Bosnia & Herzegovina

*ROAD DIRECTORATE*
*FEDERATION OF B&H*
Sarajevo

Public Company
"REPUBLIC OF SRPSKA ROADS "
Banja Luka

# GUIDELINES FOR ROAD DESIGN, CONSTRUCTION, MAINTENANCE AND SUPERVISION

## Volume IV: ROAD SUPERVISION

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University of Ljubljana
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DDC Consulting & Engineering Ltd.
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## CONTENTS:

# 1 SCOPE OF GUIDELINE

To make an engineer conversant with the system of supervision of engineering services on local and global level this guideline contains a brief description of inspection programme on Federal-Aid Highway Construction Projects – USA (FHWA) and comprehensive description of supervision system and powers of other parties in the construction process provided by FIDIC and International Financial Institutions (IFIs)

The last issued harmonized "Conditions of Contract for Construction FIDIC – MDB are anticipated to become the source document not only for financing and managing the engineering services by IFIs but to be the basic rule for a part of local Construction and Procurement Acts.

The guideline treats the system of supervision regulated by local Construction acts.

The most comprehensive is the part which treats supervision on site. On the local languages also other definitions for this level of supervision are used.

Harmonisation of local rules on placing of construction products, materials and services on market and assessment of conformity with EU regulations needs to present the Construction Product Directive – CPD.

In the guideline performance programme and site organisation, extensive programme of health and safety measurements, the programme of assessment of site environmental impacts and fire safety measurments are included. In addition a construction waste management system is treated.

The supervision of road maintenance is treated in the Guideline for Maintenance. This guideline treats only the common principles of maintenance supervision.

# 2 LEGAL BASIS

Bosnia and Herzegovina (B&H) consists of the two Entities, the Federation of Bosnia and Herzegovina and the Republic of Srpska.

Legislative body of B&H is The Parliamentary Assembly which has two chambers: the House of Peoples and the House of Representatives. Executive power belongs to the Presidency and Council of Ministers.

All governmental functions and powers not expressly assigned in the Constitution to the institutions of Bosnia and Herzegovina shall be those of the Entities

The regulation of transport between the Entities and the international telecommunication system belong to the institutions of B&H.

The Entities shall provide a safe and secure environment for all persons in their respective jurisdictions, by maintaining civilian law enforcement agencies operating in accordance with internationally recognized standards.

The Institutions of Federation of Bosnia and Herzegovina with districts and the institutions of Republika Srpska are responsible and empowered to protect and manage their own natural and residential environment, transport and telecommunication system.

The districts of FB&H are self empowered to regulate the spatial planning and construction on their territory

In the table below the Laws regulating the field of planning, protection of environment and health, transport, construction and supervision in each entity are listed:

| Federation of Bosnia and Herzegovina: | Republic of Srpska: |
|---|---|
| Zakon o građenju, (Sl. nov. FBiH, broj 55/02)<br>Zakon o prostornom uređenju (Sl. nov. FBiH br. 52/04) | Zakon o uređenju prostora (Sl.gl. RS br.:19/96, 25/96, 10/98, 53/02 i 64/02; prečišćeni tekst: 84/02)<br>Danom stupanja na snagu Zakona o uređenju prostora (vidi Sl. gl. RS broj 19/96) prestaje da važi Zakon o prostornom uređenju (Sl. list SR BiH, br. 9/87, 23/88, 24/89, 10/90, 14/90, 15/90 i 14/91), osim podzakonskih propisa, koji još nisu doneseni na osnovu člana 154 važečeg Zakona. |

| | |
|---|---|
| Zakon o ustupanju izgradnje investicionih objekata (Sl.list SRBiH br.33/77) | Zakon o komunalnim djelatnostima (Sl.gl. RS 11/95) |
| | Zakon o građevinskom zemljištu (Sl.gl. RS 41/03-11 i 86/03-1) |
| | Pravilnik o sadržini i načinu vođenja građevinskog dnevnika i knjige inspekcije (Sl.gl.RS, broj 15/02-7) |
| Uredba o prostornim standardima, urbanističko – tehničkim uvjetima i normativima za sprečavanje stvaranja svih barijera za osobe sa umanjenim tjelesnim sposobnostima (Sl. Nov. FBiH", broj 10/04) | Pravilnik o uslovima za planiranje i projektovanje građevina za nesmetano kretanje djece i osoba sa umanjenim tjelesnim sposobnostima. (Sl.gl. RS 2/03-6) |
| Zakon o putevima, (Sl.list SRBiH« br. 10/90 i Sl. list RbiH«, br 21/92, 13/94 i 33/95) | Zakon o komunikacijama BiH (Sl. gl. RS, broj 71/02) |
| Zakon o cestama FBiH (Sl. Nov. F BiH", broj 6/02) | Zakon o javnim putevima (Sl. gl. RS, broj 3/04) |
| Zakon o bezbjednosti javnih puteva (Sl. list SRBiH br. 3/90, 11/90 i Sl. list RbiH, br. 2/92 i 13/94) | |
| Zakon o osnivanju javnog preduzeća za puteve RBiH (Sl. list RbiH 13/94) | Odluka o uslovima koje mora ispunjavati preduzeće za održavanje i zaštitu puteva za obavljanje održavanja i zaštite magistralnih i regionalnih puteva (S.g. RS br.: 2/02-44) |
| Zakon o o sigurnosti željezničkog prometa posebno u vezi problema sa cestama i cestovnim prometom (Sl. list RbiH br.33/95 čl. 23, 25, 30 i čl. 102 tog zakona) | Zakon o željeznicama RS (»Službeni glasnik RS«, broj 58/01) |
| Zakon o osnovama bezbjednosti saobraćaja na javnim putevima (Sl. L. SFRJ« br. 50/88, 63/88, 80/89, 29/90 i 11/91,SRJ 34/92, 13/93, 24/94, 41/94); sa novim izmjenama (Sl. RbiH br. 2/92, 13/94 i 2/96) | |
| Pravilnik o održavanju javnih puteva, (Sl. l SRBiH« br. 24/90) | Odluka o uslovima koje mora ispunjavati preduzeće za održavanje i zaštitu puteva za obavljanje održavanja i zaštite magistralnih i regionalnih puteva (Sl.gl. RS br.: 2/02-44) |
| Pravilnik o tehničkom pregledu javnih puteva (»Sl. l. SRBiH« br.15/77) | Odluka o oblastima na koje se dijeli mreža javnih puteva za potrebe obavljanja poslova održavanja i zaštite puteva. (27.12.2001) |
| Pravilnik o postavljanju reklama i drugih natpisa pored javnih cesta (Sl.list SRBiH br.2/76 i 1/77, FMPK broj: 01-050-212-1/77 od 06.02.1997. god.) | |
| Pravilnik o vanrednim prevozima (Sl.list SRBiH br.40/75) | |
| Odluka o posebnom ograničenju saobraćaja za motorna vozila (u zimskim uvjetima), (»Službeni list SRBiH« br.40/75) | |
| Pravilnik o evidenciji javnih puteva i objekata na njima te o tehničkim podacima za puteve (Sl.list SFRJ, br. 50/82, 11/83 i 64/86) | Pravilnik o evidenciji o javnim putevima i objektima na njima kao i o tehničkim podacima za te puteve (»Službeni list SFRJ«, br. 52/83) |
| Environment regulations: | |
| Zakon o zaštiti okoliša, (Sl. novine FBiH 33/03) | Zakon o zaštiti životne sredine (Sl.gl. RS 53/02) |

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|---|---|
| Zakon o zaštiti prirode, (Sl. novine FBiH 33/03) | Zakon o zaštiti prirode (Sl.gl. RS 50/02) |
| Zakon o zaštiti zraka, (Sl. novine FBiH 33/03) | Zakon o zaštiti vazduha (Sl.gl. RS 53/02) |
| Zakon o zaštiti voda, (Sl. novine FBiH 33/03) | Zakon o zaštiti voda (Sl.gl. RS 53/02) |
| Zakon o upravljanju otpadom, (Sl. novine FBiH 33/03) | Zakon o komunalnim djelatnostima (Sl.gl. RS 11/95) |
| Zakon o vodama. (Sl. novine FBiH br. 18/98) | |
| | |
| Health and safety at work | |
| Zakon o radu (Sl. nov. FBiH br. 43/99, 32/00 | Zakon o zaštiti na radu (Sl.gl. RS 26/93, 14/94, 21/96 i 10/98) |

# 3 DEFINITIONS

## 3.1 FIDIC

### *3.1.1 Sequence of principal events and documents during engineering services*

**Base Date:** means the date 28 days prior to the latest date for submission of the tender.

**Commencement Date:** means the date the Engineer defines and shall give to Contractor with the Notice of the commencement day.

**Performance Security:** means guaranty certificate of performance security acquired by a Contractor.

**Interim payment Certificate:** means a payment certificate issued by the Engineer, usually at the end of a month.

**Time for Completion:** means the time contracted for completing the works (including tests) calculated from the Commencement Date.

**Test on Completion:** means the tests which are specified in the Contract or agreed by both Parties or required by provisions of national technical legislation.

**Taking-Over Certificate:** means a certificate issued by the Engineer and stating the date on which the Works are completed in accordance with the Contract except for any minor outstanding work and defects to be remedied in the defects notification period.

**Defects Notification Period:** means the period for notifying defects in the Works stated by the Engineer in the taking over certificate.

**Performance Certificate:** means the certificate issued by the Engineer stating the date on which the Contractor completed his obligations to the Engineer's satisfaction.

**Final Payment Certificate:** means the payment certificate issued to the Employer by the Engineer stating the amount which is finally due and all amounts previously paid by the Employer and for all sums to which the Employer is entitled.

### *3.1.2 Parties and Persons*

**Employer:** means the person named as employer and the legal successors in title to this person.

**Contractor:** means the person(s) named as contractor accepted by the Employer and the legal successors in title to this person(s)

**Engineer:** means the person *appointed by the Employer* to act as the Engineer for the purposes of the Contract and named in the Contract's documents or other person (supervisor) appointed from time to time by the Employer and notified to the Contractor.

**Employer's Personnel:** means the Engineer, responsible assistants and all other staff, labor and other employees of the Engineer and of the Employer and any other personnel notified to the Contractor by the Employer or the Engineer as Employer's Personnel.

**Dispute Adjudication Board (DAB):** means the person or three persons so named in the Contract being entitled to solve the issues of claims and disputes.

## 3.2 IFIs

**Client:** In principle IFI's fund public works, consultant services or supplies. The first step of financing procedure is Financial agreement between the member or representative of a Bank group and the Government (Ministry) of a state or Representative of an Entity. The user of bank funds is usually called »Client«. The financial agreement may anticipate a Consultant for specific phases of project management.

**Project Manager:** After successful financial contracting the State(Entity) Representative names a Project Manager, usually a Government Agency authorised to carry out the duties of "Employer" which names the Consultant(s) and Engineer(s) to manage the engineering services (as determined by FIDIC). The Engineer managing the engineering

services of national importance must be selected through a proper procedure of public procurement.

**Supervisor:** The Engineer must appoint a responsible supervisor for each construction site on which construction supervision is carried out according to the local Construction Act. Supervisor must be selected through a proper procedure of public procurement.

**Adjudicator:** As Dispute Adjudication Board – DAB EBRD use title »Adjudicator«.

## 3.3 LOCAL CONSTRUCTION ACT

**Construction** means design, execution and maintenance of works.

The provisions of these guideline shall not apply to the execution of works for protection, rescue and assistance during natural and other disasters, or to the execution of military engineering works.

Construction is the execution of construction works and other works, and includes the construction of new works, reconstruction works, replacement construction and the removal of works

The decree shall define which civil engineering works are works of national importance.

Works shall be classified in terms of the difficulty of construction and maintenance as complex works, less demanding works and simple works.

All works must comply with spatial planning documents, must be reliable and must be the subject of records.

Ensuring that works comply with spatial planning documents, are reliable and are the subject of records, shall be in the public interest.

**Building Regulations** shall define the technical properties for individual types of works, such that with regard to their purposes the works fulfill one, several or all of the following essential requirements:

- mechanical resistance and stability
- fire safety
- hygiene, health protection and environmental protection
- safety of use
- noise protection
- energy efficiency and heat retention

Only construction products that were placed on the market in accordance with regulations on construction products may be built into works.

Building regulations may refer to standards and technical guidelines relating to a specific type of works, and may stipulate the mandatory application thereof or stipulate that it should be presumed that a specific element complies with the requirements of the building regulations if it satisfies the requirements of the standards or technical guidelines.

If the presumption of compliance specified in the previous paragraph is stipulated in the building regulations, the building regulations must also define the bodies responsible for ruling and the procedure in which it is demonstrated that a project in which the standards or technical guidelines were not applied but in which solutions from the latest state of construction technique were applied in the project designer's work also ensures at least the same level of safety as a project prepared by applying the standards and technical guidelines.

**The Relevant Bodies** in the construction of works and all participants in the construction of works are each obliged for themselves and within the framework of the rights and obligations defined by this act to ensure that the works and the individual parts thereof are reliable, comply with spatial planning documents and are the subject of

records, and that during use access, entry and use will be ensured for functionally impaired persons without physical obstructions or communicational hindrances

The relevant administrative bodies for construction matters are the ministries (in BiH municipality and district bodies too) that issue the building permits for works or permits for use.

Inspection supervision of the implementation of legal regulations shall be conducted by building inspectors responsible for spatial planning and (or) construction matters.

**The Participants in the Construction** are the investor, the designer, the auditor, the contractor and the supervisor.

**The Construction** of public infrastructure works may commence on the basis of a building permit that is deemed final in legal terms. (On the territory of BiH: building permit, issued in accordance with urbanistical license and other conditions for awarding the building permit)

Building permit may be issued for preliminary works.

Usually a building permit shall not be required for simple works that a provider of public services is erecting on works of public infraworks and that is intended directly for the provision of public services or the management of public infraworks.

Regular maintenance works, maintenance works of public benefit and investment maintenance works may commence without a building permit.

**Construction Supervision** is the performance of expert supervision on the construction site by which it is verified whether the construction is being carried out according to the project for acquiring the building permit on the basis of which the building permit was issued, by which the quality of the executed works, the construction products, other materials and the installations and technological appliances built into the works is supervised, and by which it is verified whether the contracted prices and agreed deadlines for construction are being observed;

**Works** are buildings or civil engineering works fixed to the ground and built of construction products and of natural materials together with any inbuilt installations and technological fittings and kits);

**Buildings** are works with one or more premises into which a person can enter and intended for residence or the performance of activities;

**Civil engineering works** are works intended for satisfying human material and spiritual needs and interests that are not residential and are not intended for the performance of activities in buildings;

**Works of national importance** are works important to the development of a state and it's composing entities, works that can affect the health and safety of a large number of people or have a significant impact on the environment, or works and the environs of such works that are of particular importance to defense and security against natural and other disasters;

**Works of environmental impact** are works for which environmental protection regulations prescribe a mandatory environmental impact assessment;

**Works in public use** are works whose use is intended for all under the same conditions; such works are divided in terms of manner of use into public areas and non-residential buildings intended for public use;

**Public area** is an area intended for use of all under the same conditions, such as a public highway, a street, a square, a marketplace, a playground, parking place, a cemetery, a green or a recreation park or other area;

**Non-residential building intended for public use** is a building intended for public use is a building whose use is intended for all under the same conditions, such as hotel management or a similar building for accommodation, a bank, a post office, an office or a

similar commercial building, a building for trade and services, a railway or bus station building, an airport building or a port terminal building, a cableway station, a garage building or a similar building for transport and communications, a building for entertainment or recreation, a museum, a library, a school building or any other building for education, a hospital building or institutional care building, a sports hall, or a building for worship and for religious activities;

**Public infrastructure works** are civil engineering works that form a network serving a specific type of public utility of national or local importance or forms a network of general benefit to the public;

**Complex works** are such buildings whose total volume exceeds 5.000 $m^3$ and that are more than 10,00 meters in height, measured from the ground to the eaves and civil engineering works whose bearing spans are greater than 8 meters or that are more than 18,00 meters in height, measured from the ground to the level of the bearing structure, works with deep foundations, an underground works whose level of structure is more than 10,00 meters below the ground, building with pre-stressed structures whose bearing spans are greater than 12 meters, dam more then 10,00 meters in height, tunnel, public railway, motorway, fast or main or regional highway, harbors, public airports, passenger cable car or any other cable way then pass over buildings, silo or reservoir with a volume of more then 1000 $m^3$ , power facilities, long distance water pipeline, wastewater collector, solid waste dump for two or more municipalities, any hazardous waste dump, gas or oil distribution pipelines;

**Plain works** are buildings whose total volume does not exceed 5.000 $m^3$ and that are no more than 10 meters in height, measured from the ground to the eaves, or any civil engineering works not classified as complex works;

**Simple works** are less demanding works in terms of structure that do not require any special static analysis or technical verification, is not intended for residence and are not works with environmental impact; simple works are classified as auxiliary works, temporary works, practice works, memorials and urban equipment;

**Urban equipment** comprises simple mobile works that assist in ensuring the intended use of public areas;

**Building regulations** are technical regulations that define in detail the essential requirements for specific types of works, the conditions for designing, the selected levels and classes for the construction products and materials that may be built in and the manner in which they are incorporated, the methods of execution of works, the method for determining if works comply with the prescribed essential requirements, and other conditions and rules to ensure the reliability of works throughout the working life of works;

**The state of the art** is the state that, at the given moment when the project documentation is being made or the works are being executed, represents the level of development attained in the technical capabilities of construction products, processes and services based on recognized scientific findings, techniques and experience in the field of construction, reasonable costs having been taken into consideration;

**Technical guideline** is a document that for the specific type of works sets out the most precise definition of the essential requirements, the conditions for designing, the selected levels and classes for the construction products and materials that may be built in and the manner in which they are incorporated, and the methods for execution of works with the aim of ensuring the reliability of the works throughout their working life, and, if appropriate, the procedure according to which it can be determined whether such requirements have been fulfilled;

**Investor** is a legal or natural person that commissions the execution works or executes the works by himself;

**Project designer** is a legal or natural person that provides project design services as a commercial activity;

**Responsible project designer** is the individual responsible to the designer for the compliance of the design with spatial planning acts, building regulations and the conditions of the relevant approving authorities;

**Responsible design manager** is the individual responsible to the designer for the mutual compliance of all the designs that make up the project documentation and for the quality of the processing of the entire project;

**Contractor** is a legal or natural person that provides services in the execution of preparatory works on the construction site, in the execution of works, in the assembly and incorporation of machinery and electrical installations and in the execution of finalization of works, as a commercial activity

**Responsible executor of individual works** is the individual responsible to the contractor for the compliance of individual works in the construction with the project documentation based on which the building permit was issued, the building regulations, and the regulations in the area of ensuring health and safety at work on construction sites;

**Responsible executor of works** is the individual responsible to the contractor for the compliance of all the executed works with the project documentation based on which the building permit was issued, the building regulations, and the regulations in the area of ensuring health and safety at work on construction sites;

**Responsible construction site manager** is the responsible manager of execution of works that is appointed among the responsible executors of works by the investor in situation when there are more executors at a single construction site, and is responsible for the coordination of the work of all the responsible executors of works and responsible executors of individual works;

**Supervisor** is a legal or natural person that provides services of building control as a commercial activity;

**Responsible supervisor** is the individual responsible to the supervisor for the compliance of works with the conditions specified in the building permit and for the quality of the works carried out in accordance with the building regulations;

**Project documentation** is a systematical composition of plans and/or technical descriptions and reports, calculations, drawings and other appendices setting out the urbanistical, functional, formal and technical properties of the intended construction and the scope of the outline scheme, preliminary design, the project for acquiring the building permit, the project for the tender and the project for execution;

**Technical documentation** is a systematical composition of documents, pictures and drawings, plans, texts and other elements such as guarantees, certificates, confirmations, lists, schemes and instructions that set out the rules for using or operating and maintaining the works and the scope of the project of the executed works, the project for the operation and maintenance of works and the project for entry in official records;

**Technical advising** is consultation and representation of the investor related to construction;

**Building permit** is an administrative decision by which the relevant administrative body allows such execution of works and prescribes the specific conditions that must be observed during execution of works, after having found that the intended construction is in accordance with the spatial planning document, that the works will fulfill the essential requirements and that the intended execution of works will not prejudice the rights of third parties or the public good;

**Permit of use** is a ruling by which the administrative body that issued the building permit for the construction, on the basis of a previously conducted technical inspection

allows the use of the works to commence;

**Technical inspection** is an inspection of the constructed or reconstructed works by which it is determined whether the works has been constructed or reconstructed in accordance with the building permit and whether it will fulfill the prescribed essential requirements;

**Proof of the reliability of the works** is an appended declaration that demonstrates that the works as a whole will fulfill the prescribed essential requirements during use and maintenance;

**Operational monitoring** is a control of the operation of works or a technological appliance in accordance with environmental protection regulations

### 3.4 TAKING OVER OF CONSTRUCTION PRODUCTS

**Accreditation** Procedure by which an authoritative body gives formal recognition that a body or institution is competent to carry out specific tasks. (EN 45020:1998**)**

**Institution** With respect to the function of the bodies involved in the attestation of conformity, distinction shall be made between

(i) Certification body, which means an impartial body, governmental or non-governmental, possessing the necessary competence and responsibility to carry out conformity certification according to given rules of procedure and management;

(ii) Inspection body, which means an impartial body having the organization, staffing, competence and integrity to perform according to specified criteria functions such as assessing, recommending for acceptance and subsequent audit of manufacturers' quality control operations, and selection and evaluation of products on site or in factories or elsewhere, according to specific criteria;

(iii) Testing laboratory, which means a laboratory, which measures, examines, tests, calibrates or otherwise determines the characteristics or performance of materials or produces.

In case (i) and (ii) (first possibility) of paragraph 2 CPD, the three functions of paragraph 3 CPD (i) to (iii) may be performed by one and the same body or by different bodies, in which case the inspection body and/or the testing laboratory involved in the attestation of conformity carries our its function on behalf of the certification body.

For the criteria concerning the competence, impartiality and integrity of certification bodies, inspection bodies and testing laboratories, see Annex IV of CPD

**Attestation of conformity** Activity of a manufacturer or an approved certification body designed to produce a statement providing reassurance to the effect that the performances of a product conform to the requirements of a technical specification

**Audit test** Conformity control by means of random testing of samples taken at the factory, on the open market or on a construction site by the manufacturer or an approved body.

**Authorized body** Conformity assessment body, control body or testing laboratory, recognized with a Ministry written order that the body is competent to carry out conformity assessment of products.

**Certification** Procedure by which a third party gives written assurance that a product, process or service conforms to specified requirements.

**Certification of factory production control** Procedures and tasks of third party body being involved in conformity attestation systems 2+ in 2; by which the certification body issues a certificate of factory production control, as written assurance that a production control conforms to specified technical specification.

**Certificate** a written document, issued with regard to the rules of a certification system, confidential certifying that a precisely appointed product, process or service conforms to a specified standard or another normative act.

**Certification body** (see approved body) an approved body, which leads the procedure of certification and issues a certificate.

**Conformity/auto control test** For CE marking under the CPD, manufacturers should also operate a factory production control system including *auto control testing of random samples*, all in accordance with Clause 4, EN 197-2. A quality management system complying with EN ISO 9000 and that takes account of the harmonized European Standard may be regarded as meeting the factory production control requirements of the CPD

**Conformity assessment** Any activity concerned with determining directly or indirectly that relevant requirements are fulfilled.

**Conformity attestation system** is a combination of methods of conformity control according to annex III of CPD, depending of nature and importance of a product to fulfill the essential requirements of CPD regarding the influence of inconstancy of product performances on its serviceability. The anticipated systems are labeled as: 1+, 1, 2+, 2, 3 and 4.

**Conformity evaluation** Systematic examination of the extent to which a product, process or services fulfils specified requirements

**Construction product** means any product as result of an industrial activity or process that is the subject of technical specifications, being produced for incorporation in a permanent manner in construction works, including both buildings and civil engineering works

**Declaration of conformity** The declaration of conformity is a document that ensures either that the product satisfies the essential requirements of the applicable technical specification or that the product is in conformity with the type for which a type-examination certificate has been issued and satisfies the essential requirements of the applicable technical specification.

The declaration of conformity' shall specify some elements, ranging from the manufacturer's address to the technical solutions applied.

A manufacturer established outside the EEA is entitled to carry out all the certification procedures at his premises and, therefore, to sign the declaration of conformity, unless otherwise provided for in the directive(s). It is not necessary for the signatory of the EC declaration of conformity to be domiciled in the EEA

**Designated** body is third party organization who has been appointed by a State Competent Authority following completion of an in depth assessment, verification and qualification process, such as knowledge, experience, independence or resources to conduct the conformity assessments.

**Factory production control – FPC** These attestation procedures, whether or not they require the involvement of a third party Designated Body, require the manufacturer to operate a Factory Production Control (FPC) system that ensures conformity to the technical specifications.

All the elements, requirements and provisions adopted by the manufacturer should be documented in a systematic manner in the form of written policies and procedures. The documentation should enable the achievement of the required product characteristics and the effective operation of the production control system to be checked.

**Inspection body** (see approved body) EN 45004 specifies the general criteria for the competence of impartial bodies performing inspection irrespective of sector involved. It incorporates relevant requirements of IS0 9000 series of standards and many features of ISO/IEC Guide 39 (General Requirements for the Acceptance of Inspection Bodies). It is intended for the use of inspection bodies and their accreditation bodies as well as other bodies concerned with recognizing the competence of inspection bodies

Inspection is defined as - examination of a product design, product, service, process or plant, and determination of their conformity with specific requirements or on the basis of professional judgment. Conformity assessment by inspection is not limited to product and plant, but is equally relevant in other areas such as services and processes

**Product certification** Procedures and tasks of third party body being involved in conformity attestation systems 1+ and 1 (CPD), by which the certification body issues a product conformity certificate, as written assurance that a product conforms to specified technical specification.

**Surveillance** Inspection body's conformity evaluation, to determine the continuing conformity to specified requirements after acquirement of a certificate.

**Standard** shall mean a technical specification, which is approved by a recognized standardization body for repeated or continuous application and with which compliance is not compulsory. Standards may fall into the following categories:

- International standard: standard adopted by an international standards body and made available to the public;
- European standard: standard adopted by a European standardization body and made available to the public;
- National standard: standard adopted by a national standardization body and made available to the public

**Technical specification** a specification contained in a document which lays down the characteristics required of a product, such as levels of quality, performance, safety or dimensions, including the requirements applicable to the product as regards the name under which the product is sold, terminology, symbols, testing and testing methods, packaging, marking or labeling, and conformity assessment procedures. The term "technical specification" shall also cover production methods and processes used in respect of products when these have an impact on their characteristics

**Testing laboratory** (see approved body) a laboratory, which measures, examines, tests, calibrates or otherwise determines the characteristics or performance of materials or products.

Testing laboratory may be:

- *Auto control laboratory:* Internal or external laboratory that conducts tests in the context of factory production control.
- *External laboratory:* Laboratory that is independent from the supplier.
- *Internal laboratory:* Laboratory that is dependent from the supplier

## 3.4 CONSTRUCTION SITE

**Temporary or mobile construction sites** (hereinafter "construction sites") shall mean any construction site where construction works are carried out;

**Worker, employee** shall mean a person performing work with the employer based on employment contract. An employee shall be within the scope of the law also a person who on any other legal basis performs work for the employer or carries out independent professional, agricultural or other activity and a person who performs work with the employer due to training.

**Self-employed person** shall mean a sole proprietor individual or other person who by performing professional activity cooperates in the implementation of the project and does not employ workers;

**Workplace** shall mean a place intended for the implementation of work and located in the buildings of the employer as well as temporary or mobile construction sites to which the worker has access during their employment and is under direct or indirect supervision of the employer.

**Working environment** is an area where work is carried out, including workplaces, working conditions, working procedures, social relations and other impacts of the external environment.

**Means of work** shall be:

- a facility intended for working and auxiliary premises,
- working equipment,
- means and equipment for personal protection at work,
- substances and preparations,
- other means used in the work process or in any way related to it.

**Work equipment** shall mean any machine or device, appliance, tools or other equipment used at work

**Hazardous substance** shall mean a substance which can due to physical, chemical and biological harmful characteristics cause damage or health injuries and is in terms of special characteristics defined as hazardous in special regulations.

**Coordinator for safety and health at the project preparations stage** shall mean any natural person or legal entity authorised by the client and/or project supervisor during the preparation of the project design to implement works involved in design.

**Coordinator for safety and health at the project execution stage** shall mean any natural person or legal entity authorised by the client and/or project supervisor during the implementation of the project to implement works involved in construction.

### 3.5 WASTE MANAGEMENT

**Influence area** is the three-dimensional space around, above and below planned works in which the permissible emission of substances or energy from the works into the environment and other impacts on the environs from the works are envisaged, the building regulations and conditions for construction being applied;

**Machine fleet** shall mean the construction machinery and other appliances located on the construction site and intended for the execution of preparatory works on the construction site, the execution of construction works, the assembly and building-in of machinery and electrical installations and equipment, the execution of finishing construction works and the production of construction products.

**Emission** shall mean the direct or indirect release or emitting of substances, vibrations, heat or noise from an individual or dispersed sources in the plant in the atmosphere, water or soil.

**Pollution** shall mean direct or indirect depositing of substances, vibrations, heat or noise in the atmosphere, water or soil, which is the result of human activity and may damage the human health or quality of the environment, damage material property or damage or interfere with enjoyment and other permitted uses of the environment.

**Substance** shall mean any chemical element and compounds thereof, except radioactive substances within the meaning of the Directive 80/836/Euratom and genetically modified organisms within the meaning of the Directive 90/219/EEC and the Directive 90/220/EEC.

**Waste** shall mean any substance or object belonging to a category of waste specified in the Waste Management Act, which the holder discards or intends or is required to discard, and anything which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste until the contrary is proved.

**Dangerous waste** shall mean waste classified in one of the groups in the classification list of dangerous waste specified in Annex 1 of the Rules on the Management of Waste and marked by an asterisk along the classification number of the waste.

**Inert waste** shall mean waste. which does not significantly change physically, chemically or biologically, does not disintegrate, burn or otherwise react either chemically or physically, is not biodegradable and has no adverse effect on other substances when

coming into contact in any way, which would increase pollution of the environment or be harmful to health. Total leaching and values of pollution parameters in inert waste and ecotoxicity of effluents as a dangerous characteristic H14 from the regulation on waste management does not endanger the quality of surface or underground water.

**Municipal waste** shall mean household waste and other waste being similar to household waste by nature and composition.

**Liquid waste** shall mean any waste in liquid state, including wastewater, except mud or slime.

**Biodegradable waste** shall mean remains of food, kitchen waste, waste from gardens or parks, paper, cardboard or other waste, degradable when exposed to anaerobic or aerobic processes of degradation.

**Construction waste** shall mean mixture of materials resulting from demolition of concrete or built structures, removal of asphalt and other construction and demolition work and construction waste material from rock or minerals.

**Homogenous waste** shall mean waste from the same holder of waste, resulting from a process with no significant changes or disturbances, so that physical, chemical or biochemical properties of waste relevant for their disposal do not change essentially and which are classified in the same group in the classification list of waste.

**Waste shipment** shall mean the quantity of homogenous waste, which the managing entity of the disposal site accepts in one calendar day with one accompanying documentation on accepted waste.

**Waste treatment** shall mean any physical, thermal, chemical or biological process, including sorting of waste, whereby properties of waste are changed for the purpose of reducing their volume or dangerous properties, facilitated handling of waste or increasing the possibility for their recycling.

**Representative sample of waste** shall mean a sample taken from the entire quantity of waste, which has identical properties as the average composition of waste being the subject of a chemical analysis.

**Waste disposal site** (hereinafter referred to as: disposal site) shall mean a single or several facilities for depositing waste in soil or under it or underground. A disposal site is also:

- A facility or a part thereof, where the producer of waste deposits its waste at the point of their origin; and
- Permanent facility or a part thereof, where waste is stored for more than one year.

The following is not a disposal site:

- A device, facility or a part thereof where waste is unloaded for the purpose of enabling its preparation for further transport for recycling, processing or disposal; and
- Waste storage site, where waste is temporary stored for not more than three years before being recycled or processed or not more than one year before its disposal.

**Existing disposal site** shall mean a disposal site being built or operational as at the date this Rules come into force or a disposal site for which the construction permit has been obtained prior to coming into force hereof.

**Reconstruction of a disposal site** shall mean any construction and other development increasing the capacity of a disposal site or changing the type of the disposal site.

**Managing entity of a disposal site** shall mean any legal entity or natural person, who in accordance with the regulations manages the disposal site during its operation or after its closure.

**Holder of waste** shall mean any entity producing waste or any legal entity or natural person having possession of waste.

**Disposal permit** shall mean the permit for disposal as specified in the regulation governing waste management.

**Body of a disposal site** shall mean the entirety of deposited waste and the system of tightness of the disposal site's bottom, covering of the disposal site's area, the system for drainage of effluents and rainwater from the disposal site's area, the system for degassing of the disposal site and other technical devices and border and supporting embankments and other technical structures for providing stability of the body of the disposal site.

**Tightness of a disposal site** shall mean the technical system of devices and measures for preventing emission of substances in soil, consisting of tightness of the disposal site's bottom and the system for drainage of effluents and rainwater. The combined tightness of a disposal site shall mean tightness consisting of various tightening materials with supplementary properties. Mineral tightening shall mean artificial tightening, consisting of single-or multi-layer condensed layers of mineral soil and the necessary additives.

**Effluents** shall mean any liquid leaking from deposited waste or trickling through the body of the disposal site and which are drained or retained inside the disposal site.

**Leachate** shall mean any solution obtained by laboratory test of leaching of waste.

**Disposal site gas** shall mean any gas resulting from deposited waste.

**Degassing systems** shall mean degassing chambers, reservoirs and installations and regulation devices as well as any other technical facilities for capturing and controlled burning of the disposal site gas.

**Active degassing** shall mean sucking of the disposal site gas by means of artificially produced negative pressure.

**Entity producing waste** shall mean any entity, the actions or activities of which result in production of waste (the original entity producing waste) and any entity carrying out mixing of waste or other preliminary procedures changing properties or composition of such waste.

**Holder of waste** shall mean any entity producing waste or any entity having possession of waste.

**Waste management** shall mean preventing and reducing production of waste and its negative impact on the environment as well as waste handling.

**Waste handling** shall mean collection, transport, processing and deposit of waste, including control of such handling and measures for protection of the environment after the end of operation of a facility or device for processing or removal of waste.

**Waste processing** is intended for useful use of waste or components thereof and includes foremost recycling of waste for processing into raw material and reuse of waste and use of waste as fuel in a heating device or industrial furnace or use of waste in fuel production. Incineration of municipal and other waste by heat treatment for the purpose of their disposal shall not be considered waste processing. Processing of construction waste shall be waste processing in accordance with the regulation governing waste handling.

**Entity processing waste** shall mean any entity processing waste regardless of the fact whether it is also the producer of waste or is processing waste of other holders (hereinafter refereed to as: the processing entity).

**Waste removal** is intended for final treatment of waste not suitable for processing and includes foremost treatment of waste by biological, thermal, or chemical-physical methods and waste depositing. Removal of construction waste shall be waste removal in accordance with the regulation governing construction waste handling.

**Entity removing waste** shall mean any entity removing waste regardless of the fact whether it is also the producer of waste or is removing waste of other holders.

**Waste collection** shall mean collection of waste handed over by holders to waste

collectors and sorting or mixing of such waste for the purpose of transport to processing or removal.

**Waste collector** shall mean any entity, which in accordance with the regulations performs the activity of collecting a particular type of waste (hereinafter referred to as: the collector). Construction waste collector shall be any entity, which in accordance with the regulations performs the activity of collecting construction waste.

**Collection centre** shall mean the facility with the required installations, arranged for temporary storing and sorting of construction waste and other activities related to their reuse or removal.

**Entity transporting waste** shall mean any entity, which in accordance with the regulations performs the activity of transporting waste of other holders (hereinafter referred to as: the transporting entity).

**Agent** shall mean any entity, which in accordance with the regulations performs the activity of an agent in providing processing or removal of waste of other holders.

**Temporary storing of waste** shall mean storing of waste for the purpose of appropriate capturing or collection at the point of its production before providing for processing or removal.

**Recycling of construction waste** shall mean the procedure of processing construction waste for the purpose of producing construction material.

**Heavy metal** shall mean any compound having as an element antimony, arsenic, cadmium, chromium (VI), copper, lead, mercury, nickel, selenium, tellurium, thallium, and tin, as well as being in the form of metal if classified as hazardous waste.

## 3.6 CONSTRUCTION PRODUCTS FIRE RESISTANCE

**Material**: a single basic substance or uniformly dispersed mixture of substances, for example metal, stone, timber, concrete, mineral wool with uniformly dispersed binder, polymers.

**Homogeneous product**: a product consisting of a single material, having uniform density and composition throughout the product.

**Non-homogeneous product**: a product that does not satisfy the requirements of a homogeneous product. It is a product composed of one or more components, substantial and/or non-substantial.

**Substantial component**: a material that constitutes a significant part of a non-homogeneous product. A layer with a mass per unit area ≥ 1,0 kg/m2 or a thickness ≥ 1,0 mm is considered to be a substantial component.

**Non-substantial component**: a material that does not constitute a significant part of a non-homogeneous product. A layer with a mass per unit area < 1,0 kg/m2 and a thickness < 1,0 mm is considered to be a non-substantial component.

Two or more non-substantial layers that are adjacent to each other (i.e. with no substantial component(s) in-between the layers) are regarded as one non-substantial component and, therefore, must altogether comply with the requirements for a layer being a non-substantial component.

For non-substantial components, distinction is made between internal non-substantial components and external nonsubstantial components, as follows.

**Internal non-substantial component**: a non-substantial component that is covered on both sides by at least one substantial component.

**External non-substantial component**: a non-substantial component that is not covered on one side by a substantial component.

# 4 MANAGEMENT AND INSPECTION PROGRAM ON FEDERAL-AID HIGHWAY CONSTRUCTION PROJECTS - USA

## 4.1 OBJECTIVES OF INSPECTION

Inspections, either at the project or program level, are the primary method used by FHWA for fulfilling its construction program oversight responsibilities. Oversight represents the compliance or verification component of FHWA's stewardship activities.

Project oversight requirements may be different depending upon the stewardship agreements, but the general objectives of construction inspections are the same. Although State transportation agencies (STA's) may be delegated the authority to administer the program within the scope of 23 USC and related Federal laws, FHWA retains the responsibility to assure that projects are being administered in full compliance. Specific objectives are as follows:

- Obtain assurance that the project has been completed in reasonably close conformity with plans and specifications including authorized changes and extra work. Provide a basis for acceptance of the project and reimbursement of project costs with Federal-aid funds.
- Acquire information on problems and construction changes. Provide an opportunity for timely remedial action where applicable. Provide documentation of solutions to problems or commitments. Encourage other STA units' involvement and awareness of problems to avoid future reoccurrence.
- Assess the State's abilities and effectiveness in managing and controlling Federal-aid construction projects with respect to items such as these:
- Qualifications-training, certification, written guidance
- Staffing, equipment, and facilities
- Performance
- Project documentation, including inspection diaries, test reports, etc.
- Promote the development and implementation of quality management programs.
- Offer technical and procedural advice. Recommend improved construction techniques and engineering supervision.
- Report on special or innovative construction materials, methods, procedures, new equipment, and other technological innovations.
- Professional development of FHWA and State review personnel.

## 4.2 INSPECTIONS: TYPES AND SCOPE

The type of inspection will vary depending on the time at which it is conducted, the objective of the inspection, and the FHWA-STA stewardship agreement criteria. Various types of inspections may be combined depending on the circumstances. The following descriptions of construction inspection classifications have been developed to provide guidance for FHWA offices on construction monitoring activities.

The FHWA Construction and Maintenance Web page (www.fhwa.dot.gov/construction/index.htm) provides generic construction review guidelines to provide the FHWA division offices and STAs with examples of process and in-depth reviews that have been undertaken by various field offices.

### *4.2.1 Process Review/Product Evaluation*

Process review/product evaluations (PR/PEs) are comprehensive reviews that have three primary objectives:

- Assure that State processes, procedures, and controls are in substantial conformance with Federal requirements.

- Assure that projects are constructed in substantial conformance with State processes, procedures, and controls.
- Identify opportunities and implementation plans to advance existing processes, procedures, controls, and technology to the state of the practice or state of the art.

PR/PEs are oriented toward reviewing the STA's method of doing business with enough product verification to assure that the process is working satisfactorily. Process reviews are generally undertaken on a statewide or area wide basis and should include a review of the process at key decision points.

