



NCC – Norwegian Contractor Company

Quality- and Environmental Handbook for
large Contractors

February 2003

Introduction:

The following chapter shows some examples on Quality-goals, and how they should be implemented and have a consequence in terms of politics and procedures. The examples are imagined, but are based on experience from elaboration of Quality-goals in similar companies.

The examples are made to demonstrate how a Quality-system can be designed and documented, but are not a complete Quality-Handbook.

The examples describe a system divided up into three levels.

Level 1: Description of the company, Quality-goals, politics and organization with description of responsibilities and rights...

Level 2: Procedures / company-habits.

level 3:Quality-Assurance Handbook for a specific project.

Part 1 Goal and politics

1.1 Description of the company

1.2 Quality-goals

1.3 Environmental goals

1.4 Organization

1.5 Job descriptions

Part 2 Procedures

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Enclosure forms

Part 3 Quality Assurance Handbook

Part 1 The company

1.1 description of the company

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NCC A/S execute all type of constructionswork based on main- or tradecontracts. The company is established in 1950 by master carpenter Jens Peter as a private company including a small machine shop, which was producing windows and doors. The company was in 1987 reorganized to a family owned limited company simultaneously with participating first in individual trade contracts and later also main contracts. The company participate in public and selected tenders and construct buildings by own means.

This Q.A.Handbook is elaborated by Contractor Ltd. and published in a registered part 1 and an unregistered edition part 2. The registered edition is numbered, and revisions will be sent to the owners of the Q.A. Handbook according to a distributionlist. The registered edition is for internal use at Quality- trade Ltd. The unregistered edition is sent out to costumers, authorities etc. in connection with prequalifications and will not be part of the ongoing revision.

Date:

Managing Director Contractor Ltd.

1.2 Quality goal

It is the politic of Contractor Ltd. to deliver buildings and civil works of good workmanship quality corresponding with the expectations of our costumers. The requirements this politic put to the company and the employees, make it necessary to follow the guidelines, stated in the following Q.A. Handbook. The Handbook shall therefore be known and accepted by all employees in the company. The Q.A. Handbook accounts for our Quality politic, describe the organization of the company including the procedures and company habits, which are used to ensure the fulfilment of the Quality politics.

It is the declared goal of the company to appear as a Quality-concerned company, executing the trades at a workmanship level, which in all aspects, fullfill the costumers expectations, and as a minimum fullfill the demands set by law at any time including the departmental order regarding Quality assurance 2001. All trades are executed with due consideration regarding environmental impact, work environment (Safety and Health) and usage of resources including handling of waste.

The usage of substances, harmful for environment, shall be limited, just as noise- and dustpollution for other workers on the trade including neighbours to the building site. The company have implemented a Quality Management system which is documented in the following Q.A. Handbook that is known and used by all employees in the company.

The handbook is divided up in 3 independent parts.

- Part I contains goal and politics, handed out free and will not be maintained at the individual owner.
- Part 2 contains a documentation of the companys procedures. It is numbered and not for handing out. It will also contain certain forms and other aids for the execution of Quality Management.
- Part 3 which is elaborated for the individual trade, and is for the clients disposal. This part will be maintained according to need.

1.3 Politics

Services

A good and satisfactory quality for the client is a crucial competition factor for the company and by that, the survival of the company. Therefore all trades have to go through a complete scrutinity and client's important Quality demands and eventually environmental demands have to be clearly and unambigious agreed. The trade manager shall during the execution supervise fulfilment of all agreements. The responsible person shall ensure an acceptable solution for the company and that execution can be done in the agreed time, before agreements for tasks are made.

Following are pre conditions for the company to ensure delivery of the right Quality at any time,

- That the requested Qualitydemands to the services of the company are covered through a systematic Quality management in all levels from marketing to delivery,
- That feed back from clients are collected and elaborated,
- that the client allways get what have been promised in the agreed time corresponding with specifications,

Based on the Quality goal, the list of common known Quality problems and a general wish for Quality improvements, the director elaborate specific Quality objectives which are measurable. The director elaborates a plan of action for the individual Quality objective, which as a minimum contains:

- the actual Quality objective divided in measurable intermediate aims
- who is responsible for the individual intermediate aim
- time schedule with intermediate aims
- planned moment for completion of the Quality objectives
- how the Quality objective are achieved (methods, equipment, new work instructions)
- criterias for evaluation of achievement of the Quality objective (e.g. method for measurements).

