Environmental Report 2009

FCC CONSTRUCCION

The Environmental Management System and Good Practices

At FCC Construcción, environmental management is based on identifying the most common environmental aspects in our projects.

To facilitate the identification and application of the measures that have to be taken, aspects and actions are classified into a number of groups.

Criteria have been developed for evaluating each group's impact on a given project, in terms of magnitude and importance; as a result, the aspect is rated as part of the integrated planning process that takes place at the start of each project.

Once the environmental aspects have been selected, their potential impact has been evaluated and the significant environmental aspects have been identified for each location, the actions on site are planned homogeneously throughout the organization.

To minimize impacts, at the planning stage, each project identifies what environmental aspects are present and evaluates their significance depending on the expected magnitude or the amount of pollution or disturbance, and the importance and sensitivity of the affected environment.

% OF PROJECTS IN WHICH THE ENVIRONMENTAL ASPECT IS SIGNIFICANT			
ASPECT GROUP	**BLD**	**CE**	**TOTAL**
Waste generation	47%	70%	57%
Land/urban environment planning	49%	67%	57%
Natural resource use	28%	70%	47%
Atmospheric emissions	23%	66%	42%
Environmental accidents	30%	52%	40%
Noise and vibration	23%	46%	34%
Water discharge	20%	32%	25%
Occupation of watercourses or sea bed, and water capture	1%	43%	20%
Radiation: Use of sources of radiation	0%	0%	0%

GENERAL INFORMATION	BLD	CE	TOTAL
Average number of aspects identified per project	42	61	50
Average number of significant aspects per project	5 (11%)	16 (26%)	10 (20%)

BLD: Building / **CE:** Civil engineering

The tables on this page summarise the environmental aspects identified for the projects that were evaluated in 2008 and the number of aspects that were rated as significant.

FCC Construcción has a system of Good Practices in place that calls for actions, over and above the requirements established by law, contract or otherwise, in order to guarantee a real improvement in environmental outcomes.

There is a catalogue of Good Practices that can be selected by projects and applied as and where applicable.

These Good Practices are weighted by their importance. In other words, higher value is assigned to those that are more beneficial for the environment, those that are intrinsically better and those that are new or involve a greater effort for the project, in terms of investment or research, management or ingenuity.

Good practice weightings are also based on their actual scope; i.e. those that are more generally applicable, more widely used or are farther-reaching are scored more highly.

Each project can select the Good Practices it considers to be most appropriate or applicable depending on its activities, thus obviating the difficulty posed by the huge diversity of project types (which prevents blanket application of a given practice).

The target Good Practices are evaluated on the basis of a standardized quantification of two parameters: the importance of the Good Practice and its degree of implementation.

Multiplying those two parameters yields a score that is the true indicator of the project's performance and effort. Our current objective is to score an average of 55 points per project.

A computer application manages the Environmental Plan for the company's projects and centres and guarantees data reliability and availability. The information generated in each project and used by the project for environmental management is entered in a database that provides a snapshot of the company's environmental performance while guiding action for improvement and enabling disclosure to society.

Data veracity is ensured by a demanding system of internal audits and the checks to which data are subjected at the various stages of integration.

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Message from the Chairman

"...sustainability is a process, a way of grasping things and doing things, not a static, definitive destination".

It is time once again for our biennial report on the company's environmental performance. And we present it with pride, since we have continued to make progress, even though conditions did not always make it easy to take better care of our environment.

Succeeding despite adversity is what distinguishes great enterprises from small ones. And I am referring not to companies but to the enterprises that we all undertake every day, some of which will make us great and give meaning to our lives.

This report evidences that caring for our environment is not a passing craze nor an ornament with which we can dispense when it is no longer of interest; on the contrary, it is an integral component of our work and of the way we understand construction.

Whereas two years ago we were aware of our responsibility to the planet and of the need to act so that future generations will enjoy a better world, today we must maintain that vision even though the circumstances have changed. The new situation cannot serve as a pretext for ignoring what really matters; rather, it should spur us to be creative, to seek new solutions. Our strategy is to be increasingly eco-efficient. We will achieve this through efficacy.

FCC Construcción has always taken care of its people and behaved responsibly towards the community. We consider it our duty to provide solutions and build a better and more prosperous society, and we have made a commitment to meet the demands that the community makes of us.

We have taken stock of the current circumstances and are working to model them, reorient them and move to a situation more in line with our view of reality and our responsibility.

We have always understood sustainability as a process—a way of understanding and doing—not a static end-point. Sustainability is always in construction.

José Mayor Oreja
Chairman, FCC Construcción

Introduction

Our determination to improve is embodied in this report through the inclusion of data on discharges, emissions, resource consumption and biodiversity.

Purpose of the document

This is the sixth Environmental Report since we at FCC Construcción pioneered environmental reporting in the industry.

The Report has gone from strength to strength, having received the 2007 Garrigues-Expansión-CIIS Environment Prize in the "Sustainability and Corporate Social Responsibility" category, in recognition of the company's commitment to sustainable development.

Our goal in this Report is to set out the environmental risks stemming from our work and the efforts we make to keep risk at bay. We are aware that knowing about and analyzing risk scenarios is the first step towards better comprehension of how we interact with the environment and that, once the hazards are identified, we can plan Good Practices sufficiently in advance so as to minimize the probability that the hazards will materialise.

We attach great importance to the opinions of stakeholders and the points of view and suggestions of our clients, employees, shareholders, suppliers and subcontractors, government, universities, partners and the general public.

For that reason, we make an ongoing effort to upgrade the instruments we use to gather and analyze data, through which we approach the reality of different projects and from which we draw the information that we distribute to society. Our determination to improve our transparency, disseminate our results and make it easy for stakeholders to assess our management performance is embodied in this Report through the inclusion of data on discharges, emissions, resource consumption and biodiversity.

Yet another edition of our Environmental Report

Since 2000, when we first conceived the idea of creating a report devoted entirely to the company's environmental management work, we have steadily refined the data, expanded information and included examples of projects, with the steadfast goal of producing a report that is both useful and attractive for our stakeholders and for society as a whole.

FCC's role in sustainable construction

FCC Construcción sees itself as an active participant in the definition of sustainable development, and not merely a passive onlooker. We believe that we have a responsibility to shape developments and a duty to provide solutions, share experience and knowledge, and help define pathways and standards that enable us to guarantee optimal outcomes while learning from and avoiding any mistakes that may have been made in the past.

A construction that is more environmentally-friendly and more sustainable can only be achieved with clear guidelines in whose definition we builders must play an active role, by making suggestions, becoming involved in the process and providing solutions and viewpoints from our side of the equation.

As a result, FCC Construcción is a member of numerous committees for developing the standards required for sustainable construction. At present we are in working groups under the ISO/TC 59/SC 17 Committee for Sustainable Construction, where we lead Working Group 5, "Sustainability in Building Construction. Civil Engineering Works" and the Spanish mirror committee, Committee AEN/CTN 198, "Sustainable Construction" (where we hold the vice chairmanship) and Committee AEN/CTN 198/SC2, "Sustainability in Infrastructure" (chaired by FCC Construcción).

In the international field, since Mandate M/350 EN of the European Commission to CEN gave rise to the creation of CEN/TC 350 "Sustainability of Construction Works", FCC Construcción has been involved as part of the "Environmental Performance of Buildings", "Building Life Cycle Description", "Product Level" and "Task Group: Framework" working groups. We have also signed the United Nations' Bali Declaration, which seeks to encourage climate change solutions at the international level.

We chair the Spanish Committee on Engineering Activities in the Planning Process, under the Spanish National Commission on Large Dams (SPANCOLD), and we represent Spain on the Committee on Engineering Activities in the Planning Process for Water Resource Projects, under the International Commission on Large Dams (ICOLD). We belong to the Technical Committee on the Environment in SPANCOLD, to the Environment Committee of the Advisory Group for the Certification of Builders within the European Construction Technology Platform (ECTP), Focus Area Quality of Life, to the "Reduce Environmental Impact" and "Improving the Built Environment for People" working groups , as well as the Spanish Construction Technology Platform, in the Sustainable Construction Strategic Line, "Competitiveness" and "Environment" working groups, and many other organizations devoted to sustainability and the environment.

In short, we understand that our commitment goes beyond doing our best as builders; in fact, we consider that we have a broader-reaching responsibility that includes sharing what we have learned, contributing our perspective, and driving the definition of sustainability standards that guarantee a safer framework for us all. The role to which FCC Construcción aspires has led us to take stock of the current circumstances and work together to model our situation, reorient it and move to a situation more in line with our view of reality and our experience, knowledge and responsibility.

Environmental Performance

Key indicators

To measure the construction sector's effect on the natural environment, we need objective data. We need indicators that enable us to measure, evaluate and control the potential impact of our projects on the condition and quality of natural resources and the environment.

Indicators help us grasp how our projects evolve over time, and they provide us with data for action.

With a view to reporting our performance to stakeholders, we have made an effort to define a common language and a reference system we can share.

This system enables each of our projects to issue reports with the figures that best explain their performance. All these data, which are updated at least once every four months, are integrated at company level to provide average figures for our civil engineering and building activities and our overall performance, as set out in this section.

By using indicators to quantify our interaction with the environment, we can evaluate the importance of that interaction, but the indicators in question need to be sufficiently pertinent and accurate. Therefore, in addition to average figures, we also provide the percentage of projects where the various figures were evaluated. These evaluation percentages give an idea of the data quality, which can be improved in some cases. Nevertheless, data quality is improving steadily, providing a more reliable and more accurate picture of our projects' statuses and their influence on their environs.

The indicator system, which provides the projects with useful information for quantitatively evaluating their environmental performance, covers all phases of the project life cycle, from planning to decommissioning, enabling us to track not only processes, but also their evolution over time.

The following tables contain the average figures for the 2008 fiscal year:

Interaction with the Environment

INDICATORS	AVERAGE FIGURES 2008			% OF PROJECTS EVALUATED		
	Total	Civil engineering	Building	Total	Civil engineering	Building
Distance to the nearest city/town (m)	749	1.071	497	99%	99%	100%
Distance to essential community services, such as fire department, hospitals, official centres, airports, power stations, telephones (x 10 m)	304	348	257	65%	77%	56%
Distance to homes or industrial activities (m)	407	649	223	82%	81%	84%
Distance to authorised landfills for inert or non-hazardous waste (km)	14.4	16	12.3	96%	94%	97%
Distance to bodies of water (x 10 m)	464	210	667	89%	89%	88%
Length of watercourse affected by diversion (m)	206	206	0	10%	22%	0%
Depth of the water table (m)	23	23	24	91%	89%	92%
Simultaneous presence of dangerous substances at the site (x 10 l)	471	975	62	76%	77%	75%

When it is necessary to disturb a nearby river or stream, we can use bioengineering techniques, i.e. living plants, alone or in combination with inert materials, for environmental recovery purposes. These techniques enable us to reduce the possible impact and adapt the actions to the environs, as well as improve economic management of natural resources by reducing construction, energy and maintenance costs.

Project characteristics

INDICATORS	AVERAGE FIGURES 2008	% OF PROJECTS EVALUATED
Area occupied by the construction site (x 10,000 m²)	28 62 1	97% 96% 97%
Area built (buildings) (x 1,000 m²)	11 2 15	63% 52% 71%
Area of offices (x 10 m²)	25 37 16	92% 92% 93%
Area of workshops (x 100 m²)	25 30 1	5% 9% 1%
Area of the site where hazardous waste or dangerous substances are moved or present (x 1,000 m²)	45 83 2	63% 75% 53%
Area of pavement or street/road occupied by the project (x 1,000 m²)	19 49 4	54% 42% 63%
Area of public domain waters or shorelines disturbed by the project (x 1,000 m²)	100 102 5	24% 53% 1%
Number of persons on site (unit)	56 51 59	98% 96% 99%
Number of persons in the office (unit)	9 11 7	90% 92% 89%
Number of auxiliary facilities apart from project office (plants, workshops, prefab buildings, quarries, landfills, machinery pools...) (unit)	2 3 1	85% 88% 82%
Number of vehicles or items of machinery with a combustion engine at the site (not including generator sets) (unit)	15 26 5	89% 95% 84%
Number of generator sets on site for more than five days (unit)	3 4 2	71% 83% 62%
Number of disruptions of traffic (unit)	7 12 1	65% 74% 57%

Total Civil engineering Building

In all projects, we check to make sure we are using the right machinery for the job. The age of the machines, muffler use, rated acoustic power readings and CE markings are all assessed.

By using the best available technologies to minimize CO_2 emissions, noise, and vibration, we help to improve our eco-efficiency.

Building material production

INDICATORS	AVERAGE FIGURES 2008			% OF PROJECTS EVALUATED		
	Total	Civil engineering	Building	Total	Civil engineering	Building
Concrete plant production (x 1,000 m^3)	158	180	53	9%	17%	3%
Asphalt agglomerate plant production (x 1,000 t)	138	159	0	4%	8%	1%
Aggregate plant production (x 1,000 t)	474	565	7	10%	19%	3%
Use on site of asphalt agglomerate (x 1,000 m^3)	59	77	3	45%	77%	19%
Use on site of concrete (x 1,000 m^3)	39	71	13	91%	90%	97%
Percentage of electricity consumption at night-time rates (%)	6	9	4	88%	88%	88%

Sustainable construction analyzes the entire project life cycle, starting with the right choice of building materials and construction processes.

Adhering to these premises, FCC Construcción quantifies and records the main construction materials produced, purchased and delivered on site.

Evaluation of these indicators makes it possible to emphasise the importance of re-use and recycling, extending the useful life of materials and improving material quality.

Borrow pits and quarries are essential for construction. Consequently, it is very important for projects to report information concerning the volumes of borrowed and quarried materials they handle.

Once the resources needed to execute a project have been mined or extracted, restoration work is done at all borrow areas to make sure they blend smoothly back into the landscape. Excavated areas are rehabilitated or restored, and the impact of quarrying and borrow pits is corrected, considering the needs of the local community.