### *4.2.2 Inspections-in-Depth*

Inspections-in-depth (IIDs) may be made on individual projects or may be part of a statewide review effort. IIDs are product oriented but involve the tracking of processes necessary to correct deficiencies or to identify and promote processes that produce high quality products on either a project or statewide basis. They are a detailed type of inspection involving the review of specifications, procedural manuals, and specific contract requirements.

### *4.2.3 Project Inspection*

Project inspection is an on-site review to evaluate project activities, the quality and progress of the work, and, if appropriate, to follow up on findings from previous inspections. These reviews are generally more limited in scope than a PR/PE, IID, or phased inspection.

### *4.2.4 Final Inspection*

A final inspection is a review to determine the extent to which the project has been completed in reasonably close conformance with the plans, specifications, and authorized changes. The division administrator should develop and include, as a part of the construction management program, a process to determine the final inspection requirements for construction projects. This determination should consider the type, size, and complexity of the project, the degree to which the project has been previously inspected by FHWA personnel, the adequacy of the STA's internal controls, and the extent of independent inspections and evaluations that have been provided by the State. The final inspections are conducted in accordance with the FHWA/STA stewardship agreement.

A final inspection may be accomplished by any of the following methods:

- An on-site review conducted at or near the completion of work.
- A review of project records that are provided by the State at the completion of work if prior on-site inspections have been conducted.
- If previous PR/PE or IID reviews of the STA's internal control programs for inspection of completed projects have indicated the STA has satisfactory procedures, the final inspection may be based on the finding that the STA is properly exercising its internal controls and no additional review will be required.
- When similar types of work are included in an area-wide project or projects using the same contractor, an inspection of a sample of contract work locations may fulfill the requirement for a final inspection.

### *4.2.5 Specialty Reviews*

Sometimes division offices develop other types of review activities patterned after the basic inspection types in an effort to better meet their needs and the management style of the STA. Special emphasis reviews have been used successfully to focus attention on high priority/high visibility topics;

- as fact-finding tools for preliminary investigations;
- for evaluating project staffing levels;
- for making state-of-the-art evaluations;

- for determining the extent of suspected problem areas; or
- for concentrated problem solving efforts.

*Emphasis area reviews* will typically be less detailed than major phase reviews but will be more detailed than a project inspection. This type of review envisions that a concentrated effort will be expended over a number of projects to direct added emphasis to a particular item or phase for a short period of time.

*Phase reviews* will typically target a major phase of work where all parts, such as paving, will be reviewed. Minor phases or portions of major phases, such as crushing or plant operations, may occasionally be reviewed. Reviews will typically be comprehensive but may be in less detail than an IID.

*Contact reviews* are useful for monitoring the status of changing situations, change orders, and construction operations. They are also useful in maintaining effective rapport and working relationships with State counterparts and local officials, and they can facilitate the scheduling of more detailed inspections. They typically should not replace the more in-depth reviews. However, they can be effective when properly controlled. While inspections should be on site, contacts by telephone or when passing through a project help to keep FHWA aware of project status and conditions.

## 4.3 CONSTRUCTION INSPECTION REPORT AND INFORMATION SHARING

### *4.3.1 Document Project History and Compliance*

Construction inspection reports fulfill four basic requirements:

- Provide permanent file evidence that inspections are being made as required by Federal regulations.
- Provide a basis for acceptance of completed work.
- Document field conditions, contractor performance, and the State's project management.
- Document FHWA's role, observations, findings, resolution of identified problems, claims, and any other topics of interest.

FHWA project files are generally maintained through formal final acceptance before being stripped and sent to the Federal Record Center; however, FHWA reports are generally maintained in STA records for several years longer. Field inspection reports should be considered historical project records.

### *4.3.2 Convey Information to the Reader*

The report writer should take into consideration a variety of potential readers. To be comprehensive and coherent, the report should cover these areas:

- Activities taking place on the project during the inspection.
- Observations and actions taken regarding quality and progress of work.
- Comments on the adequacy of the project administration by the contracting agency's representatives (staffing, supervision, documentation, measurement and payment of contract items, material issues, etc.).
- Adequacy of addressing traffic control, safety, and environmental issues.
- The STA's handling of change or extra work including proper justification for the work and adequacy of supporting documentation.
- Information on special or unusual technical topics.
- Follow-ups from previous reports.

All reports should be clear, concise with facts, and free of unnecessary personal opinions, and should include positive and constructive observations. Above all, reports should be accurate and specific since the content may be used in evaluating or refuting contract claims.

The original report should be filed in the division's project file, a copy sent to the STA, and a copy circulated to the program technical specialist and appropriate management in the division office. Reports should be made available to headquarters and the FHWA Resource Center as appropriate.

### *4.3.3 Writing the Report*

**Forms**

Two FHWA forms are suggested for use in filing inspection reports for all Federal-aid projects:

- Form FHWA 1446 A (or similar) "Construction Inspection Report", may be used to report all construction inspections, including final inspections.
- Form FHWA 1446 B (or similar) "Final Acceptance Report" , may be used to report final acceptance, or the division office may include an alternative method of documenting final acceptance in its construction management program. (Note: The final acceptance report is not required, although some division offices use it to assist in project closeout and to support payment of final voucher.)

**Content**

Inspection reports are a source document for FHWA's project oversight and involvement. They document project observations, findings, and recommendations; provide program and project information to FHWA management and other program managers; and transmit this information to various levels of STA management.

**Body of report:**

**Purpose:** A purpose of inspection statement can be useful in helping to keep the inspection on track and in informing the reader of what to expect in the report.

**Scope:** It is not always apparent what the inspection engineer has done from reading some construction inspection reports. A scope-of-inspection statement can be useful in documenting the inspection activity although action-oriented statements in the report can accomplish the same purpose.

**Work Completed:** The reporting of work completed to date, placed near the beginning of the report, gives the reader a mental picture of the work site and improves understanding of the discussion that follows. If either the progress or quality of work is reported to be unsatisfactory, further comment is required to support the finding, discuss what is to be done to correct the situation, and clarify the status of Federal-aid participation in the cost of the work during the interim period pending correction of the unsatisfactory condition.

**Work in Progress:** The discussion of work in progress helps document whether or not the contractor is diligently pursuing the work, and the adequacy of the State's staffing. The amount of detail reported will vary with the time spent on the project and with the purpose and intensity of the inspection. As an example, documented knowledge of work progress serves as a basis for participation in time extensions or the assessment of liquidated damages.

- *Findings and Comments.* As a result of the inspection, it should be possible to draw conclusions about the project work. Some conclusions can be expressed in terms of contract requirements, progress of work, the State's operating procedures, overall quality of construction, item/project overruns and changes, cost containment, and compliance with Federal regulations. Related observations to be discussed are public involvement, stakeholder feedback, weather, and third-party actions that may affect the work.
- *Opinions* of the inspecting engineer should be based on experience and professional judgment. These observations are perfectly valid and frequently valuable. Where such items are discussed with the State, it should be understood and stated as such in the report that they are only suggestions or information,

particularly where differences of opinion may exist. It can be disconcerting when a report raises more questions than it answers.

- *Recommendations***.** As a result of the inspection, it may be desirable to make recommendations regarding further actions. Unlike the suggestions or information recorded in the Findings and Comments section, recommendations are items to which the State is expected to respond in a timely manner.
- *Followup Actions.* The STA's resolution of previous recommendations should be discussed. Future followup actions should also be set forth in this section.

**Supporting Documentation**

- *Self-Sufficiency***.** Construction inspection reports should be able to stand on their own merit. This is not intended to imply that all information needs to be included in the body of the report; it is appropriate to reference other reports, documents, specifications, and sources.
- *Work Papers.* All the information gathered during the inspection may not be suitable or necessary for inclusion in the report. Such information may be kept in the work papers and filed with the file copy of the report.
- *Photographs and Drawings.* Sketches, drawings, photographs, and other illustrative material form an important part of the report, documentation, and work papers.

**Precautions**

Some words of caution are in order to facilitate report-writing efforts:

- *Document the findings.* The inspecting engineer should make the reports factual, and be value added.
- *Report specific observations*. Generalities tend to lead to confusion and speculations and gloss over findings.
- *Avoid unsupported hearsay*. Reports should be written in a manner that clearly shows FHWA's involvement and knowledge of the operations.
- *Provide for follow-up*. Findings and recommendations should be reported, tracked, and followed.

**Review:**

It is recommended that there be at least one level of review by the division management prior to release. Field engineers should report on their observations, findings, recommendations, and conclusions as they see conditions and needs in the field. Recommendations and conclusions should be supportable and based on fact, technical soundness, and compliance with Federal policy.

**Distribution**

The division office should have a routine procedure for routing construction inspection reports. Some individuals will be designated to read all reports while others, such as bridge engineers, environmental specialists, and right-of-way officers, should be designated to receive only those reports containing topics within their specialties.

Inspecting engineers and their supervisors should be responsible for assuring that appropriate individuals have access to individual reports. A designated individual should be responsible for summarizing observations, findings, and follow-up actions. Significant data should be included in the division office control system.

The State and FHWA should agree on the distribution of reports within the STA. Distribution may be routine, or it may vary with the type and content of the reports. It is recommended that all construction inspection reports be transmitted to the State for appropriate distribution.

# 5 FIDIC CONDITIONS OF CONTRACT FOR CONSTRUCTION

## 5.1 FOREWORD

FIDIC is a French Acronym of International Federation of Consulting Engineers. International federation consists of national federations. The field of Federation's activity is to promote the professional interests of members and informing. The members are developing professional and ethic standards of consulting engineering for Europe and developing countries.

FIDIC publications contain information for consulting engineers, employers and contractors in the form of standard proposals for prequalification procedures, contract conditions and contracts between employer and consultant. The Forms may be incorporated in national tender and contract documents under the conditions published on FIDIC web page of its secretariat founded in Swiss:

http://www.fidic.org/

During the year 1999 FIDIC was publishing the first Edition of four new standard forms of contract:

- *Conditions of Contract for Construction:* which defines the procedures of contract management carried out by Employer, Engineer and Contractor performing the engineering works designed by the Employer.

  During the year 2005 FIDIC was publishing harmonised Conditions of Contract for Construction produced for MDB financed contrats

  During the year 2005 FIDIC was publishing harmonized Conditions of Contract for Construction for use under licence on projects funded by participating multilateral development banks (MDB).

- *Conditions of Contract for Plant and Design-Build,* which are recommended for the provision of electrical and/or mechanical plant and for the design and execution of building or engineering works designed by Contractor.

- *Conditions of Contract for EPC Turnkey Projects*: This defines a higher level of accuracy of final prices and terms of execution.

- *Short form of Contract:* for building or engineering works of relatively small capital value, relatively simple or repetitive work or work of short duration.

During the year 1998 FIDIC was publishing standard forms of contract:

- *Client-Consultant Model Services Agreement* (White Book) (3rd Edition).

And during the year 2003:

- *FIDIC Guidelines for the Selection of Consultants*, (1st Edition).

In addition to General Conditions, Particular Conditions must be prepared for each individual contract. The General Conditions and the Particular Conditions will together comprise the Conditions of Contract governing the rights and obligations of the parties.

## 5.2 CONDITIONS

### *5.2.1 Employer*

The appointments of the Employer are represented in the chapter 2 of Conditions.

### *5.2.2 Engineer*

The Employer shall appoint the Engineer who shall carry out the duties assigned to him in the Contract. The Engineer's staff shall include suitable qualified engineers and other

professionals who are competent to carry out these duties in accordance with the locall laws and specific conditions of IFis.

An Engineer managing the works of national importance must be selected through a proper procedure of public procurement.

The Engineer must appoint a responsible supervisor for each construction site on which construction supervision is carried out thereby.

Detailed provisions on the Engineer's duties and responsibilities are represented in the chapter 3 of Conditions.

### *5.2.3 Provision of Legal Assistance*

The Employer shall have obtained the designs, planning, zoning or similar permission for the Works.

The Employer shall provide reasonable assistance at the Contractor's request for:

i. Contractor's efforts in obtaining copies of the Laws of the Country
ii. Contractor's applications for any permits, licenses or approvals required by these Laws

### *5.2.4 Instructions and Confirmations*

The Engineer may issue to the Contractor instructions and additional or modified Drawings which may be necessary for the execution of the Works and the remedying of any defects. The instructions shall be given in writing.

### *5.2.5 Contract and Technical Documentation*

The specification and drawings shall be in the custody and care of the Employer and in due course supplied to the Contractor.

The Contractor shall keep on the site a copy of the contract documents, Contractor's documents and drawing's documents about variations.

If a party becomes aware of an error or defect of a technical nature in a document the Party shall promptly give notice to the other party.

When the Contractor give a notice to the Engineer that the Works are likely to be delayed if any necessary drawing or instruction is not issued within a particular time the Engineer is responsible for:

- an extension of completion time
- payment of any such cost plus reasonable profit, which shall be included in the Contract price.

### *5.2.6 Access to the Site*

The Employer shall give the Contractor right of access to and possession of all parts of the site within the time stated in the Contract.

### *5.2.7 Assurance of Quality*

Engineer (on behalf of Employer) must select an Institution through a proper procedure of public procurement. Supervisor (on behalf of Engineer) controls all the procedures of internal, external and additional control of conformity and taking over of construction (semi) products and their incorporation in works. (See Construction Products EU Directive)

Detailed provisions on the parties' duties and responsibilities are represented in the chapter 7 of Conditions. (draw your attention to the provisions of clause 7.4)

### *5.2.8 Remedying of Defects*

The Engineer may from time to time instruct the Contractor to:

- remove from the site or substitute any plant of materials which, in the Engineer's opinion, is not in accordance with the Contract

- remove and re-execute any other work in the Engineer's opinion is not in accordance with the Contract
- execute any work which, in the Engineer's opinion, is urgently required for the safety of the Works, whether caused by an accident, unforeseeable event or otherwise.

The time for remedying is defined with Programme of works or Performance Certificate.

### *5.2.9 Health and Environment Protection*

Contractor must perform health and safety protection provisions and implement the protection of environment provisions.

Supervisor (on behalf of Engineer) controls implementation of health and safety protection provisions.

Inspector for environment must supervise the implementation of environment regulations.

*Safety provisions:*

- (appointment of coordinators)
- assuring safety and health to authorized persons on the site
- protection of site against undue disturbances and keeping of the unauthorized persons off site.
- hoarding, lighting, guarding and control of works
- protection of residential environment and adjacent land owners.

*Protection of the environment:*

- emission of gases, noise and vibration must not exceed the permitted values.
- waste and sewage treatment and depositing on earth must accord to legal regulations on environment protection.

### *5.2.10 Unforeseeable Physical Conditions*

After receiving the Contractor's notice and inspecting these conditions the Engineer shall agree or determine whether and to what extent these physical conditions were unforeseeable.

Unforeseeable Physical Conditions are

- natural physical obstacles
- obstacles caused by human impacts on environment
- geological conditions
- hydrological conditions

Climatic conditions are excluded (low temperatures, rainfall and snowfall).

### *5.2.11 Geological and Archeological Fossils*

After receiving the Contractor's notice the Engineer must give the instructions about further treatment of items of geological or archeological interest found on the Site. They must be placed under the care and authority of the Employer.

### *5.2.12 Commencement of Works, Programme and Time for Completion*

The Engineer shall give the Contractor not less tan 7 days' notice of the Commencement Date. Usually the Commencement Date shall be within 42 days after the Contractor receives the Letter of Acceptance.

Within 28 days the Contractor shall submit a detailed programme to the Engineer.

Engineer shall verify the programme which includes:

i *Time schedule*: the order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design, manufacture of Plant, delivery to Site, construction and erection

ii *The sequence of acceptance* of construction products and plants, control of incorporation and tests of kits and sections of works or trial production.
iii *Method of construction*
iv *Number and qualification of contractor's personal*
v *Plan of equipment and machinery*
vi *Plan of payments*

The financial plan of work must contain the bill of reference prices as a base for costs of variations.

### *5.2.13 Tests on completion and Employer's taking over of the Works*

Detailed provisions on the parties' duties and responsibilities are represented in the chapters 9 and 10 of Conditions. (draw your attention to the provisions of clauses 9.4 and 10.3)

### *5.2.14 Defects Liability*

Only the Performance Certificate shall be deemed to constitute acceptance of the Works.

Detailed provisions on the Engineer's (or someone's on behaf of Employer) duties and responsibilities are represented in the chapter11 of Conditions. (draw your attention to the provisions of clause 11.9 about Performance Certificate)

### *5.2.15 Measurement and Evaluation of Works*

FIDIC conditions presume the Engineer to manage the measurement and evaluation of Works and the Contractor to attend or to assist, but local Construction Act presume the Contractor to draft Works Diary and Quantity Book.

Detailed provisions on the parties' duties and responsibilities are represented in the chapter12 of Conditions. (draw your attention to the provisions of clause 12.3)

### *5.2.16 Variations and Value Engineering*

Detailed procedures are represented in the chapter13 of Conditions. (draw your attention to the provisions of clause 13.8)

### *5.2.17 Contract Price and Payment*

Payment is regulated with the provisions of the Contract and national financial regulations.

FIDIC gives the rules about payments very concisely in the chapter 14.

### *5.2.18 Risks and responsibility*

Chapter 17 represents the conditions about idemnities, Contractor's care of works, Employer's risks and their consequencies, property rigths and limitation of liability.

(Pay attention to clause 17.7 of MDB harmonised conditions about use of Employer's accomodation and facilities.)

### *5.2.19 Insurance*

General and special requirements are given in chapter 18. Samples of all types of guarantees (securities) are represented in part 2 of annexes.

### *5.2.20 Claims, Disputes and Arbitration*

Settling the disputes shall be defined by terms of the Contract

If a dispute arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Engineer, FIDIC suggests that it shall be referred in writing to the Dispute Adjudication Board (DAB). General conditions of Dispute Board Agreement are given in APPENDIX to MDB harmonised conditions.

A DAB settlement is an agreement on technical level.

Where a notice of dissatisfaction has been given the parties shall attempt to settle the dispute amicably. Unless settled amicably any dispute shall be finally settled by (international) arbitration.

References about claims, disputes and arbitration are represented in chapter 20.

### *5.2.21 Particular Conditions*

Some subclauses of Conditons need to be completed with additional provisions of Particular Conditions which amend General Conditions. These Particular Conditions take precedence over the General Conditions.

# 6 IFIS' CONDITIONS OF WORKS CONTRACT

## 6.1 FOREWORD

IFIs' is an acronym for International Financial Institutions. International and European Financial institutions, Corporations and Agencies prepared General Conditions of Contract implemented in procurement procedures, tendering and construction of loaned international projects. European Commission (EC) prepared the Conditions for Contracts applied to European Investment Bank – Fund) (EIB, EIF). European Bank for Reconstruction and Development (EBRD) drafted its own version of Conditions

The duties and responsibilities of Consultants, Supervisors, Investors and Contractors (Suppliers) are standardized on principles of FIDIC. They includes the forms of prequalification procedures, Contract Documents, execution of works (Supply) payment and taking over.

The Terms of IFIs' are more specific for the Employer's procedures of financing of works, informing, evaluation and control of payment. IFIs' introduce Ethic Clauses for all Parties especially for the Contractor.

During the year 2005 FIDIC was publishing harmonized Conditions of Contract for Construction for use under licence on projects funded by participating multilateral development banks (MDB). It is expected that the most of IFI's will use these harmonized Condition and form of Special Conditions.

Standard documents and rules are applicable for international or national procedures of investment without license limitation. The forms are published on web-pages:

The World Bank Group:

http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/PROCUREMENT/0,,contentMDK:20060840~menuPK:84282~pagePK:84269~piPK:60001558~theSitePK:84266,00.html

http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/PROCUREMENT/0,,contentMDK:20062006~menuPK:84284~pagePK:84269~piPK:60001558~theSitePK:84266,00.html

EBRD published its documents and rules on web page:

http://www.ebrd.com/oppor/procure/

European Union (including EIB):

http://europa.eu.int/scadplus/leg/en/s11000.htm

EAR:

http://www.ear.eu.int/projects/projects.htm

Phare, ISPA and SAPARD Contract Procedures:

http://europa.eu.int/comm/enlargement/pas/phare/procedures.htm

## 6.2 CONDITIONS

Different or additional provisions of IFIs' to FIDIC General conditions of contract:

### *6.2.1 Project Manager's Duties and Authority*

While EAR diminishes mandate of a Project manager in financial services, EBRD fully empowered a Project Manager to vary works and additional costs. EBRD conditions are similar as civil legislation of SW Europe countries.

### *6.2.2 Provision of Legal Assistance*

The Project Manager is obliged to control the origin of construction products, plant and equipment. Only the goods originated in EU countries and countries in association process can be incorporated to permanent works when funded or donated by EAR.

### 6.2.3 Quality of Works

Project Manager must select an Institution through a proper procedure of public procurement. Supervisor (on behalf of Project Manager) controls all the procedures of internal and external control of conformity and taking over of construction (semi) products and inspect their incorporation in works. Supervisor determines additional tests. (See EU Construction Products Directive)

### 6.2.4 Payment

As a rule the payment of taxes or VAT is not refunded by loans or donations.

### 6.2.5 Variations and Adjustments for Changes in Cost

All variations must be verified by Consultant (on behalf of Bank, when delegated) and Project manager (on behalf of State representative). As a rule the rates and prices are fixed and unchangeable.

### 6.2.6 Security

Additional to validity of Performance Security every interim payment is diminished for (max) 10% of its value (retention money). It may be substituted by retention money guaranty.

### 6.2.7 Claims, Disputes and Arbitration

After unsuccessful amicable settlement the dispute is treated by EU legal institutions and (or) arbitration board.

### 6.2.8 Corrupt or Fraudulent Practice

IFI's require that beneficiaries of Bank loans, as well as tenderers, suppliers, contractors, concessionaires and consultants under bank financed contracts observe the highest standard of ethics during the procurement and execution of such contracts.

"corrupt practice" means the offering, giving, receiving or soliciting of any thing of value to influence the action of a public official, or the threatening of injury to person, property or reputation in connection with the procurement process or in contract execution in order to obtain or retain business or other improper advantage in the conduct of business.

"fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of a Client and includes collusive practices among tenderers (prior or after tender submission) designed to establish tender prices at artificial, non-competitive levels and to deprive the client of the benefits of free and open competition.

### 6.2.9 Administrative and Financial Penalties

IFI's assert their rights to penalize tenderers or contractors in cases when the provisions of tender or contract documentation are not regarded. Penalty may as much as 20% of works value or expulsion from IFIS programme.

### 6.2.10 Checks and Audits

The legal institutions of EU Commission and Anti-Fraud Office or European Court of Auditors may audit the procedures of investment max 7 years after final payment.

# 7 CONSTRUCTION SUPERVISION SERVICES

## 7.1 CONDITIONS FOR CONSTRUCTION SUPERVISOR

### *7.1.1 Construction Act*

The expert supervision services on the construction of a new works, the reconstruction of a works, replacement construction and the removal of works are prescribed by Construction Act

The Supervisor is a legal or natural person registered for services of building control as a commercial activity

The provisions on the obligation to ensure construction supervision shall not apply to the construction of simple works.

An investor that fulfils the conditions for the supervisor prescribed by the law may conduct construction supervision himself or may entrust it to another legal or natural person that fulfils the conditions for the supervisor.

The investor must ensure construction supervision by the day preparatory works commence on the construction site.

Construction supervison shall be entrusted to a supervisor that may be a project designer or performer that is not carrying out construction on the same works. The supervisor must appoint a responsible supervisor for each construction site on which construction supervisor is carried out thereby.

Construction supervision of the construction of complex works may only be conducted by an individual that fulfils the conditions for responsible project designer or a responsible works manager in the construction of demanding works prescribed by the law; construction supervision of the construction of less demanding works may be conducted by an individual that fulfils the conditions for the responsible project design of less demanding works and simple works or for responsible works management.

The responsible supervisor may appoint assistants for the execution of individual works in connection with construction supervision but only an individual that fulfils the conditions for responsible management of individual works.

Foreign natural persons may under condition of reciprocity act as the responsible supervisor if:

1. They prove that they fulfill the conditions for a responsible works manager in their country of citizenship.
2. They use an appropriate document to prove that in their country of citizenship they have not been finally convicted of a criminal offence against property or a financial criminal offence and sentenced to more than three months of custody, and that in such country a security measure of a ban on the performance of the profession has not been introduced against them, unless such a measure has already expired.

A foreign natural person that fulfils the conditions specified in the previous paragraph and acts as the responsible supervisor for complex works must be entered in the appropriate register at the relevant professional chamber (!)

### *7.1.2 Exclusion*

Only a legal or natural person that is not acting as a contractor of construction works, artisan works, assembly works and other works or as a supplier of construction products, appliances and equipment in connection with works whose construction is subject to construction supervision may act as the supervisor. Neither may the supervisor hold any mutual commercial connection with the contractor, and a supervisor that is a sole trader may not be a direct blood relative of the contractor's responsible works manager or be married thereto or cohabiting therewith in a non-marital union.

If the same legal or natural person is the project designer and the supervisor, the project designer may not carry out any construction as a contractor on any works for which the project designer drew up the project documentation. If the project designer is also the contractor, the project designer and the supervisor must be different legal or natural persons, and the responsible project manager and the responsible supervisor may not hold any mutual commercial connection, be direct blood relatives or be married to each other or cohabiting with each other in a non-marital union.

An investor that acts the project designer or a contractor on the same works or carries out works for the investor's own purposes or for the market may not act in such construction as the supervisor, but must entrust construction supervision to a contractor that is not carrying out construction on the same works or to another project designer. In such a case neither the contractor nor the project designer that assumes responsibility for construction supervision may hold any mutual commercial connection with the investor, and neither may the responsible construction site manager nor the responsible works manager or the responsible project manager be direct blood relatives or be married to each other or cohabiting with each other in a non-marital union.

The investor may act as the supervisor, but in such a case may not act as the project designer or a contractor on works for which the investor is conducting construction supervision.

### *7.1.3 Liability for Damage*

The supervisor of the construction of works shall be liable for direct damage incurred by third parties that derives from his work and his contractual obligations.

Prior to commencing their activities the supervisor must insure his liability throughout the time of their operation for any damage that could be incurred by investors and third parties in connection with the performance of their activities.

## 7.2 CONSTRUCTION DOCUMENTATION ON SITE

The responsible supervisor shall supervise the building activities temporary or permanently on site.

Unless otherwise provided by the contract the ontractor shall settle furnished offices in favor of supervisor and his assistants.

Supervisor shall keep on Site or have free access to the following rules and documentation:

7.2.1 *Certificate of entering the contractor in companies register*

7.2.2 *Rule of appointment to the responsible works manager:* The contractor that assumes responsibility for the entire construction must appoint a responsible works manager, and a contractor that only assumes responsibility for specific works must appoint a responsible manager for such individual works. If several contractors work together on construction at a single construction site, the investor must appoint a responsible construction site manager from among the responsible works managers designated by the contractors. Conditions for a responsible works manager are regulated by the provisions of Construction Act.

7.2.3 *Rule of appointment to responsible supervisor:* The supervisor must appoint a responsible supervisor for each construction site on which construction supervision is carried out thereby. The responsible supervisor may appoint assistants, responsible supervisors for the execution of individual works in connection with construction supervision.

Conditions for a responsible supervisor are regulated by the provisions of Construction Act.

7.2.4 *The project for acquiring the building permit* with *setting out plan* of works

7.2.5 *The project for execution:*The responsible supervisor shall supervise whether all changes and additions arising during construction are being constantly entered in the project for execution, and whether such changes have been approved by the investor and project designer. It is on Investor to name the project of executed works designer

7.2.6 *Contract documentation:* in the case of FIDIC rules consideration containing:

- Works Contract (signed by Employer and Contractor) and other contracts and annexes.
- Letter of acceptance
- Bid
- Particular conditions of contract
- General conditions of contract
- General and particular technical conditions

The parts of contracts are also drawings, priced bills of quantities, time schedule and financial plans, technical documentation and security and assurance documents.

7.2.7 *Valid building permit:* Time of validity and range of provisions are regulated by Construction Act. In addition all evidences and conformity documents belonging to building permit shall be kept on site.

7.2.8 *Performance program:* the contractor shall prepare technological specifications for execution of works or a part of works.

7.2.9 *Timing schedule* containing

- time schedule of execution
- proposal of plant and personnel employed
- time and quantity schedule of basic material delivery
- working time
- conformity of work safety plan with working processes
- plan of financial engineering

7.2.10 *Site safety plan*, containing:

- site organization plan
- plan of transport system (access routes)
- plan of store housing of basic materials and semi products.
- list of plant and equipment, including conformity documentation
- report on health and safety at work
- fire safety study
- assessment of environmental impacts (atmosphere, noise, water, etc.)

7.2.11 *Waste management report*

7.2.12 *Works execution diary and appertaining notices*; The content and method for administering the diary are regulated with the provisions of the Rules on the content and manner of administering of works execution diary.

7.2.13 *Ledger of quantitative measurements;* If the prices in the building contract are stipulated per unit of individual works, or when works are built for placing on free market, a ledger of quantitative measurements must be administered in addition to the construction diary.

7.2.14 *Certificates of conformity of construction products and their incorporation;*. Responsible supervisor must review and control adequacy of execution of works and their bearing elements to fulfill one, several or all essential requirements of mechanical resistance and stability, fire safety including the incorporated systems of passive or active protection, hygiene, health protection and environmental protection, safety of use, noise protection, energy efficiency and heat retention.

## 7.3 REPORT OF SETTING OUT

### *7.3.1 General*

Geodetic survey is one of the first services in the process of construction. They are performed before, during and at the end of construction.

The investor shall take possession and maintenance of basic geodetic accounts, drawings and marking-out. This documentation must be delivered to the contractor as a part of project documentation.

After the completion of the construction the land surveying plan of the new situation of the land shall be formulated in accordance with land surveying regulations as a topographical/cadastral plan. It must be produced as technical documentation before the day of technical inspection.

The basic element of land surveying is geodetic network linked with a system of coordinates.

An electronic way of production of geodetic accounts and drawings is very practicable based on recent measurement instruments and computers. Works are planned and designed with application of various topographic databases, digital simulation of land and spatial informatics systems.

During the phase of land acquisition a land surveyor shall carry out all administrative and technical procedures concerning the land register.

Before commencing the construction of a new works for which a building permit is prescribed the contract must attend to the marking out a building plot with the position of works

The marking-out of the works shall be carried out as a land surveying service pursuant to the regulations on land surveying activities. The marking-out shall be carried out by a land surveyor that fulfils the conditions stipulated by land surveying regulations. An authorized representative of the municipality may also be present at the marking-out.

The contractor must inform the municipal administration of the municipality in which the land with the intended construction is located of the date and place of the marking-out in writing at least eight days before the marking-out.

A special marking-out plan based on which the marking-out of the works in accordance with the conditions specified in the building permit is possible shall be formulated on the marking-out of the works in accordance with land surveying regulations.

The marking-out plan shall be signed by the responsible land surveyor and the contractor, and may also be signed by the authorized representative of the municipality if such is present at the marking-out.

If, during the marking-out of a works, discrepancies are found between the actual situation on the ground and the situation according to the building permit regarding the site of the intended works and a works of public infraworks to which the works is to be connected or regarding the elevations of the building plot on which the works is to stand that make it impossible to fulfill the conditions specified in the building permit, the marking-out of the works may not be performed without the approval of the administrative body for construction matters that issued the building permit.

In the act of approval the relevant administrative body for construction matters may stipulate additional conditions in connection with the discrepancies found, or it may deny the request for approval via a ruling issued in a fast-track procedure without the parties being heard if it determines that the change in the marking-out of the works would entail an amendment of the building permit.

If the relevant administrative body for construction matters denies the request for approval via a ruling, the contractor may not commence construction until the investor acquires an amended building permit.

The Contractor must attend the marking out of underground infrastructure, cables and conduits pipes.

The Contractor's surveyor must produce a geodetic measurement of earth volume to be removed or transferred. The supervisor's assistant shall control measurements.

All modifications of designed works geometry shall be based on geodetic measurements.

The precision, quality and price of construction depend on precise control of site machinery. It is achieved with geodetic instruments managed laser ray as visual axe of sensors fixed on site machinery.

Geodetic measurements are the means of defining the vertical or horizontal movement of works and ground sinking too. It can be measured:

- spatial movement of works
- change of works geometry entailed by spatial movement of works
- deformations of bearing elements.

The measurements are performed during construction and the life time of works using the method of spatial and time simplification;

- Spatial simplification means that the works is presented by single points stabilized on deformable medium as a model of works. The situation of points is defined by project designer and controlled by supervisor-surveyor. The control of ground sinking is carried out by supervisor and geologist, geophysics or geomechanic.
- Time simplification means that the continuous attending of the position of points on works is replaced by time sequenced attendances. The number of points and timing of attendance depends on the least level of lost information

Before the day of technical inspection a dynamic and static test loading shall be carried out measured by a proper geodetic method.

Surveying also include the manufacture of the project of executed works.

During the life time of a works periodical measurement of movement and deformation of road structures are performed.

### *7.3.2 Geodetic works during construction of civil engineering works*

#### 7.3.2.1 Take over of alignment

The employer shall submit to the contractor:

- the marked-out road alignment or ground plan of a structure with all necessary written data.

  Only the center line of the road, or structure is market out in intervals depending on the characteristics of the terrain but in interval not greater than 25 m.

  Intersections are usually market out at the edge of deceleration or acceleration lane or pavement or at the edge of the interchange itself.
- The marked out polygon points. A suite of polygon points shall be linked up to trigonometry points calculated on Gauss-Krüger system, with excepted errors defined by the regulations for I. order of polygon net.
- bench marks designated on the terrain,

- plan of marking out including the following appendices:
  - Layout 1:1000 indicating the position of alignment with road kilometers and reference of the route tracing geometrical elements; The layout includes a scheme of the main points linking on polygon net-system
  - the calculation of the main points or an electronic computed list of the main intermediate break points coordinates with chainage,
  - a list of polygon points coordinates and their topography.
  - a list of benchmarks with level data and their topography.

The contractor is due to renew and maintain marking out after the construction of the base of roadbed and before the construction of the wearing course. The supervisor shall take over the renewed marking out.

#### 7.3.2.2 Protection of marked out alignment

When the contractor takes over the marked out center line of the road or a building he is obliged to secure each cross section markings on both sides in such a distance from the edge of the embankment or excavation to be stabile to the end of construction. Each point shall be protected with triangular frame made of wooden profiles 2,5 cm by 5 cm. The point consists of wooden stake of 5/5 cm with a nail on colored top. Secured markings shall be twice leveled.

Beside the wooden frame left and right of the road alignment a signpost shall be placed indicating the number of cross section and chainage by a proper colored writing.

#### 7.3.2.3 Positioning of cross sections

In a case of dissatisfaction with the designed cross sections the contractor may carry out the measurement of leveling and sketching of the cross sections once more.

On the embankments and slopes of cuttings the designed inclination profiles and calculated cross points of slope and land shall be placed.

The inclination of slopes is defined with the bottom line of the layer of soil and rounded on the top or on the bottom of cutting or embankment.

#### 7.3.2.4 Marking out of the building (road structure)

The contractor carries out a marking out of the structures in accordance with the approved marking out drawings and calculations produced by the contractor.

The marking out elements shall be double secured with cement stakes on both side of the building.

#### 7.3.2.5 Works performance quality

Accuracy of measurements depends of geodesy standards and requirements of special technical conditions for each type of survey. The contractor shall present to the supervisor all data and elements of marking out to further application.

In a case of insufficient quality of survey defined by drawings the supervisor is authorized to stop the measurements and the contractor is responsible to repeat or to enhance the quality of surveying. Supervisor may order the survey from another surveyor to contractor's debit.

#### 7.3.2.6 Measurement and taking over of geodesic work

Measurement:

Geodesic work is measured:

- marking out of road alignment in kilometers
- placing of cross section markings (profiles) in pcs of two-sided markings.

Taking over:

Before the technical inspection the contractor shall anew marking out of alignment, the profiles and the edges of carriageway with sustainable color.

#### 7.3.2.7 Account of work

The work is priced by unit prices or lump some. In each price is included

- all the means of work and transportation
- additional work necessary for the execution of work
- technical documentation

The lump sum is determined by a percentage of the value of contracted work.

## 7.4 PERFORMANCE PROGRAMME AND TIMING SCHEDULE

### *7.4.1 Preparation and delivery of Performance Program (PP)*

The contractor prepares and submit performance plan to supervisor 15 days before the commencement date. The Supervisor shall review and accept/reject or specify the provisions of PP to be completed or changed in the period of 8 days after receiving the PP. The Investor may specify the content of PP. (see Volume 3, Section 1 General technical conditions)

PP shall be prepared for contracted permanent works or a part of it. Specifications and requirements for quality assurance for materials and construction products may be a separate document.

The contractor may conduct the PP himself or may entrust it to another legal or natural person.

### *7.4.2 Content*

The method statement shall be prepared for each of the following works:

- earth works
- pavements
- waterproofing
- drainage
- bridges, walls and other supporting/retaining structures, packed rockfills, piles
- noise barriers
- displacement of public utilities (gas, electric power, water, etc.)
- tunnelling works
- anchoring the structures by means of permanent ground anchors, and
- less demanding works like reconstruction and maintenance works and structures on roads.

### *7.4.3 Description of works*

- project description
- description of works to which the TER is relating
- mechanization inventory including documents on its suitability to the planned construction works.
- master layout drawing including characteristic details and working stages.

### *7.4.4 Materials*

*Basic materials*

The list of basic materials shall include the following:

- types and origin
- required quantities
- transportation method.

*Semi-products*

The list of semi-products shall include the following:

- types and detailed designation
- certified production methods (cement concrete design, preliminary investigation of asphalt mixtures, method to improve soils and/or mineral aggregates, etc.)
- required quantities
- necessary production equipment and methods
- transportation method.

*Construction methods*

The following shall be described:

- working methods for all the construction stages; the method and stages shall also be presented graphically, including details in particular for more complex works, e.g. connecting fills to slopes, arrangement of excavation slopes, construction joints on pavements and structures, etc.
- preparation and arrangement of locations of placing/laying/casting
- method of protection from damages (e.g. to slopes, roadway edges, waterproofing layers, etc.)
- curing/after-treatment of cement concrete, waterproofing, etc.
- environment protection (air, ground water, from noise, etc.)

and indicated:

- the coordinator of works (for safety and health at work)
- professional crew to be obligatorily present at construction works (responsible work manager, technology expert, laboratory representative); at least one of the aforementioned experts shall already be present at preparation of the performance programme.

### *7.4.5 Construction Quality*

*Test Production and Placing*

Prior to commencement of an individual working stage, for which the contractor has still not proven his capabibility to perform it adequately, the contractor is obliged to prepare, in agreement with the engineer, a test area where the required properties as well as the methods of regular production, placing, and curing/after-treatment shall be demonstrated and proven.

*Construction Quality Verification*

Within the scope of the performance programme the contractor shall submit a schedule of the average frequency of both internal and external control/random tests; this programme shall be approved by the Supervisor and shall be a basis for the construction quality verification.

### *7.4.6 Time Schedule of work progress*

- a schedule of work progress – by stages and types of the works,
- a mechanization and labour schedule:
  - by machine types and labour qualifications
  - capacities of machines by stages and types of works
  - manpower by stages and types of works
- deliveries of basic materials, and
- working time.
- a financial realization plan

In view of the work volume and time span, those schedules can be monthly, weekly, or daily.

## 7.5 HEALTH AND SAFETY AT WORK

### *7.5.1 Preparation and delivery of Site Safety Report*

The safety plan is a constituent part of the Project for execution. The Investor ordering the works is responsible for providing that the safety plan is prepared in accordance with the rules on safety and health protection at work at temporary and mobile construction sites, the rules on the building site signs and the organisation of a building site and on the control of building structures in construction sites.

(See also: Council Directive 92/57/EEC of 24 June 1992 on the implementation of minimum safety and health requirements at temporary or mobile construction sites (eighth specific Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - and Council Directive 92/57/EEC with Attachments.)

The drafting of the safety plan has to be provided by the investor or supervisor prior to the commencement of works on the construction site.

The safety plan must specify sanitary, spatial arrangement, environmentally protective, fire safety, technological and construction measures for construction site organisation intended for protection of health of employed workers and people near the construction site as well as for reducing or preventing negative impacts of construction on the environment. Every change which can influence safety and health of workers during the work on the construction site must be entered in the safety plan.

The contents and scope of the safety plan depend on several factors, depending on where the road is routed and what are the factors endangering the environment due to the implementation of construction and other works on that route.

The safety plan must establish, describe, estimate and provide for measures aimed at reducing negative impacts on:

- persons and their health, safety and living conditions;
- soil, water, air, landscape;
- natural resources and other natural wealth;
- traffic routes;
- neighbouring property and public infrastructure.

