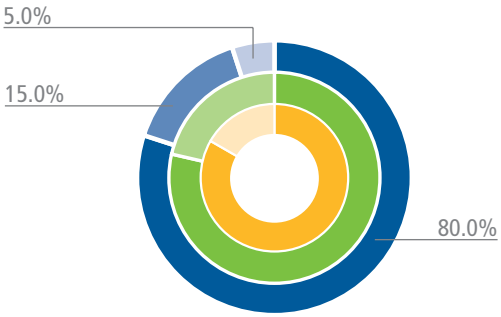
The same, in more than 60 per cent.

The same, in more than 90 per cent.

TOTAL CIVIL ENGINEERING BUILDING

USE OF DRILLING MACHINERY WITH DUST DAMPING SYSTEM, PROVISION OF WET CURTAIN AT THE EXIT OF VENTILATION DUCTS AND OTHER DUST COLLECTION SYSTEMS

Importance: 3



Projects that apply the good practice

TOTAL:	76%
CIVIL ENGINEERING:	86%
BUILDING:	65%

Implementation in one activity.

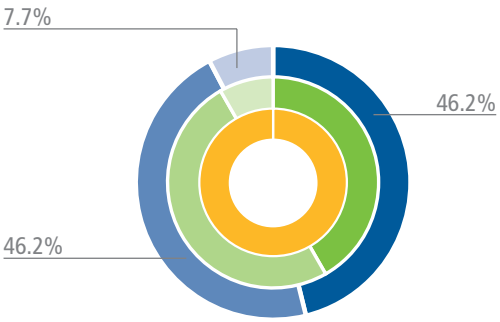
Implementation in two or more activities.

Implementation in five or more activities.

TOTAL CIVIL ENGINEERING BUILDING

IMPROVEMENT OVER THE LEVELS REQUIRED BY LAW IN PARAMETERS CONTROLLED(OPACITY OF DISCHARGES, SUSPENDED PARTICLES, ETC)

Importance: 3



Projects that apply the good practice

TOTAL:	60%
CIVIL ENGINEERING:	70%
BUILDING:	47%

Systematic obtaining of pollutant levels better than those required by more than 5 per cent in all the controlled parameters.

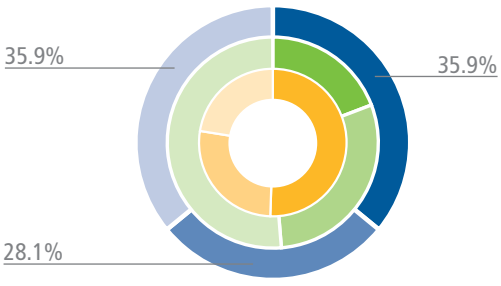
The same in more than 15 per cent or in more than 30 per cent of half of the controlled parameters.

The same in more than 30 per cent of all the controlled parameters.

TOTAL CIVIL ENGINEERING BUILDING

PROPER MAINTENANCE OF THE MACHINERY OPERATING ON THE SITE

Importance: 2



Projects that apply the good practice

TOTAL:	86%
CIVIL ENGINEERING:	95%
BUILDING:	79%

Preventive maintenance for at least 30 per cent of the machines operating on the site.

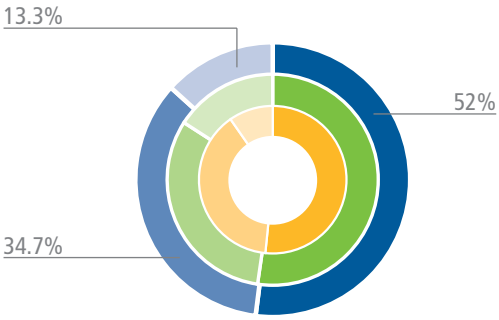
Preventive maintenance for at least 60 per cent of the machines operating on the site.

Preventive maintenance for at least 90 per cent of the machines operating on the site.

TOTAL CIVIL ENGINEERING BUILDING

NIGHT LIGHTING THAT RESPECTS THE ENVIRONMENT

Importance: 1



Projects that apply the good practice

TOTAL:	80%
CIVIL ENGINEERING:	90%
BUILDING:	70%

Directional instead of area lighting for at least 30 per cent of the area or automatic switching on and off.

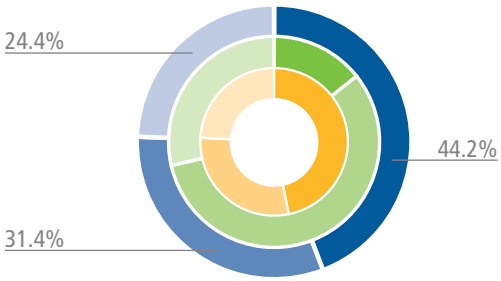
Directional instead of area lighting for at least 60 per cent of the area and automatic switching on and off.

Directional instead of area lighting for at least 90 per cent of the area and automatic switching on and off.

TOTAL CIVIL ENGINEERING BUILDING

USE OF TUBES FOR DUMPING RUBBLE FROM HEIGHTS AND COVERING OF CONTAINERS WITH CANVAS

Importance: 1



Projects that apply the good practice

TOTAL:	82%
CIVIL ENGINEERING:	69%
BUILDING:	84%

On more than 30 per cent of containers.

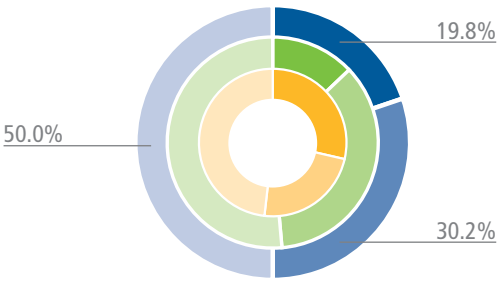
The same, on more than 60 per cent.

The same, on 90 per cent.

TOTAL CIVIL ENGINEERING BUILDING

SUITABLE CONTROL OF SPEED OF VEHICLES ON THE SITE

Importance: 1



Projects that apply the good practice

TOTAL:	84%
CIVIL ENGINEERING:	95%
BUILDING:	74%

More than 30 per cent of the tracks on the site with speed limit signs.

The same, more than 60 per cent.

The same, more than 90 per cent.

TOTAL CIVIL ENGINEERING BUILDING

The good use of energy resources and environmental awareness prevent excessive nuisances arising from the necessary lighting of sites at night. This guarantees the well-being of both persons and animals whose life cycles could be affected.

Because the generation of dust is the greatest problem associated with this group of environmental aspects, the good practices developed in this respect are also greater.

Of these good practices we can stress that in 98 per cent of sites, the tracks and stockpiles are sprayed to reduce the dust emitted to the atmosphere caused by the movement of machinery or by the project work itself. In more than half of sites in which its application is possible, screens are also used against the dispersion of dust on more than 60 per cent of the perimeter of the area in which it is generated, reducing the action of the wind and the possible scope of the impact to the minimum.

There has also been a notable increase in new technologies that reduce the generation of dust since in more than 76 per cent of our sites, machinery is used with damping systems to reduce dust or a wet curtain is set up at the outlets of ventilation ducts and other dust collection systems.

Although it is not such a significant environmental aspect, emissions of combustion gases to the atmosphere are also controlled, attempting to reduce as far as possible the CO_2 generated, in accordance with the Kyoto Protocol. In this sense, in 86 per cent of projects that use machinery, especially intensive maintenance is carried out. Low consumption machinery is used and the vehicles' engines are checked to ensure they are not running during idle periods.

Another type of frequently forgotten pollution, but one to which FCC Construcción also pays great attention, is light pollution. When projects are carried out in rural areas, this can alter the life cycles of many species that depend on the natural day/night cycle and a nuisance to persons and scientific activities in urban areas. For this reason, in natural spaces, yellow lights are preferred to white ones since they cause less nuisance, lighting only those necessary that are necessary and for the necessary time. As far as possible, lights pointing upward are avoided, switching on and off is automated and the lights are maintained periodically.

A-4 southern motorway
New surface in Despeñaperros

Client: Ministry for Development

Description of the environmental action

- Problem detected:

  The work is mostly carried out within the Despeñaperros Natural Park, also proposed as a place of community importance, key ES 6160005, so that care is required when carrying out external blasting since the noise and vibration from it could affect the reproduction cycle of the wildlife, especially birds, very typical and important aspects of this specific environment.

- Solutions adopted:

  To reduce the effect of the most valuable species in the area under study in the breeding, reproduction and nesting periods, the work of clearing, earth-moving, blasting and other activities that generate noise carried out between km 3+500 and the northern limit of the Despeñaperros Natural Park were carried out only between June and November and were stopped in from November to May.

  The work is being carried out taking the above into consideration with controls in relevant inspection points.

- Results:

  The considerations of the conditions of the environment in the working programme mean that the building of the new Despeñaperros road does not involve any alteration in the life cycle of the wildlife in the area.