Volumes managed

INDICATORS	AVERAGE FIGURES 2008	% OF PROJECTS EVALUATED
Stored volume of inflammable/combustible substances (wood, paper, etc.) (m^3)	36 57 20	86% 83% 87%
Stored volume of harmful or dangerous substances susceptible to accidental spillage (m^3)	106 186 38	60% 63% 57%
Volume of aggregates and other stocked materials that can make water turbid (x 100 m^3)	339 351 13	15% 32% 1%
Volume of water drawn from rivers or wells (x 100 m^3)	926 942 10	15% 33% 1%
Volume of water consumed in activities other than manufacturing concrete and irrigating levelled and graded surfaces (x 100 m^3)	104 235 28	68% 57% 77%
Volume of topsoil needed on site (x 100 m^3)	518 714 7	27% 44% 13%
Volume of demolitions (x 10 m^3)	816 1,008 498	48% 67% 32%
Volume of blasting (x 1,000 m^3)	345 375 6	13% 27% 2%
Volume of earthmoving (excavations plus infills, levelling plus embankments) (x 1,000 m^3)	494 1,081 41	97% 96% 98%
Volume of borrow areas and quarries used (x 1,000 m^3)	470 493 10	39% 24% 1%
Volume of earth and rubble expected to be disposed in landfills (x 1,000 m^3)	124 264 36	73% 64% 80%
Volume of expected landfill (x 1,000 m^3)	315 383 67	24% 44% 9%
Volume of soil contaminated for reasons not attributable to the project (m^3)	994 1,395 3	16% 25% 8%
Expected volume of inert or non-hazardous dredging sludge (x 100 m^3)	687 749 1	15% 18% 13%
Volume of containing slurry (bentonite) used (x 10 m^3)	209 273 138	85% 79% 90%
Volume of paints, solvents, release agents, concrete-curing agents, accelerants, liquidisers, antifreezes, epoxy resins used (m^3)	1,691 810 2,297	75% 77% 76%

Total Civil engineering Building

To minimise the impact on ecosystem dynamics in the area where we are working, it is sometimes necessary to move species or nests that the project might disturb.

To minimise accidental impacts on fauna in the environs, it is important to have a baseline survey of the local fauna population, particularly protected species, before construction begins, and to have a list of nearby wildlife recovery centres.

In addition to the figures in the foregoing tables, we believe it is necessary to take account of other environmental indicators related directly to the natural environment in which the building or civil engineering work is taking place. The data these indicators furnish are vital for identifying possible impacts, as the first step in conducting an environmental risk analysis.

Depending on the average figures provided by the different areas, we can draw a number of conclusions. For instance, in 60% of our projects, the plant cover within a ten-kilometre radius was less than 50% to begin with, while 70% of our projects did not identify any protected or listed plants. However, 90% of projects identified catalogued or protected animal species. It is important for projects to use this system to identify any animal species that might be affected by our different activities so that we can work right from the planning stage to avoid any possible disturbance.

We also ascertain and record other characteristics of the natural environment, such as the classification of the watercourses and shorelines that our projects may affect. We can conclude from project reports that most of our projects are near natural watercourses in unprotected areas and artificial coastlines.

Eighty per cent of the landscapes near construction sites are catalogued as not significant, and 90% of projects are not located near buildings of historic or artistic value.

On the whole, FCC primarily works in semi-urban areas. Our building projects are mostly located in urban areas, while our civil engineering works are generally located in semi-urban or rural areas. Roads affected by our projects are generally local roads or city streets.

Whether we are working in an urban or a rural environment, we keep the area around the construction site and nearby streets and roads tidy by cleaning up all site entrance and exit areas.

Environmental impacts in the construction sector

Identifying our risks

Although the activities involved in construction are mostly short-lived and not especially dangerous, there are some inherent environmental risks, particularly in regard to:

MAIN IMPACTS

- Impact on nature and the landscape.
- Impact generating air or noise pollution or vibrations.
- Impact on water.
- Impact on the soil and subsoil and involving the handling of dangerous substances.
- Interactions with the urban environment and land planning.
- Consumption of energy and materials, and waste production.

The first stages of environmental risk analysis consist of identifying the risks and the affected environments. All FCC's projects and locations identify the environmental aspects associated with their activities, products or services, and for each site they create a specific list of all the environmental aspects that may cause environmental damage.

The identified environmental risks are then evaluated and priority is given to actions aimed at addressing the main risks, based on their likelihood of occurrence. This is done by assessing the magnitude or quantity of pollution or disturbance involved and the importance or sensitivity of the affected environment.

This entire procedure, which is performed by all FCC Construcción projects, entails environmental risk analysis. By analyzing the environmental risks we can successfully identify and quantify the accident scenarios that could cause significant environmental damage.

Main results

The next page contains a summary of the data collected at the 381 projects from which information was obtained and processed in 2008.

These data tell us which environmental aspects were identified by the projects and how many of them were significant; extrapolating the figures to obtain average numbers for the entire company gives an idea of the risks' likelihood of occurrence.

After analyzing the 381 projects that furnished data, we established a classification system to single out the environmental aspects that proved significant in a higher percentage of projects, i.e. identifying the areas where greater efforts must be made to improve our environmental performance. The table on the next page shows the environmental aspects that were significant in more than 10% of all projects (both building and civil engineering).

The two environmental aspects that were significant in the largest percentage of projects at FCC Construcción belong to the "Land planning" group, specifically untidiness and disruption of streets or roads, primarily due to transport.

The environmental aspect "Operations entailing untidiness on site entrances and exits" was significant in almost half of the projects (49%), and in 54% of civil engineering projects alone. Furthermore, 43% of the reporting centres identified "Spillage of granular material during transport" as a significant risk (again, the figure for civil engineering alone was higher).

ENVIRONMENTAL ASPECT		% projects in which the environmental aspect is significant		
		BUILDING (213 projects)	CIVIL ENGINEERING (168 projects)	FCCCO (381 projects)
U-06	Disturbance of the land/urban environment due to operations entailing untidiness at site entrances and exits. Mud and loose materials	46% (97)	54% (90)	49% (187)
U-07	Disturbance of the land/urban environment due to spillage of granular material during transport	39%(83)	48% (80)	43% (163)
N-41	Electric energy consumption	25% (54)	43% (72)	33% (126)
M-02	Environmental accident due to fire in area for storing inflammable/ combustible substances (wood, paper, etc.)	23% (48)	28% (47)	25% (95)
R-28	Hazardous waste: Contaminated empty packaging (paints, solvents, oils, adhesives, paint removers, release agents, silicone, aerosols, explosives...)	26% (55)	18% (31)	23% (86)
R-62	Municipal waste generated from the recovery and cleaning of facilities/sites	5% (11)	44% (74)	22% (85)
N-02	Water consumed to irrigate levelled and graded surfaces	5% (10)	42% (70)	21% (80)
A-06	Dust emissions due to earthmoving, digging and filling, levelling and embankments	6% (13)	37% (62)	20% (75)
A-10	Dust emission due to transport of earth and rubble	5% (10)	37% (62)	19% (72)
A-09	Dust emission by machinery traffic	2% (5)	39% (65)	18% (70)
R-22	Hazardous waste generated: Paints, solvents, paint removers, polishing liquids, epoxy resins, accelerants, liquidisers, plasticizers, antifreezes, release agents and concrete-curing liquids outside specifications	20% (42)	16% (27)	18% (69)
W-02	Vibrations caused by demolition	13% (27)	21% (36/168)	17% (63)
A-04	Dust created by demolition	11% (23)	22% (37)	16% (60)
V-03	Sewage discharged	15% (31)	15% (25)	15% (56)
N-21	Diesel oil, petrol, fuel oil, coal consumed	0% (0)	34% (57)	15% (57)
M-06	Environmental accident due to underground pipe breakage (electric, telephone, water, liquid or gaseous hydrocarbons)	7% (14)	27% (45)	15% (59)
W-05	Waste generated due to earthmoving: digging and filling, levelling and embankments	8% (17)	22% (37)	14% (54)
S-03	Occupation of water courses and sea bed due to activities in public waters or shorelines	0% (0)	29% (48)	13% (48)
R-06	Inert or non-hazardous waste generated: formwork and moulds	10% (22)	15% (26)	13% (48)
R-23	Hazardous waste generated: contaminated soil due to spillage of chemicals from the site, diesel oil and lubricating oils	7% (15)	20% (34)	13% (49)
R-05	Inert or non-hazardous waste generated: Non-hazardous mixed packaging	17% (36)	7% (11)	12% (47)
U-02	Land/urban environment disturbed due to interference with off-site traffic	2% (5)	21% (36)	11% (41)

Considering the high probability that these environmental aspects will have a considerable impact on the adjacent environment, site access areas are kept suitably clean, shipped materials that might produce dust are kept covered, and drifts of granular material in public streets or roads are collected or swept aside. All these measures are aimed at avoiding untidiness and the consequent repercussions on the area's ecological value.

The "Waste production" group covers six environmental aspects that are significant in more than 10% of FCC Construcción's projects. These are "Hazardous waste generated from contaminated empty packaging" (23%), "Urban waste generated from the recovery and cleaning of facilities/sites" (22%), "Hazardous waste generated: Paints, solvents, paint removers, polishing liquids, epoxy resins, accelerants, fluidifiers, plasticizers, antifreezes, release agents and concrete-curing liquids outside specifications" (18%), "Non-hazardous waste generated: Formwork and moulds" (13%), "Hazardous waste generated: Earth contaminated by accidental spillage" (13%) and "Waste generated: Non-hazardous packaging and packing materials" (12%).

Systematic action is taken to supervise the proper disposal of each type of waste (municipal, non-hazardous or hazardous). In accordance with current legislation, hazardous waste is stored appropriately on-site on a temporary basis (never for more than six months, and unequivocally identifying containers and their contents using standardized labelling procedures) and handled properly. Most action involves checking periodically to ensure that waste types are not mixed, container capacity is not exceeded and the storage area is impermeable, and making a map showing hazardous waste locations.

Marking the places where company and subcontractor vehicles enter the road and implementing a number of ways to keep the construction site entrances and exits tidy minimizes inconvenience to the residents in the immediate area.

On FCC sites, we identify the triggering events that could give rise to environmental accidents, such as fires, underground pipe breakage, breakage of containers or tanks containing dangerous substances, accidental spillage, flooding and unstable terrain.

We identify, classify and pin down the sources of risk in the different processes and activities on-site, and then we evaluate the environmental risks associated with these scenarios and map out preventive and remedial measures.

If certain events do happen, environmental accidents may occur, with consequences of varying importance. Each project pinpoints the group of environmental accident scenarios that might occur so that prevention mechanisms can be arranged. The environmental aspects that have been identified as significant in the highest percentage of projects are "Fire in area for storing inflammable/combustible substances" (25%) and "Underground pipe breakage" (15%).

All FCC Construcción projects draw up Emergency Plans covering all their potential environmental accidents. These plans set out the preventive measures that have been taken and the action to be considered at the onset of a potential event.

In terms of resource consumption, three environmental aspects proved significant in more than 10% of all FCC Construcción projects: "Electricity consumption" (33%), "Water consumption to irrigate levelled and graded surfaces" (42% in civil engineering) "and "Fuel consumption" (34% in civil engineering).

Building uses large amounts of raw materials, water and energy. FCC Construcción is committed to responsible consumption, and we try to minimize our consumption of energy and natural resources. Given the importance of the infrastructure construction sector in the world economy, we must try hard to advance toward a model of construction that does not waste energy or natural resources, i.e. sustainable construction.

The two main strategies for saving electricity are to minimize energy needs right from the planning stage and to make activities energy-efficient in the construction stage. To do so, we use natural lighting as much as possible, organise information and awareness-raising campaigns, use more fuel-efficient equipment, and fluorescent instead of incandescent bulbs, and install automatic economizers.

To reduce consumption of water, fuel and building materials, we take measures to reuse, recycle and recover waste; we also purchase products whose life cycle has less of a negative impact on the environment; and we work to heighten environmental impact awareness among company and subcontractor staff.

Because of the machinery and materials we use, dust emissions into the air are the main source of pollution in construction. Four environmental aspects related to atmospheric dust emissions have been identified as significant in a high percentage of projects (fundamentally in civil engineering projects; they are not so significant in building). These aspects are the following: "Dust emission due to earthmoving" (20%; 37% in civil engineering), "Dust emission due to transport of earth and rubble" (19%; 37% in civil engineering), "Dust emission by machinery traffic" (18%; 39% in civil engineering) and "Dust emission by demolition" (16%).

Considering those aspects, it follows that, apart from specific operations such as demolition and earthmoving, transport is the main source of dust and, therefore, of air pollution.

To minimise dust, FCC Construcción projects have introduced methods such as watering of tracks and stockpiles wherever and whenever necessary, and watering of nearby vegetation affected by dust, proper

We consume water to irrigate dirt tracks, rubble piles and stockpiled materials; this is a very effective method not only of returning water to the environment but also of minimizing atmospheric emissions of dust and particles, which are the main source of air pollution due to construction.

In demolitions, we work to minimise dust and sound emissions. We also remove hazardous waste selectively, in line with the manufacturer's inventory.

Where there is asbestos, we engage a company listed on the Registry of Asbestos Risk Companies (RERA), which draws up a work plan covering the measures needed to guarantee the safety and health of the workers who are going to be carrying out these operations.

supervision of vehicle speed on site, effective total covering of any transported materials that may raise dust, restriction of the area where machinery is allowed to move, paving or stabilization of more heavily travelled areas, and reduction of activity in windy periods when the problem could be aggravated.

The list contains two aspects from the "Noise and Vibration" group: "Noise caused by demolition" (significant at 17% of projects) and "Noise caused by earthmoving" (14%).

Actions taken in FCC Construcción's projects to minimize the risk of noise pollution include performing noisier tasks at times of day more compatible with the area's activity, using modern machinery and maintaining it properly, fitting noise-reducing devices on machinery where this is possible, erecting temporary acoustic barriers, and early scheduling of building structures that can act as acoustic barriers.