### *7.5.2 Contents of Site Safety Report*

1. Introduction
2. List of regulations
3. Organisation of construction site security in view of the surrounding area
4. Organisation and maintenance of offices, changing rooms, sanitary installations and accommodation facilities on the construction site

5 Organisation of electricity and telecommunication installations

6 Organisation of traffic communications, emergency routes and exits

7 Distribution and storing of construction material
   - Premises for storing hazardous materials
   - List of hazardous and ecologically unsafe materials and products

8 Lifting and transporting equipment

9 Vehicles and machines for excavation, relocation and transport of material

10 Devices and facilities for maintaining machinery on the construction site

11 Organisation of work places

12 Installations, working devices and equipment

13 Working platforms, ladders and scaffolds

14 Protection against fire on the construction site

15 Description of selected/used construction technologies

16 Impact of construction work on additional traffic volumes on existing roads

17 Timetable for coordinating measures related to safety and health with the construction

18 Joint measures for provision of health and safety at work

19 Mutual informing of individual work managers on work progress

20 Site rules

21 Works inventory with estimated costs of the construction site arrangement and implementation of joint measures for providing safety and health at work on the construction site

22 Environmental impact and mitigation measures

23 Rules on management of construction waste

24 Graphic enclosures

- Overview site plan, RP 1:5000 with construction facilities
- Plan of organisation of living and working premises, sanitary facilities and the cafeteria, RP 1:100
- Electricity supply plan
- Telecommunications plan
- Water supply and sewage
- Traffic arrangement site plan during construction for public and construction roads with traffic signalisation, RP 1:5000
- Lift site plan, including the sketch of handling area
- Site plan of individual areas of utility line organisation and electricity supply, RP 1:1000
- Design sketches of solutions of individual facilities and devices for environmental protection under this project:
  - arrangement of warehouses for hazardous substances
  - parking area
  - working platforms for repairing machines and vehicles
  - material depositing
  - other.

25 Cadastre with the list of lots and owners, if the activity involves land outside the area of exclusive use according to the Decree on the Detailed Plan.

In the **Supplement S1** to this guidelines the detailed instructions on safety plan are specified regarding the conditions of safety and health on sites.

## 7.6 PROTECTION AGAINST FIRE AND EXPLOSION

### *7.6.1 Project documentation*

This guideline presumes obligatory preparation of the study on protection against fire and explosion as a constituent part of the construction permit project for the following civil engineering facilities:

- Tunnels intended for public road and rail transport with length of 500 m or more and urban tunnels with length of 350 m or more;
- Winning areas for oil derivatives and natural gas;
- Gas stations of pipeline and distribution gas networks;
- Transformer stations for transformation of high voltage to low-voltage distribution electricity network, if their floor area equals 20 $m^2$ or more and telephone exchanges;
- Power plants;

- Chemical industry facilities;
- Airports and buildings of air traffic navigation services;
- Ports and marinas.

The study is a document specifying measures for ensuring the prescribed level of protection against fire in facilities. The measures specified in the study has to be complied with in individual plans, which are a part of the project documentation.

### *7.6.2 Report on fire safety on construction site*

Report on fire safety on construction site is analogical document to project study but as a constituent part of the project for execution.

### *7.6.3 Contents*

The report must treat the following topics:

- Fire risk evaluation
- Fire Hazardous Material and Fire Hazardous Work
- Potential Ignition Sources
- Fire Protection Measures
    - Construction-technical fire protection measures
    - Fire extinguishing equipment
    - Protection against wilful fire-raising
    - Placement and construction of temporary facilities
    - Storing of inflammable liquids and gases
    - Implementation of power supply, and electrical and gas installations
    - Execution of hot works
    - Inflammable waste handling
    - Procedures in case of fire

More detailed handling of fire safety study is extended in **Supplement S1 and S7** to this guideline.

## 7.7 ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

### *7.7.1 Noise Impact on Natural and Living Environment and Mitigation Measures*

By definition, noise is any sound affecting the physical and psychological condition of people, distracting them at work and rest and having adverse effect on their feeling and health.

The noise emitted into the environment as the consequence of performing construction and other work may together with the existing noise sources in the environment result in exceeding of limit values permitted by regulations.

Frequently, the noise caused by construction of a road and other structures and facilities is disturbing, which occurs in environments with small noise levels prior to the construction. Hence full attention should be paid to this already during planning, organisation of work implementation and during the work itself so that inhabitants as well as workers are minimally affected.

The report of ecological arrangement and the safety plan of the construction site shall, with regard to the zero state of noise in the environment as determined in the environmental impact assessment / project, envisage such measures that noise levels in the environment and dwelling premises of bud lings, as specified in the regulations, are not exceeded during the daytime or night time. Limit values depend on the area and on the daytime or night time. The Environmental Protection Act specifies exceptions to be permitted by the Ministry of the Environment as regards temporary and occasional

excessive pollution of the environment of which the affected local community shall be informed. However the above shall not apply if the noise exceeds critical levels in accordance with the regulations.

Increased noise levels on the work post endanger health of employees and increase the possibility of accidents at work. Hence appropriate measures for reducing the noise at the noise source as well as protective measures for protecting health of employees (rumble dampers, isolated cabins, protective devices…) as prescribed by the Occupational Health and Safety Act and the Rules on the Protection of Workers from Risk Related to Exposure to Noise at Work shall be provided for. The maximum permitted noise level on the work post is 90 dB(A), if such level is exceeded, damage to hearing shall occur. Additional hearing effects are noticeable in lower levels with prolonged exposition period to noise.

Corresponding instructions are given in **Supplement S1** to this Guideline.

#### 7.7.1.1 Plan of Noise Monitoring During Construction

Monitoring is defined by the Environmental Protection Act as observation and supervision of the condition of the environment by systematic measurements of individual parameters of quality of elements/ components of the environment on selected points and the related procedures of control intended for detecting changes in the environment with regard to the underlying parameters.

In accordance with the provisions and requirements of the Decree (or Ordinance) on the location plan, the project of monitoring noise pollution of the environment during work shall be prepared as a part of the project for acquiring the building permit. Usually the Decree on the cation plan itself, on the basis of the environmental impact assessment / report, specifies the required measures to be taken into account in preparation of the monitoring project and the implementation thereof.

Open or covered construction site deems to be a noise source.

Corresponding instructions are given in **Supplement S1** to this guideline.

### *7.7.2 Construction's Impact on the Atmosphere and Mitigation Measures for Excessive Emissions*

Construction of a road and other structures and facilities and the machinery used in the work have negative impact on the quality of air in the environment, reflected in the following:

- Increased presence of dust particles in the air resulting from performing notably earthworks but also other work;
- Increased emission values of gases: $CO_2$, CO, $CS_2$, $NO_2$, $SO_2$ released from internal combustion engines or by other devices and machinery;
- Other emissions of harmful gases resulting from the use of machinery and devices;
- Dust particles of inorganic origin or organic compounds.

The safety plan shall specify the required measures for reducing the construction's impact on the air quality to be implemented during the construction itself. These measures depend on the method and technology of work implementation. The following measures are possible among others:

- Wetting of excavation points for obtaining material.
- Watering in demolition of buildings.
- Wetting of transport routes having no protection against dust.
- Dust protection of more frequently used transport routes – prior to commencement of work.
- Forced ventilation of work premises (workshops for repairing machinery on the construction site).
- Installation of filters where required and feasible.

- Use of less pollutive fuels for the machinery.
- Use of less pollutive machinery.

Technical control of exhaust gases of internal combustion engines.

Corresponding instructions are given in **Supplement S1** to this guideline.

#### 7.7.2.1 Plan of Monitoring of Air During Construction

In accordance with the provisions and requirements of the Decree on the location plan, the project of monitoring of air–pollution during work shall be prepared as a part of the the project for acquiring the building permit. Usually the Decree on the location plan itself, on the basis of the environmental impact assessment, specifies the required measures to be taken into account in preparation of the monitoring project and the implementation thereof.

The limit value of concentration of substances in the atmosphere where the impact of gases on health and feeling of people and impact on the environment is still considered to be an acceptable risk are:

- Sulphur dioxide 350 μg/m3 for 1 hour
- Nitrogen dioxide 300 μg/m3 for 1 hour
- Ozone 150 μg/m3 for 1 hour
- Carbon monoxide 30 μg/m3 for 1 hour
- Dust sediments 350 mg /m2 per day

Corresponding instructions are given in **Supplement S1** to this guideline.

### *7.7.3 Construction's Impact on Surface Water*

Construction of roads and appertaining facilities, such as: bridging facilities over watercourses, regulation work in beds of watercourses, construction of facilities on watercourses and release of waste water in these watercourses, placement and operation of temporary facilities on the construction site and other development, result in various negative impacts on the water quality in surface watercourses. Surface water is any constantly or occasionally running surface water running in natural or artificially produced beds and dammed surface water (rivers, lakes, brooks, channels, artificial water sources, etc.). Water is a natural resource under special protection.

Negative impacts are reflected in the following:

- Increased quantity of suspended particles;
- Biological pollution of water by depositing and leaching of waste;
- Chemical pollution of water by depositing and leaching of waste;
- Adverse conditions for or inability of inhabiting for water animals due to lack of oxygen;
- The risk of leaking of dangerous substances in watercourses.

The magnitude of negative impacts on the quality of surface water depends on several factors, which should be taken into account in the Project preparation in order to mitigate the consequences of development in watercourses. These are primarily the following:

- Size (volume) of the watercourse and its seasonal condition during the development;
- Magnitude of the development in the watercourse;
- Duration of the development in the watercourse;
- Technology of construction work;
- Water quality in the watercourse;
- Condition of animal species having their habitat in the watercourse;

Geological composition of the ground on which the water runs/the lake lies.

Corresponding instructions are given in **Supplement S1** to this guideline.

#### 7.7.3.1 Monitoring Plan for Surface Water

In accordance with the provisions and requirements of the Decree on the location plan, the monitoring plan for surface waters during work shall be prepared as a part of the project for acquiring the building permit. Usually the Decree on the location plan itself, on the basis of the Environmental impact assessment, specifies the required measures to be taken into account in preparation of the monitoring project and the implementation thereof.

The measurement point where measurements of dangerous substances content are performed shall be specified.

Corresponding instructions are given in **Supplement S1** to this guideline.

### *7.7.4 Construction's Impact on Underground Water and Mitigation Measures for Reducing Negative Impacts*

Construction of roads and appertaining facilities, such as: bridging facilities over watercourses, regulation work in beds of watercourses, construction of facilities on watercourses, release of waste water in these watercourses, earthworks, notably excavations, and other development, may result in various negative impacts on the quality and quantity of underground water in areas with underground water. By definition, underground water lies below the surface in the geological layer of rock, which is capable of retaining large quantities of water.

The following distinctions are made with regard to the condition of the water source:

- Reservoirs, i.e. water sources in use, the area is protected as a water source by a municipal ordinance on protection of the water source;
- Potential water source, hydrological potential for developing a reservoir – the area is protected by an ordinance adopted by a single or several municipalities in the underlying area.

The danger to water sources is the greatest during construction when protective measures have not yet been implemented and facilities for preventing pollution have not yet been built, as is the case when the road is put to use. Hence different and stricter measures aimed at reducing pollution are required during construction as the vulnerability of underground water is the greatest in that stage.

Underground water lies in different hydrogeological conditions upon which its vulnerability depends and the measures aimed at reducing pollution should take this fact appropriately into account.

With regard to the position of underground water, the risk related to geological conditions and the depth of aquifer is distinguished. It depends on the following:

- The time elapsed from the moment a pollutant sinks to the aquifer, which depends on permeability of upper layers and the depth thereof;
- Time required for the pollutant to reach the water source by the aquifer, which depends on the gradient of the current and direction of underground water.

Corresponding instructions are given in **Supplement S1** to this guideline.

#### 7.7.4.1 Monitoring plan for underground water

In accordance with the provisions and requirements of the Decree on the location plan, the Monitoring project for underground water during work shall be prepared as a part of the the project for acquiring the building permit. Usually the Decree on the location plan itself, on the basis of the Environmental impact assessment report, specifies the required measures to be taken into account in preparation of the monitoring project and the implementation thereof.

The monitoring project for underground water shall be prepared by a company or individual qualified in that respect and having authorisation of the Ministry of the

Environment. The monitoring programme shall be prior to its implementation approved by the ministry competent for environmental protection.

The measurement methods are standardized. Permitted values of individual parameters are specified in the proper rule for environment protection.

Corresponding instructions are given in **Supplement S1** to this guideline.

### *7.7.5 Impact of construction on the soil, flora and fauna*

Construction of roads and other facilities have little direct impact on soil and plants. The impact is primarily mechanical and caused by use of machinery and transport vehicles. Pollution with dangerous substances is minimal except in case of an extraordinary event. Depositing of waste and mud from sedimentation reservoirs for cleaning of wastewater on land, and notably in areas with underground water, shall not be allowed without preliminary testing. Consequences of construction on surrounding land are foremost dusting of plants and material damage.

Animals are endangered during construction as a result of interrupted paths and water supply. Particularly endangered is the fauna in beds of watercourses, where work on bridging structures or arrangement work on watercourses is being performed. Particular attention should be given to migration routes of animals.

Protection of areas of natural heritage, if an area is specified as such, includes the following:

- Water and waterside area;
- Water organisms;
- Forest area;
- Animal protection;
- Plant protection;
- Other natural sites, depending on the case and the road's location.

Corresponding instructions are given in **Supplement S1** to this guideline.

#### 7.7.5.1 Monitoring Plan for Soil and Plants

Only monitoring related to input of dangerous substances in soil and for which rules are prepared is discussed here. This monitoring is less important for the work stage than other preliminary monitoring as the danger to the soil and consequently the environment is small with regard to other factors of soil pollution.

Corresponding instructions are given in **Supplement S1** to this guideline.

### *7.7.6 Impact of blasting and other dynamic effects of work implementation on people and buildings*

Dynamic effects occur in implementing deep foundations (drove in piling), crushing of hard rock, transport with heavy vehicles, rehabilitation of the base with poor load capacity by using special procedures and other work resulting in dynamic effects on the environment.

Particularly large negative impact on the environment and people is caused by blasting of slopes during earthworks and other work requiring the use of blasting work methods. Such work is carried out by using special regulations and safety measures.

Sensitivity of the environment to such effects depends foremost on the following:

- Distance of the construction from populated areas;
- Vibration level;
- Geological conditions on the construction site and in the populated area;
- Transport routes and their distance from buildings;
- Technological procedures and machinery used;

- Condition of buildings situated in the area of influence, their age, material from which they were built and the purpose of their use.

Corresponding instructions are given in **Supplement S1** to this guideline.

### *7.7.7 Arrangement of the construction site area after work completion*

Arrangement of the construction site area after the completed works is required by decrees on the location plan and all legislation related to spatial planning and protection of the environment.

Transport infrastructure, energy, water supply and other public utility infrastructure shall be arranged and all obligations of investors and contractors related to conservation of natural and cultural heritage, sustainable use of natural resources, protection of the environment, and ownership fulfilled.

The SF has to provide for:

- The area of arrangement of road surroundings, including recultivation of land and provision of appropriate agricultural operations in the affected area;
- The area of arrangement and/or deviations of existing watercourses and arrangement of regulations;
- The area of deviation and arrangement of public utility, energy and telecommunication infrastructure buildings, lines and facilities;
- Appropriate arrangement of all roads used for deviations or transport during the construction and rehabilitation of any damage, and preservation or replacement of access routes to farmland and forests;
- Appropriate rehabilitation of infrastructure buildings, structures and other facilities;
- Area covered by measures for protection of the environment;
- Area of changed detailed land use, to be provided for after the concluded work; and:
- Remove all waste and ruins left behind after the construction site has been removed in accordance with the regulations.

If necessary, the project shall in addition to the textual part of envisaged work and measures also include the graphic presentation of the final state of the ground and environment.

## 7.8 CONSTRUCTION WASTE MANAGEMENT

### *7.8.1 Preparation and supply of waste management documentation*

Regulations dealing with waste management are adopted on the basis of the Environmental Protection Act.

Waste management is further governed by regulations related to specific types of waste (asbestos, batteries and car batteries, waste oils, titanium dioxide, infectious waste, used car tyres, construction waste, waste of animal origin, etc.), namely:

This guideline specify obligatory management procedures for waste resulting from construction work due to construction, reconstruction, adaptation, rehabilitation or demolition of buildings (hereinafter referred to as: construction waste).

The guidelines apply to waste from waste group with classification number 17 in the classification list of waste. The guidelines do not apply to earth excavations, if the earth excavation is in line with the regulation governing soil pollution by waste deposits. If construction waste contains asbestos, the regulation governing management of waste containing asbestos and the regulation on conditions for disposal of materials containing asbestos in demolition, reconstruction or maintenance of buildings and in maintenance and decommissioning of plants shall also be taken into account.

### *7.8.2 Construction waste management plan*

The investor planning to demolish a building shall enclose to the Construction Permit Project (CPP) the construction waste management plan, if it is evident from the project documentation for building demolition that the area of ground plan of the perimeter of the building exceeds 100 $m^2$.

### *7.8.3 Construction waste management report*

The investor wishing to obtain the permit of use shall include in the project of implemented work submitted to the administrative authority the *Construction waste management report.*

### *7.8.4 Obligations of the investor and the contractor during work performance*

The investor ordering construction of a facility or performing such construction by themselves, shall ensure that contractors keep or temporary store waste, resulting from construction work, on the construction site, separately by type of construction waste as specified in the classification list of waste.

### *7.8.5 Waste collection*

Collector of construction waste may commence with the collection after obtaining the licence from the ministry competent for protection of the environment (hereinafter referred to as: The Ministry) in accordance with the regulation governing waste management.

### *7.8.6 Processing and removal of construction waste*

Processing or removal of construction waste may only be performed by entities having the prescribed licence for processing or removal of construction waste in accordance with the regulations governing waste management.

### *7.8.7 Handling waste containing asbestos*

(see **Supplement S1** to this guideline)

### *7.8.8 Waste management inspection*

Inspection of implementation of waste handling and management is carried out by inspectors competent for protection of the environment.

### *7.8.9 Classification List of Waste*

(see **Supplement S1** to this guideline)

# 8 WORKS CONSTRUCTION

The construction of a new works, the reconstruction of a works, replacement construction and the removal of a works may commence on the basis of a building permit that is deemed final in legal terms. Works are completed in accordance with the provisions of works contract.

The supervisor shall organize and carry out the contractor's initiation procedures.

The supervisor shall ensure due supply of information and documentation the Contractor need to commence the performance of works like:

- The documents providing the right of access to site
- Audited project documentation
- Conditions and consent documents with building permit
- Setting out report

The supervisor shall verify the contractor's performance programme and supervise quality control.

The introducing site of works diary shall be completed ( and the inspection book shall be prepared if so regulated by local regulation).

## 8.1 WORKS CONTRACT

Type and the content are defined in tender documentation. The contract shall be drafted in accordance with the provisions of the local regulations.

A contract shall indicate:

- The Investor (Employer), Contractor and Engineer (Supervisor) and their responsible representatives.
- Type of works
- Contract value of the works and method of payments for completed works ("Turn Key/Lump Sum" principle or Cost per unit quantity)
- Deadlines for completion of works
- Other contractual documents

**Important Advertisement:**

In spite of the fact that they would be enforced by a competent administration the provisions of General conditions of Contract, which are in contradiction with the purpose of the contract or with (Special usance of civil engineering or other) custom business usances, are null and void.

It is recommendable to enter this clause in Special conditions of Contract.

The competent court may reject particular provisions of General conditions, which suppress the right of objections or the provisions which are unusual or unfair.

With enclosed **Supplement P2** we propose the draft of engineering works contract.

## 8.2 BUILDING PERMIT

The construction of a new works, the reconstruction of a works, replacement construction and the removal of a works may commence on the basis of a building permit that is deemed final in legal terms.

The request for the issue of a building permit shall be lodged with the relevant administrative body for construction matters by the investor. The request must cite information on the parcel number and the cadastral municipality of the land for the intended construction, and information on the type of works with regard to its purpose.

The following must be appended to the request for the issue of a building permit:

- At least two copies of the project for acquiring the building permit with the prescribed elements
- If the request for the issue of a building permit relates to the reconstruction of a works, it shall also be necessary to cite the number and date of the building permit based on which the works was constructed.
- The investor must also append proof of the right to build to the request for the issue of a building permit, if such right has not yet been entered in the land register.

A building permit shall not be required for a simple works if prior to commencing construction the investor acquires location information from which it proceeds that such construction is in accordance with the implementing planning document and if the size of the works, the manner of construction and use and the distance from the boundary of neighboring land are in accordance with the recent regulations.

It shall not be necessary to acquire a building permit or location information for a simple works that a provider of public services is erecting on a works of public infraworks and that is intended directly for the provision of public services or the management of public infraworks. Neither shall it be necessary to acquire a building permit or location information for the execution of finishing works in commercial premises located in a newly constructed building for which a permit of use has been acquired and specific parts of which are therefore already in use, provided such works do not encroach upon joint premises or alter the external appearance of the building.

The installation of urban equipment may also commence without the acquisition of location information, if such installation is approved by the owner of the public area.

Before issuing a building permit the relevant administrative body for construction matters must verify:

- Whether the project has been formulated in accordance with implementing planning document
- Whether the project has been formulated by a legal or natural person that fulfils the conditions for the project designer prescribed by this act
- Whether all the prescribed approvals have been obtained for the envisaged construction
- Whether the project contains all the elements prescribed by this act, and whether an audit of the project documentation has been conducted if so prescribed
- Whether the investor has submitted evidence that the charges and contributions stipulated by law have been paid or such obligations have been performed in any other legitimate manner
- Whether the investor has the right to build

A building permit shall be issued for a whole works, or for a part thereof that entails a technical, technological or functional whole and can be used independently if the works is being constructed or reconstructed in parts and the project for acquiring the building permit so defines.

Irrespective of the previous paragraph, a building permit may also be issued for a part of a works or for the execution of individual construction or installation works or the installation of technological appliances if it is a matter of the construction of a works of public infraworks.

The building permit shall cease to be valid in accordance with the Construction Act:

If, during the period of validity of a building permit, the implementing planning document is amended or replaced with a new for the area where the real estate that is the subject of the building permit is located, such amendments may not affect the validity of the building permit.

During the period of validity of a building permit the relevant administrative body for construction matters may at the request of the investor extend the validity of the permit, but no more than twice and for no more than a total of two years.

A building permit may be amended. The investor may only lodge a request for the amendment of the building permit during its period of validity.

If a building permit is amended, its period of validity shall remain unchanged upon the issue of the ruling on the amendment.

If a final building permit is abrogated because of the abrogation of the implementing planning document in proceedings to determine constitutionality and legitimacy before the constitutional court and this is a consequence of unlawful action by the municipality or by the state, if the spatial planning document was adopted by a body thereof, the investor shall have the right to the reimbursement of ordinary damages and lost profit for the damage incurred thereby because of the trust in the final building permit.

## 8.3 PROOF OF THE RIGHT TO BUILD

Proof of the right to build is evidence of title, another material right or any other right on the basis of which the investor may carry out construction on a particular piece of land or a particular works.

We recommend that the following shall be valid as proof of the right to build:

- A print-out from the land register from which it proceeds that the investor holds title to the specific real estate or any other material or obligation right thereon that allows the investor to construct or carry out works on the real estate,
- A notarized contract with proof of the lodging of a proposal for the entry in the land register of a contract on the acquisition of title to real estate or any other material or obligation right thereon that allows the investor to construct or carry out works on the real estate
- Another document that in accordance with law demonstrates the right to build or carry out works on specific real estate

A copy of the proposal for the entry of the contract in the land register with confirmation of reception from the competent court or with confirmation of the dispatch of the application by registered post, by telegram or in an electronic transaction shall be deemed to be proof of the lodging of a proposal for the entry of the contract in the land register specified in the previous paragraph.

Irrespective of the provisions of the first paragraph of this article, it shall not be necessary to append the proof specified in the previous paragraph to the notarized contract for the intended construction of works of public infraworks.

## 8.4 SITE SIGNPOSTING

The investor must ensure that the construction site is marked with a sign on which all participants in the construction of the works, the full names, titles and functions of the responsible persons and information on the building permit are cited.

Signpost shall be placed visible at the entrance of the site.

The signpost shall not be placed on the following sites:

- Works which are legal defined as works of importance for national defense;
- Works intended for security, customs and inspection activity on border crossings;
- Preventive works indispensable to prevent natural physical and man made obstructions and pollutants, including hydrological conditions, or intended to reduce the damages;

A rectangular signpost shall be made of sustainable material and paint and measures 1, 0 m by 1,5 m. The grounding of the painting shall be made of light colors and the writing of

dark colors, black as a rule. The height of writing shall be more of 8 cm, however the writing must be readable at the distance of 15 meters.

The signposting information:

- The title of works and intended use according to the rules of classification and the kind of works: new works, extension or superstructure, reconstruction, changed use, replacement or removal of works;
- Identification number of building permit (s), date of issue and the title of agency competent for issuing, and information about amendments and prolongations;
- Title (name, first name) and address of investors' headquarters;
- Title and address of designer's headquarters, which is the responsible project designer of the project for acquiring the building permit and has been performing the project for execution.;
- Title and address of contractor's headquarters;
- Title and address of supervisor's headquarters;

In the case the works is classified as demanding works the information about title and address of the Auditor(s) and of the coordinator for health and safety on site.

In the case of reconstruction of a building protected by the regulation on safeguarding cultural heritage or a construction within range of archeological findings the writing on signpost shall include the information of title and address of competent agency for safeguarding cultural heritage.

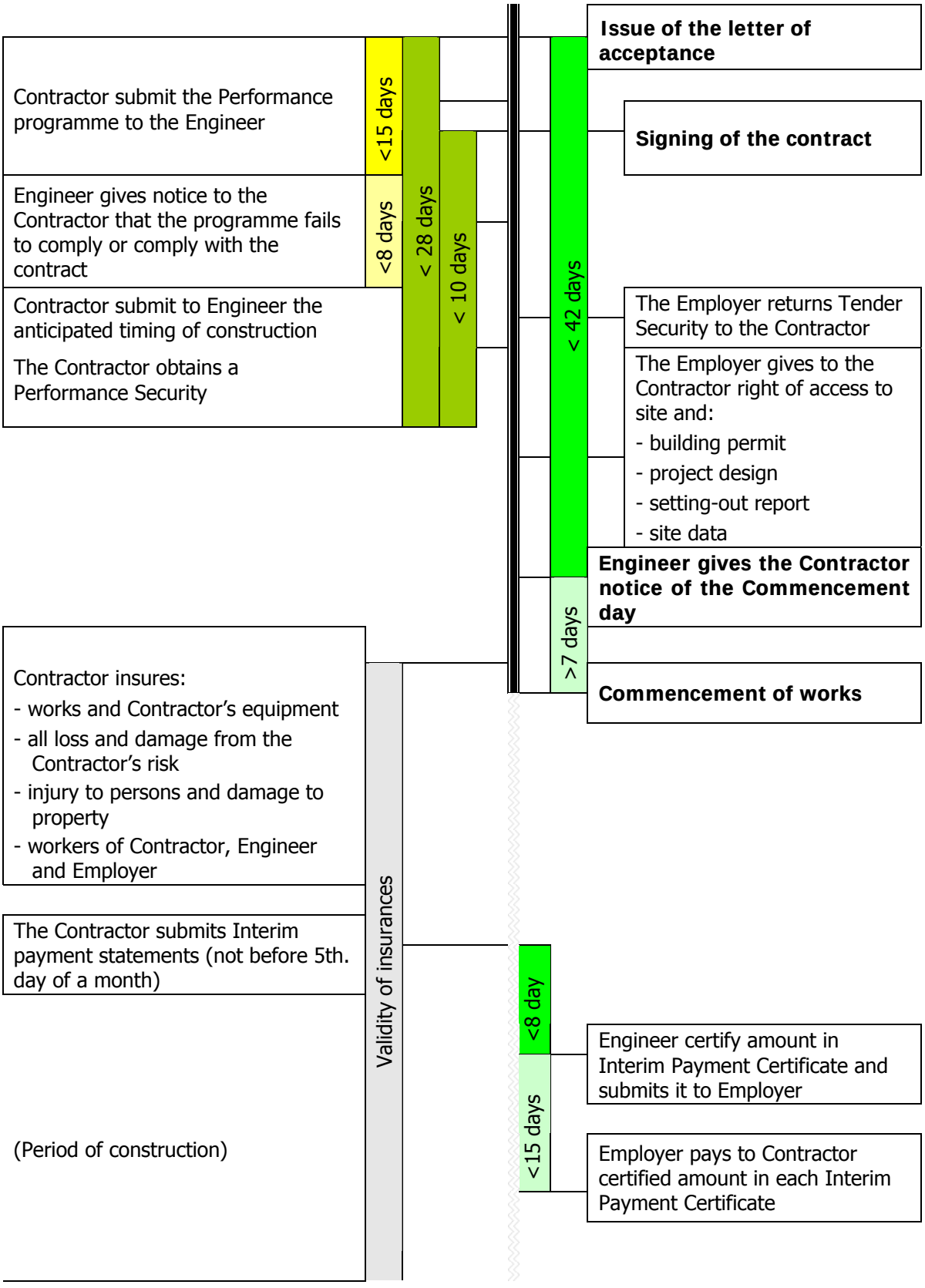
The titles and logotypes of Investor and Contractor may be on the top(bottom) margin of writings if so agreed. If the financial resources are provided by state, municipality or EU on the top margin the logotype of competent state, municipal or EU agency shall be placed.

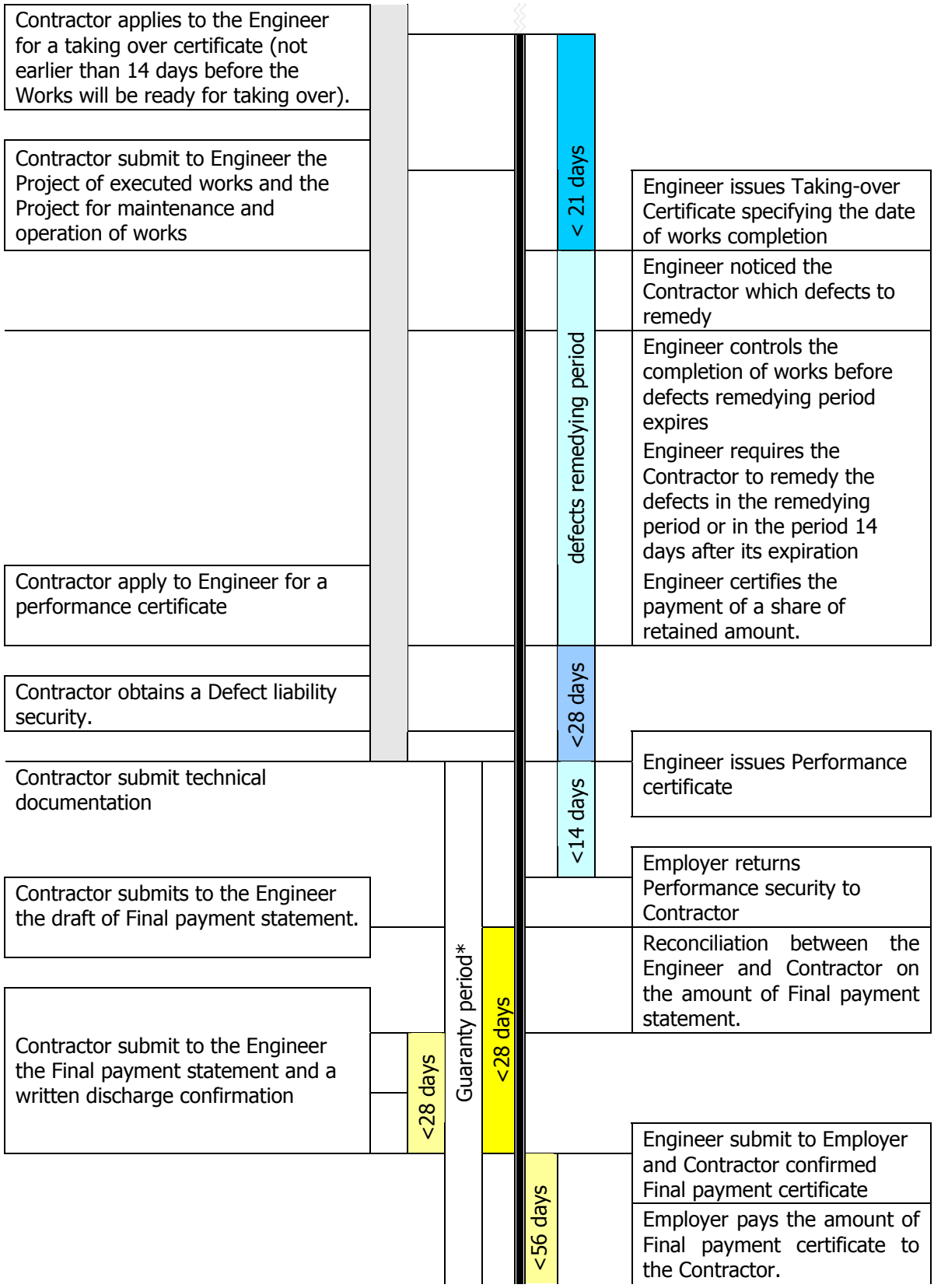
The signpost may be removed when the permit for use is issued.

## 8.5 CONSTRUCTION ADMINISTRATION

### *8.5.1 Administration Procedures*

The duties, in this schedule deemed to be carried out by an Engineer by FIDIC, may be assigned to a named Supervisor.






*Gurantee period is stated in General and Special conditions of Contract

### *8.5.2 Works Execution Diary*

#### 8.5.2.1 Administering the Construction Diary

The responsible supervisor must record all for construction important findings each day in the construction diary. By signing the construction diary the responsible supervisor shall confirm that the information and entries recorded in the construction diary are true.

The responsible supervisor must conduct all phases of construction important for quality, safety and price of works. It includes taking over of ground level, surveying and setting out, stability and bearing capacity of scaffolds and formworks and taking over of reinforcement, concrete and asphalt mixtures.

During the execution of individual stages of work the contractor must allow the supervisor to conduct constant control of constructions and other bearing elements.

Contractor or responsible executor shall notice the responsible supervisor about the start of all phases of work especially of after construction not controllable bearing elements.

If during construction the responsible supervisor finds non-compliance with the project for execution or building regulations, or finds that the quality of the inbuilt construction products and other products, the installations, the technological appliances and equipment or the procedures employed has not been demonstrated using appropriate documents, the responsible supervisor must immediately notify the building inspector and the investor of such, and record the findings and proposals of how to rectify the situation in the construction diary without delay.

If the responsible supervisor finds that the contractor is breaching the agreed deadlines for construction, he must immediately notify the investor of such, and record the findings and proposals of how to rectify the situation in the construction diary without delay.

The investor (or Engineer on behalf of investor) must ensure expert supervision of test operation, which shall be entrusted via a contract to a supervisor qualified therefore. Expert supervision of test operation shall include the ordering of tests and measurements and the entry of the results thereof in a diary of operation in accordance with regulations on the test operation of individual technological appliances.

All reports entered in construction diary oblige all participants in construction and are a part of Executed works design.

Law regulates the content, forms and administering the works execution diary.

Works execution diary consists of:

- construction diary and
- ledgers of quantitative measurements.

The works execution diary must be administered as a construction diary of all works for which the building permit is prescribed.

If the prices in the building contract are stipulated per unit of individual works, a ledger of quantitative measurements must be administered in addition to the construction diary.

A responsible composer named by the contractor administers the construction diary and the ledger of quantitative measurements in the period from commencement day till the issue of performance certificate.

The construction diary and the ledger of quantitative measurements are not administered for factory made parts of works.

Eventual incorrect entry shall be stroked out but still readable. The date when the mistake was found out and a signature of the responsible author of finding shall be recorded.

Construction diary consists of introductory and daily reports.

Introductory report consists of general information's about works and participants in construction.

Daily reports contain the description of important events and complements of design of executed works. The form contains the reports about construction waste management according to the current regulations.

Every entry shall give the information about:

1. obvious intention of entry,
3. kind of entry (informing the contractors, statement of supervisor or building inspector...),
4. evidences and the place of safe keeping,
5. specification of work:
   - earth work,
   - concrete and reinforced structures,
   - masonry,
   - prefabricated structures,
   - structural composite and steelwork,
   - timber work

The important administration entries are:

1. actual state of land parcel before the commencement of construction.
2. statements of contractor and supervisor about the conformity of setting out.
3. list of project for execution drawings handed over to contractor and the date of delivery.
4. notice on technical inspection,
5. notice on permit of use,
6. notice about all phases of taking over,
7. notice about performance certificate,

The start date of administering the construction diary is the commencement date when the first contracted activities of construction commence. (The date when the Investor introduces the contractor to work). It shall be administered every working or non working day when the contractor enters the conditions for work.

The forms of construction diary are fulfilled in duplicate. It shall be signed by responsible composer, responsible executor of works and after all the responsible supervisor or his empowered assistants.

The access to the construction diary shall be free for all participants in the construction and to the relevant building inspector.

The original of construction diary is teared out of form book and safe kept by the supervisor, the remaining copy is safe kept on site.

The end date of administering the diary is the date stated in the performance certificate.

The original and the copy of pages shall be finally bond up and sealed, one to be safe kept by the investor and one by the contractor.

The investor shall safe keep the original of construction diary all the life period of works.

The contractor shall safe keep the copy of construction diary at least 10 years, except otherwise stipulated with a special regulation.

#### 8.5.2.2 Instructions to Fill the Daily Form of CD

1. The construction diary shall be filled and signed:
   - in the case of demanding works: every working day
   - in the case of less demanding works: twice a week
   - in the case of simple works: at the end of working week.

2. The rubric "Weather conditions" shall be filled with the specification of climatic conditions in the early morning, morning and afternoon when the conditions are changed. Weather conditions would be important to make clear the reasons for delays.

3 The rubric "Description of work" shall be filled with technical description of daily work:
- mark (1) indicates contracted work (contract and annexes)
- mark (2) indicates additional work not provided by priced bill of quantities.
- mark (3) indicates changes to the quantity of contracted work"
- mark (4) indicates variation or modification of work caused by changes to the project design.
- mark (5) indicates overhead expenses needed for successful completion of construction
- mark (6) other work

4 When the extent of information needs more pages they shall be paged with the same number but sub numerated.

#### 8.5.2.3 Forms and Content of Introductory and Daily Forms of CD

**(See Supplement S3)**

### *8.5.3 Ledger of Quantitative Measurements*

#### 8.5.3.1 Administering the Ledger

If the prices in the building contract are stipulated per unit of individual works, a ledger of quantitative measurements must be administered in addition to the construction diary.

The ledger consists of:
- introductory form,
- list of inserted pages,
- forms of measurement pages,
- measurement supplements
- measurement plans

The content, forms and administering the ledgers of quantitative measurements are regulated.

The start date of administering the ledger is the commencement date when the first contracted activities of construction commence. (The date when the Investor introduces the contractor to work). It shall be administered every working day of construction

A responsible composer named by the contractor administers the ledger of quantitative measurements in one copy during the period from commencement day till the issue of performance certificate.

The works shall be measured and the quantities calculated to keep periodical accounts. Measurement shall be made of the net actual quantity of each item of permanent works and in accordance with the bill of quantities.

The responsible composer shall measure and draw up the outlines of modifications and variations of parts of works.

Temporary works like scaffolds shall be measured and recorded in the ledger too.

Each item of the bill of quantities shall be presented on separate page of the ledger. The pages - items are sorted out in the same order as in the contracted bill of quantities.

The items presenting the additional or modified works are sorted out at the end of ledger as a chapter named "Unforeseeable and additional parts of works".

The variations of quantities of works are presented on backside of original page- item.

The ledger shall be completed and signed till the issuing of performance certificate.

The original of ledger pages shall be finally bond up and sealed to be safe kept by the employer for the period of min ten years except otherwise stipulated with a special regulation..

#### 8.5.3.2 Instructions to fill the ledger

The ledger is administered by contractor's responsible composer.

The number of pages must correspond to the number of items of BoQ. They are inserted in a folder in the sequence of items of BoQ. If an itemized part of works is not realized the page shall be inserted without quantity definition and noticed: »This works are nor realized because of:.... »

The signature of responsible Investor's representative is an attestation that the quantity of works signed is completed.

#### 8.5.3.3 Forms and content of introductory and measurement forms of ledger

**(See supplement S3)**

## 8.6 FINANCIAL ADMINISTRATION

### *8.6.1 Progress Reports*

On the basis of the minutes of regular monthly /weekly meetings, construction diary and Ledger of quantitative measurements the supervisor produces progress reports. The progress report shall cover monthly /weekly and cumulative progress.