GENERATION OF NOISE AND VIBRATION

		Actions - opportunities				
		Devices to reduce noise and vibration	Consideration of the conditions of the environment	Reduction of effects of blasting	Use of modern machinery	Speed limits	Rational use of machinery
Risks	Noise pollution	✔			✔	✔	✔
	Nuisance to neighbouring population	✔	✔	✔	✔	✔	✔
	Effects on reproduction cycle of wildlife	✔	✔	✔	✔	✔	✔

In building, the generation of noise is a temporary problems since its intensity level varies widely in time and it always has a limited duration but it may produce peaks of high sound levels, annoying persons and wildlife in the environment in which the work is being carried out unless preventive measures are adopted.

Given that this problem is inherent in building, a series of good practices is carried out to reduce the emission of noise as far as possible, with the awareness that it is preferable to act at the source than at the receiver and from the planning stage of the project instead of during its undertaking.

The proper maintenance of machinery and vehicles used on site is essential as well as their correct choice. Thus, for exhaust gases, engines with a catalyser built in are used preferably while to minimise the effects of noise, noise reduction devices are used either in the machinery or in installations and noisy activities are limited to less annoying times and even to less annoying seasons of the year if any external conditioner so requires it

Thus, in 93 per cent of projects, extraordinary measures are adopted to limit noisy activities to less annoying times, less annoying seasons of the year or interrupting the work occasionally according to external conditioners.

Another good practice carried out in 87 per cent of projects to reduce noise emissions is the use of more modern, less noisy machinery and means that include noise reduction devices such as exhaust pipe silencers, portable anti-noise barriers and shock absorbers as well as their periodic and proper maintenance.

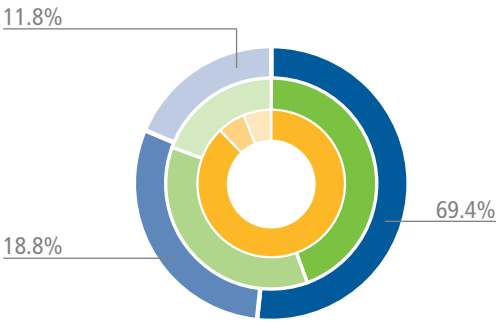
The rational use of equipment is encouraged, reducing its speeds and keeping it switched off when it is not being used in order to reduce noise emission and at the same time energy consumption. In turn, machinery with the EC mark is acquired that obliges it to comply with basic requirements with regard to noise protection.

Signposting is used to identify the areas in which the effects of noise generated by the site activity could be especially annoying or in which there is some type of limit, such as the restriction of hours, activities or special sensitivity.

The following shows the good practices adopted to minimise noise as well as their degree of implementation in projects.

INCORPORATION IN INSTALLATIONS AND MACHINERY ON THE SITE OF NOISE/VIBRATION REDUCTION DEVICES SUCH AS SILENCERS, ANTI-NOISE BARRIERS, SILENCERS, SHOCK ABSORBERS, ETC

Importance: 3



Projects that apply the good practice

TOTAL:	73%
CIVIL ENGINEERING:	83%
BUILDING:	68%

Presence of these devices in some equipment considered critical.

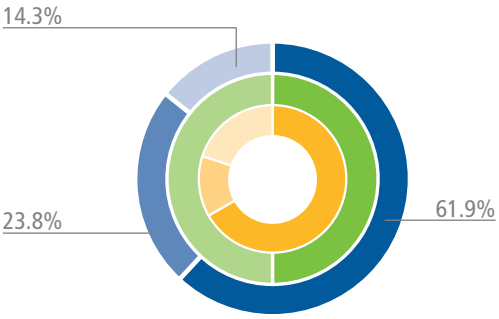
The same in 50 per cent of the equipment considered critical and in 50 per cent of that used at night.

The same in 100 per cent of both critical and that used at night.

BUILDING
CIVIL ENGINEERING
TOTAL

RUBBER LINING IN HOPPERS, MILLS, SIEVES, CONTAINERS, SHOVELS, ETC

Importance: 2



Projects that apply the good practice

TOTAL:	61%
CIVIL ENGINEERING:	62%
BUILDING:	61%

Presence of elements covered with rubber.

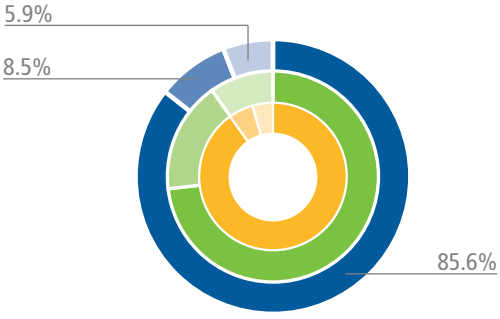
More than 30 per cent of these elements are protected against noise.

The same, more than 60 per cent.

BUILDING
CIVIL ENGINEERING
TOTAL

CONSIDERATION OF ENVIRONMENTAL CONDITIONS IN THE WORK SCHEDULE

Importance: 2



Projects that apply the good practice

TOTAL:	93%
CIVIL ENGINEERING:	94%
BUILDING:	93%

Limitation of noisy activities to less annoying times.

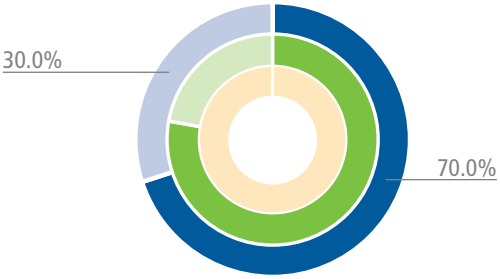
Limitation of noisy activities to less annoying seasons of the year.

Frequent interruption of work as a function of external conditioners.

BUILDING
CIVIL ENGINEERING
TOTAL

REDUCTION OF THE EFFECTS OF BLASTING

Importance: 2



Projects that apply the good practice

TOTAL:	68%
CIVIL ENGINEERING:	78%
BUILDING:	43%

Protection of the affected area through the use of rubber blankets, provision of intermediate barriers between the affected area and the origin of the blasting or protection of sensitive elements using canvas, meshes or other any other device.

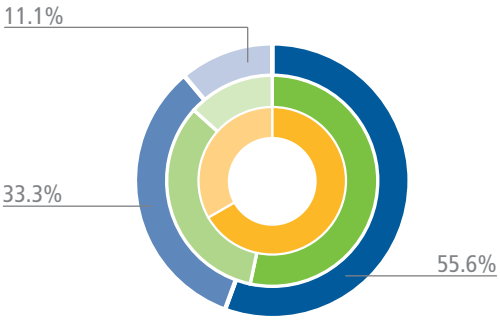
Additionally, use of low density explosives.

Additionally, reduction of the explosive load by micro delays in blasting or preparation of decoupling or spacing of the load.

TOTAL CIVIL ENGINEERING BUILDING

IMPROVEMENT OVER THE LEVELS REQUIRED BY LAW IN CONTROLLED NOISE LEVELS

Importance: 3



Projects that apply the good practice

TOTAL:	60%
CIVIL ENGINEERING:	77%
BUILDING:	38%

Systematic obtaining of noise levels better than those required by more than 5 per cent.

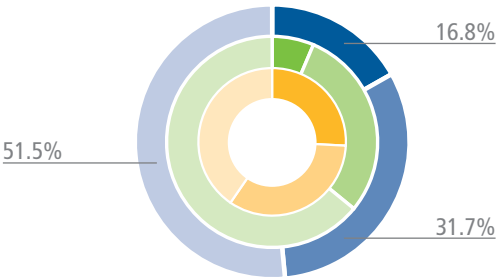
The same, by more than 15 per cent.

The same, by more than 30 per cent.

TOTAL CIVIL ENGINEERING BUILDING

USE OF MODERN MACHINERY

Importance: 2



Projects that apply the good practice

TOTAL:	87%
CIVIL ENGINEERING:	97%
BUILDING:	80%

Percentage of machinery with the EC (own and belonging to sub-contractors) greater than 30 per cent.

This same, greater than 60 per cent.

The same, greater than 90 per cent.

TOTAL CIVIL ENGINEERING BUILDING

Bracons tunnel

Client: GISA

Description of the environmental action

- Problem detected:

  During the boring of the tunnel, a large amount of effluents was produced with high levels of pH and turbidity that required treatment.

  During the first two months of boring, the system adopted to treat the effluents was not entirely effective since it was seen that the turbidity in the water was persistent. This was mainly due to a large amount of suspended solids in it and to the low specific weight of these solids which made decanting very slow. On the other hand, the drilling of blast holes and for bolts and the manufacture and spraying of concrete required a supply of large amounts of water.