The "Action in public domain waters or shorelines" aspect proved significant in 13% of projects (29% in civil engineering projects alone).

Considering the high percentage of projects where this environmental aspect is a priority, and to prevent our projects from significantly disturbing nearby water courses or shorelines, we always apply for authorization from the applicable river basin authority or coastal authority when we are going to engage in actions in public domain waters or shorelines. In addition, we take other measures, such as physically restricting the area of work or storage zones, physically protecting fish-spawning grounds and locating ancillary facilities far from the watercourse or shore.

Construction projects, particularly those dealing with infrastructure, can be located in sensitive natural environments. Whenever we identify potential accident scenarios, we take the necessary preventive measures, e.g. installing retaining barriers with built-in filters.

® FCC Construcción 2009. “System for Evaluating Environmental Behaviour Through Good Practices”

Environmental good practices

Risk analysis can identify opportunities, which we seize in projects by implementing Good Practices

The word “risk” normally has negative connotations. We associate it with the likelihood that the damage will occur and its consequences for the environment and society. However, at FCC Construcción we also look at the other side of risk, i.e. the scope for creating value, since it is by analyzing our risks that we can detect opportunities.

We go even farther. When faced with an imminent threat of environmental damage, we choose and carry out measures to prevent and avoid damage based on the system of Good Practices. This system, first established in 2000, is registered in the Spanish National Intellectual Property Registry under the title “System for Evaluating Environment Performance Through Best Practices”. The FCC Construcción system of Good Practices involves voluntarily implementing a range of environmental practices in all our projects that go beyond the requirements imposed by legislation.

The Good Practices underpin FCC Construcción’s environmental objective, providing a structure that helps each project decide what opportunities to seek and what dangers to avoid. In this way, the most appropriate practices for each location are chosen on the basis of its characteristics, and outcomes are scored accordingly; projects are required to score more than 55 points (the objective set for this year).

In this competitive, globalised world of ours, anybody who ignores the dimension of risks and the value they can provide will inevitably lag behind the pack.

We are aware of this and we manage our risks effectively, implementing at each location the Good Practices that are most appropriate to the project’s characteristics, the surrounding environment and the risk scenarios we have identified in advance.

Good Practices are evaluated according to their importance and their purpose. Greater importance is assigned to those that have a more significant repercussion on ultimate environmental quality and those that require a greater effort (economic, technical, logistical or otherwise) to implement. In addition, the degree of implementation of each good practice is rated on a scale of 1 to 3, where 3 represents the greatest effort or maximum scope of implementation and 1 is the threshold level required to score in that particular Good Practice.

New risks may arise, but different and better opportunities can also be identified for dealing with them. That is why it is vital to regularly review the Good Practice list. Continuous improvement comes into play at this point; based on the results of the previous year, the experience gleaned from the different projects and the progress in research and development concerning the best available technologies, we can add new measures, or improve the existing ones, while also changing the limits established for the goal achievement, if necessary.

The Good Practices in connection with our main business risks are defined within the following environmental categories:

GROUPS OF GOOD PRACTICES

- Relationship with society
- Atmospheric emissions
- Noise and vibrations
- Water discharges
- Soil occupation, contamination or loss
- Natural resource use
- Waste generation
- Land planning (biological diversity, urban environment)

In order to avoid accidental spills of oils, fuels, greases, etc. that might contaminate the soil, impermeable areas are provided where machinery can be greased, maintained and refuelled and tools and machinery can be cleaned.

A number of particularly meaningful conclusions can be drawn from the tracking done in 2008.

- In 2008, in practically all projects (99%), FCC production personnel took the scheduled environmental training course, and subcontractor staff attended environmental awareness and awareness-raising talks.
- In 99% of projects, environmental signposting was used to keep personnel informed and aware.
- In 99% of FCC Construcción projects, the areas disturbed by our facilities were restored, and the immediate surroundings were returned to a condition similar to that which existed before the project began.
- By introducing Good Practices to restrict access areas and occupied areas, 98% of the projects successfully avoided unnecessary occupation of land, which can affect the potential uses of the soil.
- Ninety-eight percent of FCC Construcción projects employ various means of keeping site entrances and exits clean, such as systematically sweeping accesses and cleaning the wheels of all trucks before they leave the site.

- Ninety-seven percent of FCC Construcción projects use the Good Practice of watering dirt tracks and stockpiled materials to reduce the amount of dust and particles raised by construction activities, such as machinery traffic.
- With an eye to preventing accidental discharges, containers are made available for storing dangerous substances or hazardous waste at 97% of FCC Construcción's sites.
- At 96% of FCC Construcción sites, the conditions of the environment are factored into the work schedule. From the outset, noisy activities are planned for the times of day when they will cause the least disturbance, especially in areas near population centres or wildlife habitats that are home to species which are particularly sensitive to noise and vibrations in their breeding and reproducing periods.
- To guarantee compliance with noise emissions rules, 93% of projects employ modern machinery. Also, 90% of projects maintain their machinery regularly.
- In 93% of our projects, we have managed to dispose of less waste in landfills than initially estimated. We have also successfully reduced the amount of borrow material with respect to projections in 90% of cases.
- In 93% of our projects in 2008, we discussed complaints from individual complainants and reached solutions by consensus.
- By giving priority to reuse and recycling alternatives in waste management, 92% of FCC Construcción's projects sought to minimize resource use by utilizing items that had been used previously in other projects, such as portable purifying plants, containers, etc. In addition, the same percentage of sites classified their inert waste into three or more categories for management on a more individual basis.
- During 2008, 90% of projects protected the plant specimens that might be disturbed while work was going on, and care and maintenance were provided where necessary.

Handling and storage of dangerous substances and hazardous waste on construction sites may entail significant environmental risks.

Accidental spillage during transport, storage and use of this kind of substance must always be prevented and avoided. A good practice for this purpose is the use of lidded containers.

When construction may disturb nearby vegetation, preventive and remedial measures are taken to avoid or curtail possible damage.

Activities in this connection include careful pruning by qualified personnel, and remedial action where branches are bruised or broken by machinery.

In addition to measuring the degree of implementation, it is also important to note the scope (i.e., intensity) with which measures are adopted. In the following cases, a high percentage of projects attained the maximum goal set for specific actions:

- In 80% of our projects that reused water from rinsing out concrete drums, the water was reused in the concrete plant itself to make concrete, minimising water consumption.
- Of the projects that performed automatic pH treatment for their basic effluents, 73.3% conducted pH neutralization at all their discharge points.
- In 49.3% of projects, all FCC production personnel took the two-day classroom environmental training course.
- Of the projects where environmental signposting was installed, 43.3% not only utilized full standard environmental signposting throughout the site but also put up awareness-raising posters to reduce natural resource use.

Over the pages that follow, we will present the data we have gathered on projects in 2008 and explain how each of our environmental Good Practices becomes an opportunity when responding to a number of specific risks.

On-site water treatment facilities must be able to purify effluents appropriately, controlling such aspects as oil and grease content, suspended solids and pH, as well as containing accidental spills.

Relationship with society

Good practice

Xagó underwater outfall

Client: Ministry of the Environment and the Rural and Marine Environment

Problem detected:

In the initial design, the pipe-jacking shaft was to be located inside the Xagó Beach dune complex, which is part of the Cabo Peñas Protected Landscape.

This location posed some serious environmental disadvantages, because the jacking work (which involves intense lorry traffic along narrow roads, reduction of the available leisure space, noise pollution, negative visual impact) was expected to seriously disrupt beach use, and spillage of bentonite suspension in the event of a fault in the hydraulic circuit would pollute an area of great environmental value.

In addition, there was not enough space for the jacking facilities in the zone proposed in the approved design, and specimens of Pancratium maritimum and Crucianella maritima would have to be transplanted before work could commence.

Solutions adopted:

Aware of the high environmental value and wealth of the zone, FCC Construcción relocated the shaft outside the protected area. The newly proposed site would not disturb any sensitive areas and was large enough to accommodate the necessary facilities.

Results:

The modification was approved, and pipe-jacking work is proceeding at the new site, which has the following advantages:

- It's not in a protected area.
- It is not disturbing protected flora.
- The project is not interfering with the leisure uses of the beach.
- There is no longer any risk of pollution due to any kind of accidental discharge.
- There's enough space for the jacking facilities.

	ACTIONS - OPPORTUNITIES						Relationship with society	
	Environmental training for personnel	Hiring of contractors who are committed to the environment	Client involvement in management	Communication and transparency with society	Handling of complaints and suggestions	Good environmental management recognized by society	Environmental improvements made to the original design	Environmental signposting
RISKS								
Poor relationships with people	✔		✔	✔	✔	✔		✔
Wasting of resources and production of large amounts of waste	✔						✔	✔
Insufficient separation of waste	✔							✔
Lack of awareness	✔	✔		✔				✔
Insufficient environmental training	✔	✔						✔
Limited communication with affected parties			✔	✔	✔	✔		
Projects that disturb the environment						✔	✔	

Proper application of Good Practices in this field enhances the company's value vis-à-vis stakeholders.

The first step in introducing Good Practices effectively is to let all employees and stakeholders know what our principles are. In doing so, our goal is to achieve overall environmental awareness and transparently voice our environmental commitments and the actions we are taking to protect the environment.

Aspects such as staff training, dialogue and channels of communication with stakeholders and involving stakeholders in the process of protecting the environment by giving them a role to play are vital in order to minimise the probability that environmental risks will materialise. Consequently, the associated Good Practices are assigned a higher level of importance.

The Good Practices implemented in this field and their degree of implementation are given in the table on the next page, which shows the figures for building, civil engineering and all FCC Construcción projects as a whole.

FCC Construcción actively reaches out to all stakeholders in its construction activities in an effort to meet the needs of the people with whom we inevitably interact.

We want to foster participation by and involvement of all interest groups from the earliest stages of planning by sharing information transparently, learning from others' experience and incorporating improvements gleaned from this kind of interaction.

GOOD PRACTICE	IMPORTANCE			GOAL = 1			GOAL = 2			GOAL = 3		
0a. FCC production personnel (up to foremen) who have taken the scheduled two-day environmental training course	3			> 30% of project personnel			> 60% of personnel			100% of personnel		
	Application percentage											
	100%	99%	99%	21.7%	24.5%	22.9%	26.8%	29.3%	27.8%	51.5%	46.3%	49.3%
0b. Subcontractors who have received FCC talks on environmental awareness and training (at least one hour long) concerning the contract work	3			> 30% of subcontractors			> 60% of subcontractors			> 90% of subcontractors		
	Application percentage											
	99%	99%	99%	38.5%	34.4%	36.7%	42.6%	41.1%	41.9%	19.0%	24.5%	21.4%
0c. Subcontractors who apply an environmental management system	2			At least one subcontractor holds ISO 14001 or EMAS certification			> 10% ditto			> 25% ditto		
	Application percentage											
	88%	98%	92%	81.8%	55.1%	69.3%	17.4%	33.6%	25.0%	0.8%	11.2%	5.7%
0d. Subcontractors' environmental performance	3			> 30% of subcontractors perform actions related to waste optimization, have the pertinent permits and licenses and have and fulfil contractual environmental requirements			> 75% of subcontractors perform actions (same as in M=3) or > 30% of subcontractors perform actions (same as in M=1)			> 75% of subcontractors perform waste optimization actions, have permits and licenses and have and fulfil contractual environmental requirements, and in addition either there are no irregularities resulting from their actions or any such irregularities are identified and reported by the subcontractor		
	Application percentage											
	73%	95%	84%	84.0%	72.9%	77.8%	14.7%	18.8%	17.0%	1.3%	8.3%	5.3%
0e. Relationship with stakeholders	3			All aspects that could result in a relevant significant impact have been discussed with the client, and a solution has been reached by consensus			The aspects that most affect society have been discussed with the authorities or the potentially affected associations and individuals			The aspects that most affect society have been discussed with the authorities or the potentially affected associations and individuals		
	Application percentage											
	85%	96%	90%	82.5%	51.4%	66.3%	12.4%	21.0%	16.8%	5.2%	27.6%	16.8%
0f. Complaints	3			All complaints have been discussed with the individuals affected			Consensual solutions have been reached with the complainants			These actions have been taken and there is written acceptance in at least 50% of cases		
	Application percentage											
	92%	94%	93%	55.5%	36.2%	48.2%	34.8%	41.5%	37.3%	9.7%	22.3%	14.5%
0g. Social recognition	3			A note of congratulation has been received in connection with environmental performance			An external publication has praised our environmental performance			We have received a prize with express mention of our environmental performance		
	Application percentage											
	74%	90%	83%	66.7%	87.5%	77.1%	33.3%	12.5%	22.9%	0.0%	0.0%	0.0%
0h. Owner involvement in environmental management	3			The owner knows of the introduction of the Environmental Management System on site			The owner has actively participated in some aspects of the implementation of the Environmental Management Program			A formal presentation of the Environmental Management System was given in a specific meeting		
	Application percentage											
	92%	96%	94%	86.8%	66.7%	77.5%	11.6%	28.8%	19.6%	1.6%	4.5%	2.9%
0i. At least four hours' environmental training for production personnel, from foremen to operators	3			100% of foremen			100% of foremen and > 20% of operators/crew bosses			100% of foremen and > 50% of operators/crew bosses		
	Application percentage											
	88%	96%	92%	51.6%	32.2%	43.6%	31.5%	21.8%	27.5%	16.9%	46.0%	28.9%
0j. Environmental improvements on the original design	3			An environmental improvement to the original design was proposed but not accepted			An environmental improvement on the original design has been accepted			More than one environmental improvement on the original design has been accepted		
	Application percentage											
	59%	90%	78%	36.4%	22.2%	25.0%	45.5%	48.9%	48.2%	18.2%	28.9%	26.8%
0k. Environmental signposting on site to help inform site personnel and heighten awareness	2			Standard environmental signposting for waste is used throughout the site			Full standard environmental signposting is used throughout the site			Full standard environmental signposting and awareness-raising posters are used throughout the site		
	Application percentage											
	100%	99%	99%	22.8%	27.6%	24.9%	31.0%	33.1%	31.9%	46.2%	39.3%	43.3%

Building Civil engineering Total

Environmental training

Personnel's training in environmental matters is the keystone for effective application of Good Practices on site. Environmental education minimizes the risks associated with insufficient training and lack of awareness among the personnel since, in addition to being based on the cognitive learning of capacities, knowledge and skills, it focuses especially on volitional learning, attitudes and outlooks. Once our personnel, suppliers and subcontractors want to behave in an environmentally-friendly way, we are more than half-way towards achieving exemplary environmental management through avoiding thoughtless action that might otherwise lead, for instance, to a large quantity of waste or wasteful consumption of natural resources.