Purchase.

Before ordering, an assessment of the suppliers ability and will to fullfill our demands is needed, to ensure usage of the right materials in the required Qualitylevel. All materials have to be controlled according to controlplan for delivery control, when receiving at site.

Staff education

All staff members of the company shall have a possibility to participate in courses or get job training within their field of work. Managing staff and key persons have an obligation to keep up dated with the technological development in their field of work.

Good Quality is produced by motivated and professional skilled staff, that the Contractor Ltd. wishes to attract and maintain.

Environmental impact

It is the politic of the company to limit the energy consumption of installations and transport.

Quantities of waste shall be reduced by a better usage of materials, and the waste shall be sorted out to ensure maximum recycling. The usage of substances harmful to the environment shall, if possible, be reduced by replacing with other less dangerous substances. The company aims to improve environmental efforts by up dating the detailed environment objectives. The environment objectives and their implementation status are communicated to the staff simultaneous.

The director formulates a environmental goal based upon the environmental politic of the company, the possible environmental impact caused by the implementationprocess including economy and operationconditions of the company. The director elaborates a list with normal occurring environmental impacts. The director elaborates specific measurable environmental objectives, which are based on the environmental goal and the list of normal occurring environmental impacts. The director elaborates an environmental plan of action for each environmental objective, which as a minimum contain:

- the actual environmental objective
- who is responsible
- time schedule with intermediate aims
- planned moment for completion of the environmental objectives
- how the environmental objective are achieved (methods, equipment, new work instructions)
- criterias for evaluation of achievement of the environmental objective (e.g. method for measurements).

Clientcontact.

It have to be ensured when entering into agreements, by a complete analyze that the client's need and expectations to the executed work will be fulfilled, that his requirements get fulfilled including needed corrections of his expectations.

All enquiries from the client regarding defects and deficiencies of executed work are replied with a proposal for solving the problem within 5 days from receiving the enquiry.

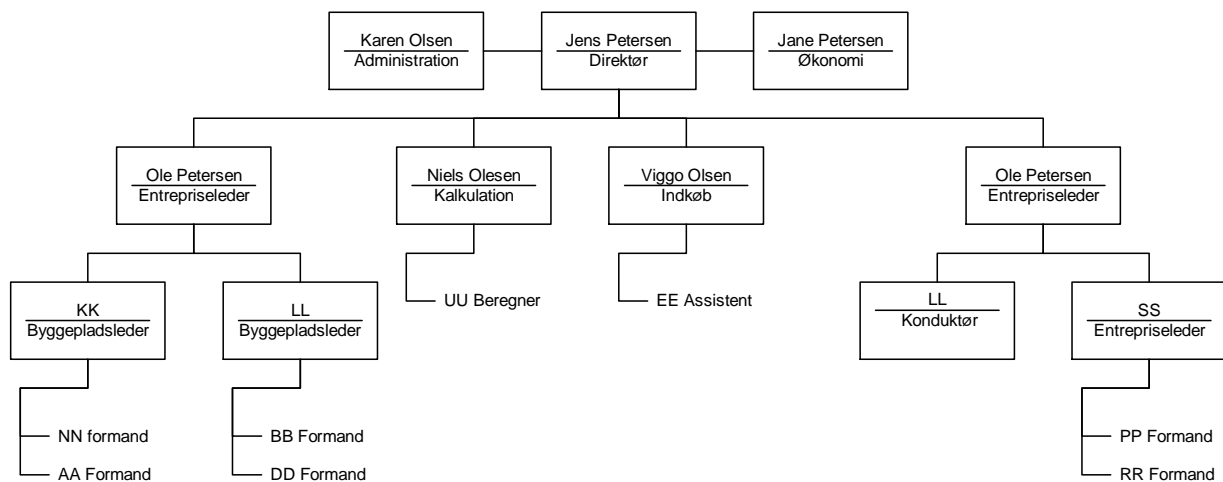
Selection of sub-contractor.

Sub-contractors and suppliers shall serve the company the best they can, in business and quality. This means:

- that we have to select confident sub contractors and suppliers in which we believe can execute the project regarding Finance and Quality and can fulfill the requirements in the project.
- That we shall consider and treat our sub contractors and suppliers as equal collaborators.
- That disputes shall be settled by negotiations and not in court.