- Solutions adopted:

  The solution finally applied consisted of a system to correct the pH, flocculation and coagulation, a decanter and a press filter to dry and collect the sludge. The clarified water obtained in this way is suitable for re-use in the drilling system or for tipping to the public domain.

  The first phase corrected the pH of the drilling water and any filtrations in the tunnel with CO_2 diffusion in the water mass. This was followed by the coagulation and flocculation phase and finally the water was clarified with a prefabricated decanter 8 m in diameter. The decanted mud was treated with an automatically opening and closing press filter equipped with 40 plates measuring 80 x 80.

- Results:

  The sludge drying systems and the use of flocculants were very effective to achieve the decanting of the suspended solids in the effluents and the neutralisation of the pH on the basis of CO_2, an experience that has been repeated in many excavations since it is an optimal solution for high pH levels in waste water.

  The press filter dries the mud by 78 per cent, thus providing type 1 material suitable for tipping and the clarified water from the decanter is suitable for re-use in the drilling system or for tipping to the public domain.

TIPPING OF WATER

		Actions - opportunities						
		Treatment of sewage	Pools for decanting effluents	Treatment of pH	Aeration before tipping	Channelling of water for quick removal	Re-use of process water	Choice of suitable cleaning systems
Risks	Generation of large volumes of tipping.		✔	✔		✔	✔	✔
	Water pollution.	✔	✔	✔	✔			✔
	Adification and resulting effect on marine wildlife.	✔	✔	✔		✔		
	Loss of scarce resources.						✔	✔
	Increased temperature and resulting effect on marine wildlife.		✔		✔			
	Eutrophication.	✔	✔	✔	✔			✔

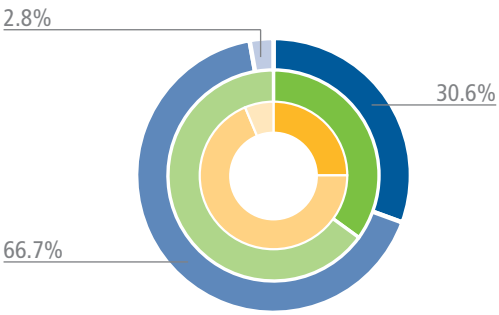
Building is an activity closely connected with water because, on the one hand, it is needed in a large number of operations and, on the other, work is carried out in contact with it in damp environments, rivers and the coast and tipping is generated that could affect the quality of water unless the necessary precautions are taken when working below the water table, when in contact with the materials used in the work or after the necessary operations of cleaning and washing.

Because of all this, FCC Construcción has implemented a series of good practices designed to reduce water consumption, improve the efficiency of its use and reduce associated tippings both in volume and in pollutant load.

The use of geotextile screens is a very effective method for separating fine matter and, by flotation, oil that could enter the water in emulsion, thus preventing the pollution of nearby water.

USE OF PORTABLE TREATMENT PLANTS OR PREFABRICATED RECOVERABLE SEALED PITS FOR TREATING SEWAGE

Importance: 3



Projects that apply the good practice

TOTAL:	71%
CIVIL ENGINEERING:	83%
BUILDING:	62%

Installed at least in the effluent with the greatest flow.

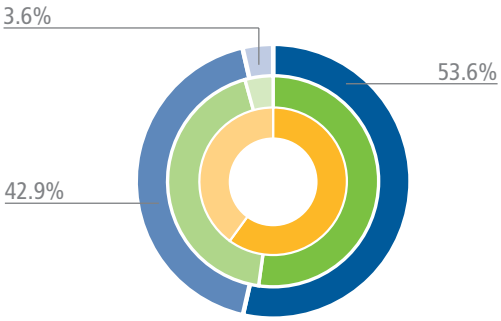
Installed in at least 50 per cent of the points that generate tipping.

The same, with elements recovered from other projects.

TOTAL CIVIL ENGINEERING BUILDING

POOLS TO DECANT EFFLUENTS WITH OR WITHOUT THE USE OF ADDITIVES IN TIPPINGS OF EFFLUENTS AND PROCESS WATER

Importance: 2



Projects that apply the good practice

TOTAL:	83%
CIVIL ENGINEERING:	94%
BUILDING:	65%

That control grease and suspended solids.

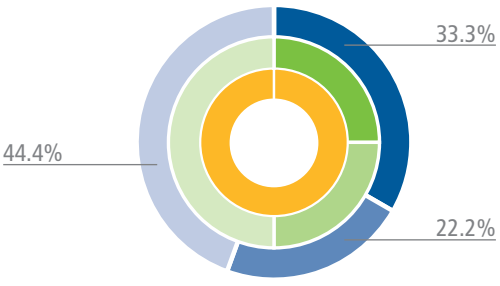
pH as well.

Effluent without colouring as well.

TOTAL CIVIL ENGINEERING BUILDING

AUTOMATED TREATMENT OF PH IN BASIC EFFLUENTS

Importance: 3



Projects that apply the good practice

TOTAL:	57%
CIVIL ENGINEERING:	67%
BUILDING:	44%

Neutralisation with HCl, H2SO4 or CO2 in at least one tipping point.

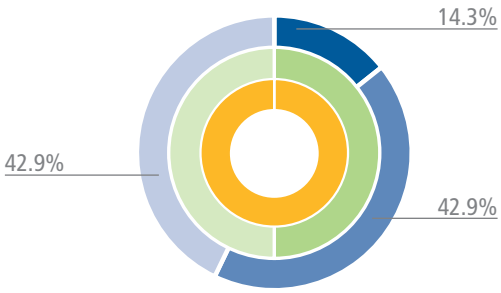
The same, in 50 per cent or at least in two tipping points.

The same, 100 per cent or at least in three tipping points.

TOTAL CIVIL ENGINEERING BUILDING

IMPROVEMENT OVER THE LEVELS REQUIRED BY LAW OR BY THE TIPPING PERMIT IN CONTROLLED PARAMETERS

Importance: 3



Projects that apply the good practice

TOTAL:	47%
CIVIL ENGINEERING:	57%
BUILDING:	36%

Systematic obtaining of pollutant levels better than those required in more than 5 per cent in all parameters.

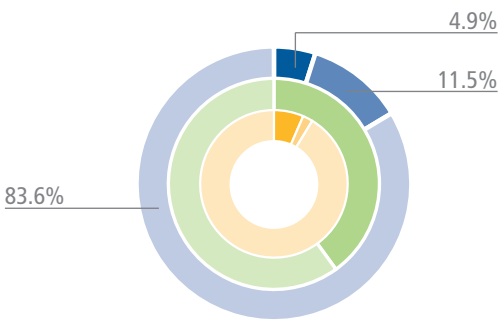
The same, in more than 15 per cent or in more than 30 per cent in half of the controlled parameters.

The same in more than 30 per cent in all controlled parameters..

TOTAL CIVIL ENGINEERING BUILDING

RE-USE OF WATER FOR WASHING CONCRETE TUBS

Importance: 3



Projects that apply the good practice

TOTAL:	79%
CIVIL ENGINEERING:	73%
BUILDING:	82%

Re-use on site for spraying tracks.

Re-use on site for washing further tubs.

Re-use in the concrete plant.

TOTAL CIVIL ENGINEERING BUILDING

Water from sites usually contains suspended solids and emulsified or floating oils. A suitable and effective treatment technique is the use of decanting pools with deflectors where the solids are decanted and the oils separated by flotation.

However small the flow of sewage, it must never be tipped directly. Thus, cesspits or portable treatment plants are installed in FCC's projects, with the relevant authorisation and with period analyses of the quality of the outlet.

In concrete making, treatment of gravels, cutting of natural stone, etc, the minimisation of water consumption and the production of tipping passes through a recovery circuit installation in 83.6 per cent of cases so that the water used for cleaning concrete tubs and other types of washing is made use of.

To treat effluents and improve the quality of waste water, decanting pools are used in 83 per cent of sites in which the grease and suspended solids, the pH the colour of the affluent are controlled. By controlling these parameters, the pollution of watercourses near the site is prevented as far as possible.

Another water emission to be monitored is sewage, which is treated on all sites, 71 per cent of them with portable treatment plants or sealed prefabricated recoverable cesspits installed in at least 50 per cent of the points at which the waste is generated to control grease, suspended solids and pH.

Badalona Marina and fishing port

Client: Marina Badalona, SA

Description of the environmental action

- Problem detected:

  Most of the residues from the excavation are black ashes and slag from burning pyrites and dust and purple soil. The rest consists of remains from the production of copper sulphate. The wastes contained highly polluting elements such as heavy metals and, to a lesser extent, sulphates. The most abundant heavy metals were copper, zinc, arsenic and lead. In prior studies before carrying out the work it was determined that there were some 45,000 m^3 of soil to be decontaminated before transporting to authorised class II tips. By the end of the project, the measurement reached 60,000 m^3 decontaminated.