During 2008, 99% of our projects encouraged their production personnel to attend the two-day environmental training course, and subcontractors at 99% of projects were given environmental awareness and training talks in connection with the activities they were to perform. Our goal was to share our knowledge, demands and commitments in environmental matters and encourage them to adopt them as their own.

Another important training activity is oriented toward foremen and operators as a group. Last year they received environmental training in 92% of projects. They are the people closest to the hands-on execution of environmental management, so making them aware creates a great opportunity to reduce the potential environmental risks.

Stakeholder involvement

It is vital to implicate suppliers and clients in environmental management. By setting up smooth, unrestricted communication with them, we can make them aware and motivate them to maintain proper environmental performance.

At 92% of our sites, we hired subcontractors who apply an environmental management system that is certified under ISO 14001 or EMAS, and in general our subcontractors displayed good environmental performance. They worked to optimise waste management, displayed their permits and licenses, met their contractual environmental requirements and reported any environmental incidents to the project's environmental coordinator.

In addition to informing subcontractors of the applicable procedures and requirements, we also furnish them with the necessary training in environmental matters, which avoids the risks associated with shortcomings in training or awareness-raising.

Clients are another important stakeholder group. In 94% of the projects on which we worked in 2008, the FCC Construcción Environmental Management System was presented to the client, the particulars of its application to the job were explained and the client was encouraged to participate actively in some aspects of implementing the Environmental Management Plan. Clients participated in 18% of the projects. Participation improves interpersonal relations and increases communication among the stakeholders, which contribute to avoiding conflicts and the consequent risks.

Any activity done on the site can have major environmental repercussions if it is not done right.

Training in environmental matters gives our workers a different way of seeing things, in which environmental aspects are another input in project decision making. We do not want environmental risks to be the deciding factor, but we do want them to be considered and to contribute to sustainable project management.

Communication

Communication and public image are increasingly important in our business culture as a means toward maximizing stakeholder satisfaction.

We know that communication and transparency are strategic management tools, and we want to broaden their scope in order to use them to manage environmental risks. By strengthening communication, we can minimize the risks that may be caused by a lack of understanding among the players involved.

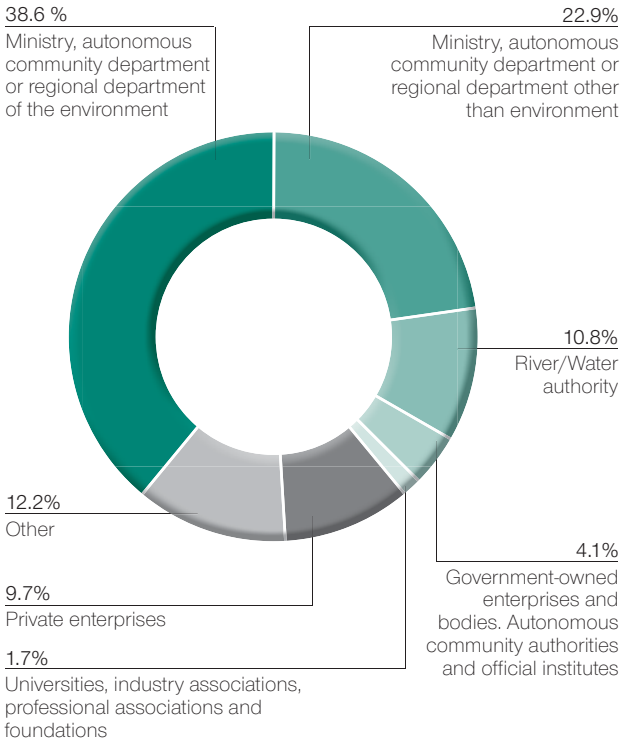
FCC Construcción applies a three-pronged strategy of communication with society:

- Image of FCC Construcción vis-à-vis society in general.
- Establishment of relations with stakeholders.
- Internal flow (upstream and downstream) of information within the project and within the company

Internal and external channels of communication have been established to enable information to flow, making it possible to receive and transmit information about environmental concerns, proposals for improvement and environmental performance, among other matters. For example, last year 83% of our projects received a note of congratulation, praise or a prize for good environmental performance.

Over the course of 2008, communication with stakeholders took place, as shown in the following charts, in terms of the number of environmental relationships established. The total number of communications is categorized according to the institution with which relations were maintained and the subject of communications.

COMMUNICATIONS WITH STAKEHOLDERS



FCC Construcción's offices are always open to suggestions, proposals for improvement and cooperation with stakeholders in order to constantly improve our environmental management system and its practical application.

There is more documentation of the company's relations with third parties this year than in previous years , so the data is now more reliable and representative.

As a consequence of environmental communications with stakeholders, last year the aspects that might have an associated environmental risk were discussed with the organization or institution directly involved in 90% of our projects, and complaints were addressed in 93% of projects . In both cases a consensual solution was eventually reached. In addition, internal and external communication led to the proposal of environmental improvements on the original design in 78% of our projects.

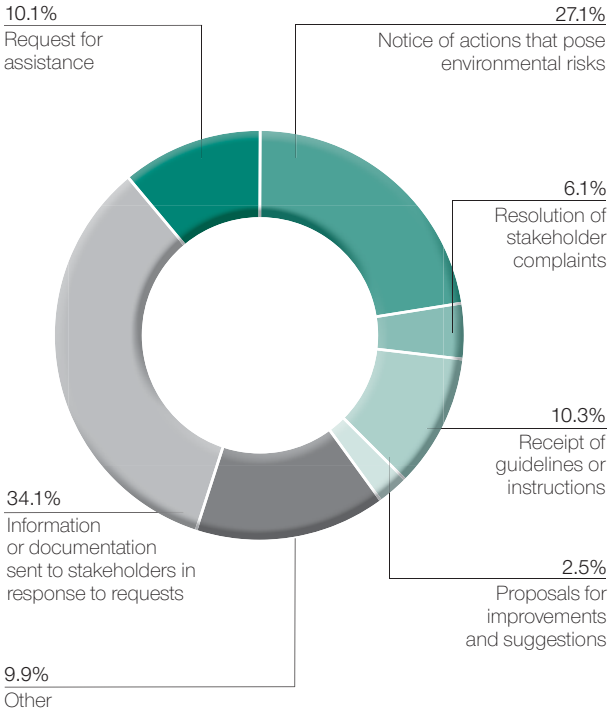
Just as important as external communication is communication with the personnel involved in the project. In environmental matters, practically all projects (99%) use standard FCC Construcción environmental signposting to keep the personnel working on-site and in offices informed and aware.

Good signposting reduces the risks associated with a lack of information and of awareness. It favours good environmental behaviour, particularly with regard to efficient resource and waste management.

As each project is encouraged to participate in effective environmental improvement in its immediate surroundings, FCC personnel and subcontractor's personnel acquire a "culture" of responsible construction.

Environmental signposting is deployed in practically all our projects to help maintain order, keep personnel informed and aware, and facilitate understanding of and compliance with environmental performance by all those involved.

SUBJECTS OF COMMUNICATIONS



Atmospheric emissions

Good practice

UTE Dique Torres

Client: Gijón Port Authority (APG)

Problem detected:

Due to the materials and location, it was found to be likely that on dry, windy days the aggregate-crushing plant in the Aboño industrial area would raise dust, although this would not disturb nearby urban areas.

The dust would be created by limestone crushing and sifting operations.

Solutions adopted:

Various actions were taken to minimise dust emissions.

First, the conveyor belts and aggregate sifters were fitted with cowlings.

Also, a dry-mist dust suppression system was installed. Using this system, airborne dust particles adhere to water droplets until they become heavy enough to fall onto the processing line. Unlike other misting systems, the system installed on this site needs very little water and does not wet the material—it merely dampens the dust. Moreover, it needs no additives or chemicals. The reason why the system is so efficient is that it can generate water particles just a few microns in size, similar to the size of the dust particles that are to be eliminated.

Moreover, the dampening systems at the end of the belt, for the middle cone and the sand, were backed up by several water sprayers installed to complement the DSI system's sprayers. On the sand belt, to optimize the aggregate-dampening process, the sprayers were fitted with cowls to protect them from the wind and, therefore, avoid dispersion of the water spray.

Results:

The results were optimal in all cases, and dust emissions were minimised.

	ACTIONS - OPPORTUNITIES					Atmospheric emissions		
	Irrigation of tracks and stockpiles	Use of screens	Use of dust control systems	Use of rubble removal chutes	Creation of value through improvement on requirements	Proper machinery maintenance	Speed limits	Supervision and limitation of night-time lighting
RISKS								
Climate change						✔	✔	
Increase in the index of particles in suspension (dust)	✔	✔	✔	✔	✔		✔	
Increase in VOC's					✔	✔		
Reduction of environmental quality	✔	✔	✔	✔	✔	✔	✔	✔
Light pollution					✔			✔

All human activities cause air pollution, and the construction industry is no exception. However, its emissions are not very high or significant: dust and particle emissions are the greatest such risk to be found on construction sites.

To prevent and minimize air pollution, we have designed and introduced the Good Practices shown in the table on the next page.

In some projects, we use windrows and plant screens to trap airborne dust. Windrows also reduce noise pollution and minimize the site's visual impact on the surrounding landscape.

Air quality

Operations such as driving machinery over dirt tracks, earthmoving, transporting dusty materials and blasting create dust and particle emissions whose primary associated risks are an increase in the index of particles in suspension and the possibility of impaired air quality in the area around the site.

An increased concentration of particles in suspension in the air affects nearby wildlife, residents (loss of visibility) and plant life (reduction of photosynthesis). To minimize this potential environmental damage, our projects implement a series of Good Practices, such as watering tracks and stockpiles of materials, paving roads, and using screens to trap dust, fine sprays at dust-creating facilities, dust-trapping systems, and chutes for dumping rubble from heights, and also covering containers and lorries with tarpaulin.

In 2008, 97% of our projects systematically watered tracks and stockpiles, 85% used chutes to dump rubble and 75% used screens to reduce wind action and minimise the possible impact.

GOOD PRACTICE	IMPORTANCE			GOAL = 1			GOAL = 2			GOAL = 3		
1a. Reduction of dust by watering tracks and stockpiles	2 Application percentage			Sporadic application			Frequent application			Systematic application		
	96%	99%	97%	38.3%	11.3%	25.6%	43.3%	49.4%	46.2%	18.3%	39.4%	28.2%
1b. Use of additives in irrigation water to create a surface crust, paving of roads and other practices for lasting dust control	1 Application percentage			Sporadic application			Frequent application			Systematic application		
	21%	71%	56%	100.0%	80.0%	81.8%	0.0%	10.0%	9.1%	0.0%	10.0%	9.1%
1c. Use of screens to prevent dust dispersion	1 Application percentage			Along more than 30% of the perimeter of the site where dust is raised			Ditto along more than 60%			Ditto along more than 90%		
	75%	75%	75%	37.5%	53.8%	44.8%	25.0%	15.4%	20.7%	37.5%	30.8%	34.5%
1d. Use of sprayers with molecular action in dust-creating facilities, such as aggregate processing plants	2 Application percentage			Sprayers at more than 30% of dust sources			Ditto at more than 60%			Ditto at more than 90%		
	0%	75%	60%	0.0%	42.9%	42.9%	0.0%	28.6%	28.6%	0.0%	28,6%	28.6%
1e. Use of drilling machinery with dust-wetting system, water curtain on ventilation pipe exhausts or other dust-trapping systems	3 Application percentage			At one activity			At two or more activities			At five or more activities		
	62%	85%	77%	100.0%	80.0%	86.4%	0.0%	6.7%	4.5%	0.0%	13.3%	9.1%
1f. Improvement on the requirements set by legislation for parameters that are checked (discharge opacity, particles in suspension, etc.)	3 Application percentage			Systematic measurement of pollutant levels more than 5% below applicable caps, for all parameters checked			Ditto more than 15% below, or more than 30% below for half of the parameters checked			Ditto more than 30% below for all parameters checked		
	44%	73%	67%	100.0%	63.6%	66.7%	0.0%	36.4%	33.3%	0.0%	0.0%	0.0%
1g. Proper maintenance of machinery operating on site	2 Application percentage			Preventive maintenance for at least 30% of the machines operating on site			Preventive maintenance for at least 60% of the machines operating on site			Preventive maintenance for at least 90% of the machines operating on site		
	82%	96%	90%	56.1%	26.8%	39.8%	24.5%	35.8%	30.8%	19.4%	37.4%	29.4%
1h. Environmentally-friendly night-time lighting	1 Application percentage			Directional lighting instead of ambient lighting in at least 30% of the area, or automated on/off system			Directional lighting instead of ambient lighting in at least 60% of the area, and automated on/off system			Directional lighting instead of ambient lighting in at least 90% of the area, and automated on/off system		
	64%	90%	78%	56.3%	42.9%	48.1%	21.9%	40.8%	33.3%	21.9%	16.3%	18.5%
1i. Use of chutes to dump rubble from heights, and tarpaulins to cover containers	1 Application percentage			At more than 30% of containers			At more than 60% of containers			At more than 90% of containers		
	88%	67%	85%	44.8%	33.3%	44.1%	33.3%	50.0%	34.4%	21.8%	16.7%	21.5%
1j. Proper control of vehicle speed on site	1 Application percentage			More than 30% of construction tracks have speed limit signs			More than 60%, ditto			More than 90%, ditto		
	70%	98%	86%	27.9%	17.3%	20.6%	31.1%	39.8%	37.1%	41.0%	42.9%	42.3%

Building Civil engineering Total

DIRECT AND INDIRECT GREENHOUSE GAS EMISSIONS		
Source of emissions	Emissions ($t CO_2$)	%
Emissions generated	33,869.89	100
■ Indirect emissions associated with electricity consumption	1,702.66	5.03
■ Direct emissions associated with earthmoving	32,167.23	94.97
Emissions avoided	24,246.83	100
Direct and indirect GHG emissions include only those from electricity consumption and earthmoving.		
Avoided GHG emissions include emissions avoided by reusing materials on site, neutralizing effluent pH with CO_2 as reagent and changing the type of fuel which is used.		