If so stipulated the supervisor produces the reports for financial institutions.

Each report shall include:

- charts and detailed descriptions of progress, including each stage of the project of execution, procurement, manufacture, delivery to site, construction, erection and testing including for work by each nominated subcontractor.
- photos showing the status of progress on the site
- details showing the number of each class of Contractor's personnel and of each type of contractor's equipment.
- a list of quality assurance documents, test results and certificates of materials
- safety statistic including details of any hazardous incidents and activities relating to environmental aspects and public relations
- comparisons of actual and planned progress, with details of modifications and variations of works and the measures to be adopted to overcome delays with advertisement on any events or circumstances which may jeopardize the completion in accordance with the contract.

### *8.6.2 Interim Payments*

The contractor shall submit a draft interim payment statement to the supervisor after the 5$^{th}$ working day of the month in a form usually approved by the Investor showing in detail the amounts to which the contractor considers himself to be entitled on the basis of approved ledger of measured quantities.

The statement shall include the following items as applicable, which shall be expressed in the contracted currency in the sequence listed:

- the estimated value of the contracted works, plant and materials executed and incorporated including (verified) variations but excluding items described in sub-paragraphs 2 to 6 below
- any amounts to be added and deducted for changes in legislation and changes in cost.

- any amount to be deducted for retention stated in contract documents to the total of the above amounts, until the amount so retained by the employer reaches the limit of retention money stated in contract documents
- any amounts to be deducted for advance payment
- addition or deduction which may have become due in accordance with the contract including those under claims, disputes and arbitration.
- the deduction of amounts certified in all previous payment certificates.

The supervisor may in any payment certificate make any correction or modification that should properly be made to any previous payment certificate. A payment certificate shall not be deemed to indicate the Engineer's acceptance, approval, consent or satisfaction.

### *8.6.3 Variations and Adjustments*

The proceedings on variations and adjustments are regulated with Act on obligatory proceedings and with provisions of General and Special conditions of contract. The basic principle which shall prevail is that every participant in construction process has the right to vary and to claim the repayment of costs originating from variations and adjustments.

Variations may be initiated by the Contractor, Engineer or Investor.

The most common reasons for variations and adjustments are:

- incompatibility of designs or delayed drawings and instructions caused by the designer of a project for executions;
- discrepancies in provisions of contract documents,
- discrepancy between bill of quantities and drawings,
- adjustments for changes in legislation
- adjustments for changes in cost
- delayed access to site
- delayed land acquisition
- improper access routes
- incomplete setting out
- major quantities of complex works
- modifications of works
- unforeseeable physical conditions
- fossils
- changes in manner of execution
- delayed payments
- unforeseeable shortage in the availability of goods
- changes and modifications of foundation
- additional requirements for environment protection
- additional requirements of Investor or Designer.
- requirements of technical inspection
- requirements of building inspector
- unforeseeable climatic conditions
- termination of works

If the contractor considers himself to be entitled to an extension of the time for completion and/or any additional payment under any clause of Special conditions of contract or otherwise, the contractor shall give notice to the supervisor as soon as practicable and not later than 28 days after the event or circumstances giving rise to the claim.

The contractor shall also submit all supporting particulars for the claim.

If the contractor fails to give notice in the time limit of 28 days the time for completion shall not be extended and the contractor shall not be entitled to additional payment.

The contractor has to represent:

- cause of delay or deviation
- designer's ( geomechanic's, supervisor's, inspector's) argumentation of additional works
- description of the proposed work and a programme for its execution.
- priced bill of quantities of new or modified parts of works.

Each new rate or price shall be derived from any relevant rates or prices for work, materials, machinery and transport estimated in the contract.

If no rates or prices are relevant for the derivation of a new rate or price, it shall be derived from the reasonable cost of executing the work.

Until such time as an appropriate rate or price is agreed or determined the supervisor shall determine a provisional rate or price for the purposes of interim payment certificates.

The contractor is not exempted from damage liability caused by incorrect instructions of investor except when he warns the investor on possibility of damages.

The supervisor controls the claim and submits it to Investor to verify it (if so stipulated):

- type and quantity of works
- price of works with the schedule of calculation
- changes of completion time
- draft of contract annex

Contracted prices may be adjusted for changes in cost in accordance with special conditions of contract.

When one participant in the construction process contracts the work on the principle "Turn Key/Lump Sum" we recommend the application of FIDIC Conditions of Contract for EPC Turnkey Projects.

The basic rule on evaluation the variations and adjustments is that the lump sum includes the rate of unforeseen and surplus works but not the price of missing works.

The works on bridging road structures are usually contracted on the principle "Turn Key/Lump Sum" but the method of calculating of foundation works is strictly "Cost per unit quantity"

### *8.6.4 Performance Liability Securitiy*

Within 28 days after issuing the letter of acceptance the contractor shall obtain at his cost and deliver to the employer a performance security in the form, amount and currencies stated in the tender documents.

The performance security shall be valid until the contractor has executed and completed the works and remedied any defects. The contractor shall extend the validity of the performance security 28 days prior to the expiry date until the works have been completed

The employer returns the performance security within 14 days after issuing Performance certificate and after receiving the guarantee for remedying defects during extended liability period.

The period of extended liability period shall be fixed in special conditions of contract.

The amount of the guarantee for remedying defects is a percent of the amount of final payment certificate.

### *8.6.5 Insurances*

In accordance with the provisions of general and special contract conditions the insurance

party is the contractor, responsible for effecting and maintaining the insurances.

- works, plant, materials and contractor's documentation; insurances are in effect till the issuing of performance certificate
- for loss or damage for which the contractor is liable
- each party's liability for any loss, damage, death or bodily injury and damage of physical property; The insurances shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the works.

### *8.6.6 Final payment*

The Contractor shall prepare and submit to the employer a final statement and a written discharge which confirms that the total of the final statement represents full and final settlement of all moneys due to the contractor under the contract.

The employer shall set up a commission to carry out the procedure of final payment constituted of:

- Employer (Investor)
- Engineer (Supervisor)
- Contractor
- Owner and/or Manager (Maintainer)

The commission states the amount which is finally due and after giving credit to the employer for all amounts previously paid by the employer and for all sums to which the employer is entitled, the balance (if any) due from the employer to the contractor or from the contractor to the employer as case may be.

# 9 TAKING OVER OF WORKS

## 9.1 TECHNICAL DOCUMENTATION

According to the purpose of use the technical documentation shall include:

- 1 The project of executed works
- 2 The project for entry in official records
- 3 The project for the operation and maintenance of the works

### *9.1.1 Project of Executed Works*

The contents of the design are minimum mandatory contents of design documents intended for construction of all types of buildings and civil engineering structures.

The Project of executed works, composed by a named Designer, is conducted and verified by the Engineer (Supervisor).

Project of executed works is a part of technical documentation intended to:

- approval of actual executed permanent works and variations
- approval of technical inspection on conformity of construction with building permit.
- acquire the permit for use,
- evidence of starting state of works and modifications through the period of service.

For special purposes, different or additional contents can be specified by special regulations. The investor and designer can make an agreement on some additional contents of the design, as well as on its different purpose.

Design of executed works consists of introductory folder and schemes.

#### 9.1.1.1 Introductory folder

Introductory folder contains basic provisions and documents about the fulfillment of conditions for project designers and other participants in the process of construction.

Introductory folder shall contain title page, table of contents, general information on completed works, and special information on project designers, statement of supervisor and contractor's responsible representative and other documentation of evidence.

Documentation of evidence applied in design of executed works:

- Evidence for conformity of prescribed conditions for project designers,
- Evidence for conformity of prescribed conditions for responsible design manager and project designers of all the designs not older than six months with the exception of the designers already registered by competent professional chamber.
- Evidence for liability assurance

#### 9.1.1.2 Designs

Designs contain documents, images, drawings, plans, warranties, attestations, lists, outlines, instructions and other documents.

Drawings of design of executed works shall represent in ground plans and cross sections all parts of completed works (such as structures, equipment, installations...)

Drawings of design of executed works are drawings of the project for execution completed graphically and in writing with variations originating from the process of construction.

The original drawings of design of executed works are used when no variation has occurred but a signed designer's declaration of conformity with the executed works shall be attached.

Variations shall be unambiguous graphically presented e.g. with diverse colors.

The folders of schemes shall be indicated:

No.1 Architecture plans

No.2 Landscape architecture plans

No.3 Construction plans and other building plans

No.4 Electrical installation and electrical equipment plans

No.5 Machine installation and machinery plans

No.6 Telecommunications plans

No.7 Technological plans

No.8 Excavation and basic sub works plans for underground works

No.8 Land surveying plans

No.10 Other plans in connection with construction, such as fire safety studies and other technical studies and reports, when such are required for reason of the specific features of the particular type of works or location on which the works is to be constructed, or if such are required by separate regulations.

The sequence of codes is not changed in the case when a part of works is not anticipated.

The folders of schemes shall contain:

- title page comprising the information on investor, works, type of technical documentation and evidence number, type and code of scheme, kind of completed works, designer of scheme, numeration and on the place and date of origin.
- table of content of scheme,
- table of content of design,
- drawings and other documents.

#### 9.1.1.3 Forms and Content of Project of Executed Works

**(See Supplement S4)**

### *9.1.2 Project for entry in official records*

Within fifteen days of the permit of use becoming final, the investor must commission the project for entry in official records from the project designer or a land surveying company. The minister responsible for spatial planning and construction matters shall prescribe, with the approval of the relevant ministers into whose field of work the individual type of works falls, the detailed content of the technical documentation, the method for drawing it up, and the types of plans that come into consideration for individual types of buildings and civil engineering works with regard to their actual use.

The presented content of expert's document is the minimal content of the documentation that come into consideration for individual types of buildings and civil engineering works.

The project for entry in the cadastral register and the register of buildings shall be produced in accordance with the regulation on evidence of real estate, state border and spatial units.

The project for entry in the register of public infraworks shall be produced in accordance with the regulation on evidence of public works in the register of public infraworks adopted on the base of Spatial planning Act or other regulations.

#### 9.1.2.1 Content of Project for entry in official records

Project for entry in official records cosists of reports. It comprise no introductory folder or designs. Detailed contens are presented in **Supplement S5**

### *9.1.3 Project for the maintenance and operation of the works*

The contents of the design are minimum mandatory contents of design documents intended for operaton and maintenance of all types of buildings and civil engineering structures.

The project for the maintenance and operation of the works is a systematically ordered collection of instructions and similar elements, based on which each owner of the works is able to maintain it in an approiate manner

Project consists of introductionary folder and plans

#### 9.1.3.1 Introductionary folder

The content is presented in **Supplement S4**

#### 9.1.3.2 Designs

The folder consists of pictorial material, plans and texts in the form of guarantees, confirmations, lists, schemes, that set out the rules for using or operating and maintaining the constructed or reconstructed works and the inbuilt installations and technological appliances. Enclosed are instructions of maintenance of construction products and information to use the furniture and equipment supplied and installed to works.

Besides the obligatory documents the projects must consists of:

- Timing of mandatory dates of regular inspection and program of periodical inspections
- Scope and program of works performing the guaranty that the works fulfil the essential requirements during expected life time
- Other reports (Operating diary etc), when required by the rules for specific works.

### *9.1.4 Safekeeping Project and Technical Documentation*

Unless stipulated otherwise by separate regulations, the relevant administrative body for construction matters must keep safe the project for acquiring the building permit based on which a building permit was issued or based on which a building permit was amended, and the project of works executed based on which a permit of use was issued for ten years after the issue thereof.

The owner of a works or the legal successor thereof must keep safe the project for acquiring the building permit based on which the building permit was issued and the project of works executed, the project for the maintenance and operation of the works and the project for entry in official records based on which the permit of use was issued as long as the works stands or until the removal of the works, unless separate regulations for a specific type of works stipulate that it is necessary to keep them safe permanently. The project may be kept safe on paper, on an electronic medium or on microfilm.

## 9.2 PERMIT OF USE

### *9.2.1 Technical inspection*

The investor shall lodge a request for the issue of a permit of use with the administrative body that issued the building permit when together with the supervisor the investor determines that the works or part thereof has been constructed or reconstructed in accordance with the building permit such that it can be used and that the project of works executed has been formulated.

The investor must lodge the request for the issue of a permit of use within eight (8) days of receiving notification from the contractor that construction is complete.

If the investor fails to lodge the request pursuant to the previous paragraph, it may be lodged by the contractor.

In the request for the issue of a permit for use it shall be necessary to cite that the works has been constructed or reconstructed in accordance with the building permit and to cite the number and date of the building permit, information on the project designer that formulated the project for execution and the project of works executed, and information on the contractor or contractors that constructed or reconstructed the works.

When the relevant administrative body for construction matters determines that the request for the issue of a permit of use is in accordance with the conditions specified in the Law, it shall via a resolution appoint a technical inspection commission and set a date for the technical inspection; no appeal shall be allowed against the resolution.

Representatives of the project approving authorities that stipulated the conditions or granted approval for the project solutions for the construction must sit on the technical inspection commission. If deemed necessary because of the technical or other specifications of the works, other experts may be appointed to the commission.

The resolution on the appointment of the technical inspection commission and on the setting of a date for the technical inspection shall be delivered to the investor and the appointed commission members. The resolution must also contain a warning that a representative of an approving authority that fails to attend the technical inspection shall be deemed to have no comments on the constructed or reconstructed works.

At any time before the day of the technical inspection a relevant approving authority may inform the relevant administrative body for construction matters in writing that the authority has no comments on the constructed or reconstructed works and is therefore waiving its right to participate in the technical inspection.

A representative of a relevant approving authority that was appointed to the commission but fails to attend the technical inspection shall be deemed to have no comments on the constructed or reconstructed works.

On the day of the technical inspection the investor must propose:

- The project of works executed and a statement by which the supervisor confirms that all changes were entered in the project during construction and that the changes were in accordance with the building permit issued
- The construction diary
- The land surveying plan of the new situation of the land after the completion of construction
- Evidence of the reliability of the works
- The project for the maintenance and operation of the works
- Other information and evidence, if so stipulated for the specific type of works by the building permit or a separate act of law

If the subject of the technical inspection is a works with environmental impact, a programme of initial measurements of operational monitoring, if such measurements are prescribed, must be appended to the project for the maintenance and operation of the works.

The contractor must attend to the evidence of the reliability of the works, and it must be signed by the responsible works manager or the responsible construction site manager, if such has been appointed, and the responsible supervisor.

The land surveying plan of the new situation of the land shall be formulated in accordance with land surveying regulations as a topographical/cadastral plan.

The provisions of this guideline shall not apply to underground works in mine areas that are directly connected to the exploration and exploitation of mineral raw materials.

The project for the maintenance and operation of the works shall set out the mandatory minimum time intervals for regular inspections, the deadlines and scope of periodic inspections, and the scope of maintenance works by which it is necessary to ensure that throughout its use the works will fulfill the essential requirements and that the installations, technological appliances and equipment will fulfill the prescribed parameters throughout its operation.

For a works a part of which can be deemed a built public asset pursuant to the provisions of this act, it shall be necessary to specifically illustrate in the project for the maintenance and operation of the works the manner and conditions for maintaining the public areas.

Through the technical inspection it must be determined:

- Whether the works has been executed in accordance with the building permit
- Whether it is clear from the evidence of the reliability of the works that the works has been executed in accordance with the building regulations that are mandatory in the execution of works of such a type and with the conditions stipulated for construction
- Whether it is clear from the evidence of the reliability of the works that the measures prescribed to prevent the impact caused by the works itself or by its use in its environs or to restrict such to the lowest possible measure have been taken into consideration
- Whether the installations, technological appliances and equipment have been built in a high-quality manner and whether they fulfill the prescribed parameters, the technological process, health and safety at work, fire safety and environmental protection having been taken into consideration
- Whether there exists appropriate evidence of the reliability of the works formulated in accordance with the provisions of the Construction Act
- Whether the instructions for the maintenance and operation of the works have been formulated in accordance with the provisions of proper regulations
- Whether the land surveying plan of the new situation of the land and of newly constructed works is in accordance with land surveying regulations

### *9.2.2 Acquisition of Permit of Use*

After the technical inspection of the works is completed, the relevant administrative body for construction matters shall issue a ruling, via which it:

- Issues the permit of use
- Orders the rectification of the deficiencies identified
- Orders test operation and the initial measurements of operational monitoring pursuant to environmental protection regulations or other regulations via which such measurements are prescribed, for the period stipulated by the programme of initial measurements
- Denies the issue of a permit of use, if the works has such deficiencies that it represents an unsafe construction pursuant to this act and the deficiencies cannot be rectified

It shall not be possible to issue the permit of use unless it is clear from the evidence of the reliability of the works that it will be possible to use and maintain the works in accordance with regulations on health and safety at work amd with traffic regulations.

Only participants in the construction of works, the representatives of the relevant approving authorities that stipulated conditions or granted approvals for construction and the representatives of the relevant inspectorates shall have the right to participate in the procedure for issuing the ruling on the permit of use.

Other parties that were participants in the procedure for issuing the building permit shall not have the right to participate in the procedure for issuing the ruling on the permit of use.

If the relevant administrative body for construction matters ordered the investor to rectify the deficiencies identified, after having rectified them the investor must submit evidence of such to the administrative body for construction matters and request that the technical inspection be repeated. If the administrative body for construction matters finds that a repeat technical inspection is not required, it shall issue the permit of use.

Following the repeat technical inspection, which may also be conducted by a single member of the commission, only those works that it was necessary to correct or subsequently carry out shall be inspected, regarding which the commission shall issue an appropriate resolution.

If, after the repeat technical inspection, the relevant administrative body for construction matters finds that the investor has failed to rectify all the deficiencies identified, it shall issue a new ruling ordering the investor to rectify the deficiencies identified by a specific deadline. If, despite an executable ruling on the rectification of the deficiencies identified, the investor fails to rectify the deficiencies, the relevant administrative body for construction matters shall via a ruling deny the issue of a permit of use and shall inform the relevant building inspector of such.

If the relevant administrative body for construction matters ordered test operation, the investor must inform the relevant inspectorates and the relevant administrative body for construction matters of the intention to commence test operation at least fifteen days before commencing test operation.

The investor must ensure expert supervision of test operation, which shall be entrusted via a contract to a supervisor qualified therefore. Expert supervision of test operation shall include the ordering of tests and measurements and the entry of the results thereof in a diary of operation in accordance with regulations on the test operation of individual technological appliances.

Before the end of the period of test operation the investor must request that a final technical inspection be conducted.

Following the final technical inspection, which may also be conducted by a single member of the commission, only those inbuilt installations, technological appliances and equipment for which the quality of the works performed and the material built in is being determined, and the parameters achieved by the technological process shall be inspected, and it shall be verified whether the parameters achieved by the technological process ensure health and safety at work (safe traffic) and fire safety and do not exceed the environmental impact permitted by regulations. On this basis the relevant administrative body for construction matters shall then issue a permit of use.

Unless stipulated otherwise by separate regulations, the permit of use specified in the previous paragraph shall also be deemed to be an operating permit for the installations and technological appliances built into the works.

If the relevant administrative body for construction matters denied the issue of a permit of use because the works had such deficiencies that it represented an unsafe construction and the deficiencies could not be rectified, the relevant administrative body for construction matters shall be obliged to inform the relevant building inspector of such without delay.

In the case of unsafe construction, the relevant building inspector shall halt the construction and prohibit the use of the works, and order that emergency maintenance works be carried out on the works or the part thereof by the deadline stipulated by the inspector, or that the works be appropriately renovated or removed.

If a works was constructed without a building permit in order to prevent a natural or other disaster or to diminish the consequences thereof, it may only remain a permanent works after the circumstances for which it was constructed have ceased if after the aforementioned circumstances cease the investor or owner of the works lodges a request for the issue of a permit of use with the relevant construction body, appending the land surveying plan of the new situation of the land and appropriate evidence of the fulfillment of the essential requirements to the request, and acquires a permit of use.

Location information from which it proceeds that the works is in accordance with the implementing planning document and a plan of the existing situation with a construction plan containing at least analysis of the work's constructions (static calculation) shall be

deemed the appropriate evidence of the fulfillment of the essential requirements specified in the previous paragraph. Such a plan may be formulated by a legal or natural person that pursuant to the provisions of this act fulfils the conditions for a responsible project designer qualified in the formulation of construction plans.

A permit of use shall be issued for a single-dwelling building constructed on the basis of a building permit without a prior technical inspection if, in addition to the land surveying plan of the new situation of the land, the investor appends a declaration by the project designer and the supervisor that the building has been constructed in accordance with regulations to the request for the issue of a permit of use.

The permit of use shall be issued by the relevant administrative body for construction.

In addition to the elements prescribed for written rulings by the Generally Administration Act, in its pronouncement the permit of use must contain an indication of the type of works with regard to its purpose of use.

The project of works executed and the land surveying plan of the new situation of the land shall be constituent parts of the permit of use.

The ruling issued in the procedure for issuing the permit of use shall be delivered to the investor and other participants in the construction of the works that were involved in the construction.

The projects and plans shall not be appended to the ruling during delivery, with the exception of that for the investor.

If separate regulations that stipulate that the use of technological appliances may only commence when an operating permit has been issued therefore do not regulate a procedure for issuing such a permit, the sense of the provisions of this title governing the technical inspection procedure shall apply to the procedure for issuing the operating permit.

If it is not stipulated by separate regulations that govern the conditions for using specific types of transport or power works of public infraworks that it is necessary to conduct test operation prior to the issue of a permit of use, the provisions of this title governing test operation and the initial measurements of operational monitoring may also be applied to such works, if the investor thereof so requests.

The sense of the provisions of this title shall also apply to the procedures prescribed by mining regulations for cases of cessation of the exploitation of mineral raw materials and, if so stipulated by separate regulations, in cases of the cessation of operation of a specific type of works of public infraworks, such as a road, a railway or a deposition site.

## 9.3 DIVIDED CO-OWNERS AND LEGAL SUCCESSORS OF WORKS

Employer (Engineer, if named) shall convene a meeting of the proposed managers, maintainers and other legal successors of works to define the parts of works to be administered and maintained by them.

The first meeting shall be organized within the period of planning and designing of civil engineering works. The data collection of owners and legal managers is a part of spatial planning designs.

On the basis of the project of executed works and surveying data a schedule of road sections, interchanges, structures and infrastructure shall be created.

During second meeting the committee defines the limits of administering and maintenance of:

- new or given up/prequalified sections of a road
- public infrastructure, electro and telecommunications
- water flows and water resources
- forest and rural ways

- road-railway crossings

Invitation to a meeting on administrative demarcation and taking over must contain:

- the list of completed works envisaged for demarcation
- the list of invited co-owners and legal successors of works and:
  - Investor
  - Contractor
  - Administrators, managers and maintainers of roads and railways (Direction of roads (railways), Municipalities)
  - Administrators of other infrastructure and natural resources (rural land, water, forests)

The minute of meeting shall contain:

- list of committee members
- resume of contract provisions
- schedule of project and technical documentation
- building permit and permit of use
- financial values of parts of works being taken over
- eventual defects and imperfections to be remedied
- warranties

## 9.4 ENTRY IN OFFICIAL RECORDS

The investor is bound to hand the completed documentation about parcelling the land on which the construction or reconstruction of a road is completed to an authorised municipal agency within one year after completion.

In the case of construction for the market must ensure the works is entered in the cadastral register immediately after receiving such project, and also in the register of buildings in the case of a building.

In the case of public infraworks, the investor must also ensure that the works is entered in the register of public infraworks within fifteen days of the permit of use becoming final.

The access to actual use data collection is open to all.

The competent geodetic direction produces the instruction for mode of access and use of data.

## 9.5 HANDOVER OF MANAGEMENT AND MAINTENANCE

Upon the proposal of the Minister of transport the government adopt:

- decree of modification of categorization
- decree of decrease of categorization of a section of public road into a municipal road (local rod)
- decree of omission of a part of road

After publication in official gazette the decrees are the basic documents for input of new data in Road data banks maintained by competent administrators of roads.

The limits of managing and maintenance of road railway cross sections are determined.

The competent government agencies take over the administering of improved water flows and other public infrastructure.

# 10 INSPECTION-IN-DEPTHS

## 10.1 GENERAL TECHNICAL CONDITIONS

- **(see Volume 2, Section 1)**

## 10.2 SPECIAL TECHNICAL CONDITIONS

- **(see Volume 2, Section 2)**

## 10.3 TAKING OVER OF CONSTRUCTION PRODUCTS

### *10.3.1 Introduction*

The Contractor must build in only those construction products that comply with the intended use and have been placed on the market in accordance with regulations on the placement of construction products on the market, and whose compliance has been confirmed with appropriate documents of compliance, and natural materials or mineral raw materials for which there is proof that they were obtained in accordance with regulations on mining or that they are from legal mining

For individual types of works, building regulations shall define their technical properties such that with regard to their purpose the works fulfill one, several or all of the following essential requirements:

- Mechanical resistance and stability
- Fire safety
- Hygiene, health protection and environmental protection
- Safety of use
- Noise protection
- Energy efficiency and heat retention

Building regulations may refer to standards and technical guidelines relating to a specific type of works, and may stipulate the mandatory application thereof or stipulate that it should be presumed that a specific element complies with the requirements of the building regulations if it satisfies the requirements of the standards or technical guidelines.

If the presumption of compliance is stipulated in the building regulations, the building regulations must also define the bodies responsible for ruling and the procedure in which it is demonstrated that a project in which the standards or technical guidelines were not applied but in which solutions from the latest state of construction technique were applied in the project designer's work also ensures at least the same level of safety as a project prepared by applying the standards and technical guidelines.

The constructor shall constantly make available to the investor or supervisor all documentation, attestations, and evidence on the inspection and measurement of the suitability of the execution of works that relate to the material and products built in.

The supervisor shall assist at sample taking and shall examine and keep the reports on conformity of construction products and their incorporation, performed by contractor's internal control representative or Institution's external control party.

In the case of missing or improper report on conformity the supervisor must with the written notice in construction diary reject the incorporation of unfit product, kit or equipment.

The supervisor shall with the written notice in the construction diary demand from the contractor to improve or substitute unfit materials, products, kits or equipment. He shall assist in the process of defining the method of mending.

Fitness for use is regulated with general and special technical conditions and technical

specifications on required or admissible level of quality and on the step of allowed deviations.

Beside technical requirements the method of calculation of financial penalties are specified in special conditions when the level of quality attains the lowest still acceptable value but not the required level of quality.

Fitness of a completed works is demonstrated by test loadings or test operations. The designer and competent Institution shall carry out performance tests in accordance of technical regulations or specifications. The supervisor assists the phases of planning and performing of the programme.

### *10.3.2 References*

The procedure of quality assessment of construction products fit for placing on market is regulated by Construction Products Directive (CPD- Council Directive 89/106/EEC of 21 December 1988).

The local regulations, like Construction Products Act, Public Procurement Act and Construction Act should introduce the Directive as valid in the territory of a state or entity.

### *10.3.3 Taking over procedures*

#### 10.3.3.1 General

The quality taking over is obligatory for construction products:

- which have influence on the fulfillment of essential requirements of the works in which they are incorporated that is safety of use, serviceability, durability and sustainability.
- which are used for environment protection or waste management.
- which protect the works against noxious impacts of environment.

Every technical specification (standard) for a construction product defines the conformity attestation and the procedure of taking over.

The required technical specifications shall be listed in tender documentation.

The external quality taking over shall be performed by a competent Institution.

Quality taking over is carried out for:

- the works or a part of works, or
- individual section or party of incorporated product if this is a condition for performance of other works.

Quality taking over is performed:

- *At the supply on site,* the construction products fit for use in works when supplied to a site and whose performances do not change after incorporation in works,
- *During the incorporation,* The construction products whose performances are fit for intended use only as a part of works.

The construction products taken over during incorporation are:

- product originating in a building process
- product supplied on site as semi products with its own certificate of conformity (concrete or asphalt mixtures, mortar) or
- product with its own certificate of conformity combined in kits on site or in site plant. (system of water pipes).

#### 10.3.3.2 Taking over of construction products supplied to site

The tasks of Supervisor and Institution as third party are:

a) when the certificates on conformity exist the supervisor shall:

- examine the validity of certificate,
- examine the report of initial type-testing if the product quality satisfies the required

performances and in the case of nonfulfilment demand additional testing by Institution.
- examine the evidences of surveillance of factory production control issued by a competent Institution,
- require the performance of identity tests by an Institution;

b) when the certificates do not exist the Institution shall attest the product in accordance with the technical specifications and before first incorporation issued the certificate of conformity. If there is no proper technical specification the Employer and the Institution determine the method of attestation.

During ordinary production supply on site the supervisor shall control:

in the case a):
- inspect the product, accompanying documentation and packaging (marks and labels),
- examine the time of validity of the evidences of surveillance of factory production control,
- perform the tests of identity if fixed by proper technical specification, regulation or tender conditions,

in the case b):
- the Institution shall examine relevant performances of product and issued or denied the certificates of conformity.

#### 10.3.3.3 Taking over of products during incorporation in works

The Supervisor and a named Institution shall:
- examine the validity of submitted evidence on conformity of (semi)product,
- examine the evidence on internal and external control of incorporation.
- assessment of conformity,

The incorporated product is taken over when the results of assessment indicate that all the required performances of incorporated product and of material components are fulfilled. In the case of incompatibility The incorporated product is rejected and the contractor shall carry out the programme of repair or removal of the product.

The conditions of rejection of products shall be defined by technical specification or tender documentation.

Named institution shall compose a report on conformity of individual product including the statement on taking over or rejection of a product incorporated in works or apart of works.

#### 10.3.3.4 Taking over of imported goods

The Law on external trade regulates the conformity assessment and attestation of the imported products or technological kits and equipment.

The evidence on conformity issued in foreign country may be the base for issuing the certificate of conformity, if the relevant conditions of the Law on technical conditions for products and conformity assessment are fulfilled.

Institution may perform:
- additional testing and assessment of product performances if national technical specification or tender documentation specify the method of testing not included in presented documentation. and
- identity tests.

Sampling may be carried out at importer or by Institution.

#### 10.3.3.5 Institution

The Institution involved in quality taking over procedures of public works is named by the Employer during proper procedure of public procurement.

The named Institution may subcontract specific tests to another competent Institution but it is its responsibility to carry out all the work correctly and in time. The Institution may not subcontract the producing of conformity assessment report representing the basic document for taking over of a product.

### *10.3.4 Conformity assessment*

#### 10.3.4.1 General

These guidelines represent the minimal requirements for conformity assessment at civil engineering works.

The conformity assessment consists of activities of internal and external control.

The applicable systems of conformity assessment, consisting of various combinations of internal and external control, are for the purpose of these guidelines marked as: A; B; C; in D.

Systems A and B are obligatory for the conformity assessment of products which incorporated in works shall beside safety fulfill some other essential technical requirements.

Systems C in D are convenient for conformity assessment of products which incorporated in works shall fulfill only singular essential technical requirement,

The systems shall be defined with technical specification of product or by tender documentation.

#### 10.3.4.2 Activities of internal control

The internal controls which are the tasks of manufacturer or contractor are:

a) initial type-testing of product or field testing when the system of conformity assessment requires this activity as a task of manufacturer or contractor;
b) fabric control, incorporation control or control of execution of works including the plant.
c) internal tests performed in accordance of contract's plan of assessment.
d) evaluation of conformity with regard to required performances of a product.

#### 10.3.4.3 Activities of external control

The activities of conformity assessment or approval of fabric control or taking over the incorporated products as the tasks of Institution are:

a) initial type-testing of product or field testing when the system of conformity assessment requires this activity as a task of third party or Institution,
b) initial examination of the plant or factory and estimation of producing capacity of plant;
c) initial examination of internal control in plant or site including the examination of proficiency of the laboratory and qualification of personnel to carry out the prescribed conformity assessment in accordance with the schedule of assessment.
d) instant surveillance of internal control;
e) examination and inspection of evaluation of conformity carried out by manufacturer or contractor;
f) random control testing of samples collected during surveillance of internal control in plant or site,

#### 10.3.4.4 Systems of Conformity Assessment

For conformity assessment of fabric manufactured (semi) products:

The systems are listed in table 1

For conformity assessment of incorporated semi products:

The systems are listed in table 2.

#### 10.3.4.5 Assessment of Conformity

On the basis of conformity assessment the certificate of conformity of a product or a kit of products may be issued.

For the products originating of a building process the conformity attestation may be produced for incorporated product or separately for semi product made in plant and for the phase of incorporation.

Separate attestation is reasonable when two or more contractors or manufacturers carry out the production and the incorporation of semi product.

The report of conformity assessment must confirm that all activities of manufacturer, contractor and institution, prescribed with technical specifications or contract, have been carried out the results of assessment.

The report of conformity assessment as a base for certificate of conformity is produced by nominated Institution.

The report of conformity assessment as a base of declaration of conformity is produced by manufacturer after approval of internal control by an Institution.

The report of conformity assessment, as a base for taking over a product is produced by an institution.

**Table 1: Systems of conformity assessment of fabricated (semi)products.**

| System | Activities of internal control | Activities of external control |
|---|---|---|
| **A** | Factory production control<br>Internal control | Initial type-testing of a product<br>Initial inspection of plant and the system of factory production control<br>Permanently surveillance of internal control<br>Audit tests |
| **B** | Factory production control<br>Internal control | Initial type-testing of a product<br>Initial inspection of plant and the system of factory production control<br>Permanently surveillance of internal control |
| **C** | Initial type-testing<br>Factory production control<br>Internal tests | Approval of internal control on the base of:<br>- Initial inspection of plant and the system of factory production control<br>- Permanently surveillance of internal control |
| **D** | Initial type-testing of product<br>Factory production control<br>Internal tests | Approval of internal control on the base of:<br>- Initial inspection of plant and the system of factory production control |

**Table 2: Systems of conformity assessment of incorporated (semi)products.**

| System | Activities of internal control | Activities of external control |
|---|---|---|
| **A** | Control of incorporation or execution of works<br>Internal tests | Initial field-testing<br>Initial inspection of plant and the system of control of incorporation or execution of works<br>Permanently surveillance of internal control<br>Audit tests |
| **B** | Control of incorporation or execution of works<br>Internal tests | Initial field-testing<br>Initial inspection of plant and the system of control of incorporation or execution of works<br>Permanently surveillance of internal control |
| **C** | Initial field-testing<br>Control of incorporation or execution of works<br>Internal tests | Initial inspection of plant and the system of control of incorporation or execution of works<br>Permanently surveillance of internal control |
| **D** | Initial field-testing<br>Control of incorporation or execution of works<br>Internal tests | Initial inspection of plant and the system of control of incorporation or execution of works |

### *10.3.5 Conformity Attestation of Factory Products*

#### 10.3.5.1 Certificate of Conformity

The Institution shall be authorized for issuing the Certificate of conformity of a product when the system of conformity assessment is A or B. but after initial inspection of plant and the system of factory production control.

The period of validity shall be limited with the period of manufacturing of a product or the quantity of produced material.

Institution shall after assessment of periodical surveillance of internal control:

- confirm the validity of current certificate of conformity when during the surveillance of internal control the Institution asses the accordance of the control with the provisions of technical specification for a product and that the evaluation of the conformity tests fulfills the required performances or
- issue to the manufacturer or contractor an advertisement and demand corrective measures when during the surveillance the Institution asses disagreement in internal control from technical specification.
- cancel the validity of current certificate after repeated assessment of unconformity.

#### 10.3.5.2 Certificate of Approval of Internal Control and Declaration of Conformity

The Institution shall be authorized for issuing the certificate of approval of internal control when the system of conformity assessment is C or D. but after initial inspection of plant and the system of factory production control.

The period of validity shall be limited with the period of manufacturing of a product or the quantity of the produced material.

On the base of the certificate of approval of internal control manufacturer may issue the declaration of conformity.

If the system C of conformity assessment is applied, the Institution shall after assessment of periodical surveillance of internal control

- confirm the validity of current certificate of conformity when during the surveillance of

internal control the Institution asses the accordance of the control with the provisions of technical specification for a product and that the evaluation of the conformity tests fulfills the required performances or

- issue to the manufacturer or contractor an advertisement and demand corrective measures when during the surveillance the Institution asses disagreement in internal control from technical specification.
- cancel the validity of current certificate after repeated assessment of unconformity.

In the last case the manufacturer or contractor shall cancel the declaration of conformity without delay.

### *10.3.6 Conditions for Manufacturer/Contractor and Institution*

#### 10.3.6.1 Manufacturer and Contractor of Works

The activities of internal control may carry out a particular department of manufacturer or contractor which:

- employs the personnel qualified for performing the tasks of internal control according to rules and which
- disposes with adequate working space and suitable testing and measuring equipment (laboratory) according to the rules of conformity assessment of a product performances.

After written order of an Employer the Institution shall asses and approve the conformity of manufacturer's or contractor's laboratory.

A contractor or a manufacturer are deemed qualified for performing the internal control when the current procedure of a site or factory production control in accordance with EN ISO 9001/2 and with the technical rules for a product performance.

The qualification of a laboratory performing prescribed conformity, identity and acceptance tests is assessed and approved on the base of:

- valid accreditation document according to EN 45001, issued by acknowledged national or foreign authoritative body which shall include the approval of all conformity tests of a product.
- affirmative statement of an Institution in all other cases.

When the manufacturer/contractor is deemed not qualified for performing all the activities of internal control it may subcontract some or all activities with any qualified institution by example an accredited testing laboratory.

#### 10.3.6.2 Institution

The testing laboratories, the inspection bodies and the certification bodies must fulfill the following minimum conditions:

- availability of personnel and of the necessary means and equipment;
- technical competence and professional integrity of personnel;
- impartiality, in carrying out the tests, preparing the reports, issuing the certificates and performing the surveillance, of staff and technical personnel in relation to all circles, groups or persons directly or indirectly concerned with construction products;
- maintenance of professional secrecy by personnel:
- subscription of a civil liability insurance.

Fulfillment of this conditions shall be verified at intervals by the competent authorities or Employer.

The Institution is named by the Employer after public procurement.

### *10.3.7 Final Assessment of Product Conformity for Intended Use in Works*

After the completion of a works an authorized and named Institution issues the final assessment of product conformity report on the total quantity of incorporated product and material.

The report shall include:

- review of certificates of approval of internal control and declaration of conformity
- stated unconformities,
- statements about:
  - the fitness of in works incorporated product for intended use or
  - making good the unfitness or additional testing of conformity of a part of works or
  - demand an improvement of works or its part in which the unfit product is incorporated

Report on final assessment is a part of a Project of executed works

### *10.3.8 EU Technical Regulations for Construction Products*

Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products regulates the placement of construction products on market.

The Directive and the Guidance papers A to L regulate the process of conformity assessment and CE marking of products *but are not intended for the taking over of part of works or semi products or incorporation of them*. This field of civil engineering is deemed to be a part of national technical specifications and legislation.

In the **Supplement P6** a proposal is described how to use CPD, guidance papers and European technical specifications in the process of taking over the construction products.

# 11 MAINTENANCE SUPERVISION

On-site-supervision of maintenance works is detailed treated with guidelines for maintenance. This guideline treats only the variants of administrative organization and general appointments of a supervisor.

## 11.1 SUPERVISION OF ROUTINE ROAD MAINTENANCE SYSTEMS

The supervision is organized according to individual areas of maintenance. So an individual contractor of regular maintenance maintains 500 to 700 km of main and regional roads. It is most appropriate that individual contractors of regular maintenance divide their areas in smaller ones (bases) covering 80 to 120 km of main and regional roads. In case that an individual contractor maintains much more than 700 km of roads, the inspection shall be organized in such a way that two persons are engaged in inspecting such an area. The supervisor and the head of the base inspect the condition of roads and approve the executed works.

The supervisor uses a special vehicle, a measuring wheel, a measuring tape, a pocket computer, and a computer with software (VGRC) operating via web, helping him to carry out accounting as well as calculating the executed works.

The supervision can be organized in three ways:

### *11.1.1 Supervision performed directly by the Road directorate*

The Road Directorate participates in road management and supervision by issuing instructions directly to the maintenance contractors.

The advantage of this supervision arrangement is that the Road Directorate has a direct connection with the routine maintenance contractors and a great direct decision-making strength. This is particularly reflected in the preparation of both short- and long-term plans, where all planned future work, including renovation and reconstruction, can be taken into account.

The downside of this arrangement for the supervision of routine maintenance is that the routine maintenance contractors are too much under the influence of decisions made for particular cases or particular contractors, and such decisions are sometimes political rather than based on a purely professional basis.

This arrangement also saddles the Road Directorate and its managing director with direct criminal and material responsibility for all decisions made in the context of routine maintenance work.