- Solutions adopted:

  The activities were focused on the management of 45,000 m^3 of class 2 and 3 wastes according to prior studies. This handling consisted of excavating the soil, treating the waste and transporting it to an authorised tip.

  The overall project involved excavating 720,000 m^3 of earth of which 200,000 m^3 were from dredging and excavation below the water table. The plan for the project was to use the sand from the excavation to regenerate the beaches next to the port.

  The problem arose when, during the work, more polluted soil was found, so that at the end of the project, only 85,000 m^3 of soil from the exterior dredging were used on the beach.

  This had two important consequences: the excavation had to be carried out in enclosed areas to prevent the pollution of the marine environment, and it had to be placed in intermediate stockpiles to take samples of the soil every 500 tonnes and thus determine its destination - class I tip or beach.

  Added to this problem was that of handling the polluted soil on the site without polluting the marine environment. It was necessary to excavate in closed areas so that the port was dredged to the 3.5 m level and at this level the material was still great effected by the surface pollution. Further, as excavation progressed, smaller areas of land were left for stockpiling and the work became more complicated.

  The outer areas that could not be reached by land means were dredged using a similar process, forming intermediate stock piles from which samples were taken every 500 tonnes. This excavation caused an important increase in at the schedule for carrying out all the work but guaranteed a suitable destination for the resulting soil, minimising the tipping of soil and making the greatest possible use of the useful sand for regenerating the beaches.

- Results:

  The results were an increase of the volume of decontaminated soil over that initially forecast, the segregation of soil not suitable for regenerating the beaches and the maximum use of the usable volume, avoiding the risk of polluting these spaces.

OCCUPATION, POLLUTION OR LOSS OF SOILS

		Actions - opportunities						
		Restoration of the affected areas	Limitation of occupied and access areas	Prevent the occupation of valuable environmental areas	Concentration of auxiliary installations	Prevention of accidental tipping	Correct undertaking of the loading and unloading operations	Suitable maintenance of machinery
Risks	Occupation of land	✔	✔	✔	✔			✔
	Visual impact on the landscape	✔	✔	✔	✔			✔
	Soil pollution		✔	✔		✔	✔	✔
	The destruction of the regenerative capability of plant life		✔	✔		✔	✔	✔
	Loss of potential uses	✔	✔	✔	✔	✔		

Soil is a resource that cannot be renewed over the short and medium terms and that is highly vulnerable.

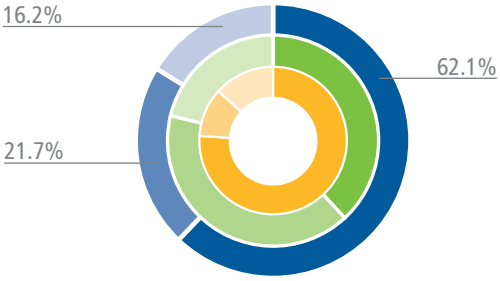
The building sector has a very significant effect on this resource due to the occupation of land by the work carried out and adjoining installations which inevitably and inherently belong to the nature of the work itself. There are however other possible impacts due to the abandoning of areas temporarily occupied by sites and the emission of pollutants to the soil (spilling of fuels, cleaning water and dangerous products, etc) which may destabilise its natural order as a result of the reduction or elimination of the capacity of the plant life to regenerate unless the necessary measures are adopted.

On this basis, greater significance has been given to it than to other resources, setting four good practices that are applied in almost all of FCC Construcción projects, the description and implementation of which can be seen in the following tables.

Building involves large movements of soil, requiring suitable planning in order to be able to re-use the earth and gravel extracted on the site, thus reducing financial and environmental costs.

RESTORATION OF THE AREAS AFFECTED BY THE SITE INSTALLATIONS.

Importance: 2



Projects that apply the good practice

TOTAL:	98%
CIVIL ENGINEERING:	98%
BUILDING:	98%

Cleaning and removal of elements not belonging to the environment or without a later used with written and/or graphical planning of the actions.

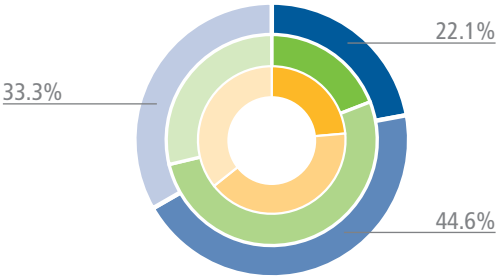
Further, decompacting of the land and matching its layout to the environment.

The same, but adding plants and ornamental elements integrated into the resulting or pre-existing environment.

TOTAL CIVIL ENGINEERING BUILDING

LIMITATION OF AREAS OF ACCESS

Importance: 2



Projects that apply the good practice

TOTAL:	95%
CIVIL ENGINEERING:	96%
BUILDING:	95%

There is written or graphical planning of the road accesses that is respected throughout the site.

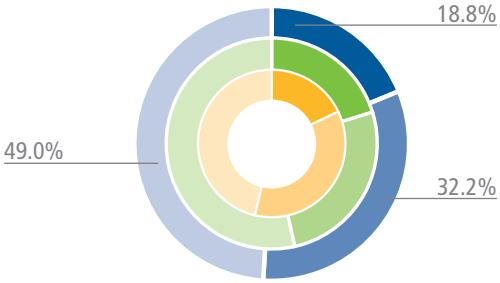
The same, but including physical signposting that delimits them on site.

The same, but limiting road accesses to already existing ones.

TOTAL CIVIL ENGINEERING BUILDING

LIMITATION OF OCCUPIED AREAS

Importance: 2



Projects that apply the good practice

TOTAL:	95%
CIVIL ENGINEERING:	99%
BUILDING:	92%

There is written/graphical documentation of the areas that the machinery and personnel may occupy.

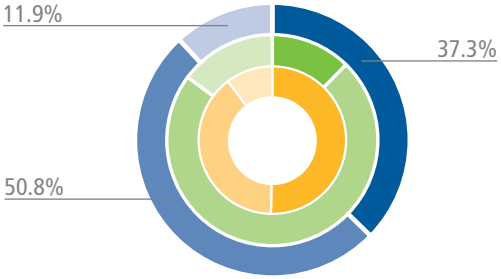
There is also physical delimitation or cordoning off of these areas.

These areas are also limited to the area occupied by the site.

TOTAL CIVIL ENGINEERING BUILDING

PREVENTION OF ACCIDENTAL TIPPING

Importance: 2



Projects that apply the good practice

TOTAL:	97%
CIVIL ENGINEERING:	99%
BUILDING:	96%

Containers are provided for storing dangerous substances or RPs.

The containers are compartmented, separating dangerous materials with different properties and RPs are stored centrally in a single point.

There are also platforms or protected areas for handling or maintaining operations that must be carried out on the site or in the centre.

TOTAL CIVIL ENGINEERING BUILDING

It is preferable to use loam removed from the site itself for the future restoration once work has finished since, in good conditions, this reduces the risk of the proliferation of non-local plant life while facilitating the subsistence of the pre-existing edaphic wildlife as well as blending perfectly into the environment. Also, it must not be forgotten that its re-use involves financial benefits as well as environmental ones, thus bringing us closer to the concept of eco-efficiency.

The restoration of the areas affected by the site installations is an obligatory good practice in all FCC Construcción's projects in which it is possible to apply it. In 83.8 per cent of projects in which it is adopted, elements that are foreign to the environment or that have no later use are removed and the land cleaned and decompacted, shaping it to match the environment and in 16.2 per cent of cases, adding plants and ornamental elements that are integrated into the resulting environment.

The limitation of access areas and occupied areas in order to affect the land as little as possible and the prevention of accidental tippings, through the provision of containers for storing dangerous substances or wastes, which, in more than half of projects, are compartmented so that dangerous materials with different properties are separated and the storage of dangerous waste is centralised in a single point, thus reducing the inherent risk of dispersion and concentrating the means of monitoring it at that point, are obligatory good practices as well as those that could affect the soil and described in the sections on the use of natural resources and generation of waste, given their relationship with operations and the possible pollution of that factor.

Laredo marina

Client: Marina de Laredo

Description of the environmental action

- Problem detected:

  Because of the large production of concrete on the site, more than 200,000 m^3, it was decided to provide a plant inside the area, and to take advantage of the re-use of water from washing the concrete tubs and elements in the plant itself in future mixes.

- Solutions adopted:

  In order to control the tipping of water, a decanting pool was built next to the plant with three big sections for decanting suspended solids, separating greases and oils and correcting the pH.

  The treated water was recirculated by a pump to the concrete plant's water tank, always in small concentrations to prevent damage to the installations, preventing, on the one hand, the generation of tipping to a watercourse and, on the other, minimising the consumption of a necessary and scarce resource such as water.