Climate change

Other kinds of emissions include combustion gas emissions from a number of sources, such as furnaces, generator sets and machinery in operation. Quantitatively the amount is not material, but they are regarded as significant because they are greenhouse gases, whose presence in the atmosphere is associated with climate change, an environmental problem that clearly has worldwide repercussions.

FCC Construcción is proactive in the fight against climate change, as evidenced by our support for the Copenhagen Call on climate change, which seeks to promote the search for solutions at the international level.

Although construction is classified as a "diffuse sector" and cannot trade emission rights, as part of a leading company in a developed country, we ought to make a greater effort and contribute our experience toward the development of protocols to reduce greenhouse gas (GHG) emissions. This year's Environmental Report contains GHG emission data for the first time. Although the measurement protocol could be improved, it is a step in the right direction and, consequently, we want to share the main results.

Adapting to climate change requires actions that generate tangible short-, medium- and long-term benefits, and they provide business opportunities, such as rebuilding assets damaged by weather, refurbishing existing buildings to upgrade their energy efficiency, retrofitting existing infrastructure and developing new underground designs that offer protection from higher temperatures.

There are a number of strategies that can be used on site. We can help vegetation continue performing its function as a consumer of CO_2 by avoiding the unnecessary felling of trees, transplanting trees and reforesting damaged areas as a mitigating measure. We can reduce, reuse and recycle materials. We can limit our driving speed and foster the use of less-polluting fuels. We can endeavour to use more efficient machinery with the best available technology and provide proper maintenance for existing machinery.

Ninety percent of our projects that involve machinery conduct particularly intense maintenance work. We believe in using machinery with low rated fuel consumption and supervising to make sure vehicle engines are not left idling when not in use.

Light pollution

FCC also pays particular attention to light pollution because of the risk it poses. Excessive lighting has a direct effect on electricity consumption and can have detrimental effects on animal species, traffic safety and personal safety.

To minimize this risk, in 2008 78% of the projects introduced environmentally-friendly night-time lighting, using directional lighting instead of ambient lighting and automatic on/off systems.

To guarantee that gas and particle emissions from construction machinery stay within the limits set by law, we conduct the inspections required by regulation and ensure proper maintenance of the systems installed on our machines to limit their pollutant gas emissions.

Noise and vibrations

Good practice

UTE Línea 9

Client: GISA

Problem detected:

In the tunnel for Line 9 of the Barcelona Underground, noise levels from the conveyor belt carrying excavated material , the rubble tip, the cranes and the conveyor line were higher than allowed by legislation and were potentially a significant nuisance to nearby residents as work was being done around the clock.

Solutions adopted:

Because the construction site was in an urban area, and considering the amount of noise being emitted, it was decided to erect a 60x10-metre metal structure with soundproof panels to reduce the acoustic impact of the conveyor belt and auxiliary machinery. A 4,000-m^2 soundproof roof was also built over the TBM crossing shaft in the La Sagrera zone.

Results:

Installing acoustic panels brought the noise levels down considerably (by about 30 dB), as shown by the acoustic studies conducted periodically during execution.

	ACTIONS - OPPORTUNITIES						Noise and vibrations
	Noise- and vibration-reducing devices	Consideration of environmental conditions	Reduction of disturbances due to blasting	Creation of value through improvement on requirements	Use of modern machinery	Speed limits	Rational use of machinery
RISKS							
Noise pollution	✔			✔	✔	✔	✔
Nuisance for neighbouring population	✔	✔	✔	✔	✔	✔	✔
Disturbance of wildlife breeding cycles	✔	✔	✔	✔	✔	✔	✔

Construction is inevitably going to make noise and vibrations, which may prove a nuisance to area residents and the fauna living in the area.

These are temporary environmental risks whose length is limited to the time it takes to complete the project. However, while noise and vibrations are being created, a number of Good Practices can be applied to minimize acoustic emissions and the consequent risks.

Preventive measures, such as fitting facilities or machinery with noise/vibration-reducing devices, lagging specific noise sources with rubber, limiting the speed of vehicles on site, locating machinery in areas where it will cause as little nuisance as possible and using modern machinery and proper maintenance are ways of reducing noise pollution during project execution.

To minimize the risks of disturbing local residents and wildlife's breeding cycle, projects include other Good Practices in addition to the measures described above. These include consideration of environmental conditions in the work schedule, planning of noisy activities outside sensitive areas, sensitive times of the day or sensitive times of the year and mitigating the acoustic impact of blasting.

By applying common sense to the environmental conditions at each site, we can adjust our planning to minimize the disturbance to wildlife and residents.

The idea is to carry out the noisiest or most bothersome activities at times when they will cause the least disturbance, especially in zones close to residential areas or wildlife habitats containing species that are particularly sensitive to noise and vibrations in their mating and breeding seasons.

GOOD PRACTICE	IMPORTANCE			GOAL = 1			GOAL = 2			GOAL = 3		
2a. Fit construction facilities or machinery with noise/vibration-reducing devices, such as mufflers, noise barriers, silencers, dampers	3 Application percentage			Devices installed on some critical equipment			Devices installed on 50% of critical equipment and on 50% of the equipment used for night-time work			Devices installed on 100% of critical equipment and equipment used for night-time work		
	60%	93%	78%	89.3%	60.5%	71.8%	7.1%	30.2%	21.1%	3.6%	9.3%	7.0%
2b. Rubber lagging for hoppers, mills, sieves, containers, buckets, etc.	2 Application percentage			Presence of components lagged with rubber			More than 30% of these components are protected from noise			More than 60% ditto		
	65%	72%	68%	100.0%	50.0%	89.5%	0.0%	25.0%	5.3%	0.0%	25.0%	5.3%
2c. Consideration of environmental conditions in the work schedule	2 % aplicación			Limitation of noisy activities to the times of day when they will cause the least disturbance			Limitation of noisy activities to the times of year when they will cause the least disturbance			Frequent one-off interruptions of work in response to outside factors		
	97%	43%	96%	88.8%	80.3%	85.9%	6.9%	8.2%	7.3%	4.3%	11.5%	6.8%
2d. Reduction of disturbances due to blasting	2 Application percentage			Protection of the disturbed area with rubber mats, barriers between the affected area and the blast device or protection of sensitive items by tarpaulins, netting or other devices			In addition, use of low-density explosives			In addition, reduction of the explosive charge using microdelays, or uncoupling or spacing the charge		
	20%	84%	75%	0.0%	61.5%	57.1%	0.0%	7.7%	7.1%	100.0%	30.8%	35.7%
2e. Improvement on the legislative requirements in monitored noise levels	3 Application percentage			Noise levels systematically more than 5% lower than those required			Ditto more than 15% lower			Ditto more than 30% lower		
	47%	77%	66%	75.0%	30.0%	42.9%	25.0%	40.0%	35.7%	0.0%	30.0%	21.4%
2f. Use of modern machinery	2 Application percentage			Over 30% of machinery with CE marking (owned by the company and subcontractors)			Ditto over 60%			Ditto over 90%		
	88%	98%	93%	23.3%	9.2%	15.9%	33.3%	33.8%	33.6%	43.4%	57.0%	50.6%

■ Building ■ Civil engineering ■ Total

The table above shows the Good Practices adopted to minimize noise and the extent to which they were introduced at the projects executed last year.

Environmental conditions were considered in 96% of the projects. The potential sufferers were identified in the planning stage so that noisy activities could be planned properly, in space and time, so as to minimise any nuisance.

In addition, 93% of our projects used machinery CE labels, which require the manufacturer to meet certain basic noise protection requirements.

Reducing traffic speeds is one of the most important ways of reducing noise pollution, because noise depends on speed, traffic intensity and driving habits.

Speed limits in and around our construction sites are therefore a very simple, effective measure for minimizing noise.

Water discharges

Good practice

Cortes-La Muela II

Client: Iberdrola Generación

Problem detected:

The water produced when digging the cavern in this project contained a large quantity of solids in suspension, in excess of the levels permitted in our discharge authorization from the Júcar River Basin Authority. The water therefore had to be decanted prior to discharge so as to minimise turbidity.

Solutions adopted:

In order to meet the required parameters, we installed a decanter equipped with a filter press capable of treating 324 m^3 of dirty water per hour.

The wastewater from the cavern excavation is collected at a number of pumping stations and then pumped to a decanter. The clean water spills over the top of the decanter and then flows to the reservoir. The sludge that accumulates at the bottom of the decanter is drawn off through a pneumatic valve into the homogenization tank, which is fitted with a stirrer to prevent the sludge from solidifying. The homogenized sludge is sent to the filter press, which squeezes the water out of the sludge and discharges dry sludge.

Results:

The solution has enabled us to improve the quality of the treated water outflow considerably, so the water can be sent back to the reservoir which will be used by the Cortes-La Muela plant to produce electricity. Thus, valuable water is fed back into the system.

	ACTIONS - OPPORTUNITIES					Water discharges	
	Sanitary water treatment	Effluent-settling ponds	PH treatment	Aeration before discharge	Creation of value by improving on requirements	Reuse of industrial water	Choice of proper cleaning systems
RISKS							
Production of large volumes of wastewater		✔	✔			✔	✔
Water pollution	✔	✔	✔	✔	✔		✔
Acidification and resulting impact on water fauna and flora	✔	✔	✔		✔		
Loss of a scarce resource						✔	✔
Increase in temperature and resulting impact on water fauna and flora		✔		✔	✔		
Eutrophication	✔	✔	✔	✔	✔		✔

In our business, we interact with our surroundings, and one component of the environment that can easily be affected is the hydrological system, especially when the work is taking place in rural areas. Even so, at FCC Construcción we consider all sites, both building and civil engineering, and the ways they might perturb the environment.

If we want all the pieces of the water management puzzle to fit, we must maintain the quality of the environments into which water from the construction area flows, as well as the quantity and distribution of the flows of surface and underground water in each site's area of influence.

To reach these objectives, we designed a series of Good Practices that are described in the table on the following page.

We can therefore say that the construction sector affects water primarily in two ways: quality and quantity.

With the object of selecting the right measures to minimize the risks associated with reducing water quality around construction sites, we analyze the problem at its root, studying the possible sources of site wastewater during both the construction and operation stages.

One option for improving on the required water quality parameters is to take measures to reduce turbidity; we do not want to make it harder for aquatic flora to perform photosynthesis and for aquatic fauna to breathe.

GOOD PRACTICE	IMPORTANCE			GOAL = 1			GOAL = 2			GOAL = 3		
3a. Use of portable purifiers or reusable prefabricated septic tanks for treating sanitary water	3 Application percentage			Installed at least on the largest effluent flow			Installed at least at 50% of the points generating wastewater			Ditto with components reused from other projects		
	65%	90%	84%	27.3%	29.8%	29.3%	72.7%	61.7%	63.8%	0.0%	8.5%	6.9%
3b. Effluent-settling ponds with or without additives for effluents and industrial water	2 Application percentage			To handle grease and solids in suspension			Also pH			Also to ensure the effluent is colourless		
	55%	84%	79%	66.7%	50.0%	52.4%	16.7%	27.8%	26.2%	16.7%	22.2%	21.4%
3c. Automatic pH treatment for basic effluents	3 Application percentage			Neutralization with HCl, H_2SO_4 or CO_2 at least at one discharge point			Ditto for 50% or at least two different wastewater flows			Ditto for 100% or at least at three discharge points		
	14%	69%	58%	100.0%	21.4%	26.7%	0.0%	0.0%	0.0%	0.0%	78.6%	73.3%
3d. Improvement in controlled parameters over the requirements set by legislation or the discharge permit.	3 Application percentage			Pollutant levels systematically more than 5% better than requirements in all parameters			Ditto more than 15% better, or more than 30% better in half of the parameters checked			Ditto more than 30% better in all parameters checked		
	50%	62%	58%	66.7%	83.3%	77.8%	33.3%	0.0%	11.1%	0.0%	16.7%	11.1%
3e. Reuse of concrete drum-rinsing water	3 Application percentage			Reuse at site to irrigate roads			Reuse at site to rinse other drums			Reuse in the concrete plant		
	79%	87%	82%	20.0%	13.3%	17.5%	4.0%	0.0%	2.5%	76.0%	86.7%	80.0%

Building Civil engineering Total

Good Practices such as treating sewage, effluent settling ponds, a drainage and purification system for construction effluents, sediment retention barriers and treatment for runoff water reduce some of the potential problems of water quality, such as pollution, acidification, temperature increase, turbidity, eutrophication and the resulting perturbation of aquatic flora and fauna.

No matter how small the amount, sewage is treated on all sites. In 78% of projects either portable purifiers or reusable prefabricated septic tanks are used at no less than 50% of the points that generate outflow.

To treat wastewater, 79% of our projects use settling ponds. Solids in suspension are removed by sedimentation, and parameters such as grease and oil, pH and colour are controlled.

Settling ponds achieve two goals: sedimentation, where the solids in suspension in the water from the project's different activities settle out, and minimisation of the risk of spillage of pollutants and dangerous substances.