1.4 Organization

It is emphasized that the individual effort has an influence on both the quality of the executed work and the impact on the environment, and therefore the employee should know her/his rights and duties, included the demands to the executed work. The management of the individual functions is responsible for information and education of the employees needed to fulfill these demands. The director has the overall responsibility for an effective Quality- and Environmental Management, which fulfill the demands in the Handbook and is liable to the authorities.



1.5 Function descriptions

Director:

Project manager:

Site manager:

Foreman:

Calculation:

Purchase:

Part 2 Procedures

Content:

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2.2.7 Information to employees

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2.2.10 Final control

2.2.11 Repairing defects and deficiencies

2.2.12 Inspection and maintenance of the system

2.2.1 Management of documents

Goal:

- Ensure that all relevant documents are accessible and retrievable.
- Ensure that all agreements are registered and communicated to the relevant colleagues of the project.
- Ensure that only valid editions of documents are on the working places.
- Ensure that environmental enquiries are registered

Validity:

- All projectspecific documents and agreement-notes.
- All documents used for management of assignments. (controlschedules, paradigm for letters, work instructions etc.)
- Relevant legal demands and provisions.
- Enquiries in writing regarding environment and work safety.

Responsibility:

The director has the responsibility, that all relevant documents are registered and that the procedures are followed.

The calculator has the responsibility for: assignment of project case numbers, numbers for internal documents and, are registering internal documents.

Case responsible project manager are registering caserelevant documents and maintains lists of documents (drawinglists).

Background:

- Approval and issue of documents and data.
- Environmental management documentation
- Staff Handbook

Approach:

All enquiries or enquiries regarding new work-assignments are registered on form xx, which are given a consecutive number. The case is given a number as soon as priceestimation or participation in a tender is agreed and decided. All agreements concerning deviations from the project are registered on agreement-note xxx, which are issued with date and signature. All changes, which deviate from the projectmaterial, are registred on deviation-note, issued with casenumber, date, serial number and signed by project manager.

Information regarding new laws and departmental orders is achieved from organization/subscription.

Enquiries regarding environmental conditions are handled by the director and all enquiries in writing are replied in writing.

Documents:

- Drawinglists
- Documentoverviews

Archive:

- Tendermaterial is filed in calculationdepartment
- Productionrelevant documentation, including existing laws and departmental orders, are filed in trade department.
- Casespecific material is filed in casefile under the case number.
- Environmental enquiries and replies are filed in a seperate file by date.

2.2.2 Elaboration of Quality Assurance Handbook.**Goal:**

- Document to the client, which Qualitymanagement- and environmental management activities are used at the case.
- Inform employees about, which control measures are agreed with the client.

validity:

- Trades, where there is demand for Quality Assurance.
- Environmental management activities executed for all trades.

Responsibility:

Project manager.

Background:**Approach:**

The project manager looks through the projectmaterial after taking over the trade. The project manager elaborates Q.A.Handbook based on demands to Quality Assurance and companys own environmental goals, which contain information regarding: organization of the case, approach at process scrutinity, information of employees and finished controlplans. The project manager informs the subcontractors about demands for Q.management and Q.A. including environmental management, when contracting.

The project manager describes how environmental action plans for each trade are specified in demands in the individual trade. Project manager's assessment of the relevance of the environmental impacts, are considered and if there are new possible environmental impacts. In

case of specific environmental demands from the client, they are incorporated. The demands to the individual trade are forwarded to the site in the Quality-plan.

Documents:

Filing:

2.2.3 Process Scrutiny

Goal:

Ensure that all demands are documented. Clarify comprehensibility problems regarding the project. Uncover conditions, which may lead to failure, or are particular risky or difficult to execute. Uncover conditions which may lead to environmental impacts. Prevent emergence of work environmental problems during the execution.

Validity:

All projects and contracts with clients. The scrutiny is documented at projects where it is agreed and project Scrutiny meeting is executed with the client (representatives of the client), which is documented by minutes from meeting.