  Since the volume of water generated on the site was greater than that which could be used in the concrete manufacturing plant, the rest was used for washing tubs or for spraying tracks within the site to prevent the generation of dust. When, because of heavy rainfall, the pool's capacity was exceeded, because the water was very diluted an emergency overflow was provided, connected to a nearby sewer.

- Results:

  The treatment of the remains of concrete in the decanting pool allowed the complete re-use of the water used in the cleaning process. Currently, due to higher production, it is not possible to use all the water generated in the decanting pool for making concrete, so that part is used for washing tubs (30 per cent) and another part for spraying tracks in the site (30 per cent), with the rest being used for making concrete (40 per cent)

USE OF NATURAL RESOURCES

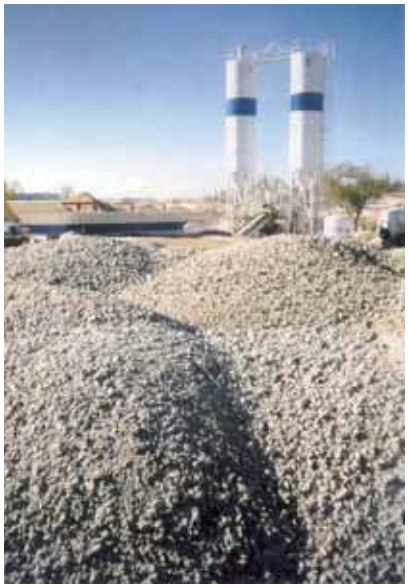
		Actions - opportunities					
		Re-use of inert and recoverable elements	Re-use of removed loam	Re-use of effluents and waste water from process	Reduction of water and power consumption	Compensation of the masses diagram	Exchange of excess with other projects
Risks	Over-use of natural resources	✔	✔	✔	✔	✔	✔
	Drought			✔	✔		
	Climate change	✔			✔		
	Difficulty for opening loans	✔	✔			✔	✔

Our activity needs to optimise the consumption of the resources that it uses. Many of these are not directly involved in the undertaking phase since it is necessary to use the materials that the project demands, but it is possible to optimise their application, preventing unnecessary losses, materials ruined by unsuitable storage or that have expired, there being an important significance in the reduction of raw materials that can be achieved with the suitable management of wastes to recover any value in them as far as possible, thus preventing their loss and the need to consume the resources needed to replace them.

The use of recoverable elements in the processes on sites follows the "three Rs" policy: re-use, recycling and recovery. This results in the improvement of two key aspects in the building sector - the minimisation of wastes generated and of resources consumed.

In fact, the good practices proposed for a moderate and aware consumption of natural resources are both the re-use of inert material or loam removed, from the site itself or from others, and the search for a useful destination other than the tip for excess inert material and the re-use of effluents and waste water from processes, with very satisfactory results being achieved in this area.

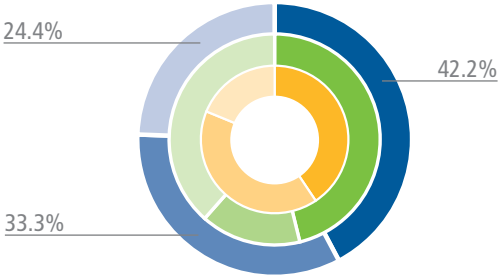
The good practices related to the minimising of resource consumption that have been implemented in FCC Construcción's work during 2006 are shown below.



Whenever possible, excess material from our projects is re-used, even as gravel for making concrete, controlling all the required and recommended quality parameters, thus reducing the consumption of raw materials as well as water and power associated with the making and distributing of basic materials.

RE-USE OF INERT MATERIALS FROM OTHER PROJECTS

Importance: 3



Projects that apply the good practice

TOTAL:	71%
CIVIL ENGINEERING:	75%
BUILDING:	69%

More than 1 per cent of all inert materials (fillings)

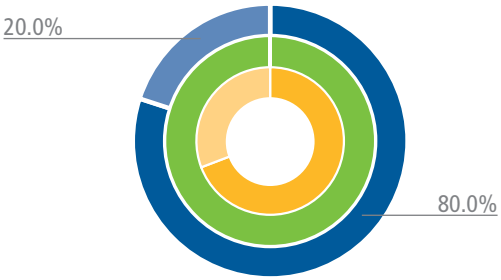
More than five per cent

More than 15 per cent

TOTAL CIVIL ENGINEERING BUILDING

USE OF RECOVERABLE ELEMENTS IN SITE PROCESSES SUCH AS REMOVABLE WALLS (TRADITIONALLY OF CONCRETE AND DEMOLISHED LATER) IN GRAVEL CRUSHING INSTALLATIONS, ETC

Importance: 2



Projects that apply the good practice

TOTAL:	62%
CIVIL ENGINEERING:	72%
BUILDING:	56%

Use of a system in at least 50 per cent of possible cases when carrying out an activity.

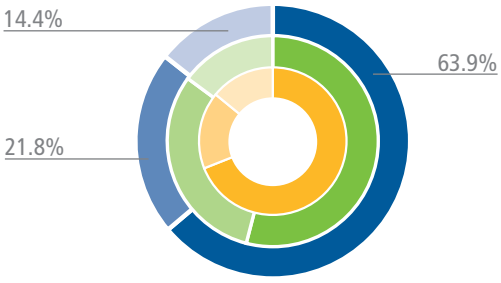
The same, in two or more activities.

The same, in five or more activities.

TOTAL CIVIL ENGINEERING BUILDING

REDUCTION OF LOANS WITH RESPECT TO THE VOLUME FORECAST IN THE PROJECT

Importance: 3



Projects that apply the good practice

TOTAL:	93%
CIVIL ENGINEERING:	94%
BUILDING:	92%

Reduction greater than five per cent.

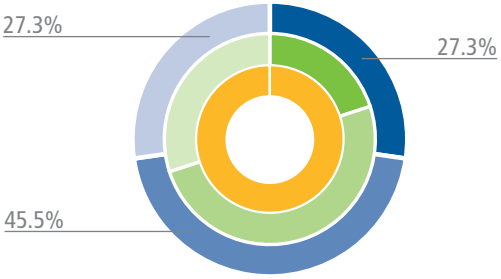
Greater than 15 per cent.

Greater than 30 per cent.

TOTAL CIVIL ENGINEERING BUILDING

RE-USE OF EFFLUENTS AND WASTE PROCESS WATER

Importance: 2



Projects that apply the good practice

TOTAL:	58%
CIVIL ENGINEERING:	74%
BUILDING:	35%

More than 15 per cent.

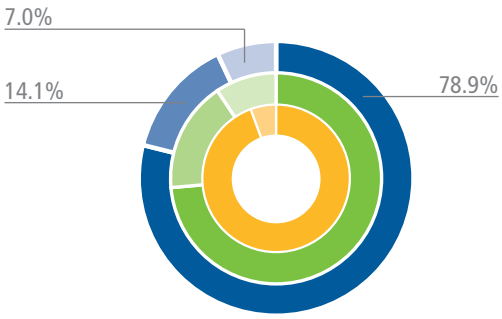
More than 30 per cent.

More than 60 per cent.

TOTAL CIVIL ENGINEERING BUILDING

RE-USE OF REMOVED LOAM

Importance: 2



Projects that apply the good practice

TOTAL:	76%
CIVIL ENGINEERING:	94%
BUILDING:	52%

Separation of loam in horizontal layers at least 2.5 metres deep.

Additionally, overturning of loam stockpiled for more than six months.

Additionally, seeding or fertilising of stockpiled loam.

TOTAL CIVIL ENGINEERING BUILDING

Loam that is to be re-used on the site itself is stored in a special, cordoned-off area to prevent its pollution with other wastes and is overturned periodically to ensure the implementation of the future plant coverage.

The stabilisation of land with the use of lime or cement prevents the need for removing it, thus reducing the amount of waste generated and the need to consume resources, optimising their management.

Inert materials play an important role among those resources traditionally handled in building and they make up an extraordinary volume. Because of this, great importance is given to their minimisation, with inert materials from other projects being re-used in 71 per cent of cases.

Loam removed must also be considered and is re-used in 76 per cent of FCC projects for creating the artificial landscape of the project itself, restoring the soil, the conditioning of fillings and embankments and in places where planting is planned.

With the use of these techniques for minimising and re-using resources, loans were reduced by 93 per cent on building and civil engineering sites over the forecast volume, showing the effectiveness and convenience of this good practice.

With regard to water, this is a scarce resource so that FCC Construcción acts with responsibility in those operations that need to use it such as making concrete, compacting spraying of embankments, curing structures, spraying unpaved tracks to prevent the generation of dust, cleaning equipment and machinery on the site, etc.

In this period, on more than half of sites, measures were provided to re-use effluents and waste water from processes.

The rational use of water is an elemental practice that is simple to apply. The idea is not to skimp on its consumption but to consume strictly the amount that is necessary. This is achieved, for example, with techniques such as the re-use of water for washing conduits.