By keeping these parameters under observation, we get minimise the risk of water pollution near the site. If settling ponds alone are not enough to lower parameters below the established figures, we add the necessary purification systems to yield adequate wastewater quality. In fact, we do this in 58% of our projects, where the basic effluents are subjected to automatic pH treatment through neutralization with HCl, H_2SO_4 or CO_2 at discharge points.

In this way, we improve on the requirements set by legislation or discharge permits in the parameters that are checked at three out of every five projects .

In addition to improving wastewater quality, we try to be more efficient in how we use water, which is a scarce resource, and we try to reduce the volume of water we discharge. To avoid these two risks, we optimize certain activities in construction, and 82% of our projects reuse concrete drum-rinsing water in track irrigation, to rinse other drums or at the concrete plant, if the site has one.

Because we know the importance of the quantity of resources we consume, use, discharge or recycle, we are starting to quantify the wastewater produced by our locations, keeping track of the volumes by type and location. Below are some of the main results found in 2008.

When hydrocarbons are spilled into our settling ponds, we deploy grease and hydrocarbon barriers near the spill to contain it and prevent or hamper it from spreading and moving, and so we limit the size of the polluting event as much as possible. As a complementary measure, we remove these dangerous substances from the pool using absorbent barriers, which float on the water's surface once they have become saturated. Then we place them in appropriate disposal containers and lay out new barriers.

WASTEWATER DISCHARGE, TYPE AND DISCHARGE LOCATION		
Type of wastewater	Amount discharged (m^3)	%
By wastewater type		
Sanitary water	376,588.75	34.31
Industrial water*	721,109.74	65.69
Total	1,097,698.49	100
By discharge location		
Discharged into PDW, PDS or PSS**	1,085,132.73	98.86
Recycled or reused on site	12,565.76	1.14
Total	1,097,698.49	100

(*) Only concrete plant effluents have been included in industrial water.

(**) PDW: public domain waters, PDS: public domain shoreline, PSS: public sewage system.

Soil occupation, contamination or loss

Good Practice

UTE Vidreres

Client: CEDINSA

Problem detected:

In the last section of a road project, where an embankment and some cross-drainage work were planned, the soil was found to be contaminated for reasons not attributable to our project. The area used to be a landfill for building materials, and we detected the remains of fibre cement containing asbestos.

To decontaminate the area, it was decided to dig out the contaminated soil using specialized equipment because of the asbestos.

Solutions adopted:

The contaminated area was excavated by an authorised company belonging to the FCC Group, with personnel specifically equipped to avoid inhaling or otherwise coming into contact with asbestos particles. Signs were posted, and the work area was fenced off, with a single entrance for better access control. Only authorised personnel were allowed to enter.

The contaminated earth was loaded onto lorries in hermetically sealed “Big Bags”, which kept the material from being scattered by wind in transit to a proper landfill. The soil was handled as class III waste at the Castellolí landfill, which is also managed by a group company and is the only landfill in Catalonia authorised to treat this sort of waste.

At the exit from the work area, lorries were washed to avoid propagating asbestos particles off-site, and dust on the worker’s coveralls was eliminated with compressed air.

Results:

We handled a total of 19,250 tons of contaminated earth in these soil decontamination operations, thus averting the risk of contaminating the area at the end section of the road.

After the area in question has been fully decontaminated, we can proceed with the drainage work and build the base for the embankment.

	ACTIONS - OPPORTUNITIES				Soil occupation, contamination or loss		
	Restoration of disturbed areas	Limitation of occupied areas and access areas	Avoidance of occupation of environmentally valuable zones	Clustering of auxiliary facilities	Prevention of accidental discharges	Correct execution of loading and unloading operations	Proper machinery maintenance
RISKS							
Land occupation	✔	✔	✔	✔			
Visual impact on the landscape	✔	✔	✔	✔			
Soil contamination		✔	✔		✔	✔	✔
Destruction of the flora's regenerative capacity		✔	✔		✔	✔	✔
Loss of potential uses	✔	✔	✔	✔	✔		

Soil is fundamental in the development of ecosystems on land as it is the basic medium for plant growth, which is decisive for all other trophic levels.

However, this vital resource is scarce, highly vulnerable and hard to renew in the short term. Therefore, it is vital to take measures to prevent and avoid potential damage as we carry out our activities.

As we work, we inevitably occupy a space that is not limited solely to the area of the project per se. We also occupy a series of adjacent areas, where we set up the necessary machinery facilities, access roads, and storage zones.

Topsoil management is highly recommendable not only because it preserves this vital ecosystem but also because it spares the amount of topsoil that has to be procured later for restoration.

GOOD PRACTICE	IMPORTANCE			GOAL = 1			GOAL = 2			GOAL = 3		
4a. Restoration of areas disturbed by construction facilities	2			Cleaning and removal of all things foreign to the environment and of no subsequent use, with written and/or graphic planning of what is to be done			In addition the earth is decompacted and shaped to blend into the surroundings			Moreover plants and decorative items are added to the resulting or pre-existing environment		
	Application percentage											
	100%	98%	99%	75.6%	42.7%	61.0%	13.2%	29.9%	20.6%	11.2%	27.4%	18.4%
4b. Limitation of access areas	2			There is written or graphic planning of access roads, and these plans are respected throughout the project			There is also signposting to delimit the access roads			Access roads are limited to existing roads		
	Application percentage											
	97%	99%	98%	26.7%	22.7%	25.0%	42.6%	49.2%	45.4%	30.7%	28.1%	29.6%
4c. Limitation of occupied areas	1			There is written/graphic documentation of the areas that machinery and personnel may occupy			In addition there is physical delimiting or marking of said areas			In addition these areas are limited to the zone occupied by the project		
	Application percentage											
	95%	99%	97%	25.3%	24.5%	24.9%	36.7%	33.8%	35.4%	38.0%	41.7%	39.7%
4d. Prevention of accidental discharges	2			Containers are provided for storage of dangerous substances or hazardous waste			The containers have compartments to separate different hazardous materials, and hazardous waste storage is centralized			In addition there are platforms or protected areas for any handling or maintenance operations that have to be done on site		
	Application percentage											
	97%	97%	97%	34.6%	25.4%	30.7%	58.2%	53.5%	56.2%	7.2%	21.1%	13.1%

■ Building ■ Civil engineering ■ Total

We may end up compacting the soil more than strictly necessary or possibly contaminating the land with accidental dumping or spillage, which can significantly affect the local plant life's regenerative capacity. In addition to considering the environmental damage, we do not want to lose sight of the fact that soil contamination can pose a major risk to human health, since contaminants can seep into groundwater or into the trophic chain through plants.

We understand the importance of this natural resource within the ecosystem. Consequently, practically all our projects apply the Good Practices that have been defined for soil, as shown in the table on this page.

Restoration of the areas affected by construction facilities is a Good Practice that mitigates the environmental risks of land occupation, visual impact of construction on the surrounding landscape and loss of potential uses of the land on which we erect buildings and infrastructure.

The use of geocells when restoring a water course helps plants to grow back on the banks, because geocells halt erosion and provide plants with pockets in which to take root.

For 99% of our projects, the site is restored at job completion. Restoration includes operations such as cleaning up and removing anything not native to the environment, loosening compacted soil, removing the topsoil (which is stockpiled and properly maintained so it can be reused later), replanting the restored area and blending it into the landscape.

Limiting access areas and land occupation are two very simple yet highly effective Good Practices that were taken at 98% and 97%, of our projects during the last year, respectively.

The purpose of temporarily limiting the areas we occupy is to establish a physical barrier between the work area and unoccupied areas, to prevent sprawl. With the same object in mind, we cluster all our auxiliary facilities in a single area and avoid occupying environmentally valuable areas so as not to disturb or alter the soil by compacting it.

These actions on the project's part minimize the risks of soil occupation, compaction and contamination, and they maintain the soil structure in such a way as to allow permanent plant cover to take root and grow. In this way, we respect the potential uses of the land in our work's area of influence.

In 97% of FCC Construcción's projects executed during 2008, actions were aimed at preventing the accidental discharge of pollutant substances of any kind.

To accomplish this, we pay special attention to the correct performance of loading and unloading operations and lubricating, cleaning, maintaining and fuelling machinery, and we also have container areas for storing dangerous substances and hazardous waste. Before we start a project, we prepare an Emergency Plan, which systematically defines actions and outlines the necessary soil protection measures in the event of an accidental discharge or a leak from a recipient or storage tank containing dangerous substances.

In construction, we have to occupy some space. However, it is important to occupy only the space we really need, for only as long as we need.

To avoid occupying more space than strictly necessary and in cases where there are especially sensitive areas, we mark the areas where movement is allowed.

Machinery maintenance operations are among the activities that may pose significant risks to the environment, because they involve handling and storing dangerous substances and hazardous waste.

In order to prevent and avoid accidental discharges, we set up specific areas for these operations, so there is no seepage of potential pollutants.

Natural resource use

Good practice

Ferreira-Foz Road

Client: Galicia Regional Government - Department of Land Policy, Public Works and Transport

Problem detected:

The project was located in a very important rural environment, and there was a surplus of material from a pre-existing road which had to be removed to a controlled landfill for building waste. We therefore needed to take steps to minimize impact and reduce the volume of waste.

Solutions adopted:

With the goal of reducing the amount of inert waste created, FCC Construcción looked at the possibility of using a sandwich of surfaces made of cement mix and hot bituminous mixture.

The cement mix was made by recycling old road surface with cement in a wet process in the areas where the new road ran on top of the old road, and by recycling selected materials in the areas where the new road departed from the old route.

After a preliminary series of test bores to ascertain the precise thickness and characteristics of the road surface, we built a test section to check the results of our working formula. Then we found the amount of cement that would be needed to ensure sufficient strength in the cement layer using recycled materials. The results of this preliminary work revealed the need for a granulometric correcting substance to obtain cement mix in the required parameter range.

Results:

Road surface recycling minimizes environmental impact, because it reduces the volume of waste that has to be disposed of in a landfill and uses the material already on the road site to make cement mix with the right aspects and bearing capacity for use as the base layer of the new road surface.

Altogether, a major amount of resources was saved that otherwise would have had to be quarried from the natural environment, with all the environmental, social and economic costs that this would have entailed.

	ACTIONS - OPPORTUNITIES					Natural resource use	
	Reuse of inert waste	Reuse of removed topsoil	Material compensation	Use of components recoverable from other projects	Exchange of surplus materials with other projects	Reuse of effluents and industrial wastewater	Reduction of water and energy consumption
RISKS							
Overuse of natural resources	✔	✔	✔	✔	✔	✔	✔
Drought						✔	✔
Climate change	✔		✔				✔
Difficulty of opening borrow pits	✔	✔	✔		✔		

One of the environmental aspects inherent in our business, and one that is clearly identified in the execution stage of any project, is the need to consume resources.

That is why one important line of action consists in minimizing the material and energy consumption associated with our work. Moreover, by encouraging reuse and recycling of our waste and even waste from other activities, we minimize the amount of waste we create. Waste that has been reused is no longer waste; it is a by-product.

The key is to get everything that can be recovered into the chain, by recycling and reusing inert materials, earth, rubble, surplus materials from other projects, effluents and industrial wastewater. Our projects do this, and not only with their own waste. We foster trading between projects, so that one project's surplus can be used to cover another's needs.

Resource management measures are highly useful for construction projects because of their simplicity and low cost and because of the fast, satisfactory results they give. They represent a good opportunity to minimize the environmental risks associated with the considerable amount of waste created and resources consumed by construction, and they are now an established competitiveness factor and continuous improvement in the company.

The Good Practices related to minimizing resource consumption that were introduced in FCC Construcción projects during 2008 are shown on the following page.

Especially on sites in areas that have a high annual rainfall, we install separate storm and wastewater drains to avoid overloading the water disposal system after heavy rain, which could lead to undesired discharges.

Water from the storm drains can be discharged directly into natural watercourses after the required analytical parameters have been checked, or it can be reused on site, for example, for irrigation or cleaning equipment and machinery.

GOOD PRACTICE	IMPORTANCE			GOAL = 1			GOAL = 2			GOAL = 3		
5a. Reuse of inert waste from other sites	3 Application percentage			More than 1% of all inert waste (as fill)			More than 5%			More than 15%		
	80%	85%	83%	60.0%	58.3%	59.2%	28.0%	20.8%	24.5%	12.0%	20.8%	16.3%
5b. Use of recoverable components, such as non-permanent walls (traditionally made of concrete for subsequent demolition) at aggregate crushers, etc.	2 Application percentage			Use of some system in at least 50% of possible cases			Ditto in two or more activities			Ditto in five or more activities		
	43%	88%	62%	77.8%	100.0%	85.7%	22.2%	0.0%	14.3%	0.0%	0.0%	0.0%
5c. Reduction of borrow material as a percentage of the project design volume	3 Application percentage			Reduction of more than 5%			More than 15%			More than 30%		
	89%	92%	90%	71.7%	60.2%	66.5%	19.2%	24.5%	21.6%	9.2%	15.3%	11.9%
5d. Reuse of effluents and industrial wastewater	2 Application percentage			More than 15%			More than 30%			More than 60%		
	22%	79%	66%	50.0%	54.5%	53.8%	50.0%	0.0%	7.7%	0.0%	45.5%	38.5%
5e. Reuse of removed topsoil	2 Application percentage			Separation of topsoil into horizontal layers less than two and a half metres tall			In addition, turning of the topsoil stockpiled for more than six months			In addition, seeding and fertilizing of stockpiled topsoil		
	49%	94%	82%	80.0%	67.0%	68.9%	20.0%	16.5%	17.0%	0.0%	16.5%	14.2%
5f. Use of items recovered from other projects, such as portable purifying plants, containers, etc.	2 Application percentage			Use of one item			Use of up to three items			Use of more than three items		
	94%	89%	92%	63.6%	50.0%	61.5%	27.3%	0.0%	23.1%	9.1%	50.0%	15.4%

Building Civil engineering Total

Construction normally involves huge volumes of inert materials; 83% of our sites reuse inert waste from other projects, contributing to extend the useful life of materials and reduce our consumption of natural resources. Moreover, 62% of our projects obtain aggregate from at least one item that the project has already used, such as non-permanent walls.