Because the supervision of routine road maintenance takes place all over the country, the Directorate must employ several people to supervise the execution of routine maintenance work in various parts of the country and Directorate needs more employees, more time is spent traveling and higher expenses are incurred (because the supervisors must drive from the centre to all parts of the country). This decreases the efficiency and quality of the supervision.

### *11.1.2 Supervision performed by the Road directorate through a special supervision division*

The Road Directorate sets up a professional department of its own to supervise the performance of routine road maintenance. This is a department of the Road Directorate but is autonomous and reports directly to the managing director of the Road Directorate.

Under this arrangement, maintenance is still heavily subject to political decisions, but these decisions apply to the entire area of the country and therefore affect all the routine maintenance contractors equally. This is an improvement over the system where the Road Directorate supervises the work directly.

The Road Directorate still has a strong influence on the preparation of long- and short-term work programmes.

The direct responsibility of the director of the Road Directorate is now smaller, as part of the responsibility for the supervision (and therefore for the performance) of routine maintenance is shouldered by the departmental head of the routine road maintenance supervision department.

Although the routine maintenance supervision department employs the same number of people as would be needed in case of direct supervision by the Road Directorate, the cost efficiency and effectiveness of the work may improve because the sector can be organized on a regional basis, which decreases the time and costs caused by the supervisors traveling to the area they supervise. This also increases the supervision quality since the supervisor can spend more time actually supervising the quality of the maintenance work.

### *11.1.3 Supervision performed by a contractor*

The Road Directorate conducts a public tender process to select a competent company that will supervise the routine maintenance of roads. The company and the Road Directorate sign a contract detailing the supervisory tasks.

The maintenance contractors now receive the Road Directorate's instructions indirectly through the company in charge of routine road maintenance supervision. Instructions dealing with the performance of routine maintenance work are uniform all over the country.

Routine road maintenance contractors have a contractual relationship with the Road Directorate; this contract requires them to perform maintenance work and to inform the Road Directorate on all matters affecting the roads they maintain. The Road Directorate forwards all such information to the company in charge of the supervision of routine road maintenance work.

A similar procedure is also used when preparing long- and short-term routine road maintenance plans. The maintenance contractor prepares the plan, which is then reviewed by the supervisor and approved by the Road Directorate.

The advantage of this arrangement is that supervisors are not employed directly in the Road Directorate, meaning that there are fewer public employees. The supervising company is organized as an independent entity that signs a contract with the Road Directorate. The supervisors can be based away from the company headquarters, which allows for more efficient use of their time, making the company as a whole function more effectively. Choosing the supervisor through a public tender also reduces the supervision costs.

## 11.2 SUPERVISING THE ROUTINE MAINTENANCE

### *11.2.1 Administrative supervision*

The supervisory body prepares its supervision programme by arrangement with the maintenance contractor and on the basis of the latter's short-term work plan for the next month. During on-site supervision, the supervisor:

- cooperates with the contractor's representatives, coordinates work and issues instructions and commands,
- inspects and supervises the work being carried out, as well as work already completed, with a view to controlling the quality and quantity,
- performs the required measurements of the work already completed, where necessary,
- augments its records on the completion of work, amount of work done, quality and condition of the road,
- examines, corrects, augments, and approves the inspection logs, maintenance logs, and measurements used for billing,
- compares measurements with data from the Road Data Base.

The maintenance contractor must use the VGRC system to account for any previously registered work no more than 5 calendar days after the work has been completed.

The maintenance log and the work account, both in electronic form, must be examined and approved by the supervisory body no more than 15 days after the account has been made, and no later than the fifth day of the next month. After that, the supervisory body compares this data with its own records and may correct them if necessary. The approved maintenance log or account of work is the basis for the preparation of monthly state of routine maintenance reports.

The supervisory body's other tasks include:

- participating in the preparation of annual work programmes of routine maintenance and other work (patching, drainage, joint and crack sealing, wall repairs, road-railway crossings, etc.),
- preparing the road condition records that are a basis for defining the priorities of various tasks,
- preparing lists of needed works, tenders, preparation of contracts,
- participating in the preparation of winter maintenance execution plans,
- participating in the road condition and passability information service, which is organized in the Road Directorate's headquarters,
- participating in the settlement of damage claims and related problems,
- participating in technical control of roads after some work has been completed, and of newly constructed roads,
- controlling any activities in the road body and the protected area of public roads to make sure that any conditions set forth in the permit or approval issued by the Road Directorate are being observed,
- maintaining an overview of any unauthorized activities in the road body and the protected area of the road,
- participating in the technical inspection of completed work in the road body or the protected area of the road,
- organizing the activities decreed by the road inspectors, participating in road inspections,
- controlling any work carried out under the approvals issued by the Road Directorate,
- immediately organizing the necessary activities to remove the damage caused by environmental emergency events,
- supervising the work caused by environmental emergencies and preparing reports on this work,
- preparing answers to tasks forwarded from the road administration,
- cooperating with other authorized institutions, and
- any other tasks assigned by the road directorate.

### *11.2.2 Maintenace works types and supervison methods*

#### 11.2.2.1 Inspection service

In the field, the supervisor inspects the condition of the road and, on the basis of the supervision diaries he also inspects both quantity and quality of the works performed. He also checks whether the contractor's inspector has recorded or made good all the deficiencies noticed.

At the office, the supervisor checks the quantity of executed kilometres for an individual road section (in the supervision diary) as well as the total number of inspections at an individual road base.

Required condition:

There are no potholes on the roads. The vertical traffic signs are adjusted. There is no sand on the asphalt of crossroads and points of access.

#### 11.2.2.2 Pavement cleaning

In the field, the supervisor checks the executed cleaning of the carriageway by inspecting both quantity and quality of the work carried through. A measuring wheel and a measuring tape shall be used to measure the quantities.

At the office, the supervisor verifies whether the executed works are conformable to the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

On crossroads, sand may occur in the middle only during the winter service period, where there is no snow. On the carriageway and shoulders no deposited or alluvial material such as mud, sand, or stones is permitted. During raining, the carriageway must not be muddy.

#### 11.2.2.3 Cleaning of drainage structures

In the field, the supervisor inspects whether individual parts of the drainage have been cleaned properly: he measures the quantity of the executed work and verifies the quality of those works as well. For measuring the quantities, the supervisor uses a measuring wheel and a measuring tape. He also checks, whether it is urgent to clean individual drainage elements, and requests the contractor to enter these works in the programme for the next month, and also to carry out these works within the next month.

At the office, the supervisor verifies whether the executed works are conformable to the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

Inspection and inlet shafts are not damaged. The same also applies to the shaft cover. The inspection and inlet shafts are clean – without any sand and leaves during the summer service period. The inlets into the shafts are clean – there are no leaves on and at them. The sewage system and drainages enable undisturbed water flow.

Culverts are undamaged. Deviations from the foreseen vertical alignment amount to 5 cm maximum. Pipe joints are protected. In the culverts some deposited alluvial material is admitted locally, however it shall not exceed 20% of the culvert cross section. Culvert inlets and outlets are cleaned from alluvial material at a length of at least 2.0 m, thus allowing the water to flow without hindrance through the culvert. The culvert inlets and outlets must not be overgrown with shrubs, and the grass must not be higher than 30 cm. Prior to commencement of the winter, the grass height shall not exceed 15 cm.

Gutters and pointed channels are undamaged. Alluvial material of up to 20% of the surface and up to 20% of the depth does not hinder the water to flow away. Ditches for precipitation water are not overgrown with shrubs, and the grass is not higher than 30 cm. The precipitation water ditches are profiled and cleaned to such an extent that the water does not stagnate within them and does not damage the road body as well. The outlets from the drainages into the ditches are so cleaned as to allow the water to discharge into the ditch and not to stagnate at the outlet. Prior to commencement of the winter, the grass height shall not exceed 15 cm in the ditches.

#### 11.2.2.4 Roadside mowing, ensuring visibility

In the field, the supervisor checks the quantity and quality of mowing works. For measuring the quantities he uses a measuring wheel and a measuring tape. He also verifies whether mowing works are urgent. He informs the contractor to carry out those works within the time limits as specified by the supervisor.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

The grass on the shoulder or 1.30 m from the asphalt edge is not higher than 30 cm. The grass which is more than 1.30 m from the asphalt edge, in ditches, and on slopes is not higher than 40 cm. The grass in the sight distance triangle and in the berm is not higher than 30 cm. The grass on islands at the crossroads is up to 30 cm high. All the grass on a public road shall be mowed once a year (after September 15). Prior to winter begin the grass height on a public road must not exceed 20 cm.

#### 11.2.2.5 Lopping and pruning of vegetation

In the field, the supervisor inspects both quantity and quality of lopping and cutting works. For measuring the quantities he uses a measuring wheel and a measuring tape. He also verifies whether such works (in the sense of the required sight distance) are urgent. He informs the contractor to carry out those works within the time limits as specified by the supervisor.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

Shrubs and treetops in cuts shall be at least 3.0 m away from the roadway edge. Shrubs and treetops on fills shall be at least 2.0 m away from the roadway edge. Shrubs and treetops do not interfere with the sight distance triangles and berms. In a public road area, the height of trees must not be greater than the horizontal distance of a tree from the carriageway. At least 70% of the slope area shall be covered with vegetation. The vegetation is vital, individual tree species decay, but the growth of certain species is still increasing. Individual trees shall be felled. Erosion can be noticed, however the extent of the erosion does not jeopardize the traffic or the road furniture. The amount of eroded material is small.

#### 11.2.2.6 Shoulder repair

In the field, the supervisor checks both quantity and quality of the executed shoulder repair. He also verifies the quality and quantity of the material placed. To measure the quantities, he uses a measuring wheel and a measuring tape. He also checks whether it is urgent to apply additional material to level the shoulders and to execute outlets from the shoulder. He informs the contractor to carry out those works within the time limits as specified by the supervisor.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

The shoulder at the contact with the carriageway is levelled with the latter or, at certain location, by up to 3 cm lower than the carriageway. Minor damages to the shoulder are allowed. Some holes in the shoulder are also tolerated, however they shall not be deeper than 5 cm, and their number per 10 $m^1$ shall not exceed 3. The cross fall of the shoulder allows the water to be drained away from the carriageway. It shall not be less than 4% and not more than 10%. The shoulder is even and consolidated.

#### 11.2.2.7 Pavement patching

In the field, the supervisor inspects both quantity and quantity of the pothole patching and damage repair. He also checks the need of repairing the carriageway damages and

informs the contractor to enter those works into the programme of works for the next month and to execute those works within the next month as well. During the patching works the supervisor also inspects the intermediate working stages, from the cleanliness and moisture of the surface to the compaction of the materials placed. He shall pay special attention to the treatment of the joints. He shall also check the certificates of the materials placed (granulometric composition. void content, compaction, etc.) for both tampon materials and bituminous layers.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

On the carriageway there are individual potholes (not deeper than 5 cm with sharp edges) of total area less than 5% of the carriageway area. No potholes are admitted on cycle tracks and footways.

There are no ruts deeper than 5 cm on the carriageway. Minor winter damages (netlike cracks) are allowed to the carriageway. The wearing course is partly peeled-off. On the carriageway, cycle tracks, and footways there are minor unevenness in the longitudinal and/or transverse direction.

#### 11.2.2.8 Sealing of cracks and joints

In the field, the supervisor inspects both quantity and quality of filling the joints and cracks. For measuring the quantities he uses a measuring wheel and a measuring tape. Attention shall be paid to "cutting" the joints and to the cleanliness of the already prepared joint. Prior to being filled up, a joint shall be completely dry. The supervisor shall paid special attention to the temperature of the filling compound, which shall comply with the temperature indicated in the certificate.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

Individual cracks are admitted on the carriageway. Filling up is required when more than 1 m of joints per $m^1$ of road occur in an individual section.

#### 11.2.2.9 Gravel roadway repair

In the field, the supervisor verifies both quantity and quality of the executed repair of macadam carriageways. He also checks both quality and quantity of the material placed. To measure the quantities he uses a measuring wheel and a measuring tape. The supervisor also checks whether some manual repair of macadam carriageways is urgent, and he informs the contractor to execute those works within the time limits as specified by the supervisor.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

The carriageway is in such condition that the water can flow away from it undisturbed (cross fall minimum 4%). The carriageway edges enable draining away of the complete precipitation water onto the slope or into the road ditch. On a roadway which longitudinal fall is greater than 6%, drainage channels are provided to drain the water away from the carriageway. The number of minor potholes of up to 7 $dm^2$ shall not exceed 8 per 10 $m^1$ of the carriageway. There are mo deformations due to insufficient consolidation of the road and to frost damages.

#### 11.2.2.10 Minor repairs of retaining and crib walls

In the field, the supervisor inspects both quantity and quality of executed repair of walls and cribwork. To measure the quantities he uses a measuring wheel and a measuring tape. He also supervises the quality of the intermediate stages of the wall and cribwork repair. The supervisor shall verify the certificates of placed materials for tampons and concrete.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition

Walls and cribwork shall be repaired and maintained in an appropriate condition to ensure their stability and not to jeopardize the traffic by eventual crumbling material falling onto the carriageway.

#### 11.2.2.11 Cleaning of structures

In the field, the supervisor inspects both quantity and quality of executed cleaning of bridges. To measure the quantities he uses a measuring wheel and a measuring tape.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

At the carriageway edge, next to the footway kerb, on the footway itself and/or edge beams dirt and dust are accumulated hindering a free outflow of the water from the carriageway. On the carriageway, kerbs, footways, and edge beams salt crystals can be found. 30% of inlet grating and outlets from gullies are not clean, and the precipitation water drainage pipes do not conduct the water sufficiently. Individual graphiti can be seen on the bridge structure and equipment. Dirt can be found in the expansion joint grooves, but the expansion joint is still functioning and the structure is not being soaked. There is also some dirt on the bearing blocks at abutments. Dewatering systems on slopes and bridge drainages are soiled, however they are still in operation. Below the bridge and in the bridge area there is a layer of alluvial material and plenty of shrubs.

#### 11.2.2.12 Cleaning of traffic signs and road furniture

In the field, the supervisor inspects both quantity and quality of executed cleaning of traffic signs and equipment. Accounting is made on the basis of the actual number of traffic signs.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

Traffic signs shall be properly adjusted (upright) and clean to ensure a perfect reflectance of foils.

#### 11.2.2.13 Cleaning of road devices

In the field, the supervisor inspects both quantity and quality of executed cleaning of delineators. Accounting is made on the basis of the actual number of delineators.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

Road delineators (particularly retroreflectors) shall be properly adjusted (upright) and clean to ensure a perfect reflectance of foils.

#### 11.2.2.14 Repair and maintenance of slopes

In the field, the supervisor inspects both quantity and quality of executed slope repair. For measuring the quantities he uses a measuring wheel and a measuring tape. He also supervises the quality of intermediate stages of the works being executed.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition

Slopes crumble at times, minor interventions such as removal of overhangs and unstable blocks have been carried out. Erosion protection – vegetative cover does not ensure sufficient protection; there are erosion centres on larger areas, additional vegetation shall be planted, and protective measures are required. Up to 30% of area is damaged: hanging meshes are partly damaged due to excessive amount of material. Major erosion ditches occur in the slope, larger rock blocks are crumbled-off, additional cleaning of the slope and replacement of hanging meshes is necessary. Up to 30% of area is damaged. Anchored meshes are locally damaged due to major erosion centres; anchors are loose for excessive amount of material. Up to 30% of area is damaged. Additional cleaning of the slope as well as renewal of meshes and anchors is required. Protective barriers – palisades and intercepting fences are filled; damages occur, the material shall be evacuated, and the barriers repaired. The retention spaces behind the intercepting walls are filled up, thus evacuation of material is indispensable. Surface dewatering systems and drainages do not function at times, repeated cleaning is required.

#### 11.2.2.15 Roadside cleaning

In the field, the supervisor inspects the quality of executed cleaning of surfaces along the road.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

On surfaces along the road and parking places individual waste is noticed such as paper and plastic. Trash cans/baskets are not excessively filled up. There is no spread waste and rubbish on resting places.

#### 11.2.2.16 Parking lots cleaning

In the field, the supervisor inspects the quality of executed cleaning of parking places.

At the office, the supervisor verifies whether the executed works comply with the planned ones. He also checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

Individual waste such as paper and plastic can be noticed on surfaces along the road and parking places. Trash cans/baskets are not excessively filled up. There is no spread waste and rubbish on parking places.

#### 11.2.2.17 Emergency response

When supervising the interventions, special attention shall be paid to timely executed repair works as well as to the method of execution of these urgent works. The intervention measures shall be as economical as possible. The traffic shall run safely,

damages shall be made good as soon as possible, and the road sections shall be disturbed to the smallest possible extent.

At the office, the supervisor checks whether correct data have been entered into the computer software as well as the total amount of the works performed.

Required condition:

In case of elementary events such as landslides, earthquake, floods, etc., on expressways, main roads, and regional roads within the RS, which are subject of this contract, the contractor is obliged to secure a dangerous location and to mark it by means of suitable road traffic signs. Where circumstances allow, however without any hazard to the contractor, the road shall be immediately cleaned and made free for traffic.

The contractor shall inform the client and the authorized supervising engineer, by phone, fax or in writing, of any elementary event. The contractor shall fully comply with any written instructions issued by the engineer, who is in charge to supervise the regular maintenance. In case that the road is blocked the contractor shall inform the Motoring Association and the local communities. Within 24 hours the head of the contractor's maintenance division shall prepare a report on the event including a cost estimation, i.e.:

- a cost estimation relating to re-establish the full traffic capacity of the particular road
- a cost estimation relating to a long-term repair.

As a rule, the costs relating to re-establishing the condition after elementary events are not subject of this contract, except in case of minor costs relating to re-establishing the road passability.

When an event requires a roadblock, the contractor is obliged within a period of 24 hours to submit to the Sector for traffic safety and technical regulation of traffic within the Dirctorate for appraisal and approval the layout of the roadblock he has carried out.

In exceptional cases, where the extent of damages is significant, the contractor is obliged to submit to the client a detailed report including a cost estimation related to re-establishing the road passability within 3 days, whereas a brief report shall be submitted within 24 hours.

In case of road accidents, where the contractor is requested to eliminate the consequences of the particular accident or any other event (intervention teams), he is obliged, within the frame of possibilities, to collect all the information on the causer of the damage (registration plate of the causer's vehicle, etc.), to provide photo-documentation of the event, and to record damages to the road or road furniture. Within three days after the event, the contractor shall submit a written report to the client, such a report including the abovementioned data and appropriate photos. In addition, the contractor shall also inform the client in writing of damage in cases, where he has not been present upon the occurrence of such damage or he has established the damage within the scope of performing the inspection service, not later than three days after such damage has occurred.

The contractor is obliged to carry out the works in accordance with the Decree of ensuring safety and health at work at provisional and mobile construction sites, as well as with the safety plan being a constituent part of the contract. In case that several contractors are engaged in the works, the contractor shall make an agreement on the execution of works, the work programme as well as the implementation of safety measures to protect the property of the client and other contractors.

#### 11.2.2.18 Wintermaintenance

A duty operator shall perform a multiple daily road inspection, as necessary. He checks the condition of the carriageway at critical locations. In fair weather this shall be done from 4 to 5 a.m. In bad weather (ice rain, snow) such inspections shall be carried out by the drivers of strewing and ploughing units, who also take adequate steps if necessary.

In the field, the supervisor simultaneously inspects the works and verifies whether the works are executed properly and in due time.

At the office, the supervisor checks whether correct data have been entered into the computer software as well as the total amount of the works performed. He also verifies the mechanical reports, bills of carriage, tachometric records, book of orderly duty, and other information as may serve to settle final account of the works performed.

Required condition:

The snow cover height on roads of class I does not exceed 10 cm. The snow cover height on roads of class II to V does not exceed 15 cm. Roads of class IV and V may be closed in wintertime (according to programme). Ploughing is carried out from 5 a.m. to 10 p.m. Ploughing shall be done properly: the edges of the asphalt and shoulders are cleaned to such a width that the water does not spill over the carriageway upon thawing of the snow. Snow marking posts, palisades and supplemental traffic signs are placed in due course and perfectly. After the snowing has terminated, all major culverts and bridges are cleaned.

#### 11.2.2.19 Environmental protection

During regular maintenance different waste may occur being harmful to the environment.

After the winter period, spreading sand shall be swept away and brought to a suitable communal deposit area.

Concrete residues and remains of demolished concrete products shall be transported to an adequate deposit area for construction waste.

In addition, all the demolished reinforcing steel shall be brought to the deposit area as well.

Residues of asphalt due to demolishing of asphalt carriageways shall also be transported to a deposit area for construction waste. They can be brought to asphalt bases as well, where they are milled and recycled in a new bituminous mixture (added to new bituminous mixtures). Asphalt milling residue, which is won on the road by milling the carriageway, shall be removed as well.

Chemical agents for decomposition of liquids, which remain on a road upon traffic accidents, represent a special case. Areas of stains of oil, anti-freeze liquid, sulphuric acid from batteries, etc. shall be powdered with suitable chemical absorptive agent. After the waste liquids are absorbed, the absorptive agent is swept away and stored in an adequate closed container. Such containers shall be delivered to specialized companies to destroy the waste at an appropriate combustion plant.

In case of interventions after a traffic accident, which represents a major hazard to the environment (overturning of a tank lorry containing harmful material etc.), a fire brigade shall be notified of the accident to protect the area, and relevant rescuing authority within the region or the state shall be informed to sanitize the area as well as to remove harmful waste and polluted soil. (See also **Supplement S1).**

### *11.2.3 delays caused by contractor and penalties for delay and for unfulfilling the conditions*

The contractor is in delay, when he fails to complete all the works specified in the approved monthly programme, or when he fails to submit in due time to the client all the reports, forms, and other documents as provided by the contract.

If the contractor is in delay or exceeds the completion date for works specified in the approved monthly programme or in the approved annual maintenance and winter service programme, the client is entitled to charge for the contractual penalties.

The penalties amount to 0.2 percent of the amount of confirmed progress statement for the month, in which the contractor came in delay, for each day of the delay. The total contractual penalties for the delay must not exceed 10 percent of the amount of the

confirmed monthly progress statement. The client has the right, notwithstanding the charged contractual penalties, to claim the contractor for eventual indemnification for any suffered damage caused by the contractor by failing to fulfil the provisions of this contract.

## 11.3 SUPERVISION OF EXTENDED MAINTENANCE WORKS

The organization of extended maintenance supervision of roads is defined with the Public Roads Act, Construction Act and the Public Procurement Act.

The technical specifications for inspection-in-depth are given in General and Special technical conditions.

# GUIDELINES FOR ROAD DESIGN, CONSTRUCTION, MAINTENANCE AND SUPERVISION

## Volume IV: ROAD SUPERVISION

### SUPPLEMENT S1: CONSTRUCTION SITE AND WASTE MANAGEMENT

# 12 S1 CONSTRUCTION SITE AND WASTE MANAGEMENT

The bases for this guideline are the Directives of EU Council and European standards. As applicable some international and national standards are referenced.

## 12.1 EU DIRECTIVES

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| COUNCIL DIRECTIVE 92/57/EEC of 24 June 1992 on the implementation of minimum safety and health requirements at temporary or mobile constructions sites (8th individual Directive within the meaning of Article (16/1) of Directive 89/391/EEC |
| COUNCIL DIRECTIVE 92/58/EEC of 24 June 1992 on the minimum requirements for the provision of safety and/or health signs at work (9th individual Directive within the meaning of Article (16/1) of Directive 89/391/EEC |
| COUNCIL DIRECTIVE of 16 June 1975 on the disposal of waste oils (75/439/EEC) |
| COUNCIL DIRECTIVE of 22 December 1986 on amendments to the Directive 75/439/EEC on the disposal of waste oils (87/101/EEC) |
| COUNCIL DIRECTIVE of 15 July 1975 on waste (75/442/EEC) |
| COMMISSION DECISION of 21 April 1976 setting up a Committee on Waste Management (76/431/EEC) |
| COUNCIL DIRECTIVE of 20 February 1978 on waste from the titanium dioxide industry (78/176/EEC) |
| COUNCIL DIRECTIVE of 24 January 1983 on amendments to the Directive 78/176/EEC on waste from the titanium dioxide industry (83/29/EEC) |
| COUNCIL DIRECTIVE of 8 June 1989 on the prevention of air pollution from new municipal waste incineration plants (89/369/EEC) |
| COUNCIL DIRECTIVE of 18 March 1991 on amendments to the Directive 75/442/EEC on waste (91/156/EEC) |
| COUNCIL DIRECTIVE of 12 December 1991 on hazardous waste (91/689/EEC) |
| COUNCIL DIRECTIVE of 27 June 1994 on amendments to the Directive 91/689/EEC on hazardous waste |
| COUNCIL DIRECTIVE 94/67/EC of 16 December 1994 on incineration of hazardous waste |
| COUNCIL DIRECTIVE 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs) |
| COMMISSION DECISION of 28 January 1997 establishing the identification system for packaging materials pursuant to European Parliament and Council Directive 94/62/EC on packaging and packaging waste (Text with EEA relevance) (97/129/EC) |
| COMMISSION DECISION of 3 February 1997 establishing the formats relating to the database system pursuant to European Parliament and Council Directive 94/62/EC on packaging and packaging waste (Text with EEA relevance) (97/138/EC) |
| COUNCIL DIRECTIVE 1999/31/EC of 26 April 1999 on the landfill of waste |
| COMMISSION DECISION of 3 May 2000 replacing Commission Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified by document number K(2000) 1147) (Text with EEA relevance) (2000/532/EC) |
| DIRECTIVE 2000/76/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 December 2000 on incineration |
| COMMISSION DECISION of 16 January 2001 amending Decision 2000/532/EC as regards the list of wastes (notified under document number K(2001) 108) (Text with EEA relevance) (2001/118/EC) |
| COMMISSION DECISION of 22 January 2001 amending Decision 2000/532/EC replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number |

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| K(2001) 106) (Text with EEA relevance) (2001/119/EC)<br>COUNCIL DECISION. of 23 July 2001. amending Commission Decision 2000/532/EC as regards the list of wastes. (2001/573/EC) |

## 12.2 TECHNICAL SPECIFICATIONS

### Health and environment protection

| | |
|---|---|
| DIN 30787(1 do 6) | Transportbelastungen – Messen und Auswerten von mechanisch - dynamischen Belastungen |
| E VDI 3840-2002-09 | Schwingungstechnische Berechnungen |
| DIN 45669 | Messung von Schwingungsimmissionen |
| EN ISO 8041:2005 | Human reaction on vibrations – measuring instruments (ISO 8041:2005) |

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|---|---|
| Rules on Equipment and First Aid Procedure, and on Organization of Rescue Service in the Case of Accident at Work | Official Gazette of the SRFY, no. 21/711 |
| Rules Concerning the Provision of Accommodation and Meals or Transportation of Workers from the Lodging Place to the Place of Work And Back | Official Gazette of the SRFY, no. 41/68 |
| Rules on General Industrial Safety Measures and Standards at Work with Regard to Constructions Intended for Workrooms and Auxiliary Rooms | Official Gazette of the SRFY, no. 27/67 |
| Rules on Hygienic Integrity of Drinking Water | Official Gazette of the SRFY, no. 33/87 |

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|---|---|---|
| EN 1263-1:2002 | Zaštitne mreže – 1. dio: Zaštitni zahtjevi, probne metode | EN 1263-1: Safety nets – Part 1: Safety requirements, test methods |
| EN 1263-2:2002 | Zaštitne mreže – 2. dio: Zaštitni zahtjevi za namještanje zaštitnih mreža | EN 1263-2: Safety nets – Part 2: Safety requirements for the positioning limits |
| HD 384.7.704 S1:2001 | Električne instalacije građevina – 7. dio: Zahtjevi za posebne instalacije ili lokacije –. odjeljak 704: Gradilišta (IEC 60364-7-704:1989, promijenjen) | Electrical installations of buildings – Part 7: Requirements for special installations or locations – Section 704: Construction and demolition site installations (IEC 60364-7-704:1989, modified) |
| HD 1000:2000 | Radne skele iz prefabriciranih tipskih elemenata ( sistemske skele) – Materijali, mjere, opterećenja i zaštitni zahtjevi | Service and working scaffolds made of prefabricated elements – Materials, dimensions, design loads and safety requirements |
| EN 74:2000 | Cijevne spojnice, vezne centrične spojnice i bazne ploče za radne i nosive skele iz čeličnih cijevi - Zahtjevi i postupci ispitivanja | Couplers, loose spigots and base-plates for use in working scaffolds and falsework made of steel tubes - Requirements and test procedures |
| EN 131-1:1996 | Ljestve - Terminologija, tipovi, funkcionalne veličine | Ladders - Terminology, types, functional sizes |

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|---|---|---|
| EN 131-1: 1996/AC:2001 | Ljestve – Terminologija(termini), tipovi, funkcionalne veličine | Ladders - Terms, types, functional sizes |
| EN 131-2:1996 | Ljestve - Zahtjevi, ispitivanje, označavanje | Ladders - Requirements, testing, marking |
| EN 131-2: 1996/AC:2001 | Ljestve - Zahtjevi, ispitivanje, označavanje | Ladders - Requirements, testing, marking |
| prEN 131-3:2004 | Ljestve – 3. dio: Informacija za korisnika | Ladders - Part 3: User information |
| HD 1004:2000 | Pomične radne skele na točkovima iz prefabriciranih tipskih elemenata - Materijali, mjere, opterećenja i zaštitni zahtjevi | Mobile access and working towers made of prefabricated elements - Materials, dimensions, design loads and safety requirements |
| HD 1039:2000 | Čelične cijevi za nosive i radne skele - Zahtjevi, probe | Steel tubes for false work and working scaffolds - Requirements, tests |
| EN 1065:2000 | Čelični teleskopski građevinski potpornici - Specifikacije proizvoda, dimenzioniranje i dokazivanje nosivosti sa proračunom i sa probama | Adjustable telescopic steel props - Product specifications, design and assessment by calculation and tests |
| EN 1298:2000 | Pokretne radne skele na točkovima - Pravila i smjernice za pripremu uputstva za montažu i upotrebu - | Mobile access and working towers - Rules and guidelines for the preparation of an instruction manual |
| EN 1808:2000 | Zaštitni zahtjevi za viseće sprave za dizanje - Konstrukcijski izračuni, kriteriji stabilnosti, izvedbe – Probe | Safety requirements on suspended access equipment - Design calculations, stability criteria, construction - Tests |
| EN 60439-4:1995. | Sastavi niskonaponskih prekidačkih i sprava za upravljanje – 4. dio: Posebni zahtjevi za gradilišta (ACS) | Low-voltage switchgear and controlgear assemblies - Part 4: Particular requirements for assemblies for construction sites (ACS) (IEC 439-4:1990) |
| EN 60439-4:1995/A11:2004 | | Withdrawal of Austrian A-deviation regarding sub clauses 9.1.3d, 9.3.3 and 9.5.2 of EN |
| EN 60439-4:1995/A1:2000 | Sastavi niskonaponskih prekidača i sprava za upravljanje – 4. dio: Posebni zahtjevi za gradilišta (ACS) – Dopuna A1: | Low-voltage switchgear and controlgear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS) - Amendment A1 (IEC 60439-4:1990/A1:1995) |
| EN 60439-4:1995/A2:2000 | Sastavi niskonaponskih prekidačkih i sprava za upravljanje – 4. dio: Posebni zahtjevi za gradilišta (ACS) – Dopuna A2 | Amendment A2:1999 to EN 60439-4:1991 |

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| EN 60439-4:2005 | Sastavi niskonaponskih prekidačkih i sprava za upravljanje – 4. dio: Posebni zahtjevi za sastave na gradilištima (ACS) | Low-voltage switchgear and control gear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS) |
| HD 22.4 S3:1998 | | Rubber insulated cables of rated voltages up to and including 450/750 V - Part 4: Cords and flexible cables (IEC 245-4:1994, modified) |
| HD 22.4 S3:1998/A1:1999 | | Rubber insulated cables of rated voltages up to and including 450/750 V – Part 4: Cords and flexible cables - Amendment A1 |
| HD 22.4 S3:1998/A2:2003 | | Cables of rated voltages up to and including 450/750 V and having cross-linked insulation - Part 4: Cords and flexible cables |
| HD 22.4 S4:2004 | Kablovi sa gumenom izolacijom za označene napone do uključeno 450/750 V – 4. dio: Trake(užad) i fleksibilni kablovi | Cables of rated voltages up to and including 450/750 V and having cross linked insulation – Part 4: Cords and flexible cables |
| EN 60 598-2-8:1998 | | Luminaries - Part 2: Particular requirements - Section 8: Hand lamps (IEC 60598-2-2:1996, modified) |
| EN 60598-2-8:1998/A1:2000 | Dopuna A1:2000 k EN 60598-2-8:1998 | Amendment A1:2000 to EN 60598-2-8:1997 |
| EN 471:2003 | Dobro vidljiva upozoravajuća odjeća za profesionalnu upotrebu – Probne metode i zahtjevi | High-visibility warning clothing for professional use - Test methods and requirements |
| Serija standarda ISO 8421-(1 do 8) | Zaštita od požara– rječnici | ISO 8421-(1 to 8) Fire protection – Vocabularies |

**Self protective equipment**

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|---|---|
| Equipment for protecting the respiratory system: | EN: 132 to 145; 148, 149; 269 to 271; 371, 372, 402 to 405; 1146, 1827, 1835, 12083, 12419, 12941, 12942, 13274, 13794, |
| Respiratory equipment | EN: 250, 13949, 13949, |
| Personal eye-protection | EN: 165 to 172, 174, 175, 208 |
| Protective clothing | EN: 340, 343, 348, 367 to 369; 373, 381, 463 to 471; 530, 531, 533, 702, 863, 943, 1073, 1149, 1999, 1486, 50286, 50321, 60895; EN ISO 6942; 13997, 13998, 14877, 15025 |
| Personal protective equipment against falls from a height | EN: 341, 353 to 355, 358, 360 to 365; 795, 813, 1868, 1891, |
| Protective and working footwear for professional use | EN: 344 to 347; |
| Hearing protection | EN: 352, 458, 13819, 24869, 24869; EN ISO 4869-2, |

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| Safety gloves | EN: 374, 388, 407, 420 to 421; 659, 1082, 12477, 50237, 60903, |
| Self-darkening filters (welding goggles) | EN: 379, |
| Lifejackets and personal buoyancy aids | EN: 340, 393 to 396; 399 |
| Industrial safety helmets | EN: 397, 812, 13087, 50365, |
| Helmets for firefighters | EN: 443, |
| Eye protectors | EN: 1731, |
| Mechanical vibration and shock | EN ISO 10819 |

## 12.3 COORDINATION OF SAFETY AND HEALTH AT WORK

When works on the construction site are implemented or are planned to be implemented by two or more contractors, the client or the project supervisor must appoint one or more coordinators for safety and health at work.

The client or project supervisor must appoint coordinator(s) especially for the stage of project preparation and project execution.

Coordinator for safety and health at the project preparations stage shall have at least higher professional education in technical studies, a professional examination as stipulated by law regulating construction of buildings or a professional examination as stipulated by law regulating safety and health at work, training under the programme for coordinators for safety and health at work and at least three years of experience in designing and implementing construction works.

Coordinator for safety and health at the project execution stage shall have at least higher professional education in technical studies, a professional examination as stipulated by law regulating safety and health at work, training under the programme for coordinators for safety and health at work and at least three years of experience in designing and implementing construction works. Coordinator at the execution stage cannot be a person employed with one of the contracting companies.

### *12.3.1 Tasks of the coordinator in the design preparation stage*

Coordinator for safety and health at the preparations stage shall perform the following tasks:

prepare or make sure/coordinate that the safety plan is prepared in line with the rules referring to the relevant construction site, taking into account, if necessary, also industrial activities on the construction site; this plan must include also special measures for works which belong to one or more categories of works of special danger;

prepare the documentation according to the characteristics of the project, which shall include the suitable safety and health data that need to be considered in all further works (during use, maintenance, demolition, etc.).

### *12.3.2 Tasks of the coordinator in the project execution stage*

In the project execution stage the coordinator shall have mainly the following tasks:

a) to coordinate the implementation of basic principles of safety and health at work:
   - when making decisions about technical and/or organisational aspects in planning individual phases of work;
   - when setting deadlines necessary for safe completion of individual phases of work carried out at the same time or successively;

b) to coordinate the implementation of relevant provisions to ensure that employers and self-employed persons:
   - consistently follow the basic principles from Article 10 of the above Decree;
   - comply with the safety plan;

c) to prepare or provide for the preparation of the necessary adjustment of the safety plan and documentation to the changes on the construction site;
d) to ensure cooperation and mutual informing of contractors, who either at the same time or successively work on the construction site and their workers' representatives with the aim of preventing injuries or health risks at work;
e) to check safe implementation of work procedures and coordinate planned activities;
f) to ensure that the construction site is accessed only by persons employed there and persons authorised for access.

### *12.3.3 Obligations of clients, supervisors and contractors*

Appointment of a contractor does not relieve the client or supervisor of responsibilities related to ensuring safety and health of workers during works on the construction site.

Tasks implemented by coordinators do not affect the obligations of the contractors as regards the provision of safety and health of workers on the construction site pursuant to the law regulating safety and health at work.

The contractors must follow the instructions of the coordinators.

## 12.4 SAFETY PLAN FOR CIVIL ENGINEERING CONSTRUCTION

These guidelines include proposed contents of the SP, which contain also a description of measures in civil engineering construction.

### *12.4.1 Contents*

1. Introduction
2. List of regulations
3. Organisation of construction site security in view of the surrounding area
4. Organisation and maintenance of offices, changing rooms, sanitary installations and accommodation facilities on the construction site
   - Rest rooms and/or accommodation rooms
   - Utility and sanitary - hygiene installations
   - Transport to work
   - Supplying workers with food and drinking water
   - Ventilation and lighting
5 Organisation of electricity and telecommunication installations
6 Organisation of traffic communications, emergency routes and exits
   - Transport routes on and along the construction site
   - Emergency routes and exits
   - Traffic routes on danger areas
   - Doors and gates
   - Loading bays and ramps
7 Distribution and storing of construction material
   - Premises for storing hazardous materials
   - List of hazardous and ecologically unsafe materials and products
8 Lifting and transporting equipment
9 Vehicles and machines for excavation, relocation and transport of material
10 Devices and facilities for maintaining machinery on the construction site
   - Handling fuel, lubricants and hazardous substances on the construction site
   - Washing and maintaining vehicles on the construction site
   - Parking of vehicles and machinery and maintenance

11 Organisation of work places
- Works of special danger and protective equipment
- First aid
- Impacts of stability and strength on safety at work
- Earthworks, underground facilities and works in constricted areas
- Demolition and disassembly
- Work along traffic
- Massive constructions, metal or concrete frames, formwork and heavy prefabricated elements
- Roof work
- Work places at height
- Maintenance works

12 Installations, working devices and equipment

13 Working platforms, ladders and scaffolds

14 Protection against fire on the construction site

15 Description of selected/used construction technologies

16 Impact of construction work on additional traffic volumes on existing roads

17 Timetable for coordinating measures related to safety and health with the construction

18 Joint measures for provision of health and safety at work

19 Mutual informing of individual work managers on work progress

20 Construction rules

21 Works inventory with estimated costs of the construction site arrangement and implementation of joint measures for providing safety and health at work on the construction site

22 Environmental impact and mitigation measures
- Noise impact on natural and living environment and mitigation measures
- Plan of noise monitoring during construction
- Construction's impact on the atmosphere and mitigation measures for excessive emissions
- Plan of monitoring of air during construction
- Construction's impact on underground water and mitigation measures for reducing negative impacts
- Plan of monitoring of air during construction
- Construction's impact on underground water and mitigation measures for reducing negative impacts
- Monitoring plan for underground water
- Impact of construction on the soil, flora and fauna
- Monitoring plan for soil and plants
- Impact of blasting and other dynamic effects of work implementation on people and buildings
- Arrangement of the construction site area after the concluded work

23 Rules on management of construction waste
- Construction waste management plan
- Construction waste management report
- Obligations of the investor and the contractor during work implementation
- Waste collection

- Processing and removal of construction waste
- Handling waste containing asbestos
- Waste management supervision

24 Graphic enclosures

- Overview site plan, RP 1:5000 with construction facilities
- Plan of organisation of living and working premises, sanitary facilities and the cafeteria, RP 1:100
- Electricity supply plan
- Telecommunications plan
- Water supply and sewage
- Traffic arrangement site plan during construction for public and construction roads with traffic signalisation, RP 1:5000
- Lift site plan, including the sketch of handling area
- Site plan of individual areas of utility line organisation and electricity supply, RP 1:1000
- Design sketches of solutions of individual facilities and devices for environmental protection under this project:
  - arrangement of warehouses for hazardous substances
  - parking area
  - working platforms for repairing machines and vehicles
  - material depositing
  - other.