Siete Aguas - Bunyol high speed train

Client: Railway Infrastructures Administration (ADIF)

Description of the environmental action

- Problem detected:

  Because of the lengths of the tunnels on the route, especially that of La Cabrera, a large amount of good quality material was extracted, mainly limestone, which made up a considerable volume of inert wastes to be handled.

- Solutions adopted:

  Due to the existence of suitable material and the need to acquire concrete as the raw material for work on the route, it was decided to re-use the material extracted from the tunnel in our own plants to make concrete and tunnel linings, thus avoiding the generation of waste and its handling, returning it to the production cycle as a resource with the associated environmental and financial saving.

  For this purpose, the site has a gravel crushing plant in which three sizes of gravel are obtained according to the quality required for the concrete. There is one concrete plant that uses the crushed gravel for the manufacture of this resource and a manufacturing plant for the tunnel linings used to line the tunnel as the tunnel boring machine progresses.

- Results:

  The solution used to reduce the generation of inert wastes avoids the occupation of land as a tip for these and minimises the consumption of resources since they are generated on site using the material that would in principle have been discarded. The location of the gravel crushing plants and the concrete and tunnel lining plants on the site in turn reduces the cost of energy associated with the acquisition of raw materials.

GENERATION OF WASTES

		Actions - opportunities						
		Improvements in the design and building process	Individual classification and handling of the RCDs	Reduction of packaging waste	Handling of excess material from excavation	Evaluation on site	Correct identification and storage of wastes and containers	Purchase of material in suitable amounts and containers
Risks	Generation of large volumes of RCDs	✔	✔	✔		✔	✔	
	High amount and variety of containers and packaging	✔	✔	✔		✔	✔	✔
	Generation of RP and associated risk	✔					✔	✔
	High amount of soil and other excess material from excavation	✔			✔	✔		
	Increased production of wastes due to unsuitable storage		✔	✔			✔	✔
	IIncreased production of waste due to unsuitable transport		✔	✔		✔		

Wastes from building work may have different origins: the installation on the site itself, internal transport from the storage area to the specific area for its application, unsuitable storage conditions, packaging that automatically becomes waste, handling, cut-offs to match geometry, etc.

Considering that the rate at which waste is generated in our current society is greater than the assimilation rate of the environment in which we carry out our activity, that available natural resources are limited, that the physical space that can be used for tips is reduced and that there are regulations regarding environmental matters, it is essential to provide correct management of resources,

The use of means to compact wastes generated (in case of the photograph, paint cans) reduces the space occupied by them and the volume to be transported. This means that the transport of the waste is much more efficient and the associated financial and environment costs are minimised.

optimising their consumption, avoiding the high production of wastes as far as possible.

The integrated management of wastes and resources is necessary since the flow of the former category to the latter forms a desirable solution from both economical and ecological points of view.

Separate areas are set up to collect the wastes generated on the sites, for both dangerous and non-dangerous wastes. This systemises and facilitates their later treatment.
The above photographs show an area for collecting the remains of metalwork, an area for collecting cardboard and a container for collecting used fluorescent materials.

The basic initial stage of the correct management of wastes is to identify the wastes that will be generated on the site and to forecast the quantities that will be produced.

The following monitoring of good practices contains the data for the materials used and those that come from recycling or from better environmental management, as summarised in the following table.

WASTES GENERATED

	Amount forecast	Real amount
Empty packaging (kg)	**103,528**	**502,897**
15 01 10 Empty RP packaging	47,821	56,036
15 01 10 Empty plastic RP packaging	22,807	289,243
15 01 10 Empty metal RP packaging	32,900	157,618
Solid dangerous wastes (kg)	**219,013**	**1,931,729**
15 02 02 Absorbent materials and cleaning cloths that contain SPs	11,724	9,048
16 01 07 Oil filters	8,100	5,175
16 05 04 Aerosols containing SPs	18,505	14,834
16 06 01 Lead batteries	13,286	3,786
16 06 02 NiCad batteries	2,923	2,191
16 06 03 Batteries containing mercury	1,934	703
17 05 03 Polluted soil and rocks	49,322	1,348,643
17 06 05 Building materials containing asbestos	108,810	144,415
17 09 03 Building materials (including mixed) that contain SPs	2,921	390,969
20 01 21 Fluorescent tubes containing mercury	1,488	481
16 01 09 Components containing PCBs	0	11,484
Used oils (kg)	**129,238**	**157,511**
13 01 13 Hydraulic oils	5,725	30,716
13 03 08 Oils from engines, mechanical transmissions and lubricants	106,048	126,795
13 03 10 Insulation and heat transmission oils	17,465	0
Liquid dangerous wastes (kg)	**294,023**	**74,716**
08 01 11 Paint and varnish wastes that contain SPs	5,218	1,185
08 01 17 Wastes from stripping or removing paint or varnish that contain SPs	267	170
08 01 19 Watery suspensions containing paint or varnish with SPs	1,462	1,403
08 04 09 Waste from adhesives and sealants that contain SPs	3,432	1,012
08 04 15 Liquid watery wastes containing adhesives and sealants with SPs	18,259	36,305
13 07 03 Combustible liquids	254,220	23,044
14 06 03 Solvents and coolants	1,885	623
16 01 13 Brake fluid	195	160
16 01 14 Anti-freeze containing SPs	135	790
16 01 21 Coffering removal agents, curing liquids, plasticisers, liquefiers	8,950	10,024
Inert wastes (m)	**24,500,013**	**15,303,243**
17 05 04 Excess soil and rocks	18,603,449	14,787,417
17 01 07 Clean rubble (concrete, mortar, bricks, prefabricated elements, others)	5,896,564	515,826
Urban wastes (kg)	**586,702**	**1,675,392**
20 03 01 Urban and similar wastes	586,702	1,675,392
Other non-dangerous wastes (kg)	**48,491,623**	**184,565,503**
01 05 04 Bentonite mud	10,668,400	8,585,257
08 03 18 Printer toner waste	3,122	3,096
15 01 06 Non-dangerous packaging	10,053	3,869
16 01 03 Unused tyres	2,135	54
16 06 04 Alkaline batteries not containing mercury	3,399	5,121
17 02 01 Wood	807,772	4,105,637
17 02 02 Glass	20,052	46,597
17 02 03 Plastic	154,764	101,909
17 03 02 Bituminous mixes (agglomerates and bitumen)	1,776,787	752,190
17 04 07 Metal	1,579,408	5,578,445
17 08 02 Plaster	15,852	159,205
17 09 04 Mixed rubble (mix of non-dangerous wastes)	32,775,390	161,271,247
19 08 05 Mud from treatment of urban sewage (cesspits and treatment plants)	522,950	3,072,383
20 01 01 Paper and cardboard	151,454	880,486
20 01 32 Expired medicines, class II bio health wastes	85	7

RECYCLED/RE-USED MATERIALS

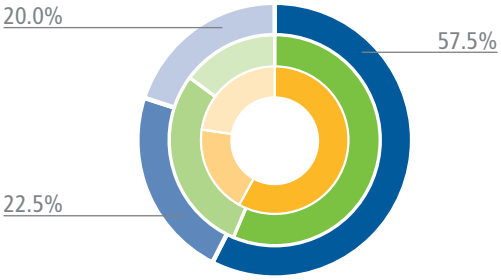
	Amount forecast	Real amount
Excess soil and rocks		
To tip (m^3)	20,732,236	12,000,712
Used on site itself (compensation/excavation/filling) (m^3)	50,460,549	27,374,011
Used from other sites (m^3)	750,400	629,675
Used on other sites (m^3)	3,410,723	4,154,052
Obtained ex profeso (loans) (m^3)	16,097,153	9,510,424
Total excavation (m^3)	85,899,019	48,013,749
Total filling (m^3)	69,394,887	39,241,811
Clean rubble (concrete, mortar, bricks, prefabricated elements, others)		
To tip (m^3)	1,068,427	320,086
Used on site itself (m^3)	2,101,008	98,865
Used from other sites (m^3)	1,000	5,180
Used on other sites (m^3)	3,195	25,888
Delivered for evaluation (m^3)	42,069	92,391

Regarding the forecast amount of soil to be sent to the tip, it is notable that this has been reduced by 42 per cent with 873,134 m^3 having been re-used thanks to the correct management of wastes. In the case of rubble, these magnitudes are even higher, preventing the tip from being the final destination of 70 per cent of rubble.

These results show the work carried out by FCC Construcción in minimising wastes, achieved through good practices such as those shown below.

REDUCTION OF INERT MATERIAL SENT TO TIP COMPARED TO VOLUME FORECAST IN PROJECT

Importance: 3



Projects that apply the good practice

TOTAL:	96%
CIVIL ENGINEERING:	94%
BUILDING:	97%

Reduction greater than 5 per cent.