Responsibility:

Project manager of trade

Background:

Town and Dwelling agency guidance

Approach:

During the bidding, eventually ambiguities and quality-relevant problems in the project are registered. These are to be solved as far as possible with the client by the calculator, before the bid is filed. Project manager and foreman and eventual calculator shall participate in the process scrutiny. Critical work operations are identified during the process scrutiny and controlplans are elaborated for delivery- and process control, which account for:

- What to control?
- Who will do it?
- Where in the process?
- How often?
- How?
- Which documentation, is elaborated for the control.

The possible environmental impacts are scrutinized during the process scrutiny. The company's standard list with environmental impacts which normally occurs, are used as starting point. If the process scrutiny point out other possible environmental impacts, which are not on the list or indicate that some from the list are of no interest for the trade, this is communicated to the director for lay-out of environmental goals for the trade (see procedure 2.2.13). It is recorded in the minutes from meeting, whether more or less possible environmental impacts are registered than from the standard list. After acceptance, a process scrutiny is executed and project scrutiny meetings with the client are held as agreed. For the project scrutiny meeting, a quality plan and proposal for a control plan should be elaborated.

Minutes from the process scrutiny provide a basis for the project scrutiny meeting. Contract manager follow up, that eventual problems are solved e.g. at follow up meeting.

Documents:

Minutes of meetings

Filing:

In casefolder

2.2.4 Project scrutiny meeting

Goal:

- Ensure that intentions in the project are understood.
- Ensure that the available drawingmaterial is sufficient.
- Ensure that the project is practicable and feasible in line with legislation in force.

Validity:

All projects with demands for Quality assurance.

Responsibility:

Contract manager

Background:

Approach:

The participants are called in by request of the Company with a minimum of 14 days notice. Eventual ambiguities and Quality-relevant problems are registered. Timeframe for solutionproposals are determined.

Q.A. Handbook is scrutinized and controlprocedure determined

Procedure for interim certificates and agreement notes are determined.

Participants: Contract manager and eventually responsible fitter and also client and/or client's representative.

Documentation:

Minutes from project scrutiny.

Filing:

In casefolder

2.2.5 Management of drawings and changes in drawings

Goal:

- Ensure that only valid drawings are used by execution of the work.
- Ensure that valid drawings are at the building site at any time.
- Ensure that invalid drawings are removed from the place of usage.
- Ensure that changes are approved by contract manager before execution

Validity:

All trades

Responsibility:

Contract manager

Background:

Approach:

All changes have to be documented and stated clearly by marking of change and date of the change in the document. Changed documents have to be sent to the contract manager at the address of the company. Contract manager have to approve all changes and distribute the documents to the relevant places of usage (building site). The foreman bring about changes further to workplaces and withdraw invalid drawings, which is marked clearly with stamp or in another way, and also placed in a special archive.

Documents:

Filing:

2.2.6 Selection of suppliers and purchase

Goal:

Ensure that all used materials fulfill Quality- and environmental demands for the project and the company, and that requested documentation are present.

Validity:

Delivery of materials, which are built in, or have an impact on the Quality.

Responsibility:

Contract manager

Basis:

Approach:

Possible suppliers enquire information regarding, which informative labelling, testcertificates, certificates and other Quality- and environmental-relevant documentation, they can deliver with the products. Contract manager ensure, that suppliers understand eventual environmental demands. The sub-suppliers ability and will to keep the agreed Quality- and environmental-level is assessed eventually by a visit to the Company. A suppliers list is elaborated from where suppliers are selected to projects. The list shall be on the building site.

Documents:

Filing:

2.2.7 Education and information to employees

Goal:

- Ensure that own employees and sub-contractors knows work-methods and Quality- and environmental demands in theproject.
- Ensure that own employees have relevant education.

Validity:

Information: Relevant operations with particular emphasis on operations where there is special Quality- or environmental demands.

Education: own employees,

Responsibility:

Information. Foreman.

Education: Director.

Background:**Approach:**

By employment of new employees, the director looks through their education so far and discuss the need for further education together with the employee. New employees are informed about the system for Quality Management and Environmental Management and about the company's Quality- and Environmental goal. The employee's obligations regarding Quality and Environment and the importance of acting in line with the procedures are looked through. The director draw up a basic file on each employee, where time for information regarding the system are registered together with the education so far and planned education. The need for education are revised once a year as a minimum. The foreman instruct verbally by starting up an operation or by run in of a new team on the building site. In special occasions, the foreman makes a work sketch, or written instruction is handed out, e.g. user manual or Byg-Erfa sheets.