25 Cadastre with the list of lots and owners, if the activity involves land outside the area of exclusive use according to the Decree on the Detailed Plan.

### *12.4.2 Instructions for preparing a safety plan*

#### 12.4.2.1 Introduction

The SP has to be prepared in accordance with implementing regulations of the Construction Act. Within the scope of the SP a waste management study must be carried out. Such study comprises: the description of construction waste and its quantity, the description of temporary depositing and the description of construction waste management. The requirement to prepare a project of ecological organisation of the construction site is for motorway sections included in the Decrees on Detailed Plans, especially for those sections, where the route runs across areas protected as natural heritage, areas with underground and surface waters, and under other measures of local communities or government bodies, if the activities in these areas would without proper preventive protection measures endanger natural balance.

The introductory (or general) part of the SP must describe the characteristics of the intervention in the environment (road construction or other construction) related to the scope of planned works and their characteristics. Moreover, it must include data about the geological, hydrological, pedological and biological characteristics of the intervention location in terms of the status before the intervention. Data are adopted from the Environmental Impact Assessment Report - EIA (if prepared or prescribed), which is produced in the framework of the detailed plan. This report is required for road construction according to the Environmental Protection Act. The Environmental Protection Act stipulates that load on the environment is every intervention or consequence of intervention in the environment resulting or having resulted in environmental pollution, degradation, risk or damage. Every intervention in environment must be planned so as to cause minimum changes in the environment and risk for the environment. A programme for monitoring impacts on the environment must be prepared for monitoring the status.

Such programme must be implemented in the work execution phase.

The SP must define and assess the risk of ecological disaster as an extraordinary event arising from uncontrolled event and resulting in danger to health or life of people, destruction, damage or critical load to the environment. In this sense the SP must describe:

- the type, quantity and characteristics of hazardous substances and planned management of these substances;
- measures during their use, warehousing, transport and disposal;
- potential and planned measures for reducing the risk of an ecological disaster;
- potential ecological disaster scenario, including the probability and size of affected area as well as the consequences for the health of people and impairment of the environment;
- the necessary intervention measures for alleviating or preventing consequences.

The SP must deal with all works implemented in the scope defined by the detailed plan and CPP. If there are several contractors on the construction site, more plans have to be prepared. These plans must be coordinated or a single plan must be produced for all contractors, which has to include all contents and measures prescribed for such SP.

The person(s) responsible for the implementation of measures provided for by the project must be stated in the SP. Such person(s) are in charge of implementing the measures specified in the project and certain measures defined in other legal provisions. Such person proposes to the responsible works manager additional measures, if these are needed for eliminating the consequences of the intervention in the environment, provides the principle of public ness according to the Environmental Protection Act and cooperates with the competent national authorities and local community bodies in matters concerning environmental protection and health of people.

The construction log must include all events related to the contents of the SP and the measures provided in the SP.

### *12.4.3 Organisation of construction site*

#### 12.4.3.1 Protection of the construction site

The arrangement of security of the area surrounding the construction site is prescribed by the Construction Act. Organisation plan is a part of Safety Report (plan) (SP)

SP provides for:

- construction site marking (sign containing data on design, designer, Contractor and Employer);
- security of the construction area and individual facilities (plastic tapes, various fences);
- security of facilities intended for environmental protection;
- method of security during and outside working hours;
- method of informing the person in charge about extraordinary ecological events;
- instructions for taking measures in the event of extraordinary ecological events outside working hours;
- other, depending on the nature of the construction site.

#### 12.4.3.2 Construction site organisation

The plan of construction site organisation is prepared by the contractor selected by the investor. The plan of construction site organisation has to be produced in accordance with the project based on which a building permit has been issued and in line with the safety plan, if prescribed. It has to include all the necessary data about communication paths on the construction site and points of access to the public infrastructure from the construction site, showing also the access to the public road, about warehouses, disposal

sites, workshops, office for managing the construction site and engineer/supervision, changing rooms and sanitary premises for workers as well as other information relevant for safe and reliable operation of the construction site.

Prior to the start of construction the plan of construction site organisation has to be approved by the investor.

The plan of construction site organisation need not be prepared for self-managed construction and the construction of less demanding and simple facilities, unless such construction takes place in areas referred to in the previous paragraph or if three or more less demanding facilities are planned to be constructed at a single location or building plot.

If construction is carried out in the area of a public airport, road, railway or port, which is operating and the construction and operation of such public infrastructural facility have to be simultaneous, the plan of construction site organisation has to provide for safe air, road, railway and see transport.

If construction is carried out in an area with overhead lines or underground cables of public infrastructural facilities, such as sewage, water pipeline, electricity network, telecommunications network, gas pipeline, heating installations and other utility facilities, the plan of construction site organisation has to provide for their uninterrupted operation.

Before any works start being implemented in the area of the future construction site, it has to be ensured that during the implementation of works all workers' safety and health hazards are prevented which could arise from the existing installations, devices, facilities and activities (being) carried out on the construction site.

Throughout the construction, the construction site has to be arranged so that it enables unobstructed and safe implementation of all works, preventing danger of injuries and health risk to workers and other persons. All passages and accesses to the construction site have to be clear, wide enough, regularly cleaned and maintained as well as suitably illuminated. Any vertical rods and other obstacles protruding from the ground or ceiling have to be bent or protected and marked so that the workers cannot injure themselves. The construction rules have to be posted at visible places at all entries to the construction site, in the cafeteria and all changing rooms of workers.

Auxiliary construction site facilities, such as carpentry, joiner, locksmith and other workshops as a rule have to be outside dangerous zones. If this is not possible, safety and health of workers have to be ensured in some other suitable way, as specified in the safety plan.

All measures that have to be implemented in order to ensure safety and health of workers due to circumstances and events not projected in the safety plan have to be recorded by the safety and health co-ordinator in the book of measures for safe work. The book of measures for safety work is kept by the co-ordinator and has to be at the construction site at all times, available to the work inspection and all contractors implementing works on the construction site.

In the case of major works the investor may require that the constructor builds and equips working premises for a supervisor or engineer.

Specific equipment required by the investor on their working premises is usually the following:

- telecommunication equipment
- personal computers with software
- off-road vehicles
- rest premises for workers - only for three-shift work (tunnels)

All equipment has to comply with the relevant standards, ensuring safe and healthy work and transport.

### *12.4.4 Organisation and maintenance of offices, changing rooms, sanitary installations and accommodation facilities on the construction site*

Until the national Decree entered into force, this issue may be regulated by the regulations of former SFRJ:

**Rest rooms and/or accommodation rooms**

On engineering construction sites, which include the construction of roads and other infrastructural facilities within the scope of road construction, there are several possible approaches to and methods of accommodating all workers working on the construction site occasionally or on a permanent basis. These possibilities depend on:

- the scope of works and the planned number of employees;
- construction site location;
- existing accommodation capacities in the area where works are implemented;
- duration of works;

According to the above stated conditions the following examples of accommodating labour force are possible:

- on the construction site full accommodation is organised for all labour force (temporary prefabricated wooden facilities, living containers);
- accommodation of part of labour force is not organised on the construction site;
- labour force or a part of labour force is accommodated at the existing overnight facilities or leased residential facilities;
- labour force resides at their homes;
- other cases depending on local conditions, working conditions and the scope of work.

SP has to specify:

- the number of workers permanently residing in the construction site facilities;
- the number of workers migrating daily;
- the method of accommodation and solutions;
- the structure of labour force by qualification;
- the method of sanitary water supply.

Rest areas and/or accommodation facilities have to be large enough and equipped with a suitable number of tables and seats with backs accommodating the total number of workers on the construction site.

If no special rest areas are available, other premises have to be provided for workers to spend their time when work is interrupted.

Permanent accommodation facilities have to have sufficient sanitary equipment, rest area and room for spending free time, unless used only in exceptional cases.

They have to be equipped with beds, closets, tables and seats with backs, taking into account the number of workers, and arranged, where appropriate, separately for men and women.

Appropriate measures should be taken for the protection of non-smokers against discomfort caused by tobacco smoke in rest areas and/or accommodation facilities. If necessary, rest areas and/or accommodation facilities of smokers have to be separate.

Pregnant women and nursing mothers must be able to lie down to rest in appropriate conditions.

Work places must be organized to take account of handicapped workers, if necessary.

This provision applies in particular to the doors, passageways, staircases, showers, washbasins and lavatories used directly by handicapped persons and the work sites at which they are employed.

#### 12.4.4.1 Utility and sanitary - hygiene installations

##### *12.4.4.1.1 Utility installation*

Contractors and supervisors have to be provided:

- electricity;
- cold and hot running water or water reservoir;
- telephone connection and wireless telephones;
- waste water collector, treatment and/or removal to a treatment plant;
- liquid petroleum gas reservoir with distributors (for heating, if planned);
- other resources, depending on the need of the construction site;

The extent of the necessary utility connections depends on the extent of construction works, the number of employees and the accommodation and diet method. This is assessed depending on the technology of work implementation and the needs arising there from.

SP includes:

- the method of supplying necessary quantity of drinking and fire extinguishing water as well as technological water, if needed in the working process, and the calculation of quantity and water supply source;
- drawing of energy supply and source location;
- drawing of waste water collection and drainage from the construction site;
- the procedure for handling polluted and waste water, which has to be properly treated before discharged to a water course or underground stream, so that the permitted parameters of hazardous substances are complied with or the water is collected and taken to the sewage treatment plant. The measures depend on the pollution level of the waters and the vulnerability of the environment, surface and underground water;
- a map of construction site organisation showing utility and energy lines RP 1,5000 or 1:1000.

##### *12.4.4.1.2 Sanitary hygiene installation*

Sanitary conditions for employees depend on the method of accommodation in residential facilities and organisation of the construction site itself.

Changing rooms have to be provided for workers on the construction site. Changing rooms have to be sufficient for the number of workers needing them, so that each workers is provided at least 0.45 m2 of area. If work is organised in shifts, double area specified above has to be provided.

The following has to be provided on the construction site:

- changing rooms;
- water for showering and washing;
- sanitary facilities (toilets).

The method of implementing the necessary measures to a high degree depends on:

- planned number of employees;
- ecological vulnerability of the area where the construction site is located;
- employee structure by gender;
- nature of work.

If the natural area of a construction site is less vulnerable, toilets with septic tanks may be arranged.

A septic tank may be provided for:

- dry toilets, volume min 50 l/person or 3,000 l, double-cell without outlet;
- toilets with water flushing, volume min 50 l/person or 3,000 l, double-cell;

- septic tank with several divisions, volume 2,000 l/person or min. 6,000 l if pumped, if there are more than 10 but less than 60 persons;
- if more than 60 persons are permanently employed, a (temporary) biological cleaning device has to be provided.

A project has to be prepared for a toilet with septic tank and the rules of procedure drawn up. The rules of procedure have to comply with the Instructions on Septic Tanks and Leaching Cesspools. The latter determine that septic tanks have to be emptied at least on a yearly basis or when 2/3 full. When emptying, 1/6 has to be left inside to enable the metabolism. The rules of procedure have to specify the mud disposal sites resulting from emptying. A disposal site has to be properly selected according to the local situation.

A sanitary container on the construction site provides a combination of a toilet and a shower and is today most frequently used.

In environmentally vulnerable areas (underground water), toilets with septic tanks must not be provided and used. In such cases, chemical toilets have to be used instead of flushing toilets and rules of procedure for handling and maintaining them drawn up.

SP has to include:

- sanitary facilities of accommodation facilities in the facility design (A.1);
- changing room area and the number of lockers (double);
- the number of toilets by the number of employees, taking gender into account;
- the method of organisation according to environmental protection conditions;
- drawing of locations of toilets and washing water RP 1:1000;
- a plan of a toilet with a septic tank;
- rules of procedure and maintenance of sanitary facilities;
- a plan of chemical toilet, rules of procedure and keeping of operation log.

#### *12.4.4.1.3 Dressing rooms*

Appropriate changing rooms must be provided for workers if they have to wear special work clothes and where, for reasons of health or propriety, they cannot be expected to change in another room.

Changing rooms have to be equipped with lockers for personal items.

Every worker has to be provided at least one locker, however, if (s)he carries out work in extremely dirty, aggressive or hot atmosphere, the employer has to provide him/her separate lockers for dirty and clean clothes.

Changing rooms are not necessary if the implementation of works is of short-term nature or when they are available to workers less than 30 km away from the construction site and the employer provides transportation for the workers to these changing rooms. Workers have to have a place available where they can lock their clothes and personal possessions in such case.

Changing rooms must be easily accessible, roomy and equipped with seats.

If circumstances so require (e.g. dangerous substances, humidity, dirt), lockers for work clothes must be separate from those for ordinary clothes and personal items.

Provision must be made for separate changing rooms or separate use of changing rooms for men and women.

#### *12.4.4.1.4 Showers and washbasins*

A suitable number of showers has to be provided, if so required by the nature of work or health reasons.

Provision must be made for separate showers or separate use of showers for men and women.

The shower rooms must be sufficiently large to permit each worker to wash without reservations in conditions of an appropriate standard of hygiene.

Showers must be equipped with running hot and cold water.

If showers are not necessary, a sufficient number of washbasins with running water (also hot, if necessary) has to be provided in the vicinity of work sites and changing rooms.

Provision must be made for separate washbasins or separate use of washbasins for men and women.

If the premises with showers or washbasins are separate from changing rooms, they have to be directly connected with them.

*12.4.4.1.5 Lavatories*

Separate facilities must be provided in the vicinity of work sites, rest rooms, changing rooms and rooms housing showers or washbasins, with an adequate number of lavatories and washbasins.

One toilet has to be provided for every 30 workers. In the approximate vicinity of the toilets workers have to be provided a possibility to wash. One washbasin with soap and paper towels has to be provided for every 10 workers who complete their works at the same time.

Provision must be made for separate lavatories or separate use of lavatories for men and women.

### 12.4.4.2 Transport to work

If necessary, the workers have to be provided organised transport to work by means of transport which is in perfect technical condition. Transport of workers has to be provided by the contractor, if the place of residence is more than 5 km away.

On engineering construction sites, which include the construction of roads and other infrastructural facilities within the scope of road construction, there are several possible approaches to transporting labour force, i.e. all workers working on the construction site occasionally or on a permanent basis. These possibilities depend on:

- the number of workers without own means of transport:
- the number of workers;
- the possibility of public transport;
- construction site location;
- existing accommodation capacities in the area where works are implemented.

According to the above stated conditions the following examples of transporting labour force are possible:

- own means of transport are used;
- public means of transport are used (buses, train, etc.);
- transport organised by the company - contractor;
- other cases depending on local conditions, working conditions and the scope of work.

In practice there is often a combination of the above, which should be considered in planning and producing a SP. For this reason this part of the project to a great extent depends on the selected contractor of works and its location.

SP has to specify or state:

- the number of workers permanently residing in the construction site facilities;
- the number of workers migrating daily;
- method of transport;
- means of transport;
- proof of conformity in accordance with the regulations.

#### 12.4.4.3 Supplying workers with food and drinking water

Workers have to be provided:

premises where they can consume their meals in suitable circumstances;

accessories enabling preparation of food in suitable circumstances, whenever necessary.

The method of providing food and water is similar as accommodation conditioned by:

- the scope of works and the planned number of employees;
- construction site location;
- existing catering capacities in the area where works are implemented;
- duration of works;

Depending on the above stated conditions and circumstances, food and water supply can be provided as follows:

- meals prepared by the contractor's kitchen provided on the construction site;
- meals prepared by a facility provided by the lessee are available on the construction site;
- food is delivered to the construction site from an outsourced facility;
- food is supplied in a catering facility (nearby);
- other solutions, depending on the circumstances.

All employees have to be provided one hot meal during working time, regardless of how it is prepared.

If food is delivered from outsourced facilities, premises have to be provided on the construction site for the distribution and consummation - canteen. Washbasins have to be installed in the entrance room leading to the canteen. The premises must have heating installed and be suitably ventilated. The area of the premises depends on the number of workers and on whether the food is distributed in one or two shifts.

Supply of liquids (water or other soft drinks) has to be provided regardless of the previous conditions. A suitable number of locations where drinking water can be obtained and other beverages delivered during daily meal has to be provided on the construction site. Hygienic taps for drinking water have to be distributed so that they are no more than 100 m away from the work place. At least one tap has to be provided for every 60 workers.

SP has to specify:

- description of solutions required by food and drinking water supply;
- the quantities necessary considering the number of employees;
- ensuring drinking water health and hygiene safety and control;
- graphic sketch showing the arrangement of facilities and devices for supplying food and drinking water.

#### 12.4.4.4 Ventilation and lighting

##### *12.4.4.4.1 Ventilation*

Steps shall be taken to see to it that there is sufficient fresh air, having regard to the working methods used and the physical demands placed on the workers.

If a forced ventilation system is used, it has to be maintained in working order. The workers must not be exposed to harmful draught.

Forced ventilation system has to be fitted with signalisation for reporting breakdowns.

Any deposited objects (things) or dirt which could by polluting the air jeopardise workers' health, have to be removed immediately.

##### *12.4.4.4.2 Temperature*

During working hours, the temperature of working environment must be adequate for human organism, having regard to the working methods being used and the physical

demands placed on the workers.

The temperature in rest areas, rooms for staff on duty, sanitary facilities, canteens and first aid rooms must be appropriate to the particular purpose of such areas.

Windows or skylights and glass barriers must prevent excessive sun radiation, taking into account the type of work and the purpose of areas.

##### *12.4.4.4.3 Natural and artificial lighting of work sites, rooms and traffic routes on the construction site*

Work sites, rooms and traffic routes must receive as much natural light as possible. At night and when natural daily light is insufficient, suitable and sufficient artificial lighting has to be provided. If necessary, movable light sources have to be used, protected from negative impacts.

The colour of used artificial lighting must not influence the recognition of safety notices and signs.

The installations for lighting the rooms, work sites and traffic routes have to be provided so as not to represent danger.

Rooms, work sites and traffic routes lit by artificial lighting, where workers carry out dangerous works, have to be equipped with emergency lighting of adequate intensity.

##### *12.4.4.4.4 Floors, walls, ceilings and roofs of rooms*

The floors of work places must have no dangerous bumps, holes or slopes and must be fixed, stable and not slippery.

The surfaces of floors, walls and ceilings in rooms must be such that they can be easily cleaned or refurbished to an appropriate standard of hygiene.

Transparent or translucent walls, in particular all-glass partitions, in rooms or in the vicinity of work sites and traffic routes must be clearly indicated and made of safety material or be shielded from such places or traffic routes to prevent workers from being injured should the walls shatter.

It must be possible for workers to safely open, close, adjust or secure windows.

When open, they must not be positioned so as to constitute a hazard to workers.

Windows and skylights must be designed in conjunction with equipment or otherwise fitted with devices allowing them to be cleaned without risk to the workers carrying out this work or to workers present in the area.

##### *12.4.4.4.5 Impacts of weather conditions*

Workers have to be protected against weather conditions which could jeopardise their health and safety.

### *12.4.5 Electricity and telecommunication installations*

Installations have to be designed, installed and used so as not to present a fire or explosion hazard. All persons must be protected against the risk of electric current caused by direct or indirect contact.

The design, installation and choice of equipment and protection devices must be appropriate to the type of energy and voltage, external conditions and the competence of persons with access to parts of the installations.

Electrical installations and equipment on the construction site have to comply with the applicable regulations and requirements of the standard SIST HD 384.7.704 S1:200.

Electrical installations and equipment have to be protected against weather impacts (at least IP 43 protection). Fixed devices and installation of the construction site as well as tools, equipment, switches and control devices have to be protected against dust particles and water at least according to IP 44.

Distribution devices bought after 1 January 2003 have to be designed in line with the requirements of the standard EN 60439-4.

They have to be fixed, accessible and closed. They have to be equipped with a protective device with differential current (FI - switch), which does not exceed the nominal value of 30 mA.

Free electricity lines on the construction site have to be installed so that there is no danger of mechanic injury. Freely placed on the floor can be only cables of HO 7 RN - F type, which have to be mechanically protected or installed at prescribed height at all passages for vehicles and in the areas where heavy construction machinery is used.

Extension cables for power supply to electrical movable and portable tools and devices on the construction site have to be flexible. Cables bought after 1 January 2003 have to be produced according to the requirements of the standard HD 22.4, at least in HO 5 RN - F version and with suitable mechanic protection or installed at adequate height as stipulated in special regulations. On construction sites only such cable drums can be used which are equipped with covered sockets protected against water sprays, thermic protection against overheating and heavy rubber cable type HO 7 RN - F.

Before cable extensions are used, they have to be visually inspected. When there is visible damage on isolation, inlet, plug, socket, thermic protection or when the cable is pulled from the socket or plug, the extension must not be used. The isolation must not be patched with the isolation tape.

Electrical devices can be connected to the network only through electrical distributors, additionally protected by protective device with differential current with nominal value up to 30 mA. Electrical devices must not be directly connected with the house installation sockets.

On the construction site only plugs and sockets with a protective pole or industrial sockets can be used. The use of distribution sockets is prohibited. Industrial three-phase sockets have to be five-pole with rightward connection.

General illumination of the construction site (when works are implemented at night and in areas where there is no natural light) has to be at least 50 luxes, while local illumination on work places next to machines and where load is attached and released has to be at least 150 luxes. Lighting bought after 1 January 2003 has to be designed in accordance with the requirements of the standard EN 60 598-2-8 of at least IP 23 type and protected against damage by a protective net or installed at least 2.5 metres above ground and always clean.

In wet and moist areas only such devices may be used which are permitted to be used in constricted areas and are well guidable.

Electrical installations, devices and equipment on the construction site can be used only after the measurements have shown that they are impeccable. Periodical tests of installations have to be performed at least twice a year (in the summer and in the winter). Visual inspections have to be carried out regularly by qualified construction workers and monthly by qualified electro-technical engineers. The measurements and monthly inspections have to be minuted and relevant records kept until the construction is completed.

### *12.4.6 Traffic communications, emergency routes and exits*

The issue depends on the following factors:

- the spread of the existing road network, whether national or local;
- the quality of the existing road network;
- the scope of cargo to be transported to the construction site from various external locations;
- the type of cargo;

- means of transport and their characteristics (the number of axes and axle load);
- traffic density on these roads;
- road route (outside urban area or/and in urban area);
- bearing capacity of bridging structures and other.

The contractor implementing the works or the client have to prepare a study to establish the possible increased load of a public road used for transport and implement construction measures to mitigate the impact on such roads and accompanying facilities as well as the negative impacts on the health and safety of the inhabitants, if such transport routes lead through urban areas.

Transport routes, stairs and passage ramps have to be designed, located and installed in such a way that they ensure safe passage or transport and so that traffic streaming over them does not endanger the workers working on work sites in the approximate vicinity. The area designated for vehicles and the area designated for pedestrian passage have to be apart and separated by a fence. The doors must not open towards the area designated for passage.

Accesses to work places at height (or depth) can be provided only in the form of ramps or stairs.

SP has to:

- establish the number of vehicles with load bearing capacity of 10 tons or more on the existing road based on at least 4 traffic counts at the target-source location;
- calculate road loading by construction site traffic, taking into account the schedule and transport routes, using the vehicles with load bearing capacity of 10 tons or more;
- specify the percentage by which the road load will increase;
- provide for consolidation and expansion of the exiting roads in line with the increased load, based on the methods for dimensioning carriageway structure;-
- provide for the implementation of measures ensuring the safety of pedestrians and cyclists;
- provide for the installation of additional traffic and warning traffic signs;
- provide for arrangement of cleaning sites with water at locations where mudded vehicles passing from the construction site to a public road are cleaned; These pools have to be watertight and drained to a discharge duct or ditch after the waste water us treated and passes through an oil trap;
- provide for strengthening of bridging structures.

#### 12.4.6.1 Transport routes on and along the construction site

Transport routes on and along the construction site have to be designed based on a technological study. The project has to include the necessary data on transport by material type and the scope of internal transport, means of transport and dynamics.

It is important that the routes are organised so as not to have a negative environmental impact. Namely:

- they must not endanger water sources and surface water courses;
- they must not pollute air by dust particles and emission of other elements;
- they must not cause excessive noise;
- they must not cause vibrations affecting facilities and other;
- they must, as much as possible, be routed over the construction site.

SF provides for:

- transport routes over the construction site;
- consolidation of construction routes and their width;
- maintenance of the above routes;

- traffic regime (speed, priority directions, etc.);
- warnings about secured areas;
- frequency of vehicles (traffic);
- working hours;
- marking of the work site or access to it on a public road.

Traffic over the construction site has to follow the same rules as apply to public roads. If traffic frequency is high, traffic signalisation has to be introduced to arrange a traffic regime. In this case the Road Traffic Safety Act, stipulating traffic on non-categorised roads, applies. Crossings of construction road and categorised public road have to be marked using the prescribed traffic signs.

The transport project also specifies the speed of the means of transport, which must not exceed 40 km/hour on open route or 5 km/hour in the vicinity of work places where workers and construction facilities are located.

A constituent part of a SP is a design showing all transport routes RP 1:5000.

#### 12.4.6.2 Emergency routes and exits

Emergency routes and exits must remain clear and lead as directly as possible to a safe area.

In the event of danger, it must be possible for workers to evacuate all work sites quickly and as safely as possible.

The number, distribution and dimensions of the emergency routes and exits depend on the use, equipment and dimensions of the construction site and the maximum number of persons that may be present.

Special emergency routes and exits have to be indicated by safety signs in accordance with the Rules Governing Safety and Health Signs. (Official Gazette of the RS, no. 89/1999)

The signs must be sufficiently resistant and installed in appropriate places.

The emergency routes and exits, and the traffic routes and doors giving access to them, must be easily accessible and free from obstruction so that they can be used at any time without hindrance.

Emergency routes and exits requiring illumination must be provided with emergency lighting of adequate intensity in case the lighting fails.

Access to area where materials of insufficient solidity are located is prohibited, unless equipment and means enabling safe access are provided.

Emergency doors must open outwards. Emergency doors should not be so locked or fastened that they cannot be easily and immediately opened by any person.

Sliding or revolving doors are not permitted to be used as emergency exits.

#### 12.4.6.3 Traffic routes on danger areas

Danger areas on the construction site (passages over water courses, construction sites of bridging structures, ditches, etc.) must be secured and fitted with signalisation so as to be protected also in the event of ecological disasters.

Traffic routes, including stairs, fixed ladders and loading bays and ramps, must be located and dimensioned (with the possibility of relocation) to ensure easy, safe and appropriate access for workers employed in the vicinity of these traffic routes in such a way as not to endanger them.

Routes used for pedestrian traffic and/or goods traffic, including loading and unloading routes, must be dimensioned in accordance with the number of potential users and the type of undertaking.

If means of transport are used on traffic routes, a sufficient safety clearance must be

provided for pedestrians or a barrier installed.

Routes have to be clearly marked, regularly checked and properly maintained.

Sufficient clearance must be allowed between vehicle traffic routes and doors, gates, passages for pedestrians, corridors and staircases.

If the construction site contains areas with restricted access such areas must be equipped with devices preventing unauthorized persons from entering them.

Appropriate measures must be taken to protect workers authorized to enter danger areas.

Danger areas must be clearly indicated.

#### 12.4.6.4 Doors and gates

Sliding doors must be protected against being derailed and falling over.

Doors and gates opening upwards must be fitted with a mechanism to prevent unintentional closing.

Doors and gates along emergency routes must be appropriately marked.

Doors for pedestrians must be provided in the immediate vicinity of any gates intended essentially for vehicle traffic, unless it is safe for pedestrians to pass through. Such doors must be clearly marked and left permanently accessible.

Mechanical doors must function in such a way that there is no risk of injury to workers.

They must be fitted with easily identifiable and accessible emergency shut-down devices and, unless they open automatically in the event of a power failure, it must also be possible to open them manually.

#### 12.4.6.5 Loading bays and ramps

The inclination of the ramps must not exceed 40%, unless there is insufficient space for a passage with the required inclination. When the sloping floor of the ramp is more than 100 cm above ground, a solid safety fence has to be installed at passages and ramps on both sides, at least 100 cm high.

Ramps and passages have to be constructed of solid and healthy wood or other supporting material. Formwork panels must not be used for ramps and passages. It is prohibited for the ramps and passages to be open towards unstable elements of the facility under construction or to piles of material. Wooden ramps and sloping passages with an inclination greater than 10% must have on the upper surface laths 2.4 cm x 4.8 cm equally - maximally 35 cm - apart. The surfaces of ramps made of other materials have to be designed so as to prevent workers from skidding. Ramps and passages comprised of several elements have to function as a whole and be supported so that they do not bend or swing excessively. The floor elements are considered not to bend excessively, when the bend under projected load is less than 1/100 of the distance between supporting elements.

Before use and during the implementation of works the ramps and passages have to be regularly inspected and maintained in good condition as well as cleared of any scattered material. The use of damaged and incomplete staircases and ramps is prohibited, and has to be prevented by the employer by a physical barrier or marking using a suitable sign.

Conditions:

- Loading bays and ramps must be suitable for the dimensions of the loads to be transported.
- Loading bays must have at least one exit point.
- Loading ramps must secured to prevent workers from falling off.
- Ramps and other oblique accesses and passages for transporting material have to be at least 60 cm wide.

### *12.4.7 Distribution and storing of construction material*

Material warehousing has to be organised so that the workers' safety and health are not endangered. Material has to be arranged according to its characteristics and in such a way that it cannot be accidentally moved. Maximum permissible height of manually arranged stacks is 2 m with the exception of lighter material. Warehoused materials have to be protected from external influences (traffic on the construction site, work implementation, etc.).

#### 12.4.7.1 Premises for storing hazardous materials

Hazardous substances on the construction site have to be kept on premises separate from other, marked and arranged for such purpose according to the characteristics of the substances and in line with the instructions contained in safety documents. Decanting of hazardous substances into vessels designated for storing food or drink and other vessels intended purposes other than storing of hazardous substances is prohibited.

In the approximate vicinity of hazardous substances the copies of safety documents have to be available at all times in addition to suitable means and equipment for first aid and, in case of flammable or explosive substances, also fire extinguishing equipment. Hazardous substances can be kept directly at work places on the construction site only in the quantity necessary for one-day work.

#### 12.4.7.2 List of hazardous and ecologically unsafe materials and products

All materials installed in a road body and other facilities and devices have to be ecologically safe. All materials have to be equipped with suitable attestations proving their safeness and the dangerous consequences of construction on the environment.

Special attention has to be paid to use of materials for embankments where hazardous substances may be washed into the soil and subsoil. Particularly so, if materials used are produced by chemical or metallurgy processes.

The project has to state the materials which could be ecologically inadequate and whose composition should be analysed.

Monitoring programme, if necessary according to the type of materials, has to state the type of product, quantity of the material as well as the type and frequency of tests.

SF has to:

specify the means of transport and the site for depositing hazardous materials;

provide for checking of the content of hazardous substances in materials intended for construction, their composition and possible environmental consequences;

based on the findings of environmental hazard, provide for technological procedures that will during the use of environmentally hazardous substances not endanger the environment, neither during the implementation of works nor during exploitation;

if occasional monitoring is needed, provide for a monitoring programme and the method for monitoring warehousing and installation of material as well as specify the institution which will implement monitoring;

provide for other measures depending on the materials and technological procedures used.

### *12.4.8 Lifting and transporting equipment*

All lifting and transporting devices and accessories, including composite parts, additions, anchors and supporters, have to be:

- suitably designed and composed as well as sufficiently solid in view of their intended purpose;
- properly installed and used;
- maintained in good working condition;

- inspected and regularly tested and controlled in accordance with applicable regulations;
- operated only by suitably qualified staff.

Maximum permitted load bearing capacity must be clearly indicated on all lifting and transporting devices and accessories.

Lifting equipment and accessories must not be used for purposes other than their intended use.

### *12.4.9 Vehicles and machines for excavation, relocation and transport of material*

All vehicles and machines for excavation, relocation and transport of material have to be:

- suitably designed and produced, taking into account ergonomic principles;
- maintained in good working and driving condition;
- properly used.

Drivers and operators of such vehicles for excavation and relocation of material have to be specifically qualified for these tasks.

Safety measures have to ensure that the vehicles and machines for excavation and relocation of material do not fall into construction pits or water.

Machines for excavation and relocation of material must be equipped with safety constructions protecting the driver from being squashed if a machine tips over and against falling objects, whenever necessary.

### *12.4.10 Devices and facilities for maintaining machinery on the construction site*

All devices and facilities on the construction site have to be designed, implemented and used in a manner ensuring that they operate in line with environmental protection regulations. The type and quantity of machinery on the construction site depends on the type of works and their scope.

The maintenance method and environmental protection measures depend on the vulnerability level of the environment and potential consequences of omission of protective measures or poor maintenance of facilities and machinery.

Environmental hazards are the following:

- seepage of oil derivatives into soil and underground waters;
- pollution by lubricants and other waste resulting from maintenance;
- pouring fuel into tanks of machines and vehicles;
- improper warehousing of oil derivatives and other hazardous substances as well as environmental consequences.

This issue is regulated by numerous regulations issued based on:

- regulations governing the protection of waters;
- regulations governing the protection of soil;
- regulations governing waste management;
- regulations related to hazardous substances;
- regulations related to air protection.

For this reason the SP has to provide for all the measures necessary to ensure - according to the vulnerability of the environment - protection of underground and surface waters as well as other natural resources against pollution by waste oils, oil derivatives and waste resulting from maintenance of vehicles and machines.

The project has to provide for a suitably large area (indoor or outdoor) for repair and maintenance works on vehicles and machinery, the size depending on the number of vehicles and machines on the construction site. The area for one unit must be 4.00 x

10.00 m minimum. The area has to be concrete paved with slopes towards the intake shaft with oil trap.

SP and rules of procedure or internal rules have to specify a person in charge of monitoring, in addition to which instructions have to be drafted and all operators of vehicles, machines and devices informed thereof.

#### 12.4.10.1 Handling fuel, lubricants and hazardous substances on the construction site

Construction machinery, vehicles and other devices on the construction site require regular maintenance using oil derivatives and lubricants for drive and maintenance. In addition to these substances there is a possibility of other environmentally hazardous substances used for technological operations in work implementation (chemical products for concrete and rehabilitation works, panel oils, etc.). These substances are to a certain extent hazardous for the environment and health of people, if not used, handled and warehoused according to the instructions.

In the current conditions, the most common supply is delivery in a tank used for transport of oil derivatives from the warehouse to users. Moreover, if the demand is smaller, a substance may be provided from tanks on the construction site or vehicles filled at nearby public gas stations. The method of supply depends on the location of the construction site regarding the pubic gas station, the necessary quantity and the ownership of machinery and vehicles. In ecologically sensitive areas a uniform and controlled method of supply has to be provided regardless of the above.

As regards the use of hazardous substances the SP has to provide for:

- Method of warehousing hazardous substances used in technological process.
- These facilities and transport devices have to be, with regard to the type of material, production, corrosion protection and equipment, constructed and set up so as not to cause the pollution of water, air or soil or deteriorate their properties. More detailed instructions and requirements are given in the regulations on the construction and equipment of warehouses and transport devices for hazardous and harmful substances.

If liquefied oil gas is used on the construction site, the Rules on Liquefied Oil Gas apply. The above stipulate technical regulations on tanks, storing of cylinders (outdoor or indoor), use of gas, decanting of gas, safety distance, regulation, pipelines, users, user connections, flue gas outlet and other technical details to be considered in the SP.

If an own fuel pump is set up on major construction sites, the Rules on Construction of Facilities for Flammable Fluids and Warehousing and Decanting of Flammable Fluids have to be complied with. The latter define technical regulations applying to the construction of a station, preparation for supplying motor vehicles with fuel, pipelines, fuel decanting, fire safety.

A transport route must be set for fuel transport and other provisions of the Transport of Dangerous Goods Act considered, applying to vehicles, transport and handling of hazardous substances. In addition, the Rules on Records of Inspection of Transport of Dangerous Substances have to be complied with.

The SP must for every case define the method of supply and measures for environmental protection against pollution due to leaking fuel and other hazardous substances.

Method of controlling the implementation of preventive measures has to be provided and a person responsible for the implementation of SP provisions specified.

Mitigation and rehabilitation measures in the event of an ecological catastrophe have to be laid down.

#### 12.4.10.2 Washing and maintaining vehicles on the construction site

Vehicles operating on the construction site and construction roads are due to the nature of work often muddy and otherwise dirty. So that such vehicles would not dirty public roads onto which they pass from the construction site, the vehicles have to be cleaned of mud and other environmentally hazardous substances. Road Traffic Safety Act stipulates that traffic participants must not, on the road or next to it, release, place, deposit or throw nothing that could jeopardise the safety of traffic or be harmful to the health of people, animals, plants or pollute the environment.

The condition of public roads is supervised by the company for public roads.

SF provides for:

- the method of ensuring that vehicles do not pollute public roads;
- plan of measures related to vehicles passing onto a public road;
- plan of platform for washing vehicles and draining waste water;
- depositing mud from platforms;
- instructions for drivers and the name of the person in charge.

The platform for washing vehicles has to comply with the following conditions:

- the ground has to be impervious, the platform has to be edged by kerbs;
- vehicles access it over a small-inclination ramp;
- water is drained into the sewage system and an oil trap with coalescent filter is provided;
- equipment for water supply and a hose for water spraying have to be provided.

#### 12.4.10.3 Parking of vehicles and machinery and maintenance

Parking of vehicles and other machinery and devices can, if not organised properly, cause environmental pollution, especially contamination of soil and the underground water as well as of surface waters in the event of a major oil derivative spill. For this reason - depending on the vulnerability of the environment - suitable technical measures have to be provided aimed at preventing the possibility of environmental pollution. Moreover, instructions to drivers and operators of machines have to provide that parking instructions are implemented. Potential environmental hazards are the following:

- fuel leakage from vehicle or machine as a result of defect;
- pollution by oil from engine, transmission, differential gear, etc.;
- oil change and storing.

Rules on minimum technical and other requirements for parking and maintenance facilities of motor vehicles stipulate that:

- parking lots and other parking areas have to be impervious to water and oil derivatives;
- areas have to be kerbed;
- rain water has to be led from the parking lot over the sewage to the oil trap;
- parking lots for vehicles transporting hazardous liquids have to be separate from other parking lots;
- parking lots have to be marked with vertical signing and ground marking;
- no washing, maintenance or repair is permitted on parking lots; only daily check-ups of vehicles are allowed;
- a separate work station has to be assigned for repairs and washing, such where environmental protection is ensured;
- the floor of workshops used for repair of vehicles and machines have to be impervious to water and oil derivatives and sewage has to be drained through a properly dimensioned oil trap with a coalescent filter.

SF has to:

- provide that a suitable number or parking spaces is prepared in view of the number of vehicles parking on the construction site or other locations, in accordance with the above requirements;
- provide for the drawing up of a construction plan regarding the parking lot organisation;
- provide for the drawing up of a plan for an oil trap with coalescent filter as well as maintenance rules of procedure;
- provide for the drawing up of instructions for users of the parking lot and machine maintenance engineer;
- state the person in charge of maintenance of the parking lot, working platform for repair and oil trap.

### *12.4.11 Organisation of work places*

Work places have to be at all times orderly and accessible according to:

- type of construction
- changing status on the construction site
- weather impacts
- type of works

and have to ensure safe implementation of works.

Work places have to be of suitable area and height for the workers to perform their work without their safety, health of well-being being endangered.

The area of the ground of a work site has to be such to enable workers free movement while performing work. The area for free movement has to be determined with regard to the presence of equipment or devices.

#### 12.4.11.1 Works of special danger and protective equipment

*12.4.11.1.1 Draft list of works of special danger*

Draft list of works of special danger was included in Attachment II to the Decree on Safety and Health Protection at Work at Temporary and Mobile Construction Sites:

- works in excavations deeper than 5 m or on unstable or marshy terrain, more than 10 m above the ground;
- works with chemical or biological substances representing particular hazard to
- safety and health of workers or which according to regulations require medical supervision;
- works in the area of ionising radiation;
- works in the vicinity of high-voltage electricity lines;
- works where there is danger of drowning;
- works involving digging, cleaning or repair of wells, under ground and in tunnels;
- works involving diving, using air under pressure;
- works in the caisson with compressed air atmosphere;
- works involving explosive and easily flammable substances;
- works during assembly or disassembly of heavy components and/or sets;
- works along traffic on roads or railway;
- works involving tensioning of tendons in prestressed concrete and other constructions;
- works during concreting, cutting and processing of surfaces with devices under high pressure.

*12.4.11.1.2 Basic requirements for safe work*

Workers must not be exposed to harmful levels of noise, gases, vapours or dust.