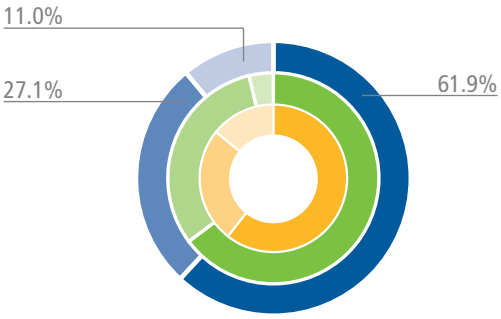
More than 15 per cent.

More than 30 per cent.

TOTAL CIVIL ENGINEERING BUILDING

BUILDING AND DEMOLITION WASTES SORTED FOR INDIVIDUAL HANDLING

Importance: 2



Projects that apply the good practice

TOTAL:	93%
CIVIL ENGINEERING:	97%
BUILDING:	92%

The building and demolition wastes are sorted into two categories.

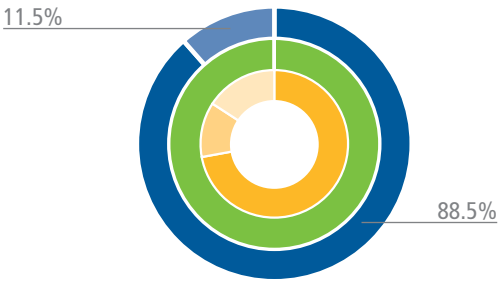
The building and demolition wastes are sorted into four or more categories.

All the building and demolition wastes are sorted and valued.

TOTAL CIVIL ENGINEERING BUILDING

CHANGES IN THE DESIGN OR IN THE BUILDING SYSTEM RELATING TO THE USE OF MATERIALS GENERATED FROM RP SUCH AS FIBRE CEMENT, COFFERING REMOVAL AGENTS, ADDITIVES, RESINS, VARNISHES, PAINTS, ETC, GENERATING WASTES WITH LOWER OR NO DANGER

Importance: 3



Projects that apply the good practice

TOTAL:	64%
CIVIL ENGINEERING:	60%
BUILDING:	65%

Some RP is allowed to be generated in at least one activity on the site, for example, by applying water-based paint instead of paints with organic solvents.

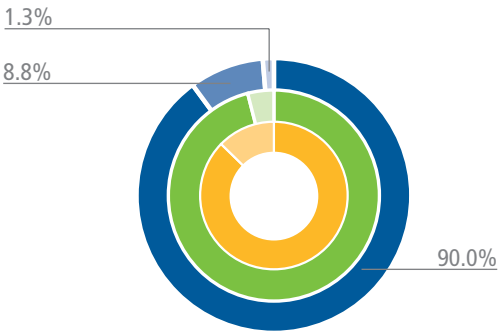
The same, in three or more activities.

The same, in five or more.

TOTAL CIVIL ENGINEERING BUILDING

REDUCTION OF PACKAGING WASTES THROUGH PRACTICES SUCH AS ORDERING MATERIALS IN PACKAGING THAT CAN BE RETURNED TO THE SUPPLIER, RE-USE OF POLLUTED PACKAGING, RECEIPT OF LARGE ELEMENTS OR BULK MATERIALS NORMALLY DELIVERED IN PACKAGING, ETC.

Importance: 2



Projects that apply the good practice

TOTAL:	79%
CIVIL ENGINEERING:	85%
BUILDING:	76%

Applied to two or more materials.

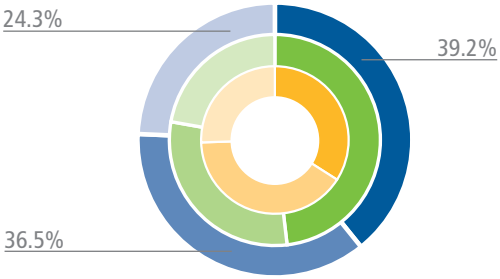
The same, to 5 or more.

The same, to 10 or more.

TOTAL CIVIL ENGINEERING BUILDING

HANDLING OF EXCAVATION EXCESSES

Importance: 2



Projects that apply the good practice

TOTAL:	80%
CIVIL ENGINEERING:	79%
BUILDING:	80%

More than 1 per cent in another project or degraded area.

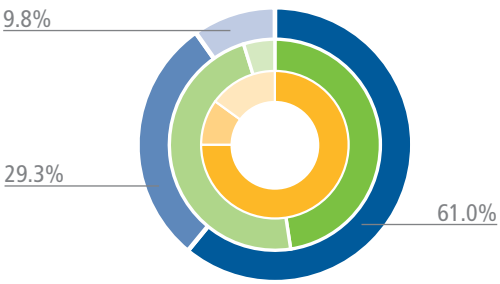
More than 30 per cent.

More than 50%.

TOTAL CIVIL ENGINEERING BUILDING

VALUATION OF RUBBLE

Importance: 2



Projects that apply the good practice

TOTAL:	67%
CIVIL ENGINEERING:	84%
BUILDING:	57%

Re-use or recycling in other project or external plant.

Re-use on same site.

Recycling of stone installing a plant on the site itself.

TOTAL CIVIL ENGINEERING BUILDING

One of the good practices adopted by FCC Construcción in the area of wastes is the valuing of rubble from demolition to form gravel which is used as a new raw material.

In almost all (96 per cent) of FCC Construcción projects, the amount of inert material sent to the tip at the end of the work is reduced compared to that forecast in the design phase.

Residues from building and demolition such as stone, rubble, metal elements, wood, asphalt agglomerate, glass, etc, are the main wastes generated in building activities. It is therefore important to note that in 93 per cent of cases this type of waste is sorted and separated into various categories for individual handling.

With regard to packaging waste, in 79 per cent of FCC Construcción projects, this amount is reduced by practices such as requesting materials with packaging that can be returned to the supplier, the re-use of polluted packaging, the receipt of large elements or bulk supplies to reduce the number of packages used, etc, providing a container for each type of waste, encouraging selective collection from origin.

The handling of dangerous substances and wastes deserve special mention. Although not used in significant amounts in building, they are important because of the effects they may have on the environment and for the different system for treating and handling them.

The practice of the suitable handling of dangerous wastes is generalised in FCC Construcción with proposed changes in the design or building process with relation to the use of materials that could generate dangerous wastes in order to reduce the volume of this type of waste as far as possible.

It is very important to provide correctly cordoned-off and signposted areas for temporarily storing dangerous wastes that must remain closed when not in use. This prevents spillages, tipping and mixtures of dangerous wastes.

It is necessary to reserve a special place to separate and store the great diversity of packages that concentrate on the site,. Its management involves delivery, either to the stored system and return or an integrated management system if they are submitted to some of these or to a financial agent for recovery, recycling or power production.

LAND ARRANGEMENT

Seville - Cadiz high speed line
Jerez airport - Cadiz section
El Puerto de Santa Maria sub-section

Client: General Railways Directorate, Ministry for Development

Description of the environmental action

- Problem detected:

  The route of this sub-section runs for 1,800 m within the Cadiz Bay Natural Park and for another 4,200 m near to it or along its edge.

  This natural park, together with other humid areas nearby, forms a migration route for many birds on their way to Africa or are places chosen by them to pass the winter. Two rivers also run along the route of the project with important water life, both fish, amphibians and mammals. Of special importance is the chameleon (chamaeleo chamaeleon) found in the pine woods crossed by the project that is currently in danger of extinction and protected by Royal Decree 3181/1980, 30 December.

  For this reason, great care was taken during the clearing and cleaning of the land in order not to worsen their situation.

- Solutions adopted:

  The cleaning and clearing work was limited to avoid the breeding and egg laying seasons, from July to October.

  Maximum precautions were taken during the work, consisting of limiting the use of heavy machinery and using manual means. Whenever possible, each plant was supervised carefully since the chameleons often hide among the roots of bushes.

- Results:

  The animals found (about 10) were handed over to forestry agents and taken to the local fauna recovery centre or deposited, where relevant, in nearby pine woods within the Cadiz Bay Natural Park.

AND
ARE

		Actions - opportunities					
		Production of plants	Transplanting	Use of local species in restoration	Project planning (life cycles, critical stages, etc)	Movement of nests and individuals	Use of means to prevent dirt	Use of protective marking and signposting for reduced occupation of pavements and tracks
Risks	Elimination of plants	✔	✔	✔	✔		✔	
	Corrosion, and desertification	✔	✔	✔	✔			✔
	Effects on wildlife	✔			✔	✔		
	Loss of biodiversity	✔	✔	✔	✔	✔		
	Visual impact on landscape	✔	✔	✔	✔		✔	✔
	Dirt in environment						✔	✔
	Interference with the traffic and exterior installations						✔	✔

When the work could affect the life of animals, measures are taken such as moving individuals or providing specific protection.