It is fundamental to gather topsoil from the site and reuse it in environmental restoration when project is completed. We do this in 82% of cases, avoiding the consumption of additional resources. Additionally, during project execution, we compensate volumes of material in order to effectively reduce the amount of borrow material with respect to the design plan at 90% of our building and civil engineering sites.

It is not enough just to reserve topsoil for use when construction is completed. For reuse to be effective, topsoil needs to be maintained so that it does not lose any of its original qualities. That is why proper storage conditions and sustained maintenance are necessary.

RESOURCE CONSUMPTION		
Resource consumed	Unit	Consumption
Asphalt agglomerate	t	10,052,822
Concrete	m^3	13,291,412
Paints, solvents, release agents, concrete-curing liquids, accelerants, fluidifiers, antifreezes and epoxy resins	m^3	547,997
Other noxious or dangerous substances	m^3	24,146

INERT WASTE REINCORPORATED AS RESOURCES	
Resource consumed	Consumption (m^3)
■ Excess earth or rock	24,183,012
■ Excess clean rubble	88,213
Resources obtained from waste	24,271,225

All these Good Practices save us from having to open new borrow pits and the difficulties that entails in many areas, and they minimize the risks of overexploiting natural resources and the associated impact on climate change because they reduce the amount of greenhouse gases emitted.

The table on this page presents the data on our consumption of natural resources in 2008. It specifies what waste ceased to be waste due to reuse as resources, thus demonstrating its value.

Water is an important factor in the sustainable development of our society, so FCC Construcción projects focus on saving water, using it wisely, and reusing it with the end goal of consuming this natural resource responsibly.

Sixty-six percent of our projects reuse their effluents and industrial wastewater with a view to stretching out the water cycle, thus minimizing associated environmental risks such as drought and overuse of this natural resource. For each activity that requires water, such as concrete production, irrigation to compact embankments, and cleaning of construction equipment and machinery, we apportion only the quantity and quality of water that is right for that particular use.

We are aware that water is a very scarce resource that we must use rationally. In many of our projects, we store the water used to rinse out concrete-pouring chutes in properly waterproofed ponds for subsequent reuse.

We also minimize the amount of energy we consume by reducing demand and upgrading the performance of conventional systems or using more efficient alternative systems.

In today's context, the construction industry must learn to reduce water and energy consumption because it contributes to mitigating the effects of climate change, drought and overexploitation of natural resources.

The first step is to meter how much we consume. So, for the first time, this year's Environmental Report includes a summary of our consumption figures.

Awareness about reducing water consumption is the reason why on some sites there are devices installed in the office toilet tanks to reduce the volume of water used in each flush. It is a minor action, but it is indicative of how concerned FCC Construcción personnel are about the problem and how willing they are to do something about it.

DIRECT* AND INDIRECT ENERGY CONSUMPTION		
Energy type	Consumption (GJ)	%
Gas	9,837.69	0.93
Petrol, gas oil, fuel oil	1,032,958.20	97.60
Coal	0.00	0.00
Electricity**	15,545.49	1.47
Total	**1,058,341.39**	**100**

(*) Direct energy consumption figures include only the fuel consumed by construction machinery.

(**) Electricity consumption refers only to the electricity used by FCC Construcción site offices.

WATER CONSUMPTION BY SOURCES		
Origin of water consumed	Consumption (m^3)	%
Rivers, streams and wells	5,183,764.00	70.54
Public water supply system	2,152,557.30	29.29
Recycled or reused on site	12,565.76	0.17
Total	**7,348,887.06**	**100**

Waste generation

Good practice

Torres Portafira

Client: Torres Porta Fira (offices) and Promociones Urbanas, SL (hotel)

Problem detected:

From the start of the project, FCC endeavoured to introduce a waste management plan and have the construction and demolition (C&D) waste collected selectively, and it wanted to involve all the subcontractors working on the job. However, because of the huge size and great complexity of the project, it was thought that there might be some difficulty in achieving proper waste management.

Solutions adopted:

In order to optimize the environmental and economic costs and avoid poor C&D waste management, each building was inspected and the subcontractors were informed of any cases of waste mismanagement (misclassification of waste or untidiness on site) by means of incident reports.

A ranked list of the subcontractors for each of the buildings (office and hotel) was drawn up monthly, specifying the subcontractors that had failed to meet the standard level of C&D waste classification and tidiness, the subcontractors that had remained within the minimum required levels and those that had maintained good standard. In addition, meetings were held at least once per month to keep contractors abreast of the results of their waste management and correct any deviations found. At these meetings, subcontractors were reminded of the general rules about construction waste classification and cleaning.

We also conduct training, communication and resource management activities with new subcontractors to familiarize them in advance with the waste management and site orderliness and tidiness rules, the inspection procedure, the means of waste disposal and the consequences of failure to comply with the procedure.

Results:

Thanks to these actions, the following C&D waste was correctly sorted and managed: rubble, paper/cardboard, wood, scrap metal, plastic film, dirty rubble, plasterboard and glass. A specialized waste management company provided monthly figures on the weight and volume of waste managed.

The fact that each subcontractor took pains to classify and collect all or part of its waste not only had clear associated benefits for the environment, but also represented a considerable economic saving in waste management and clean-up squads and reduced the proportional amount of time spent on these tasks by the project's non-construction personnel. The resulting monthly saving averaged 30,000 euro.

	ACTIONS - OPPORTUNITIES						Waste generation	
	Construction process and design improvements	Reduction of packaging waste	Purchasing of materials in the right quantities and proper packaging	Correct identification and storage of waste and containers	Classification and individualized management of C&D waste	Mass diagram compensation	Management of surplus excavation materials	On-site waste recovery for other uses
RISKS								
Creation of large volumes of C&D waste	✔			✔	✔	✔	✔	✔
Large amount and diversity of packaging and packing materials	✔	✔	✔	✔	✔			✔
Creation of hazardous waste and associated risk	✔		✔	✔				
Large quantity of earth and other materials left over from excavation	✔					✔	✔	✔
Increased waste production due to improper storage		✔	✔	✔	✔			
Increased waste production due to improper transportation		✔			✔	✔		✔

As a consequence of the kinds of construction, demolition and modification operations done at building sites, a large amount of waste can be produced due to internal transport from the stockpiles to the place where materials are needed, storage conditions and procurement planning. Some of this waste is inevitable, but some of it, can and should be reduced.

Thus, effective waste abatement is the big challenge for the construction sector. But at the same time it is an evident responsibility that we assume in our ongoing quest to factor the environmental variable into the day-to-day decisions we take on site.

Following the precepts of the new Framework Directive on Waste, our projects view waste disposal as the last option in a cycle that begins with prevention and reuse, followed by recycling and use for energy purposes, and ending, only as a last resort, with disposal in authorised landfills.

Thus, prevention is seen as a highly effective means of mitigating the risks associated with waste generation and a very important method for overcoming Spain's scarcity of certain natural resources. The measures we take accordingly not only reduce the amount of waste but also improve waste quality, thus minimizing the potential impact on the environment and human health and the harmful substance content in materials and products.

It is evidently necessary to adopt an integrated approach to waste and resource management. If we can reclassify materials from the "waste" to the "resource" category, the outcome is optimal from an economic and an ecological perspective.

The first basic steps in proper waste management are to identify the waste the project is going to create, and predict the quantity that will be produced and the periods when it will be generated. This information will enable us to select feasible management options and organise the project, defining the necessary physical and human resources for correct waste handling, collecting and storing.

The tables on pages 57 and 58 summarize the quantities of waste projected and actually managed during 2008. They give separate figures for surplus earth or rocks and rubble when it is reused and recycled, since in those cases it does not constitute C&D waste but is plugged back into the production cycle as a resource.

The amount of earth disposed of in landfills was a remarkable 38.6% less than anticipated: 10,751,036 m^3 did not end up in landfills as a result of good waste and resource management.

In addition, a total of 24,183,012 m^3 of earth or rocks left over from excavation and 88,213 m^3 of clean rubble (concrete, mortar, bricks, precast components, etc.) were used on the same site where they were created and, therefore, were regarded as raw materials instead of being handled as waste for disposal in a landfill.

These results are hard evidence of FCC Construcción's work in waste abatement. We are meeting the objective we set for ourselves, fundamentally by applying Good Practices such as the ones shown on page 57.

Using industrial oils creates hazardous waste which can lead to serious environmental damage if improperly managed.

As producers of this kind of waste, in each autonomous community we contact the management and transportation companies authorised to remove this type of waste and manage our hazardous waste properly. This minimizes the impact the waste could otherwise have on the environment.

RECYCLED/USED MATERIALS	Projected amount	Actual amount
Surplus soil and stones		
Disposed in landfill (m^3)	27,864,010	17,112,974
Used in the same project (compensation/excavation/fill) (m^3)	48,191,645	23,190,507
Used from other projects (m^3)	887,952	992,505
Used in other projects (m^3)	8,853,095	4,908,903
Obtained from borrow pit (m^3)	18,920,268	5,543,853
Total excavation (m^3)	98,246,193	51,407,415
Total fill (m^3)	74,180,694	34,079,755
Clean rubble (concrete, mortar bricks, tiles and ceramic, other)		
Disposed in landfill (m^3)	1,184,772	1,207,609
Used in the same project (m^3)	203,106	87,213
Used from other projects (m^3)	2,500	1,000
Used in other projects (m^3)	0	1,539,252
Delivered to a recovery installation (m^3)	117,465	162,524

WASTE PRODUCTION	Projected amount	Actual amount
HAZARDOUS WASTE (kg)	1,961,469	21,969,949
Empty packaging (kg)	187,459	154,894
15 01 10 Empty packaging containing residues of DS or contaminated by DS	63,028	15,639
15 01 10 Empty plastic packaging containing residues of DS or contaminated by DS	62,875	57,468
15 01 10 Empty metal packaging containing residues of DS or contaminated by DS	61,556	81,787
Solid hazardous waste (kg)	1,108,680	21,422,486
15 02 02 Absorbents and wiping cloths contaminated by DS	31,209	40,773
16 01 07 Oil filters	20,751	8,775
16 01 09 Components containing PCBs	2,205	1,100
16 05 04 Gases in pressure containers containing DS	38,814	31,811
16 06 01 Lead batteries	21,854	7,065
16 06 02 Ni-Cd batteries	7,036	3,891
16 06 03 Mercury-containing batteries	2,543	1,919
17 01 06 Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing DS	0	0
17 02 04 Glass, plastic and wood containing or contaminated by DS	0	0
17 05 03 Soil and stones containing DS	701,040	1,554,648
17 06 05 Building materials containing asbestos	253,979	19,701,296
17 09 03 Other construction and demolition wastes (including mixed waste) containing DS	27,417	70,085
20 01 21 Fluorescent tubes and other mercury-containing waste	1,832	1,123
Used oil (kg)	280,352	298,998
12 01 12 Spent waxes and grease	0	0
13 01 13 Hydraulic oils	23,495	9,059
13 02 05 Non-chlorinated mineral-based engine, gear and lubricating oil	0	623
13 03 08 Engine, gear and lubricating oil	255,232	289,939
13 03 10 Other insulating and heat transmission oils	1,625	0
Liquid hazardous waste (kg)	384,978	93,571
08 01 11 Waste paint and varnish waste containing organic solvents or other DS	14,191	4,809
08 01 17 Wastes from paint or varnish removal containing organic solvents or other DS	695	10
08 01 19 Aqueous suspensions containing paint or varnish containing organic solvents or other DS	12,322	1,465
08 04 09 Waste adhesives and sealants containing organic solvents or other DS	5,980	4,858
08 04 15 Aqueous liquid waste containing adhesives or sealants containing organic solvents or other DS	2,495	24,549
12 01 09 Machining emulsions and solutions free of halogens	251,902	24,715
13 07 03 Fuels (including mixtures)	3,556	1,960
14 06 03 Solvents and solvent mixtures	2,000	160
16 01 13 Brake fluids	1,330	0
16 01 14 Antifreeze fluids containing DS	90,507	31,045
16 01 21 Release agents, curing liquids, plasticizers, liquidisers	0	0
16 05 06 Laboratory chemicals consisting of or containing DS	0	240
16 07 08 Wastes containing oil	0	3,300
MUNICIPAL WASTE (kg)	2,518,311	4,564,571
20 03 01 Mixed municipal waste	2,518,311	4,564,571
NON-HAZARDOUS WASTE (kg)	34,917,135,049	27,617,706,560
Inert waste (m^3)	34,842,048	27,505,612
17 01 01 Concrete	1,804	1,754
17 01 02 Bricks	0	0
17 01 03 Tiles and ceramics	0	0
17 01 07 Mixtures of concrete, bricks, tiles and ceramics not containing DS	7,872,567	4,494,751
17 05 04 Soil and stones not containing DS	26,969,481	23,010,861
Other non-hazardous waste (kg)	73,283,049	110,340,560
01 05 04 Fresh-water drilling mud and wastes	11,605,366	4,796,745
08 03 18 Waste printing toner	6,476	2,329
15 01 06 Non-hazardous mixed packaging	22,125	18,574
16 01 03 End of life tyres	35,856	36,998
16 06 04 Alkaline batteries (except mercury- containing batteries)	2,625	3,480
17 02 01 Wood	8,871,247	7,807,530
17 02 02 Glass	89,502	50,241
17 02 03 Plastic	1,359,402	601,996
17 03 02 Bituminous mixtures not containing coal tar	10,610,937	3,533,984
17 04 07 Mixed metals	2,230,830	2,443,907
17 08 02 Gypsum-based construction materials other than those mentioned in 17 08 01	46,440	255,405
17 09 04 Mixed non-hazardous construction and demolition wastes	33,031,054	88,782,259
19 08 05 Sludges from treatment of urban waste water	2,348,302	1,545,408
20 01 01 Paper and cardboard	3,022,682	461,697
20 01 32 Expired medicines other than cytotoxic and cytostatic	205	7