If workers must enter a closed area where the atmosphere may contain a toxic or harmful substance or if the atmosphere does not contain sufficient oxygen or is flammable, the atmosphere has to be controlled and adequate measures preventing danger have to be introduced.

If in closed area hazardous gases arise in working process, forced ventilation has to be provided, gases controlled and an alarm system set up.

The dust and gases resulting from the work process have to be sucked out at a location nearest to the place of their origin.

Under no circumstances may a worker be exposed to high risk in closed atmosphere, if they are not all the time under external supervision so that they may be assisted in any moment, if necessary.

Work places in closed, tight (pipelines, silos, etc.) and underground areas (tunnels, wells, shafts, etc.) have to be ventilated so that the oxygen concentration in the air is at least 19%; maximum permitted concentrations of hazardous gases and dust in the air must not be exceeded; possibility of explosion has to be non-existent.

When on the construction site workers implement works in very dusty atmosphere, under the influence of poisons, caustic substances or substances that may cause an infection or when they work in a hot room, one shower with hot and cold running water, soap, protection cream and means of disinfection have to be provided for every 10 workers. If under such conditions more than 10 workers carry out works on the construction site for more than 14 days, bathrooms have to be provided. The temperature of these premises in the period between 15 October and 30 April must not be less than 21°C.

When works are planned to be implemented on the construction site outdoors or on open premises, an area has to be provided where workers can rest, dry their clothes and warm up. The clear surface of such area has to be at least 0.75 m2 per worker, but not less than 4 m2, while the height has to be at least 205 cm. The temperature of these premises in the period between 15 October and 30 April must not be less than 21°C. Changing rooms or accommodation facilities can be used as the area for staying or warming up, provided that they meet the above stated requirements. These premises need not be provided on construction sites, where up to five workers work for less than seven days, however it has to be made sure that the workers can dry their clothes and warm up.

The construction site has to include a clean room with tables, which the workers can use as a dining room. There have to be chairs at tables. The room has to be equipped with hangers for over clothes, while close by the workers have to be able to wash their hands and be provided cold drinking water or other chilled alcohol-free beverages. In the winter, the room has to be suitably heated. Dining rooms are not necessary, if the employer provides workers meals in some other suitable way (at public restaurants or bistros near the construction site).

*12.4.11.1.3 Protective equipment*

The personal protective equipment specified in the safety plan and other regulations has to be manufactured in accordance with regulations and standards, used for specific purposes as well as maintained and checked before use. It shall be prohibited to use damaged, worn out, and poorly maintained personal protective equipment and equipment past the expiration date.

Any person being present, for any reason whatsoever, at the construction site where the possibility of objects falling on the head, falling for more than 1 m or a blow to the head from impact with a hindrance in space exists or the safety plan has determined the possibility for injury of the head due to other causes, shall wear a protective helmet.

Signs specifying obligatory wearing of a helmet shall be placed on all accesses to the construction site and on exits from facilities to the construction site.

When the danger of head injuries exists only on a part of the construction site, the co-

ordinator in charge of safety and health may, notwithstanding the provisions of the first paragraph hereunder, specify that a safety helmet be worn only on the part of the construction site in question.

The danger area shall be specifically marked and signs indicating obligatory wearing of a helmet shall be placed on all accesses to the area.

In case workers of a single employer perform work in closed spaces of the construction site, for which the co-ordinator in charge of safety and health has established that there is no danger specified in the first paragraph hereunder, they do not have to wear helmets. However, they should be in possession of helmets and use them on other parts of the construction site. Such measure shall only apply if entered in the book of measures for safe work.

The number of helmets available on the construction site has to equal the maximum number of visitors allowed at any time, which must be defined in the safety plan for the construction site in question.

When the co-ordinator in charge of safety and health establishes that no danger for head injuries exists anymore, the signs indicating obligatory wearing of helmets shall be removed and the measure entered in the book of measures for safe work.

#### 12.4.11.2 First aid

First aid service organisation in the event of an occupational accident or injury has to be provided by the contractor implementing works on the construction site: The method and scope of the necessary measures depend on:

- the location of the construction site in view of the location of a health station;
- the number of employees;
- the danger involved in work operations and the scope of work.

In the case of large construction sites with many workers, an outpatient clinic has to be provided on the ground floor, with an entrance allowing unhindered access by a medical vehicle. The doors have to be wide enough for a patient to be carried or transported through. The clinic may also be set up in a container, if the latter complies with the stated provisions.

SF has to provide for:

- first aid organisation in accordance with the law and rules;
- premises for offering first aid in line with special regulations;
- staff in charge of organisation and offering first aid;
- number of qualified staff for offering first aid;
- first aid equipment (lockers);
- preventive medical examinations in a health care organisation and management of employee records;
- managing records of occupational injuries.

The procedures and equipment for offering first aid in the event of occupational accidents are stipulated by relevant regulations and standards. With SIST these standards applying to first aid are Technical Committee - Health Protection (TC VAZ).

International classification of standards regulating this issue is as follows: 11.xxx.yy and in addition to others classifies standards applying to:

11.020 - Medical sciences and health care facilities in general

11.040 - Medical equipment

11.080 - Sterilization and disinfection

11.160 – First aid (medical vehicles and equipment)

11.180 - Aids for disabled or handicapped persons

#### 12.4.11.3 Impacts of stability and strength on safety at work

Materials, equipment and every part which could during any movement influence safety and health of workers have to be fixed suitably and securely.

The construction and stability of facilities have to correspond to their intended use. For load-bearing parts of facilities, scaffolds and construction equipment suitable stability, strength and safety estimate has to be provided, especially after each change of height or depth on the work site.

Access to area where materials of insufficient solidity are located is prohibited, unless equipment and means enabling safe implementation of work are provided.

Movable or fixed work sites at height or on the ground have to be solid and stable, taking into account the following:

- the number or workers on work sites,
- maximum load-bearing capacity and distribution of weight,
- external impacts to which they can be exposed.

If the supporting construction and other parts of work site construction are not stable as such, their stability has to be provided by suitable and secure methods of attachment so as to avoid any unintentional or automatic movement of the entire work site or its individual parts.

#### 12.4.11.4 Earthworks, underground construction sites and works in constricted areas

When working in construction pits, wells, underground construction sites, pipelines or tunnels, the following safety measures have to be complied with:

- suitable supporting constructions or embankment have to be provided,
- danger of workers, material or objects falling as well as flooding have to be prevented,
- sufficient ventilation has to be provided on all work sites to ensure breathing air which is not hazardous or harmful to health,
- workers have to be able to evacuate to a secure area in the event of fire, or water or material intrusion.

##### *12.4.11.4.1 Earth works*

Before excavations start, measures have to be taken to determine and to the highest degree possible reduce any danger arising from underground cables and other installations.

Secure access from/to construction pit has to be provided.

Heaps of soil, material and moving vehicles have to be at a suitable distance from construction pits. If necessary, adequate barriers must be set up.

Prior to commencement of earthworks, the existing installations and facilities shall be marked out and if possible dangers arising there from excluded (by transfer or temporary shutting down of power supply, closing and emptying of pipelines and reservoirs and the like).

In case of excavations in areas where gas, electricity, water supply, sewage or other installations, facilities or buildings are located, the work shall be carried out in accordance with the instructions and under supervision of an expert, to be appointed in agreement between the facility's owner, or the maintenance entity appointed by them, and the contractor.

Such agreement shall be entered in the book of measures for safe work.

Should workers during the excavations unexpectedly come across such facilities, they shall stop work until the supervision specified in the first paragraph hereunder is provided.

Prior to excavations or cleaning of caves, wells, channels and such filled with earth, any

presence of carbon monoxide and other harmful, inflammable or explosive gases shall be established.

Excavations in depths exceeding 100 cm shall be carried out with obligatory implementation of safety measures preventing collapse of soil from the sides and mucking out of excavated material (using sheet piles, slurry trench techniques or arrangement of slopes below the angle of inner friction of earth). At least 100 cm wide free area (clearance) shall be provided on the upper edge of the excavation, where no material deposit or use for transport are allowed. Excavations as well as slurry trench techniques for slopes shall be performed professionally, in line with appropriate norms and static calculations and under direct supervision of the manager of individual works. The possibility of flood or increased pressure in excavated walls or sheet piles shall also be taken into account.

In traffic areas, the protection and stability of slopes shall be previously proven by taking into account the expected load.

Building pits and excavations deeper than 2 meters and having slopes under an angle of more than 45° (steeper) shall have a safety fence erected at least 100 cm from the upper edge or arranged protection of the danger area of the excavation.

Earth excavations have to be made from top down. Sapping is not permitted.

In machine excavations, no presence in the machine's work area shall be permitted. Manual work may be performed only when the machine is not operating.

Trenches and other excavations must be made in adequate width enabling unhindered work in them, meaning that after slurry trenching and placement of pipelines or other facilities (panelling, walls…) the excavation still has at least 60 cm available for movement of workers.

The stability of the machine shall be provided in machine excavations. The excavated earth shall be deposited so that stability of lateral sides of the excavation is not endangered. The edges of excavation (and the 100 cm area along them) may be loaded with machinery or other heavy equipment only if appropriate measures preventing collapsing, which would result from the additional load, have been taken.

The formwork for slurry trenching of lateral sides of the excavation shall be at least 20 cm above the terrain. Wood or other material and equipment of appropriate strength and size shall be used for slurry trenching of lateral sides of the excavation.

The means for joining and strengthening of parts of support members (wedges, hardware, screws, nails, wire and such) shall comply with the relevant SIST standards. The empty space between the formwork and the lateral side of excavation shall be filled and strengthened. The formwork shall fit to the bottom of excavation over the entire length.

Removing formwork upon filling of the excavation shall be made in accordance with the instructions and under supervision of the manager of individual works. In case removing of the formwork would endanger workers, it shall be left in the excavation.

For stepping down of workers in the excavation deeper than 100 cm or return therefrom, a ladder of appropriate length shall be provided, so that the hand handle shall be at least 100 cm above the edges of the excavation.

The ladder can be replaced by adequate stairs or ramps, if such a method provides for safe movement of workers during precipitations.

Prior to commencement of work related to excavations of earth and in any case after adverse weather conditions, frost or melting of snow and ice, the manager of individual works (earthwork) shall examine the excavation and, if need be, take appropriate action (in order to protect against collapse of lateral sides of the excavation).

Ways and ramps used for hauling material from the excavation shall be appropriate with regard to strength of the terrain and characteristics of transport vehicles. Their inclination

must not exceed 40%.

Loading of material by way of loader or other mechanical means to the freight vehicle over the vehicle's cabin shall not be permitted, unless the cabin is protected against mechanical damage.

The material required for construction or assembly work in excavations (foundations, channels, installation ducts, shafts and the floor) shall not be deposited on edges of the excavation or in areas where it might collapse or pose danger to workers in the excavation.

Devices (channels, hoppers) or transport means used for lowering the material in excavations shall be appropriate with regard to the type, shape and weight of the material. Lowering of heavy construction elements shall only be made by using appropriate work equipment and by workers familiar with such work, under the supervision of the manager of individual works (assembly, carpentry).

*12.4.11.4.2 Underground facilities*

The appropriate technical documentation shall be prepared for all work related to construction of underground facilities. The used material and constructions shall be made in line with the regulations and in accordance with the montageological conditions on the construction site.

As regards planning of work on underground facilities through hills, where methane may be expected with regard to performed geological studies, the safety plan shall specify special measures for removal of any dangerous gases.

These measures shall also include:

- the system for determining and controlling methane;
- measures for safety of personnel.

In case methane concentration exceeds 0.5%, all machinery and devices must be immediately turned off.

Work under ground may only be performed by qualified workers under constant and direct supervision of the manager of individual works. Workers shall be informed on dangers to which they are exposed and measures to be taken with that regard.

Regulations applying to mining work shall be complied with in excavations, implementation of support and the basic construction.

The contractor building under ground shall keep accurate records on entering and leaving of all persons to/from the underground facility.

The basic construction shall be regularly monitored and appropriate action taken in case of any detected irregularities.

Transport routes shall be appropriately protected on spots of openings, slopes and spaces on lower levels. In case strewers leading to the lower underexcavation are implemented for transport of material from the underexcavation, their openings shall be adequately protected.

Work places in underground facilities shall be well ventilated by using forced ventilation. The ventilation system shall be appropriate for the location and length of the area and the type of harmful substances appearing during work (gases, dust and other). Vacuuming of dust shall be provided directly on the spot of its appearance.

Smoking and bringing igniters shall be prohibited in tunnels, galleries and under excavations where methane may be present.

At the first instance when methane concentration exceeds 0.5%, the contractor shall immediately inform the Labour Inspectorate of the RS thereof.

Installations for power supply, technological water, compressed air and other shall be placed so that they are not exposed to mechanical damage.

Power installations and equipment shall be implemented as prescribed for narrow and guidable spaces and shall be checked regularly at least once a month and after any reallocation, flooding or other change.

Any machinery used in construction under ground shall be in perfect working condition, and machine operators shall be specially trained to operate such machinery.

Machines with internal combustion engines may only be used if they have diesel engines equipped with devices for cleaning exhaust gases.

Vehicles for transporting material shall be equipped with appropriate light and sound signals, which are automatically turned on when driving in reverse. The work place of the machine operator shall be protected by a protective construction.

Machinery and vehicles shall in addition to the prescribed equipment also have a handy fire extinguisher. Examination of the work equipment shall be made prior to each reallocation to a new construction site and at least once a year.

As regards the use of chemicals added to concrete for faster setting, regulations and instructions for working with dangerous substances shall be taken into account and appropriate protective equipment used.

#### *12.4.11.4.3 Constricted work sites, shafts and pipelines*

Work in constricted areas may only be performed by adult, capable in terms of health and qualified workers, previously informed on dangers and measures for safe work in narrow areas.

Prior to commencement of work, the manager of individual works shall check the condition of the pipeline (inspection for presence of any gases, visual check…) and implement the required preventive measures for providing safety and health of workers. Any work in pipelines may only be carried out under direct supervision of the manager of individual works.

Protection of workers in pipelines shall be provided from the surface in all open accesses. Reliable means of communication shall be used for communication between workers in the pipeline and the responsible person outside. The manager shall have a telephone on their person to be able to call the rescue service.

Outside, near entries to the pipeline, the number of qualified workers and appropriate equipment shall be such that rescuing of workers from the pipeline may begin instantaneously.

Each worker in the pipeline shall be equipped with a battery or electric flashlight.

Lowering and lifting of workers by means of a ladder in a vertical pipeline (or shaft) of more than 5 m in height shall only be permitted by using the personal protective equipment against falling. The exit ladder shall be placed in the pipeline at all times during work.

Workers may only perform work in pipelines with the diameter of more than 1000 mm. Work in pipelines with diameter between 600 mm and 1000 mm may be performed in exceptional cases only, provided that:

- It is previously established that such work can be performed without any danger for collapse of pipes, explosion, drowning, suffocation or poisoning of workers;
- It is ensured that workers move in the pipeline using only devices which are interlinked and guided by ropes or bars from the entry opening to the pipeline or from outside.
- the worker is under constant visual supervision.

It shall be prohibited for any worker to enter a pipeline with diameter of less than 600 mm.

In exceptional cases, work may be performed in pipelines with free surface (without increased pressure) with diameter of more than 1000 mm also in cases when the pipeline

cannot be fully emptied. In such cases, the employer shall provide special instructions for carrying out work and implementation of measures for protecting workers against drowning and other dangers.

Power supply installations, machinery and devices used for work in pipelines shall comply with regulations regarding narrow and guidable spaces.

Appropriate regulations regarding work in constricted spaces shall be taken into account when welding, sawing and carrying out similar procedures in pipelines.

The use of liquid gases and work machinery with internal combustion engine shall be prohibited in pipelines.

Forced ventilation shall be provided, if harmful gases or dust result from the work process. The dust resulting from the work process in the pipeline has to be removed or sucked out at a location nearest to the place of its origin.

Workers shall immediately leave the pipeline in case of flooding, occurrence of harmful gases, power failure or shutting down of the ventilation system. Work may be resumed only after the manager of works has verified that the danger no longer exists.

#### *12.4.11.4.4 Wells and caissons*

All diving bells and underwater caissons have to be made of suitable material of appropriate strength, adequately equipped, so that in the event of water or material intrusion workers can recourse to a safe area.

Construction, assembly, modifications or disassembly of diving bell or caisson can be carried out only under expert supervision.

All diving bells and caissons must be checked by an expert at suitable intervals.

#### *12.4.11.4.5 Danger of drowning*

In case the danger of drowning exists, the following shall be provided for:

- appropriate arrangement of the site and adequate equipment ensuring work safety;
- the prescribed rescue equipment and means of rescue (as applicable for bathing sites);
- at least one qualified water rescuer;
- training of workers for self-rescue from water (swimming);
- unhindered access for rescuers and rescue equipment;
- other prescribed measures.

During work above/near rivers and water barriers with a large flow, workers shall in addition to implementation of other measures for safety and health at work also wear lifejackets.

As regards inflows to power plants and other sites where water has a sucking effect, gates shall be closed prior to commencement of work or other appropriate measures taken to prevent sweeping off or drowning of workers.

As regards work sites where the danger of drowning exists due to fast rising of water level, measures shall be envisaged (supervision, signals, methods and routes for escape…) and equipment for quick rescue or escape of workers from the danger area provided.

As regards waters with traffic, measures for protecting the work site against dangers arising from water transport shall also be provided.

As regards work sites on floating objects (platforms, ships, boats, pontoons…), lifejackets for all workers and any visitors of the facility shall be provided.

Vessels shall have a sailing permit in accordance with special regulations and shall be (when work is carried out from them) firmly fastened or anchored and have safe access from land and water.

The areas on vessels where the possibility of falling into water exists shall be protected by a solid and stable protective fence. Openings in the floor of the vessel shall be permanently closed or protected by a safety fence unless being used.

#### 12.4.11.5 Demolition works and disassembly

In case of demolition or disassembly of a facility or a part thereof, a work programme and safety plan shall be previously prepared regardless of the demolition method (manual, machine or by blasting).

The safety plan shall specifically include the method for detecting the presence of any residual dangerous gases, liquids or other dangerous substances in spaces, recesses, installations, equipment and construction of the facility and measures for preventing dangers resulting there from.

Power supply shall be turned off and any installations, reservoirs and other areas shall be emptied in the facility to be demolished prior to commencement of work.

Prior to the demolition, probing on characteristic spots shall be used for checking whether any asbestos is present in the material. In case the contractor establishes the presence of asbestos or the possibility for occurrence of dangerous dust, they shall implement all measures prescribed for handling of such substances.

Work involving asbestos is regulated by the Rules on Conditions for Disposal of Materials Containing Asbestos in Demolition, Reconstruction or Maintenance of Buildings and in Maintenance and Decommissioning of Plants (Official Gazette of the RS, no. 71/01).

The demolition may be carried out exclusively by workers receiving written instructions on safe work and being qualified to perform it. The work may only be implemented under direct and constant supervision of the responsible manager of individual (demolition) works.

The use of personal protective equipment for protecting the respiratory system and other appropriate personal protective equipment shall be obligatory.

Prior to commencement of the demolition, the danger area shall be fenced by a protective fence or protected by another appropriate method of protection. Protection of the danger area shall be in place until the demolition is completed.

Manual demolition shall be carried out gradually from the top down. Demolition of the construction between floors or of the ceiling may begin only when all parts above its level have been demolished and removed. Manual demolition of freestanding walls (partition walls, fences, columns and similar) shall only be permitted by using the appropriate scaffolding. In disassembly work, at least two workers shall work on the same spot or in the same room. When this is not possible, the other person shall be within visual or hearing range of the worker.

Demolition of walls by sapping shall not be permitted. Accumulating demolished material on individual floors shall not be permitted in demolition of multi-storey buildings.

All elements to be disassembled shall be prior to loosening of joints by unscrewing, sawing, autogenously cutting or by using another method firmly supported or hanged so that they cannot endanger the safety of workers after loosening of joints.

Disassembled beams, supporters or other heavy or large construction parts may be removed from the facility only by using the appropriate work equipment. Free lowering i.e. dropping of elements and material from the facility shall be prohibited. Bulk and dusty material may be removed from the facility only by using completely covered channels or pipes or by using another method preventing spreading of dust.

In case of machine demolition (by using caterpillar tractor and similar), the machine's distance from the facility or the part to be demolished shall be at least 1.5 the height of the facility or the part in question. Tear up strength of the steel rope used for transmission of the traction force required for the demolition shall be at least three times

the traction force of the machine. The machine's traction force shall be transmitted to the surface of the facility or the part to be demolished (wall, column and other) evenly by using placed under planks, beams and such.

Buried concrete columns, steel supporters and other parts of the facility shall not be pulled from ruins by using machinery without removing the ruins first. Demolition or pulling of heavy objects from the construction facility shall not be carried out by using tractors with wheels.

When individual parts or the entire construction facility is demolished by blasting, regulations regarding handling of explosives and blasting shall be complied with.

#### 12.4.11.6 Work along traffic

When work is performed on roads on which traffic has not been stopped, protection of the work site in accordance with special regulations and the provisions of these rules shall be provided. Works shall not be carried out in conditions of strongly reduced visibility (fog, darkness…) unless the work site has appropriate artificial lighting.

Workers performing any kind of work near traffic flows, shall wear signal clothing with reflective strips manufactured in accordance with the SIST EN 471 standard. Equally applies to workers carrying out daily work in utility services (waste removal, road and pavement sweeping, measuring of the terrain…).

In case the carriage lane is not closed, work may only be performed under supervision of the manager of individual works appointed by the employer providing for work safety. Workers shall be provided with clear work instructions prior to commencement of the work.

The work site has to be marked by the employer with traffic signs in accordance with the Rules on Traffic Signs and Equipment on Public Roads (Official Gazette of the RS, no. 46/2000).

#### 12.4.11.7 Massive constructions, metal or concrete frames, formwork and heavy prefabricated elements

Metal or concrete frames and their elements, formwork, prefabricated elements or temporary support constructions and struts may be installed or removed only under expert supervision.

To secure workers from dangers arising from temporarily insufficient strength or instability of construction, special safety measures have to be introduced.

Formwork, temporary support constructions and struts have to be planned, designed, installed and maintained so that without any danger they sustain any load or tension that may be applied.

Concreting, construction of arches and other work on the supporting scaffold may only commence when the person performing expert supervision of the construction verifies that the supporting scaffold has been made in accordance with the project, that it is secured by a safety fence and that all required preliminary work has been carried out and make a note thereof in the book of measures for safe work. The work may only be implemented under direct supervision of the manager of individual works.

Prior to commencement of work on the scaffold, any sharp tops and edges of means joining individual parts (nails, clamps, wires and other) protruding from the formwork and other parts of the wooden construction of the supporting scaffold must be bended or covered.

Large-scale concreting on heights and depths (tall buildings, hydro power plants, dams and other) may only be carried out in line with previously prepared programme, by qualified and healthy workers, being informed on dangers related to such work.

In concreting with the use of a pump, the transport pipe for concrete shall be at the point of flowing out of concrete held by two workers.

Forced taking down of the formwork by using lifting or other equipment shall not be permitted. During sliding or taking down of the formwork by using winches (or manually), it is not permitted to stand on the equipment gripping the formwork (sledges and such).

Concreting and concrete treatment with equipment under high pressure may only be performed by qualified workers. The area where such work is carried out shall be secured at the appropriate distance and marked by a warning tape, no access sign and the general danger sign. Workers performing such work shall use personal protective equipment during the work for protection of the face, respiratory system and the entire body.

Prefabricated construction shall only be permitted in accordance with the assembly programme, which shall include the following:

- plans of prefabricated elements including data on their weight, marking, support points for transport and storage and details on anchors for moving;
- description of the required lifting devices and the plan of auxiliary devices for moving;
- plan for storage on the construction site;
- description of the assembly procedure (order of production and transport of individual prefabricated parts, the method and order of lifting, placement and strengthening of prefabricated elements…);
- safety measures for all work related to prefabricated construction.

Joining and fastening of prefabricated elements and other assembly work on the facility shall only be preformed by adults capable in terms of health to work at heights and trained for safe assembly under direct supervision of the manager of individual (assembly) works.

Each prefabricated element shall be adequately visually and otherwise appropriately marked in accordance with the prefabricated construction programme. The production date and weight of the element in kilograms shall be marked on the element in addition to the marking referred to above. In addition to parts needed for assembly and fastening of the element on the facility, each element shall also have auxiliary metal anchors enabling reliable moving and placement of the element on the assembly spot.

Prefabricated construction shall only be permitted with the use of appropriate transport and lifting work equipment and auxiliary devices prepared for such work.

Work at heights related to prefabricated construction shall only be permitted with the use of specified-purpose equipment for work at heights (scaffolds, equipment for lifting people…). Walking and work on elements not being stably placed shall not be permitted.

Prefabricated elements on the construction site shall be properly and in line with the assembly plan placed on a particular spot so that they may be without any delay and safely moved and installed in the facility.

Fastening of prefabricated elements on a hook and their unfastening from a lifting device in loading to motor and other vehicles and unloading therefrom shall generally be carried out without the workers mounting on the vehicle or the elements.

The driver shall not be in the cabin of the vehicle during lowering and lifting of prefabricated elements to/from the motor vehicle by a lifting device.

Assembly of elements on a higher floor of the facility shall not commence until reliable access to this floor has been provided.

Assembly of heavy prefabricated elements (slabs, beams and other) shall only be permitted after previous preparation of auxiliary devices for moving, placing and fastening of elements on the facility (yokes, moving frames and other).

Auxiliary devices shall be prior their use examined and tested with regard to the planned load.

During moving, placement and fastening of each individual prefabricated element on the facility, the signaller and the lift operator shall carefully monitor the path of the prefabricated element to the assembly spot and the work of assembly workers placing and fastening the element.

The assembly worker shall use a special signal to inform the signaller and the lift operator that the operation of moving and assembly of the element on the facility has been concluded.

Parts of the reinforcement protruding from the element after the assembly, which may cause a worker to get stuck or injured, shall be appropriately removed or protected (cut off, bended and similar).

*12.4.11.7.1 Works during the tensioning of tendons in prestressed constructions*

Works during prestressing may be carried out only by expert professionals acquainted with dangers and safety measures which need to be considered during work. In the approximate vicinity of the work sites there have to be instructions for safe work and safety measures as well as the documents about work equipment.

The works are carried out in three phases:

*12.4.11.7.2 Tendon composition and assembly*

The anchor head has to be installed precisely in the tendon axis. Protective rib pipes have to be assembled and installed according to the manufacturer's instructions. Only undamaged pipes, clips and injection pipes may be installed. Before tendons are installed, the functioning of the equipment for pushing strands and pulling rope has to be checked. The workers must avoid strand exit locations. All manual interventions in driving or measuring wheels are prohibited.

*12.4.11.7.3 Tensioning*

Tensioning is carried out by means of a tensioning device. During tensioning, none of the workers can stand behind or below the tensioning device. The tensioning device has to be mechanically secured to mitigate the blow if a tendon breaks. The strand or rope gripping mechanism has to be in perfect condition. It is strictly forbidden to remove protective devices on work equipment. The pipes of the hydraulic mechanism have to be laid without sharp turns, transparently and not over sharp objects. Manual interventions in moving elements or parts of machinery are prohibited.

*12.4.11.7.4 Injection*

Injection pipes have to be firmly attached to injection caps. Before injection, the passability of the pipe has to be checked by inserted tendons. The injection mass mixer and pump can be lifted to a suitable position only by the specified lifting device. Injection must be supervised by the injection manager.

### 12.4.11.8 Works during concreting, involving devices under pressure

Devices operating under pressure, used for concreting or gunning can be operated only by expert qualified staff, capable in terms of health and acquainted about safety measures applying to work. The work site has to be secured and suitably marked.

If the concrete pouring site is not managed by machinery, the concrete pipe has to be held by two workers standing on stable and solid basis.

Protective equipment for the face, respiratory system and the entire body is obligatory.

### 12.4.11.9 Work places at height

*12.4.11.9.1 Roof work*

If the height exceeds 2 m or the slope is greater than 30°, the employer has to adopt collective safety measures to prevent workers, tools or other objects or material from falling.

If workers work on a roof, near it or on any other area made of breakable material, through which they might fall, the employer must adopt safety measures to ensure that workers do not walk over such area carelessly or fall off.

Work on surfaces with the inclination exceeding $45^0$ and on roofs may only be carried out by workers capable in terms of health to perform work at heights. Such work may only be performed in favourable weather conditions and with implemented measures for preventing of sliding and falling of workers.

Measures for preventing of sliding and falling shall be implemented with regard to:

- height of the work place;
- inclination of the surface (steepness);
- type and bearing capacity of the roofing (or other surface);
- duration and type of work (and dangers arising therefrom).

As regards height and inclination of the surface, the following measures shall be deemed appropriate: on areas with inclination up to $20^0$ the installation of safety fences on overhangs of roofs (or scaffolds along the roof) or placement of warning signs about the danger area at least 2 m from the overhang – only when there is no danger of sliding on the surface (the surface is not made from smooth sheet metal or material with similar characteristics);

As regards surfaces with inclination between $20^0$ and $45^0$, placement of safety fences or safety scaffolds or nets on overhangs of roofs on such distances that the height of sliding is less than 5 m;

As regards surfaces with inclination between $45^0$ and $60^0$, protection (fastening) of the worker by using personal protective equipment against falling shall be used in addition to placement of safety fences or safety scaffolds or nets specified in the previous indent hereunder;

As regards surfaces with inclination exceeding $60^0$ in addition to measures specified in the previous indent hereunder, safe access (stably placed ladder…) for climbing the surface shall be provided and horizontal working platforms placed at every 2 m to be used by workers for performing work (fitted with safety fences).

Safety fences shall have at least the height providing that the upper edge measured right-angled to the inclined surface is not less than 100 cm above such surface. In case the inclination of surface is more than $45^0$, the lower (solid) protective edge of the fence shall have the height of at least 50 cm or the fence shall be protected by a net preventing the material from falling.

Prior to commencement of work on existing roofs the responsible person appointed by the employer shall check the condition of the roof structure and the roof itself (laths, roofing) and, if need be, take all measures required for preventing injury of workers or other persons.

No one shall be allowed in the area directly under the roof construction during work on the roof. The danger area shall be protected and marked by placement of appropriate danger signs.

As regards roofs covered with fibre cement plates, thin sheet metal or similar roofing (industrial roofs) unable to sustain large loads (weight of workers, material and tools), reliable passages and working platforms shall be prepared prior to commencing the work. Areas safe for movement of workers shall be clearly marked.

In cleaning of snow and maintenance of the roof near light shafts, windows and other breakable surfaces, the employer shall provide for appropriate protection of such surfaces (covering with safety nets…).

Light shafts and windows with glass cover shall be raised above the roof level. All industrial roofs regardless of their shape and roofing type shall have reliable access to such spots.

Accesses, passages and working platforms shall be at least 60 cm wide and, if need be, have solid protective fence.

In case of short periods of work on the roof requiring plenty of movement, workers may be protected against sliding and falling only by personal protective equipment against falling. The danger area around the facility shall be protected against falling material.

*12.4.11.9.2 Falling objects*

Workers have to be protected against falling objects by collective measures whenever this is technically feasible.

Materials and working equipment must be placed or distributed so that they cannot fall down or tip over.

If necessary, roofed passages have to be provided on the construction site or access to dangerous areas prevented.

Work places which involve the danger of falling have to be fall-protected, namely: independently of the height, work places at passages and paths as well as above and next to water and substances where there is danger of drowning; more than 1 metre above ground at staircases, ramps, passages and work places next to machines; more than 2 metres above ground at all other work places; all openings and deepening in ground, mezzanine constructions, on roofs.

Regardless of the first paragraph of this item, protection need not be provided when workers are in terms of health capable of implementing works at height and carry out the following works:

- at the height of 5 metres, when preparing supporting scaffold of mezzanine plates with maximum 20° inclination;
- on the external (or opposite) side when constructing or concreting a wall up to 7 metres high above the terrain or ground. However, such work place where a worker stands and works has to have fall-protection behind the worker's back.

Implementation of works above work places is permitted only if adequate protection measures for all workers are provided.

### 12.4.11.10 Protection of work places at height

Falls from height have to be physically prevented by fencing all work places at height with a fence of sufficient height and strength having a border board on the lower part and a knee-high crossbar. The handrail has to be sufficiently strong. Fences can also be provided in some other suitable way.

Work at height may be carried out only with suitable equipment or by using safety devices, such as fences, platforms or safety nets.

If the use of this equipment or devices is not possible because of the nature of work, adequate safety has to be provided by other methods and means.

Fall-protection of work places at height can be provided by a safety fence, described as:

The safety fence has to be 100 cm high with ±5 cm tolerance, measured from the ground of work area. It has to be made of healthy and undamaged wood or other suitable material. The distance between the posts and the size of the posts and other elements of the fence must on the upper edge (rail) be suitable for horizontal load of at least 300 N/m. The distance between the horizontal elements of the safety fence (inside material) must not exceed 47 cm. At the bottom of the safety fence a full protection edge (board) has to be installed on the inner side of vertical posts at least 15 cm high. The lower protection edge is not needed in the fence on staircases, ramps and oblique passages.

Instead of the longitudinal filling of boards (knee protection) a grid may be used with maximum 2 cm x 2 cm openings on the entire height of the fence. In the case of longer safety fences and greater load (traffic, etc.) and fences at great heights, suitable plans and static calculations have to be made in advance.

Safety fence is considered safe even if it is produced differently, in accordance with Slovene, European or international standards, provided that this can be proved by suitable documentation.

If due to the nature of the works the safety fence needs to be removed from exposed edge, the workers at such work places have to be protected by safety belts and the work has to be carried out under the supervision of a qualified professional on the construction site. Such area has to be protected by a substitute parallel fence 1 to 3 m from the exposed edge. If the surface inclination is below 20, a signalling rope or chain with well visible flags 1 metre apart can be placed at least 2 m from the overhang edge. The signalling rope has to be 1.0 to 1.3 m high from the ground and attached to posts or other support so that the load from one field cannot be transferred onto another. The posts must not turn over or move across the surface at the load of 70 N at 1.0 m in height.

At all accesses and other places next to the rope warning signs have to be placed maximally 20 metres apart, prohibiting access, warning against fall and denoting obligatory use of safety belt.

If safety fence cannot be provided for technological reasons, the unprotected work place at height which requires protection according to item 6 should be protected by safety nets, safety scaffolds or the safety of workers has to be ensured in some other way (by personal protective equipment, etc.) in line with the provisions of the relevant standard. Safety nets have to be designed and installed in accordance with the SIST EN 1263 standard. Workers have to be prohibited from walking under the net or allowed to do so only in restricted scope, if there is danger of the falling material breaking through the net (protection of dangerous area under the net, installation of safety signs).

Before the commencement of works the manager of individual works has to check if the safety nets are suitably installed and the protection of the dangerous area adequate.

Openings in walls more than 2 m above the terrain with the parapet lower than 85 cm, have to be up to 100 cm above ground protected by safety fence.

Openings and passages in the ground, mezzanine constructions or roofs have to be, regardless of the dimensions of the opening or the depth of potential fall, protected by hard covers, consolidated in such manner than they cannot be moved.

Instead by a cover, an opening can be protected also by a safety fence.

When works are implemented on openings in walls which are more than 2 metres above the terrain, the workers have to be protected against fall by being attached by personal protective equipment.

#### 12.4.11.11 Works with carcinogenic and mutagenic substances

The European Parliament and Council Directive 2004/37/EC of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work (Official Journal, no. 229 dated 29 June 2004, p. 23), codified version, lays down the minimum requirements for ensuring safety and health of workers protecting them against risks arising from the exposure to carcinogens or mutagens and specifies minimum binding values for occupational exposure.

Work involving carcinogens and mutagenic substances is all activities during which workers are exposed or may be exposed to carcinogens and mutagenic substances while using, producing, warehousing, processing, modifying, decanting, mixing, disposing, destroying these substances and during similar activities. These works include also activities where, due to the conditions during procedures, carcinogens and mutagenic substances are released or created.

Carcinogens and mutagenic substances, preparations and processes are those which meet the criteria for classifying substances, preparations and processes on the classification, packaging and labelling of dangerous substances:

- Auramine production.
- Work involving exposure to polycyclic aromatic hydrocarbons present in coal soot, tar or pitch.
- Work involving exposure to dust, smoke, vapours or aerosols arising from roasting and electrolytic refining of copper-nickel compounds.
- Strong acid procedure for producing isopropyl alcohol.
- Work involving exposure to hard wood dust.

In road construction research is carried out about the workers' exposure to carcinogens and mutagenic substances in production and installation of asphalt mixtures. (European Asphalt Pavement Association; Health, Safety & Environment Committee).

During the implementation of works where there is the risk of exposure to particles of carcinogens and mutagenic substances, the employer has to establish the nature, level and duration of exposure in order to assess the risk for safety and health of workers and based thereon specify all the necessary safety measures.

When risk is estimated, all exposure paths have to be considered, and particular attention has to be devoted to carcinogens and mutagenic substances which more easily penetrate through skin and can lead to absorption of carcinogens and mutagenic substances into and/or through skin.

The employer has to pay special care to the assessment of risk of young, pregnant and nursing workers who may come into contact with carcinogens and mutagenic substances, taking into account the possibility of assigning these workers to such work places where they will not come into contact with carcinogens and mutagenic substances.

The employer has to provide for health supervision of workers who come into contact with carcinogens and mutagenic substances.

The employer has to inform the competent body thereof in writing 15 days before the carcinogenic or mutagenic substance starts being used.

The employer must provide for lower exposure of workers, namely:

1) The employer has to, if this is technically possible, replace and substitute the carcinogenic or mutagenic substance at work place with a substance, preparation or process which is under the conditions of use not dangerous or is less dangerous to safety and health of workers.
2) If a carcinogen or mutagenic substance cannot be technically replaced by a substance, preparation or process which is under the conditions of use not dangerous or is less dangerous to safety and health of workers, the employer must make sure that these substances are produced or used in a closed system.
4) The employer must ensure that at work place workers are not exposed to concentrations of carcinogenic or mutagenic substances in the air exceeding the maximum values specified in the regulations (Attachment III of the Rules on the Protection of Workers from the Risk Related to Exposure to Carcinogens and Mutagenic Substances).

For all works during which the use of carcinogenic or mutagenic substances cannot be avoided, the employer has to adopt and implement the following measures:

a) reduce the quantity of carcinogenic or mutagenic substances at work place to a minimum;
(b) reduce the number of workers exposed or potentially exposed to carcinogenic or mutagenic substances to a minimum;
(c) plan work procedures and technical control measures so that the release of carcinogenic or mutagenic substances into air at work place is prevented or reduced to a minimum;

d)* eliminate carcinogenic or mutagenic substances at source by introducing the local or general ventilation system, with all methods of elimination being suitable and compatible with the principles of protecting human health and the environment;

(e) use suitable established procedures for measuring concentrations of carcinogenic or mutagenic substances in the air at work place, especially for early detection of unusual exposure on account of unforeseen event or accident;

(f) use suitable work procedures and methods;

g implement collective safety measures and/or personal protective measures;

h) implement hygienic measures, such as regular cleaning of floors, walls and other surfaces;

(i) inform the workers;

j) mark dangerous areas by suitable warning and safety signs, including "no smoking" and "No consumption of food and drink is allowed" signs in the areas where workers may be exposed to carcinogenic or mutagenic substances;

k) prepare plans for taking measures in extreme cases, which are the consequence of unusually high exposure level;

l) ensure suitable equipment for safe storage, handling and transport of carcinogenic or mutagenic substances, especially the use of sealed, clearly and visibly marked containers of carcinogenic or mutagenic substances;

m) provide means enabling the workers to safely collect, store and dispose of waste as well as to provide sealed, clearly and visibly marked containers of carcinogenic or mutagenic substances, which have to be used at work.

If during work an unforeseen event or an accident occurs which could cause unusual exposure of workers to carcinogenic or mutagenic substances, the employer has to immediately inform the workers thereof. Until normal condition is fully reinstated and the causes of unusual exposure eliminated, the employer has to:

- ensure that only the workers truly necessary for repairs and other required tasks work in the affected area;
- provide workers working in the affected area protective clothes and personal protective equipment for the respiratory system as well as ensure that the workers also use it;
- ensure for every individual worker that their exposure to carcinogenic or mutagenic substances is not permanent and is of minimum duration;
- prohibit unprotected workers to work in the affected area.

During the implementation of certain works, e.g. maintenance, rehabilitation, demolition, control, repairs on machines, devices, instruments and facilities, during which workers' exposure is expected to be significantly higher and for which all technical preventive measures to reduce the exposure have already been implemented, the employer has to, after consulting with the workers or their representatives, set safety measures to reduce the duration of workers' exposure to a minimum and ensure safety and health of workers during the implementation of such works.