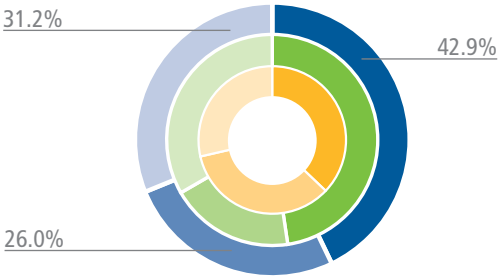
To protect individual plants, the use of ropes, cables, chains, nails, etc on trees is avoided without proper protection as well as the storage of any type of waste it in areas with plants.

As well as affecting abiotic factors (water, atmosphere, soil) the building sector also has a clear effect on the biotic factors such as plant life and animals in the environment in which the work is carried out as well as in the urban medium and service infrastructures for nearby centres of population. Another of the important environmental challenges that concerns FCC Construcción is the conservation of the biodiversity.

The following good practices are used to prevent this effect as far as possible.

PHYSICAL PROTECTION OF PLANTS

Importance: 1



Projects that apply the good practice

TOTAL:	88%
CIVIL ENGINEERING:	94%
BUILDING:	83%

All special individual plants affected by the work are protected.

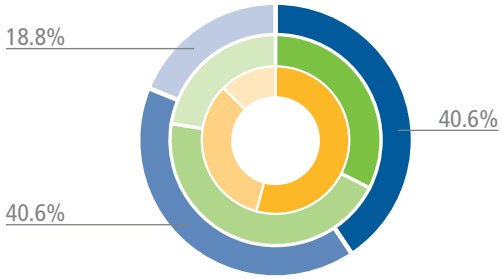
The same, for all plants.

Care and maintenance work is also carried out.

TOTAL CIVIL ENGINEERING BUILDING

TRANSPLANTING

Importance: 1



Projects that apply the good practice

TOTAL:	85%
CIVIL ENGINEERING:	88%
BUILDING:	82%

Special individual plants affected by the project are transplanted.

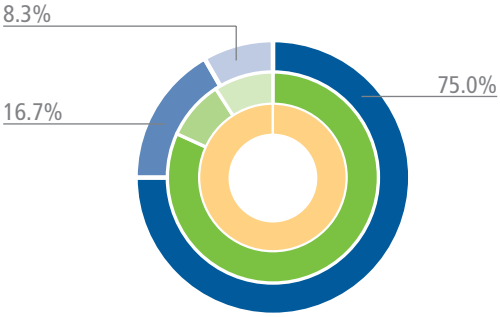
The same for all special plants.

The success of the transplants is greater than 80 per cent.

TOTAL CIVIL ENGINEERING BUILDING

ADAPTATION OF THE PROJECT PLAN TO THE LIFE CYCLES OF THE MOST VALUABLE SPECIES

Importance: 2



Projects that apply the good practice

TOTAL:	71%
CIVIL ENGINEERING:	8%
BUILDING:	50%

The project forecasts are improved.

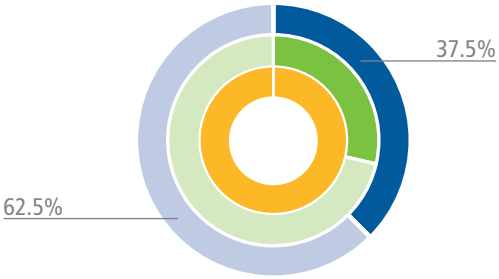
If not included in the project, taken into account and done.

The affected individuals are also monitored for more than six months.

TOTAL CIVIL ENGINEERING BUILDING

MOVEMENT OF NESTS AND INDIVIDUALS

Importance: 1



Projects that apply the good practice

TOTAL:	58%
CIVIL ENGINEERING:	67%
BUILDING:	46%

Some movement is carried out.

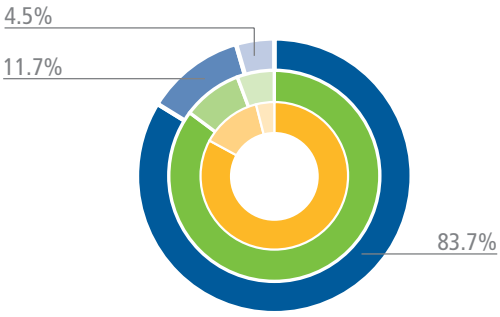
General movement is carried out.

The affected individuals are also monitored for more than six months.

TOTAL CIVIL ENGINEERING BUILDING

USE OF MEANS TO PREVENT DIRT AT THE SITE ENTRANCE AND EXIT

Importance: 2



Projects that apply the good practice

TOTAL:	99%
CIVIL ENGINEERING:	99%
BUILDING:	98%

The entrances and exits are swept systematically.

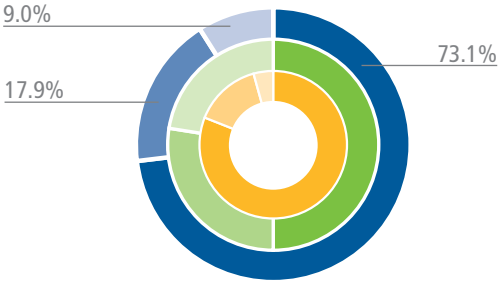
The wheels of all trucks are cleaned before they join the public road.

Fixed devices are used for the above (pits with water at the exit, sprays, etc)

TOTAL CIVIL ENGINEERING BUILDING

OCCUPATION OF PAVEMENTS AND TRACKS

Importance: 2



Projects that apply the good practice

TOTAL:	94%
CIVIL ENGINEERING:	94%
BUILDING:	94%

Protective measures are adopted (fencing, signposting, separation of pavement/road, etc).

Alternative means of access are also provided

The maximum authorised occupation time or space is also reduced.

TOTAL CIVIL ENGINEERING BUILDING

With regard to plant life, in 88 per cent of projects, important examples are physically protected if they might be affected by FCC Construcción's activities, and in 31.2 per cent of cases in which this good practice is used, care and maintenance work is also carried out. Sometimes, some of the plant life cannot be conserved in its original location nor physically protected during the undertaking of the project and in 85 per cent of these cases they are transplanted.

Animals whose habitats may be affected by the undertaking of certain projects are also taken into account, especially in protected areas and those of special landscape value.

Where nesting may be affected negatively by the project, in 58 per cent of cases the nest or individuals are moved, and in most cases the affected individuals are monitored for more than six months.

The most frequent good practices in land arrangement are, nevertheless, the use of means to prevent dirt at the site entrance and exit, carried out in 99 per cent of projects, as well as measures related to the interference with traffic outside the site, such as signposting the entry and exit of vehicles, planning the traffic in the site, the signposting of permitted tracks and temporary accesses and the cleaning of public roads.

'07

Society is watching us

Finding is a matter of tenacity and luck,
which, they say,
is given to those who find it

SOCIETY IS WATCHING US

In this report we have discussed the most relevant environmental factors to our activity. It is a sort of examination of conscience which we hope we have passed but which, as we know, we are required to undergo.

Society is watching us. Nature is watching us. There is an environment around us and we are not always aware that it is watching us and waiting for the results of our management. It is a vulnerable environment but one of which we are part. What happens to it, happens to us. What we do is what happens to us. And we are aware of that.

For this reason, when we say that the environment is watching us, we mean that we have improved our capability for observation. That the quality of our data collection has improved as well as the analysis of the information in this report, because it is of interest to us. Because we are part of this vulnerable environment and we are especially interested in our development, to see what happens to us. We are improving our understanding of the processes, our understanding if sustainability and the road that we must follow.

We have made progress but we haven't finished. Every day we start afresh. We learn from our mistakes - for which we make an effort to identify and get to know them - and we propose new ideas. We have thought about what sustainability means, where responsibility lies, what we owe, and what our commitment involves.

We have taken part in and led various international working groups to prepare standards for sustainable building, defining what this means in building where there is more tradition and in civil engineering where there is a challenge to innovate that FCC Construcción has led from the start, including in ISO standardisation groups. We have improved and increased the means of dialogue with the interested parties. We have increased the effort made in projects to apply good practices, proposing new objectives and increasing their degree of undertaking. We have improved the ratio of materials used in projects compared to those discarded, reducing the resources-wastes flow and sometimes reversing it.

Much has been achieved but, far from being complacent, this encourages us to continue along this line, always aware of what is happening around us, receptive to suggestions made to us, willing to learn and to offer what we have learned and always making efforts to achieve a development that allows us and our children to enjoy our environment.

Balmes, 36 08007 Barcelona
Tel. +34 93 496 49 00
Fax +34 93 487 97 92

General Perón, 36 28020 Madrid
Tel. +34 91 514 10 00
Fax +34 91 514 10 12

www.fccco.es

Premios de Medio Ambiente

GARRIGUES
MEDIO AMBIENTE

Expansión