Documentation:**Filing:****2.2.8 Deliverycontrol****Goal:**

- Ensure that used materials fullfills the demands in the project.
- Ensure that materials are without considerable defects and deficiencies.
- Ensure that complains regarding deliveries with deficiencies are handled i due time.
- Ensure that the requested Quality documentation are procured.

Validity.

All deliveries

Responsibility:

Foreman.

Background:

Approach:

The foreman order deliveries according to the project- or materialelist at the suppliers on suppliers list. All deliveries are controlled for: transport damages, correspondance between delivery note, ordering list, recieved materials and marking. Delivery note is signed. The foreman make complains to the supplier in case of deviations and decide whether the delivery shall be sorted out or returned. If the defect has an influence on the time schedule or the quality of the executed work, the contract manager are informed and will decide what to do.

Documentation:

Filing:

2.2.9 Processcontrol

Goal:

- Ensure that all executed work are according to project demands.
- Ensure that all work is executed craftsmanlike.
- Ensure that all work fullfill the company's Quality norms.
- Ensure that all work fullfill the company's environmental goals for the individual project.
- Ensure that work is executed according to legislation in force.

Validity:

All works.

Processcontrol regarding Quality are documented by controlplans and control schedules, where it is requested in kontrakt or agreed with the client.

Process control regarding environment are documented by control plans and control schedules at all works.

Responsibility:

Contract manager has the responsibility for planning and follow up.

Foreman has have the responsibility for practical execution.

A substitute is pointed out at control activity.

Background:

Approach:

Deviations, which have an influence on the Quality of the final work or on fulfilment of environmental goal for the project, are reported to the contract manager, who will decide the consequences of the deviation, and determine necessary provisions. The client shall be informed about all deviations and approve all deviations, which are not repaired and which have an influence on the quality of the completed work. A deviation report is elaborated, which have to be approved by the client.

Documentation:**Filing:****2.2.10 Final control****Goal:**

- Ensure that all completed works fulfil Quality demands from the project and politics from the company.
- Ensure that eventual defects and deficiencies are repaired, before handing over to the client.
- Ensure that the company's goal regarding delivery of buildings without defects and deficiencies are met.

Validity:

All projects

Responsibility:

Contract manager

Background:**Approach:**

Contract manager goes through the trade with foreman, eventual defects are registered, and repairing is initiated immediately. Control documentation, certificates and other agreed documentation is examined and arranged for handing over to the client. File with documents are signed by contract manager and foreman as receipt, that the contract part is ready for handing over.

Documentation:

File with quality relevant documents, dated and signed by foreman and contract manager.

Filing:

In casefile.

2.2.12 Repairing of defects and deficiencies**Goal:**

Prevent unintended usage of deviating materials or services in the completed building.
Clarify eventual deviations internal, and where it is relevant with the client or supplier

Validity:

All works

Responsibility:

Foreman

Background:**Approach:**

Every material, which deviates from demands in the project, have to be returned or sorted according to agreement with supplier or used after documented permission from the client. Rejected deliveries have to be marked clearly until decision for use or scrap is taken. Materials, which are sorted out and scrapped, have to be removed from the building site. Deviating services have to be demarcated, until the deviation is corrected or accepted by the client, and client's accept is documented.

Documents:

Control schedules
Minute from final control scrutiny

Filing:**2.12 Inspection and maintenance of the system****Goal:**

- Ensure that the system is in line with the company's Quality- and environmental goal and politics.
- To get corrective actions
- To assess the effectivity of the system

Validity:

The complete Quality management- and environmental management system

Responsibility:

Director

Background:**Approach:**

Random check visits on building sites are executed to control observance of Quality- and control plans. List of defects from handed over building cases are scrutinized. Feed back from the client are scrutinized.

Every ½ year, the director scrutinize the process control schedules from selected contracts and assess on this basis, the fulfillment of the environmental goals. Earlier decisions regarding rectifying actions are controlled for result. The result are presented at ½ year meetings between foreman, contract manager and director. A minute for decisions are elaborated at the meeting, regarding which rectifying actions are needed, to keep the system work effective and ensure that the system is followed. The director initiate de rectifying actions and follow up on the execution of these.

Documents:**Filing**