GOOD PRACTICE	IMPORTANCE			GOAL = 1			GOAL = 2			GOAL = 3		
6a. Reduction of inert waste taken to landfills compared with the volume planned in the design	3 Application percentage			Reduction of more than 5%			More than 15%			More than 30%		
	93%	93%	93%	59.8%	61.0%	60.3%	20.7%	19.5%	20.2%	19.5%	19.5%	19.5%
6b. Classification/ collection of construction and demolition waste for individualised management	2 Application percentage			Construction and demolition waste is classified into two categories			Construction and demolition waste is classified into four or more categories			All construction and demolition waste is classified and put to some use		
	91%	95%	92%	65.0%	62.8%	64.1%	27.0%	30.2%	28.3%	8.0%	7.0%	7.6%
6c. Changes in design or system of construction in connection with the use of materials that create hazardous waste, such as fibre cement, release agents, additives, resins, varnishes, paints, etc., so as to produce less-hazardous or non-hazardous waste	3 Application percentage			Projected HW is not created in at least one activity/job unit, for example, by applying water-based paints instead of paints with organic solvents			Ditto in three or more activities			Ditto in five or more		
	70%	75%	72%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6d. Reduction of packaging waste through practices such as ordering materials with returnable packaging, reuse of contaminated packaging, reception (in large volumes or bulk format) of materials that are normally packaged	2 Application percentage			Applied to two or more materials			Ditto five or more			Ditto ten or more		
	73%	90%	79%	86.2%	93.5%	88.8%	13.8%	6.5%	11.2%	0.0%	0.0%	0.0%
6e. Management of surplus materials from excavation	2 Application percentage			More than 1% used in another project or to restore damaged area			More than 30%			More than 50%		
	73%	88%	80%	29.2%	60.8%	45.5%	39.6%	21.6%	30.3%	31.3%	17.6%	24.2%
6f. Rubble recoverys	2 Application percentage			Reuse or recycling in another project or off-site plant			Reuse on site			Recycling of stone by setting up a plant on site		
	61%	80%	69%	78.1%	39.1%	61.8%	18.8%	52.2%	32.7%	3.1%	8.7%	5.5%

■ Building ■ Civil engineering ■ Total

Proper planning is a fundamental preliminary step for reducing waste. The initial effort to minimize waste is an ecological priority that affords long-term economic and social benefits due to the lower consumption of resources.

By adopting changes in our designs or construction systems, 72% of our projects created less hazardous waste. Moreover, in eight out of every ten projects, we reduced the amount of packaging and packing waste through practices such as ordering materials in returnable packaging, reusing contaminated packaging and receiving large-volume or bulk items to reduce the number of packages used.

When we find we have a considerable volume of demolition debris on site, we endeavour to recover the rubble. For instance, we can recycle it into aggregate that we can use on site.

This Good Practice not only reduces the volume of inert waste we have to take to landfills, but also cuts down the volume of aggregates we have to procure from borrow pits.

It is fundamental to provide the people working on the project with training and information to achieve effective cooperation and optimize waste management.

Proper waste storage and identification avoids the risk of contamination and accidents that might cause environmental damage.

To increase efficiency in waste management, safe storage areas are prepared where the waste we produce can be sorted properly; this avoids mixing hazardous waste with municipal waste and non-hazardous waste.

Construction and demolition (C&D) waste is a top-priority flow because a large amount of it is produced and it has considerable scope for recycling. In 92% of our projects we classify and separate C&D waste for subsequent individualized management. In this way, we avoid increasing waste production due to improper storage or transportation, and we bring down the costs of management by ensuring that the separated waste is of higher quality.

In practically all FCC Construcción projects (93%), the amount of inert waste sent to landfills is less than that anticipated in the design stage. To achieve this reduction, we employ Good Practices such as using surplus material from excavations in other projects or restoration work (at 80% of projects), or we put rubble to alternative uses on site or in an off-site plant (in 69% of projects).

Although the construction industry does not produce large amounts of dangerous substances, and hazardous wastes, they are quite significant because of their potential effects on the environment and the different approach to treating and handling them. All hazardous waste is identified from the start, so we can take into account the terms of the applicable current legislation and look at nearby authorised management and transport firms.

Sorting is the fundamental first step in recovering waste. Depending on how accurately and painstakingly construction and demolition waste is classified, there will be different options for later use: recycling, reuse or incineration to create energy.

To reduce the risk of waste spillage, discharges and mixing, our sites are provided with both fixed and mobile roofed container areas where hazardous waste can be stored for up to six months.

Land planning

Good practice

Puerto del Rosario port

Client: Puerto del Rosario, Fuerteventura

Problem detected:

After dredging out the inner harbour basin, we had a total of 30,000 m^3 of clean sand on hand. We deliberated potential uses of the surplus material from dredging

Solutions adopted:

The site was located near a small beach called "Playa de los Hornos", next to the town of Puerto del Rosario. The beach was not very popular due to its small useful area.

FCC Construcción consulted the architectural supervision team before dredging work began and proposed using the sand dredged out of the harbour to build up the beach and improve its use as a recreational facility for the local residents.

The sand was analyzed and the architectural supervision team approved the idea. As a result, the pertinent permits were secured and the operation designed. First, a permanent 300-mm pipe was installed on the beach. When the dredger filled its 1,000-m^3 sand tanks, it would sail to the end of the pipe and pump the sand to the beach. Afterwards, the sand was spread uniformly using machinery on shore to improve appeal to bathers and the general public. The average yield was 3,500 m^3 of sand, working around the clock.

Results:

This action to regenerate the landscape, featuring the controlled dumping of a total of 30,000 m^3 of sand onto the beach, transformed the small bay into a beach for public use, with 100 linear metres of clean sand.

The controlled dumping and uniform spreading of the clean, dredged sand solved two issues: it obviated transporting the sand to a landfill (which would have occurred if it had been regarded as waste) and it regenerated an area, thus increasing its tourist and recreational value.

	ACTIONS - OPPORTUNITIES						Land planning
	Protection of plant specimens	Transplanting	Use of native species in restoration	Project planning (life cycles, critical stages)	Moving of nests or individuals	Efforts to avoid untidiness	Use of marking, protection and signposting to occupy less pavement and roadway space
RISKS							
Elimination of vegetation	✔	✔	✔	✔		✔	
Erosion, desertification	✔	✔	✔	✔			✔
Disturbance of wildlife	✔			✔	✔		
Loss of biodiversity	✔	✔	✔	✔	✔		
Visual impact on the landscape	✔	✔	✔	✔		✔	✔
Untidiness in the environment						✔	✔
Interference with traffic and outside facilities						✔	✔

A major challenge we face is identifying the damage that might result from works execution with significant adverse effects on natural spaces, wildlife and wild plant species. However, projects are not always located in purely natural environments, so we must also take into account interactions with environments more adapted for human living and the resulting repercussion on human beings. This takes place during the first stages of planning, before project execution even begins.

Once each project's risks are identified, an approach to dealing with those risks is established. For that purpose, a selection is made from among the Good Practices grouped under the heading of "Land planning" shown in the table on this page.

These Good Practices are oriented towards minimising effects on plant and animal life, the urban environment and infrastructure.

Biodiversity

Natural vegetation in the vicinity of any construction project needs to be protected and conserved. In 90% of our projects we protect specimens that may be affected by the construction work itself or by construction machinery and vehicle traffic.

In addition, we avoid cutting plants and felling trees where possible to minimize the associated erosion, and we select native species for restoration to achieve more effective plant cover and to blend the restored areas into the surrounding environment.

In 88% of our projects, when it is necessary to avoid destroying outstanding specimens of trees, we have found it expedient to transplant the trees before we clear the site. In more than 21% of these cases, the transplant success rate exceeds 80%.

GOOD PRACTICE	IMPORTANCE			GOAL = 1			GOAL = 2			GOAL = 3		
7a. Physical protection of plant specimens living at the site	1 Application percentage			All unique specimens affected by the project are protected			All specimens ditto			In addition, plant care and maintenance work is done		
	84%	93%	90%	50.0%	70.8%	63.6%	29.4%	20.0%	23.2%	20.6%	9.2%	13.1%
7b. Transplants	1 Application percentage			At least one unique specimen affected by the project is transplanted			All unique specimens ditto			In addition, more than 80% of transplants are successful		
	82%	91%	88%	55.6%	47.7%	50.7%	22.2%	31.8%	28.2%	22.2%	20.5%	21.1%
7c. Project planning adjusted to the life cycles of the more valuable species	2 Application percentage			Design projections are improved on			Taken into account even though not envisaged in the design			In addition, the individuals involved are tracked for more than six months		
	25%	80%	75%	0.0%	52.9%	50.0%	100.0%	29.4%	33.3%	0.0%	17.6%	16.7%
7d. Moving of nests or individuals	1 Application percentage			At least one move is made			Moving is widespread			In addition, the individuals involved are tracked for more than six months		
	0%	74%	65%	0.0%	87.5%	87.5%	0.0%	0.0%	0.0%	0.0%	12.5%	12.5%
7e. Efforts to avoid untidiness at site entrance and exit	2 Application percentage			Entrances and exits are systematically swept			The wheels of all lorries are cleaned before they drive on public roadways			A permanent device (water pits at the exit, sprinklers, etc.) is used to clean wheels		
	98%	98%	98%	82.6%	82.5%	82.6%	14.0%	13.3%	13.8%	3.4%	4.2%	3.7%
7f. Occupation of pavements and roadways	2 Application percentage			Preventive measures are taken (fencing, signposting, separation from pavement/ street, etc.)			In addition, alternative accesses are made available			In addition, the project occupies less than the maximum authorised time or space		
	96%	93%	95%	75.5%	37.3%	62.4%	17.5%	48.0%	28.0%	7.0%	14.7%	9.6%

Building Civil engineering Total

Sometimes it is not possible to complete the project while leaving plant specimens in their original locations. In these cases, the best compensatory measure possible is to transplant the specimens in question so they can continue performing their functions in an alternative ecosystem.

The different activities involved in the construction stage trigger a series of changes in the territory that may have repercussions on the more sensitive animal species.

So as to disturb wildlife as little as possible during construction and to reduce the probability of these risks occurring, we adjust project planning to suit the life cycles of the more valuable species. This was taken into account in 75% of projects during 2008.

For wildlife's sake, we avoid especially noisy activities, such as blasting, machinery and vehicle movement, land clearing and earthmoving during the local wildlife's mating and breeding season. Also, at the times of year when these activities are less harmful, we avoid them early in the morning and late in the afternoon, when birds are most active.

Another measure that is applied in 65% of our projects is the moving of nests or individuals that may be affected. We then track these individuals to see that they are adapting well to their new habitat.

All these actions minimize risks such as removal of vegetation and resulting erosion, disturbance to wildlife, loss of animal and plant biodiversity and visual impact on the surrounding landscape.

A baseline study to identify the main animal species and wildlife corridors in the area before we start building enables us to ascertain at each point in the job what damage our project may do to species and their habitats, and to act accordingly.

LAND ADJACENT TO OR INSIDE PROTECTED NATURAL SPACES OR UNPROTECTED AREAS OF HIGH BIODIVERSITY	
Disturbance type	Projects (No.)
Location in natural or protected areas	14
Location in zone with landscape catalogued as important	32
Disturbance of natural watercourse in protected area	15
Disturbance of catalogued or protected plants	14
Disturbance of catalogued or protected animal species	19
Protective measures	Area (ha)
Restoration of affected areas	50.54
Protection of sensitive areas	32.55

The table at the end of page 62 lists the number of projects in 2008 that were located in the vicinity of or inside a natural area of high biological diversity, plus the area of the protected and restored land.

Urban environment

The most-frequent Good Practices in the "Land planning" group are those that have to do with reducing possible disturbance to the urban environment, which is the most immediate environment of the site, since construction work projects are not always located in natural spots where they might upset protected species, but they always have some influence on human beings.

At 98% of sites, we used some means of avoiding untidiness at the entrance and exit, either by sweeping or by cleaning wheels before we allow lorries out.

Moreover, 95% of the projects executed in 2008 took measures to minimize the inconvenience caused when construction encroaches upon pedestrian areas and roadways. Fencing, signposting to mark vehicle entrances and exits, alternative routes and minimization of authorised occupied space are all aimed at minimizing the possible inconvenience to local residents.

That is how we are reducing the likelihood of environmental risks such as untidiness, interference with traffic and visual impact on the landscape.

Permanent or mobile systems to wash lorry wheels and undercarriages is a good method for reducing the tracking of mud and dirt onto roads. These low-maintenance facilities clean truck wheels and the resultant sludge is allowed to settle, after which the water is recycled.

Building sustainability

Building sustainability in construction

Sustainability is a constant factor in construction. That is why it is necessary to take frequent looks backwards and forwards along the path we have taken and share the results so we can ensure that we are building what we really want.

Self-analysis is important, but so too is listening to the opinion of the stakeholders to whom we are presenting our results and lines of work in this Report. We feel reasonably satisfied with what we have done, but only because it is a good start. Beginning always brings a new, different reality that enriches us.

To every time, there is a different equilibrium in the difficult harmony between society, the economy and nature. In times of crisis, the equilibrium is not the same, but it still must be found. The search for equilibrium informs all our actions because, if we overlook any factor, we will stray from our goal. Hard times plus our determination to become better motivate us to refine methods, improve results, search for greater efficacy, optimize resource handling and strip impediments and deadweight from processes. Without reducing our demands or straying from our eternal pursuit of excellence.

We believe we have done our homework well. In this report, we review the principal environmental aspects in our business and render accounts of how we have improved and increased our channels for dialogue with stakeholders, increased our projects' efforts to apply good practices, participated in multiple international working groups for standard-setting in sustainable building, increased the ratio of materials used on site with respect to material that is disposed of, inverted around the resource-waste flow on many occasions, trained, motivated and cared for people and persevered in our drive to make a better world for ourselves.

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