In accordance with the above paragraph the employer has to provide all exposed workers protective clothes and personal protective equipment for the respiratory system, which the workers must use throughout the exposure.

The duration of each worker's exposure must be restricted to a minimum.

The employer has to ensure that the access to the areas where the above stated works are implemented is provided only to suitably qualified and authorised personnel. These areas have to be clearly separated from other areas and suitably marked.

### 12.4.11.12 Works in the area of ionising radiation

Council Directive 2003/122/EURATOM of 22 December 2003 on the control of high-activity sealed radioactive sources and orphan sources (Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work (Sixth individual Directive within the meaning of Article 16(1) of Council Directive 89/391/EEC) (codified version) (Text with EEA relevance); Corrected by..304L0037R(01) define the minimum requirements on safety and health protection.

In addition to radioactivity in the environment, the workers are exposed to the danger of radiation during earthworks and mining works as well as measurements of density and moisture of the carriageway structure.

#### *12.4.11.12.1 Radioactivity in the environment*

We are exposed to natural radiation due to radioactive stone materials on Earth and due to radiation from space (cosmic rays). The existing data about external radiation and the concentration of radon in apartments and outdoors show that the bulk of radiation, approximately 50%, is accounted for by internal radiation caused by inhalation of radon and its progenies (1.2–1.5 mSv annually) in residential buildings. The intake of radioactivity by food and water represents about 0.4 mSv of the annual dose. Annual effective dose of outdoor radiation originating from radioactive soil, construction material in buildings and cosmic radiation in Slovenia totals 0.8-1.1 mSv.

#### *12.4.11.12.2 Earthworks and mining works*

Radioactivity exposure measurements in addition to radon emissions and liquid radioactive discharge include also measurements of specific activities of radionuclides of uranium-radium decay chain in the environment, including the measurements of radon and its short-lived progenies in the atmosphere as well as outdoor radiation measurement. When radionuclides of natural origin are measured, the impact of former mining (estimate of radioactivity increase in the environment) is based also on reference measurements at locations that are not influenced by mining emissions.

#### *12.4.11.12.3 Facilities and devices*

All operation of facilities and devices releasing radioactive substances into the environment is supervised. Radioactivity measurements in the environment are carried out even before regular operation, during it and for a certain time after the operation stops. It is established if the release activities were within the permitted limits and the radioactivity concentrations in the environment below the set maximum.

#### *12.4.11.12.4 Density measurements*

Measurements of density and moisture of carriageway construction are carried out by isotopic measuring devices of density and moisture, with integrated closed radiation sources. Measuring devices are used for controlling the implementation of the final carriageway layers (asphalting) and need to be relocated between individual measuring points.

The environment in the approximate vicinity of the measuring device is exposed to radiation. The danger zone is a circle around the measuring device with a 5 m radius. During the measurement, the access to the danger zone is strictly prohibited.

If the measuring device is damaged or breaks down, a detector has to be used to check for uncontrolled increase in radiation. If uncontrolled radiation appears, the radiation beam has to be directed towards the ground, the site physically fenced and the authorised service called for an intervention.

#### 12.4.11.13 Maintenance works

When workers are performing minor maintenance work or cleaning on the outer side of a tall building by hanging on ropes, such work is considered particularly dangerous hence only qualified workers capable in terms of health for work at heights shall perform such work. Such work shall not be carried out in adverse weather conditions. During work it is compulsory to use the combined protective-positioning work belt made in accordance with the regulations, and workers shall be fastened with a positioning rope and protected with a protective rope. Each rope shall be fastened to its own solid anchorage.

If the works are performed directly above or next to the traffic communication or the area where other activities are carried out, safety and health of passers-by have to be ensured. The area below the work site needs to be marked by a warning tape and suitable signs.

### *12.4.12 Installations, working devices and equipment*

Installations, machines and equipment, including manual tools, mechanically driven or not have to be:

- suitably designed and produced, taking into account ergonomic principles;
- maintained in good working condition;
- used exclusively for the work for which they are intended;
- operated only by suitably qualified staff.

Devices and equipment under pressure must be regularly checked and tested in accordance with the applicable regulations.

Installations for the distribution of energy on the construction site, especially those affected by external impacts, have to be regularly examined and maintained.

Electrical installations have to be made, repaired, maintained and removed only by qualified professional electro-technical engineers.

Prior to the start of work on the construction site the existing installations have to be identified, examined and clearly marked.

If possible, overhead electrical conductors have to be relocated outside the construction site or electrical current interrupted.

If this is not possible, safety barriers have to be installed, ensuring that vehicles and installations do not come into contact with overhead electrical conductors.

When vehicles have to drive under electrical lines, suitable warning signs and hanging protection boards must be installed.

All work equipment shall be examined, tested and be in perfect working condition prior to its allocation to the work site (construction site). Machinery may be operated only by workers being qualified in accordance with the regulations and which were previously informed and passed tests in relation to safe work.

The employer shall appoint the person in charge or the manager of individual works responsible for correct and professional placement and maintenance of work equipment at the construction site.

The devices for lifting and moving freely suspended loads (cable crane, building tower crane, tackles and other) and any auxiliary suspension devices shall comply with the prescribed requirements.

Building tower crane and crane lines must be set up according to the manufacturer's instructions for assembly and disassembly and under the supervision of a geomechanic.

The documentation of devices for lifting and carrying load has to be available on the construction site and needs to be kept until a device is disassembled.

The devices must be inspected by the manager of individual works

- before they start being used,
- later at regular intervals, at least once monthly,

- after any modification, after a longer period of non-use, after being exposed to poor weather or earthquakes or any other circumstances which could influence the stability and strength of the device.

All findings are entered in the device control list, signed by the responsible manager of works, geomechanic and safety and health at work coordinator.

Scaffolds may be set up, reshaped, upgraded and disassembled only under direct supervision of the managers of individual works (responsible person), who are in terms of health capable of implementing works at height.

As regards construction sites where movable lifting devices with hooks and other handling devices suspended on a steel rope are used for lifting and moving loads, the employer shall provide for safety of loads and workers in the danger area.

Transport devices in the form of containers may only be filled up to two thirds of their volume or up to the height marked on the container.

The danger area on the spot where loads are being lifted shall be fenced or marked by suspended loads and no access warning signs. Access to the danger area under the loading platform of the lift shall only be permitted to workers loading or unloading material.

The area of loading and unloading of loads for lifts on individual floors shall be appropriately protected to prevent workers falling from the floor.

In case of lifting of loads, protruding parts shall be removed throughout the length of the construction facility or guides preventing the load from getting stuck shall be placed.

Transport of persons with lifting devices for transporting loads shall only be permitted in extraordinary situations, namely:

- in case the placement, use or disassembly of means for access to the work site, such as stairs, elevators, ladders, lifting platforms or similar devices is impossible due to configuration of the work site or when ascending/descending by using such devices poses greater danger to workers;
- in case of work carried out over short time periods.

The following shall be provided with that regard:

- that persons shall be lifted and lowered only in specially manufactured equipment for personal transport (baskets);
- that safe entry and exit are provided for. The basket shall be stably placed on a bearing surface sufficiently large and protected to prevent any danger from workers falling.
- that the speed of the basket's movement is less than 0.5 m/s and the movement is without thrusts in any direction. No sharp or pointed objects shall be present in the basket during lifting/lowering of workers.
- that written instructions are prepared for safe transport of persons and that the lift's operator and users have been informed thereof.

No more than 4 persons shall be lifted/lowered in the basket simultaneously. Only 1 person may be in the basket mounted on a device for transporting concrete. Work from the basket may only be performed, if the worker is fastened to the stable part of the basket by a safety belt.

In stronger wind (gusts of wind exceeding 5 m/s), lifting/lowering shall not be carried out, the lifting in progress shall be stopped and the basket with workers shall be lowered to the ground at reduced speed.

Communication must be established between the lift operator and persons in the basket.

Prior to any transport of persons with lifting devices for transporting loads, the employer shall inform the Labour Inspectorate thereof.

The lift, which can be used for lifting/lowering workers in a basket, shall fulfil the following conditions:

It shall be placed on a solid and flat surface with inclination of less than 1%.

The lift shall be tested and examined prior to any transport of persons. The employer shall provide for periodical checkups to be carried out daily by the lift operator and regularly each month by authorised personnel of the employer in charge of checkups.

In case of any established defects or deficiencies the employer shall immediately stop transporting persons and re-examine the device after deficiencies have been eliminated.

Loading of the lift with the basket having the maximum number of persons shall not exceed one half of permitted loading in the entire area of the planned manoeuvre.

In case two lifts are placed so close together that their areas of operations overlap, one of both lifts shall be still during lifting/lowering of workers in the basket, with the handle turned away from the joint area of operations and both operators being present in the lift the whole time.

Lowering of the loading hook shall be carried out by a motorised drive. Lowering by means of gravity and regulating speed by using brakes only shall be prohibited.

The basket shall be manufactured in accordance with the regulations and previously tested as well as examined monthly and the employer shall keep the related documentation on the construction site.

The basket shall have a rope used for lifting of a ladder or rescue rope in case of unforeseen stopping of the lift. The rope's length shall be such that it reaches the ground when the basket is lifted to the highest possible position and shall have a weight at the end. Tear up strength of the rope shall be at least 10 kN.

Until no regulation exists with regard to baskets for transporting persons, the following conditions shall be fulfilled:

- The basket shall be designed and manufactured for five times the planned load and examined before use.
- It shall have the following clearly indicated:
  - name of the manufacturer
  - year of production
  - type
  - factory number
  - own weight
  - permitted load and the number of persons.

Fence of the basket shall be solid and at least 110 cm high, measured from the floor. Solid protective edge of height not less than 15 cm shall be placed above the floor, the basket shall be closed by a steel net or similar, where openings shall not be more than 2 cm x 2 cm. A round handle shall be placed 1 m above the floor. The cabin shall be free of any sharp edges and pointed parts of the construction.

Entry to the basket/platform/cabin must not open to the outside during lifting/lowering. Appropriate measures shall prevent unintentional opening of the door during lifting and lowering.

The basket's top shall be solid enough to protect workers from falling objects. There must be enough room under the top for the workers to be standing up.

The top over the basket is not required on the basket for transport of concrete with a worker present.

In one-sided loading of the basket with 1.5 useful load at 1/4 of the basket's length, the inclination shall not exceed $20^{o}$.

An anchorage shall be provided in the basket where a rope is fastened in case workers need to be evacuated (in case of breakdown of the lifting device).

### *12.4.13 Working platforms, ladders and scaffolds*

#### 12.4.13.1 Working platform

Working platform where work at height is carried out has to be stable and firm. It has to be made of elements that comply with the planned load and apply to scaffold floor as stipulated in SIST HD 1000 standard.

If boards are used for working platform, they have to be at least 4.8 cm think (planks) and no less than 20 cm wide, supported at less than every 250 cm. They have to be made of healthy and undamaged wood, without nails and other obstacles. The planks have to fit each other and be placed horizontally on solid supporting elements. If the planks are not placed on the same level, but rather one on top of the other, a triangular lath has to be attached to the joint, which enables carts to be pushed across and prevents workers tripping over. The planks must not extend over the final supporting element by less than 20 cm and more than 30 cm. In addition, they have to be secured so that they cannot move. Formwork panels must not be used for working platform.

The width of the working platform has to be adjusted to the nature of the work carried out on it, but must not be less than 60 cm, if the work does not involve stacking or preparing of material. If material is laid or prepared on the working platform or auxiliary elements are laid on it, it has to be so wide that a worker has at least 30 cm of free space for movement.

If the working platform next to the wall of the facility is more than 100 cm above the ground or the floor of the premises, its edge can be no more than 30 cm away from the wall. If it is farther from the wall or if the wall of the facility has large openings, the safety of workers has to be provided according to the measures applying to protection of work places at height or otherwise.

Platform elements on the scaffold (boards, sheet metal plates and other) have to be carefully inspected before use.

Damaged or worn out elements must not be installed.

Special care is required when construction material and heavy construction elements are moved, transported and stacked on the working platforms. The material has to be properly stacked on the working platform and arranged so that it does not exceed the planned load. Working platform has to be regularly inspected and maintained, and the waste material promptly removed.

**Ladders**

Ladders have to be strong enough and suitably maintained.

They have to be used carefully, at suitable locations and in accordance with their intended use.

Ladders can be used for accessing a work place at height only if the height difference between bridged levels is less than 5 m;

- access is needed only for implementing short-term works;
- for access to the facade scaffold and under the condition that the ladders are installed within scaffold construction;
- if a ramp or staircase cannot be provided for access to excavations and shafts due to technical reasons.

Portable ladders have to be made in accordance with the requirements of the standard SIST EN 131. Before used, they have to be checked and in perfect condition.

When used, ladders have to be placed firmly, so that they cannot skid, break or turn over.

Portable single ladders used by workers to access wall edges, scaffolds, openings in the ground, pits, shafts and similar, have to be of suitable length, so that they extend at least 1 m over the structure against which they are leaned. The lean angel has to be between 65° and 75°.

Ladders must not be leaned against wedges (at the corners of buildings or poles).

Ladders can be used only for short-term works that do not require great press force of the worker and when only light hand tools and a small quantity of material are used, which cannot additionally endanger the safety and health of workers. The worker has to be standing with both legs on one step. If there is no fall-protection (without the worker being fastened) works can be implemented only up to 3 metres high. Maximum permitted length of portable single ladders used for works is 8 m, and that of double (A) ladders 3 metres.

**Scaffolds**

Scaffolds are auxiliary constructions intended for construction works at height.

Scaffolds have to be produced and set up according to the plans, which define:

- the size of the scaffold and all its elements,
- the means for joining the elements of the scaffold,
- the method of attaching the scaffold to a facility or ground,
- maximum permitted load,
- types of material and its quality,
- statistical calculation of bearing elements and
- assembly and disassembly instructions.

When a scaffold is designed, the requirements of the SIST HD 1000 standard have to be considered.

For standard scaffolds with a statement on scaffold compliance with the requirements of the SIST HD 1000 standard suitable documentation has to be provided as required by the standard. This documentation has to present the set up of elements, anchorage or support so as to prevent turning over as well as state the permitted loan and the method of assembly and disassembly.

The documentation about the scaffolds has to be available on the construction site and kept until the scaffold is disassembled.

The scaffolds must be inspected by the manager of individual works

- before they start being used,
- later at regular intervals, at least once monthly,
- after any modification, after a longer period of non-use, after being exposed to poor weather or earthquakes or any other circumstances which could influence the stability and strength of the scaffold.

All findings are entered in the scaffold control list, signed by the responsible manager of works and safety and health at work coordinator.

Scaffolds may be set up, reshaped, upgraded and disassembled only under direct supervision of the managers of individual works (responsible person), who are in terms of health capable of implementing works at height.

If the setting up of the scaffold is hindered by unisolated electrical lines or other obstacles, it has to be postponed, until the danger of electrical current is eliminated and other obstacles removed.

The working platform (floor) of the scaffold has to be produced according to the requirements applying to working platforms. The working platform must not be more than 30 cm away from the wall of the facility, unless when this cannot be avoided due to work technology and other form of fall-protection is provided for workers between the facility

and the scaffold (by safety fence, by no more than 3 metres lower safety scaffold reaching to the wall, by fastening workers or in some other manner).

The platform elements have to completely fill in the space between the supporting posts of the scaffold.

Safety fences on scaffolds have to be made in accordance with the requirements applying to fences.

A reliable access (or descent) has to lead to every level of the scaffold. If on the scaffold ladders are used for access, their upper pats have to be attached.

The height of the work place in the scaffold that is less than 100 cm wide must not be raised by means of trestle or ladder scaffold or some other auxiliary construction being placed on the working platform of the scaffold.

If the scaffold is placed next to connection or adjoining facility, protection has to be provided in accordance with the requirements applying to scaffolds being set up next to connection or adjoining facility. If scaffold is protected by a safety net placed on it, the material used must not cause any danger for the scaffold turning over or falling down and has to be self-extinguishing. Impervious sheeting may be used for protecting the scaffold only when this is necessary due to the nature of work (removal of asbestos material, etc.), while the stability of such a scaffold (and sheeting) has to be proved by means of a computer.

The sheeting has to be made of self-extinguishing material as well.

#### *12.4.13.1.1 Trestle scaffold*

Works may be implemented also on trestle scaffolds up to 2 m high. The working platform of such scaffolds has to be at least 80 cm wide and made in accordance with the requirements applying to working platforms. The safety fence need not be installed nor the documentation provided, with the exception of manufacturing instructions. Before the trestle scaffold is used, the adequacy of scaffold implementation has to be checked by the manager of individual works or some other responsible person of the employer.

The trestle on which the working platform is placed, has to be produced in such a way that it resist the planned horizontal and longitudinal load. The trestles must not be extended, not even by inserting construction material under them. The distance between the trestles must not exceed 200 cm.

Trestles can be placed only on solid and flat surface. Improperly produced or damaged trestles must not be used. Trestle scaffolds must not be placed on the working platform of other scaffolds.

No digital devices or other heavy devices may be placed on the working platform of a trestle scaffold, unless the statistical calculation and project prove that this is possible.

#### *12.4.13.1.2 Metal scaffolds*

In terms of shape, size and quality of material the pipes of metal scaffolds have to comply with the SIST EN 1039 standard requirements, and the connecting and supporting elements with the SIST EN 74 standard.

Metal scaffolds can be constructed only of flat and undamaged steel pipes, rods and other elements.

The components of the metal scaffolds (steel rods, pipes, joints and other) have to be firmly fastened into a stable and uniform construction unit.

Horizontal supporting rods of the metal scaffold have to be placed vertically to special elements (supports, drags), and these onto a flat surface (main supporting element, concrete plates and other).

When clamps with screws are assembled, the screws have to be attached by torque wrenches according to the instructions of the manufacturer.

Self-standing metal scaffolds and metal scaffolds higher than the facility under construction or some other facility in the approximate vicinity have to be grounded according to the applicable regulations.

#### *12.4.13.1.3 Timber scaffolds*

Timber scaffolds are permitted only for the implementation of easier works at the height up to 10 metres measured from the ground.

The diameter of the round wooden pole on the thinner part must not be less than 8 cm. The poles have to be placed on such surface that they cannot move horizontally nor vertically. The poles must not be extended. When to scaffolds are assembled on the corner of a facility under construction, the corner pole on the outer side of the scaffold has to be doubled and, if necessary, dug into the ground. All vertical poles have to be connected also by diagonal attachments.

The distance between vertical poles of the scaffold must not be greater than 250 cm and it has to correspond to the size of the poles and the planned scaffold load. Longitudinal beams have to be installed horizontally next to the poles and well attached to them. The joints of extensions and the connections with the longitudinal beams can be installed only above the poles or on supports placed over the poles. The transversal scaffold supports must have equal cross-section and have to be installed on longitudinal supports equally distanced. Transversal supports must not be replaced by boards.

#### *12.4.13.1.4 Safety (fall arrest) scaffolds*

Safety scaffolds can be used for fall protection of workers only when the safety fence cannot be installed at work places. They have to be erected as close to the work place or overhang as possible, but not lower than 3 metres.

The width of the safety scaffold depends on the vertical distance between the overhang and the scaffold and should, when the distance is up to 200 cm or up to 300 cm, equal at least 130 cm or 150 cm respectively. The lower protective edge of the safety fence of the scaffold has to be full and at least 50 cm high.

#### *12.4.13.1.5 Bracket scaffolds*

Bracket scaffolds can be installed only for less demanding construction works, if they can be safely attached to the facility or its construction and if this is proved by sketches and calculations.

The maximum overhang of the bracket scaffold used as a working scaffold can be 150 cm. Bracket scaffolds with an overhang up to 3 m can be used only as protective constructions for intercepting material above the facility entrances and passages.

Bracket scaffolds may be anchored only into supporting reinforced concrete elements (plate, wall, pillar). Anchorage may be carried out only by means of standardised steel anchoring elements. Only in exceptional cases anchorage is permitted by double loops made of steel reinforcement bars at least 8 mm in cross-section.

Boards (planks) must not be used for supports of the bracket scaffold.

#### *12.4.13.1.6 Movable scaffolds*

Movable (transportable) scaffolds can be used only on supporting and flat horizontal surface. They have to be manufactured in accordance with the SIST HD 1004 standard. The instructions for assembling and using the scaffolds have to be prepared in line with the SIST EN 1298 standard requirements and available on the construction site throughout the period during which the scaffolds are used. The scaffold has to be assembled and used completely in accordance with the instructions, so that undesirable movements, falling down or turning over cannot occur.

Workers may ascend and implements works on the movable scaffold only when the scaffold is protected against movement. If the scaffold is accessed by ladders installed in

the side element of the scaffold, the workers may ascend it only on the inner side of the scaffold. The use of movable single ladders for accessing the scaffold is prohibited.

When the scaffold is moved, it has to be free of persons, material or working equipment.

*12.4.13.1.7 Overhead protection*

Entrances, passages and paths around the facility under construction have to be protected against the material which could fall from height by overhead protection. They have to be manufactured in such a way that they can hold the fallen material and prevent the material from bouncing off and spreading over the surrounding area.

Overhead protection at construction site must not be less than 220 cm and more than 600 cm above the ground. Wooden construction of overhead protection which is not standard has to be made of two perpendicular layers of boards with a full vertical protection on the edges at least 50 cm high.

The material that falls on the safety scaffold has to be promptly removed.

*12.4.13.1.8 Supporting scaffolds and panelling*

Supporting scaffolds are used for concrete, reinforced concrete and similar massive constructions (scaffolds supporting panelling). The support structures of these scaffolds have to be made of metal. The quality of material used for producing supporting scaffolds has to comply with the standards and the provisions contained herein. Telescopic support members with adjustable length and safety elements for fixing the set element length have to be manufactured according to the SIST EN 1065 standard.

Notwithstanding the previous item, wooden support members may be exceptionally used up to the height of 3 metres. They have to be made of a single piece of healthy wood, with the smallest cross-section equalling 8 cm x 8 cm. They have to be inspected before use. Moreover, they have to be firmly attached on both sides so that any movement is prevented. The support members can be installed no more than up to the height of 10 cm, using wooden or steel elements.

Before the supporting scaffolds start being erected, the ground load capacity has to be checked.

Before use, the installed scaffolds have to be inspected by a person in charge of professional supervision over construction, while during use and work implementation they have to be examined by the manager in charge of individual works appointed by the employer.

The panelling must not be removed and the supporting scaffold disassembled without a written instruction of a person in charge of professional supervision over construction. The supporting scaffold has to be disassembled according to the manufacturer's instructions. When the wooden support members of the panelling are disassembled, safety support members have to be installed for protection against potential falldown as stipulated in the scaffold project.

*12.4.13.1.9 Hanging scaffolds*

Hanging scaffolds can be used in accordance with the regulations and instructions of the manufacturer, provided they are manufactured, assembled, tested and inspected according to the requirements of the SIST EN 1808 standard. When working on hanging scaffolds the workers have to be attached to the scaffold by special personal fall arrest equipment.

### *12.4.14 Protection against fire on the construction site*

#### 12.4.14.1 Introduction

Fire safety on the construction site is directly or indirectly regulated by Council Directive 92/57/EEC (the eighth specific Directive pursuant to Article 16(1) of the Directive 89/391(EEC) and the standards published by the European and international technical

committees: CEN/TC 72 (O), CEN/TC 191 (O), ISO/TC 21 (O), ISO/TC 21/SC 8 (O), CEN/TC 127 (O), CEN/TC 166, ISO/TC 92 (O), ISO/TC 92/SC 1 (O), ISO/TC 92/SC 2 (O), ISO/TC 92/SC 3 (O), ISO/TC 92/SC 4 (O)

International classification:

13.220 Protection against fire

13.220.01 Protection against fire in general

13.220.10 Fire-fighting

13.220.20 Fire protection

13.220.40 Ignitability and burning behaviour of materials and products

13.220.50 Fire-resistance of building materials and elements

13.220.99 Other standards related to fire protection

### 12.4.14.2 Fire Safety Study for construction site

*12.4.14.2.1 Fire Risk Evaluation*

The basis for specifying the required fire safety measures on construction sites is the fire risk evaluation.

The factors increasing fire risk are the following:

- Properties and quantity of combustible construction material;
- Properties and quantity of other combustible substances (inflammable liquids, gases and highly flammable solid substances);
- Improvised storing of inflammable liquids, gases and highly flammable solid substances
- Improvised installations;
- Improvised temporary facilities and premises;
- Improvised executed work and work procedures;
- "Implemented and unimplemented" fire safety measures, such as evacuation routes, fire separations, fire detectors and alarm devices, devices for initial fire extinguishing (fire extinguishers, indoor hydrants), automatic fire-fighting equipment, water supply, outdoor hydrants and access routes for fire-fighting vehicles, etc.;
- Permanent presence of a large number of workers and visitors on the site, which are not familiar enough with the construction site or the planned safety measures.

*12.4.14.2.2 Fire Hazardous Material and Fire Hazardous Work*

There are usually large or small quantities of fire hazardous material on the construction site, e.g.:

- Highly flammable solid substances (construction material: shavings, wood, plastic, foamed insulation material (Styrofoam, PU foam), packaging material: cardboard, foil, wood pallets and internal decoration elements, etc.);
- Inflammable liquids (automotive fuels, paints, diluents, solvents, cleaning agents, etc.);
- Inflammable gases (acetylene for welding, UNP, heating gas, etc.).

Fire hazardous work includes:

- Hot works such as welding, soldering, cutting and buffing of metal and other elements;
- Storage and decanting of inflammable gases, inflammable liquids and highly flammable solid substances;
- Cleaning with organic diluents;
- Painting and lacquering;

- Placement of combustible heat insulation and roof coverings;
- Use of electrical and gas devices in temporary facilities and in improvised conditions;
- Other fire hazardous work.

*12.4.14.2.3 Potential Ignition Sources*

The following potential ignition sources exist as a result of:

- Hot works such as welding, soldering, cutting and buffing of metal and other elements;
- Defects on electrical installations and devices;
- Incompliance with the Fire Code;
- Smoking and cigarette butts;
- Wilful fire-raising.

The possibility of ignition due to the following reasons should also be taken into account:

- Fire on adjacent buildings – emission, flying particles;
- Fire in natural environment.

### 12.4.14.3 Fire Protection Measures

*12.4.14.3.1 Construction-technical fire protection measures*

Construction-technical fire protection measures on construction sites include:

1) Evacuation routes;
2) Division of the construction site to fire sectors;
3) Protection of steel structural elements;
4) Devices for protection against lightning;
5) Automatic fire detectors;
6) Water supply – connection to the public water supply system or pools;
7) Indoor hydrants;
8) Outdoor hydrant network and outdoor hydrants;
9) Automatic fire-fighting equipment;
10) Unhindered and safe access for fire fighting and rescue, access routes for fire-fighting vehicles.

*12.4.14.3.2 Fire extinguishing equipment*

Depending on characteristics of the construction site, dimensions and use of premises, the equipment on the construction site, the physical and chemical properties of the substances present and the maximum potential number of people present, the construction site must be equipped with appropriate fire-fighting equipment and, as necessary, with fire detectors systems.

Fire-fighting equipment, fire detectors and alarm systems should be regularly checked and maintained.

Checkups and testing of the devices referred to in the first paragraph hereunder should be carried out in the prescribed periods.

Non-installed fire-fighting equipment must be easily accessible and simple to use.

The equipment referred to in the first paragraph hereunder shall be marked in line with the Rules Governing Safety and Health Signs at Work.

Signs/markings shall be sufficiently resistant and placed on appropriate positions.

The equipment and its placement shall be in line with the fire risk evaluation and provisions of the applicable rules, standards and guidelines for placement of fire extinguishers.

*12.4.14.3.3 Protection against wilful fire-raising*

Measures preventing wilful fire-raising shall be in place in all construction sites. The measures used for prevention of wilful fire-raising include:

- Lighting of the construction site;
- Use of video surveillance with cameras;
- Permanent 24-hour control by a security guard.

The requirements should always take into account the fire risk evaluation with regard to the possibility of wilful fire-raising and provisions of guidelines for preventing wilful fire-raising.

*12.4.14.3.4 Placement and construction of temporary facilities*

Placement and construction of temporary facilities with devices for heating, cooking and other actions with fire risk shall be specified for the construction site. Particular attention should be given to the following:

- Distance from the construction site;
- Fire resistance of external walls and ceilings of these temporary facilities;
- Installations;
- Electrical and gas devices in these temporary facilities;
- 24-hour security supervision of temporary facilities.

The requirements should take into account results of the fire risk evaluation and provisions of applicable rules ,standards and guidelines related to protection against fire.

*12.4.14.3.5 Storing of inflammable liquids and gases*

The method and implementation of temporary storage should be specified as regards construction sites:

- Inflammable liquids: diesel fuel, heating oil, paints, lacquers, diluents, solvents, cleaning agents;
- Inflammable gases: UNP, acetylene, etc.;
- Highly flammable solid substances: cardboard, foil, foam insulation materials, etc.

The requirements should take into account the type, quantity, and properties of fire and explosion hazardous material and provisions of applicable rules, standards, and guidelines for storing, decanting and use of inflammable liquids, gases and solid substances.

*12.4.14.3.6 Implementation of power supply, and electrical and gas installations*

Implementation of the following shall be specified for construction sites:

- Electrical installations and devices;
- Gas installations and devices.

The requirements should take into account results of the fire risk evaluation with regard to the risk of ignition and explosion hazard zones, and provisions of applicable rules ,standards and guidelines related to protection against fire with regard to electrical and gas installations.

*12.4.14.3.7 Execution of hot works*

The method and procedure of hot works should be specified as regards construction sites. These hot works include:

- Welding;
- Soldering;
- Cutting and buffing of metal material;
- Heating of and heating by solid, liquid and gaseous fuels;
- Hearths and burning;
- Other hot works.

The requirements should take into account the planned implementation work, envisaged construction materials, results of the fire risk evaluation and provisions of applicable rules, standards and guidelines related to execution of hot works.

*12.4.14.3.8 Inflammable waste handling*

The method of collection, disposal and removal of waste resulting from construction should be specified for construction sites.

The requirements should take into account the type, quantity and properties of expected waste, results of the fire risk evaluation and provisions of applicable rules, standards and guidelines related to fire safety and protection of the environment.

*12.4.14.3.9 Procedures in case of fire*

The following shall be specified for construction sites:

- The person responsible for fire safety on the construction site;
- Activities and procedures regarding fire prevention on the construction site;
- Activities and procedures in case of fire on the construction site;
- Fire-fighting plan in case of fire on the construction site;
- Control of the fire's impact on surroundings.

Implementation of aforementioned tasks should take into account the following: results of the fire and explosion risk evaluation, the envisaged fire scenario and provisions of applicable rules, standards and guidelines.

*12.4.14.3.10 Fire safety rules*

The local decree on fire safety rules shall be adopted. The minimal content of rule is submitted in local language issue of this guideline.

### *12.4.15 Description of used construction technologies*

The designer shall in all stages of project planning and preparation take into account the basic principles of safety and health at work as specified in the Occupational Health and Safety Act, and notably as regards the following:

- Deciding on architectural, technical, technological and/or organisational aspects, in order to be able to plan various items or work stages, to be implemented simultaneously or consecutively;
- Determining the time required for finishing such work or work stages.

### *12.4.16 Additional Traffic Volumes on Existing Roads and interaction with other industry*

Construction of new roads and service facilities results in additional traffic volumes on the existing road network. This network is in accordance with the Public Roads Act either state or municipal. The Roads Directorate manages main (major) and regional roads, while lower-level roads are managed by municipalities (local roads, public paths and urban roads) or other entities, depending on the road's purpose. Increased traffic results in negative impact on the environment and human health as well as safety of road users.

The Public Roads Act specifies that an additional duty, beside the annual road-use fee, is paid for extraordinary road transports and excessive use of public roads. The excessive use of a public road occurs when the temporary or permanent volume resulting from implementation of the investment, exceeds 50% of all transport on the road in question. The proportion of the transport is determined in the average annual daily traffic of freight vehicles with capacity of more than 10 tonnes. The excessive road user is a natural person or legal entity carrying out the investment causing the excessive volumes. In order to determine the impact on the road/roads with excessive volumes, a special study is required to determine and then implement the physical measures.

In order to establish negative impacts on the environment, resulting from increased traffic, the safety plan should determine the following:

- Volume of increased traffic and its time dynamics;
- Noise impact, notably in urban areas;
- Impact on surface and underground water;
- Impact on air quality, notably in urban areas;
- Impact on flora and fauna;
- Impact on safety of people.

In accordance with the study on negative impacts on the environment and human health due to increased traffic on the existing road network, active or passive protective measures for reducing negative impacts should be envisaged. Provisions of the Environmental Protection Act, allowing temporary excessive pollution of the environment with consent of the Ministry of the Environment and Spatial Planning and by informing the local community, can be used. If the case in question involves an area of protected natural heritage or endangerment of human health, the permit can only be issued with the consent of the competent ministry. Such permit cannot be obtained if pollution of the environment causes critical pollution of the environment.

The following measures are possible for reducing the negative impact on health and lives of people due to increased traffic:

- Active or passive noise protection;
- Putting new asphalt coating on the roadway;
- Arrangement of pavements and cyclist ways in urban areas;
- Using vehicles with reduced emissions of exhaust gases in the air;
- Placing appropriate traffic signs.

### *12.4.17 Coordinating the time table of construction and measures related to safety and health*

The timetable of construction work with specified work/measures for protection of health is used by the designer, supervisor and coordinator for the following purposes:

- Coordination and control of implementation of basic principles of safety and health at work between the employer, sole proprietors and companies in the area of or adjacent to the construction site;
- Adopting decisions on technical and organisational aspects in planning of individual work stages;
- when setting deadlines necessary for safe completion of individual phases of work carried out at the same time or successively;
- Prompt adapting of the actual time of construction work, used for various types of work or work stages;
- Consultation and cooperation with workers.

### *12.4.18 Joint provisions for measures of health and safety at work*

Prior to commencement of work, the selected and appointed contractors conclude an agreement in writing on joint measures related to safety at work.

In case of simultaneous work, the joint measures are possible as regards the following tasks:

- Supplements to the safety plan;
- Organisation of construction site security in view of the surrounding area
- Arrangement of entry to the construction site;
- Construction, equipment and maintenance of public utility, dwelling and sanitary facilities on the construction site;
- Arrangement of transport routes;
- Work scaffolds and devices;
- Installation and maintenance of protective gear of machines;

- Power supply installations and lighting of the construction site;
- Warning signs on the construction site (work on heights, obligatory wearing of protective helmet);
- Premises and equipment for first aid;
- Purchase and installation of fire extinguishers and organisation of fire guard;
- Performing checkups and tests of work equipment and electromeasurements prior to commencing work;
- Special refuse treatment;
- Organising food and water supply;
- Arranging premises for the engineer and supervisor.

The joint safety measures are entered in the Construction Site Code.

### *12.4.19 Mutual informing*

Employers (contractors and subcontractors) shall review the safety plan prior to commencement of work. Any proposals on changes prior and during work shall be coordinated with the work coordinator.

The responsible site manager shall introduce subcontractors and outsourced contractors into work prior to its commencement.

Workers shall also be informed on all measures for providing safety and health.

Competent persons of contractors on the construction site shall daily or as need be agree on the method of work implementation and safety measures and enter them in the control logbook of measures.

The control logbook of measures shall be set up by the competent coordinator of the Client in charge of coordination and implementation of safe work and protection against fire on the construction site. The logbook of measures is also the register of all agreements between employers on the construction site.

Contractors for individual work/technological stages shall comply with the overall timetable for works.

Contractors shall comply with the instructions provided by coordinators. The site manager and the coordinator may:

- Require reports from responsible persons of contractors with regard to implemented safety and fire safety measures.
- Require from responsible persons of contractors to enter the agreed safety measures in the logbook of measures and to sign the logbook.
- Stop the work if workers of a particular contractor fail to implement the measures and if such conduct could endanger health and lives of workers or material damage could be the result.
- Review safety plans of employers on the construction site.
- Supervise the implementation of measures and instructions.

The prescribed documentation to be had by each employer on the construction site is the following:

Data on workers:

- Decision on employment including data on professional qualifications;
- Medical certificate on the ability to perform the work in question;
- Certificate on passed exam from safety at work and protection against fire.

Data on employers (contractors):

- Outsourcing contract;
- Signed agreement on joint safety and fire safety measures;
- Crafts licence or the document of company registration;

- Contracts of employment;
- Certificate of medical and disability insurance;
- Work and residence permit for foreign nationals.

Data on machinery:

- Reports on tests and checkups of machinery;
- Safety certificate or statement of the supplier for imported machinery.

### *12.4.20 Construction rules*

#### 12.4.20.1 Red na gradilištu

The construction rules are an abstract of measures and rules related to safety and health protection on the construction site. It is primarily intended for employed staff. The minimum contents of the construction rules consist of the following:

1. Each employee shall perform the work with due care so that his work poses no threat to his own or his fellow co-worker's health and life.
2. The employee shall be physically and mentally capable of performing his work. The employee shall come to work rested and sober, and shall not consume alcohol or other narcotic substances during working hours.
3. The employee shall use the prescribed protective equipment.
4. The employee shall undergo a medical examination upon beginning of the job or upon transfer to another work area. The employee may only perform the work if his health condition, notably his senses, has been deemed adequate for performing the job in question.
5. Work can be performed only by the employee with the appropriate vocational education and passed exam on knowledge of measures for health protection as well as the general and fire safety.
6. The employee can only perform the job he has been assigned to and use only the machinery and tools prescribed for the job in question.
7. The work shall be performed in line with the prescribed regime by using machinery and tools in perfect technical condition.
8. Hazardous work shall be performed only under direct supervision of the work manager.
9. All work shall be coordinated.
10. Fire guard shall be provided during performing work with fire risk. Call the Information Centre on **XXX** in case of an initial fire.
11. The employee shall prior to commencement of the work check whether the work and protective equipment is in perfect condition.
12. The employee shall forthwith report any defect on machinery or tools to the work manager and the coordinator.
13. The employee shall be prohibited from repairing by himself any machinery for which properly trained employees are responsible.
14. In case not all measures related to safety and health at work are implemented, the employee shall have the right and duty to refuse to work on such work post.
15. During operation of machinery it is prohibited to remove the protective equipment, perform any measurements, cleaning except lubrication, if the machine is designed in such a way that the lubrication procedure excludes any danger.
16. The engine of the machine shall be turned off after sudden interruption in power supply, each time the worker distances from the work post and at the end of working hours.

17. Leaning on and bending over the machine or distancing of the worker from the machine while the machine is operating, shall be prohibited.
18. Manual transfer of loads shall only be allowed to workers informed on the instructions on health-friendly handling
19. The worker shall report any injury or sick leave to his supervisor, who shall carry out the prescribed first aid measures and fill the appropriate forms.
20. Until the accident has been investigated, the scene of the accident shall be left as it is unless this could result in further accidents or material damage.
21. The work post shall be clean and tidy. Non-hazardous waste shall be deposited to waste baskets and containers.
22. Construction waste shall be managed in accordance with instructions prepared in line with the Rules on the Management of Waste Generated by Construction Activities.
23. Laying off clothes and footwear on the work post shall be prohibited. Dressing rooms are used for that purpose.
24. The safety fence around the construction site and arrangement of blockade of the entry shall be undamaged and impassable.
25. Only employees may enter the construction site. Other visitors can only move around the construction site under supervision of the work manager and the safety and health at work coordinator.

### *12.4.21 Works inventory*

The Works Inventory with estimated costs of the construction site arrangement and implementation of joint measures for providing safety and health at work on the construction site is used by the contractor – bidder for the purpose of accurately and correctly taking into account the costs in the bid pro-forma invoice. Usually the Client specifies in the instructions to bidders where and how these costs should be taken into account.

In case there are several contractors on the construction site, they can use the cost estimate to equitably divide the costs of construction site arrangement and implementation of joint measures for providing safety and health at work on the construction site.

## 12.5 ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

### *12.5.1 Noise Impact on Natural and Living Environment and Mitigation Measures*

SF has to provide for:

- Characteristics of machines and the noise emitted at full loading of the engine, when working separately or as a group;
- Use of machinery with minimum noise pollution of the environment;
- Work only during daytime, if noise levels are exceeded at night;
- Use of communications for supply and removal notably outside populated areas;
- Required passive measures for affected facilities;
- Required active protective measures (if possible in combination with the final measures for traffic, if any).

#### 12.5.1.1 Plan of Noise Monitoring During Construction

Open or covered construction site is deemed as the source of noise.

**The plan of monitoring** of noise during the construction includes in addition to the general part of the project also the following data and annexes:

- Level(s) of the area's sensitivity;
- Limit values of noise with regard to underlying areas;
- Data on zero state measurements carried out as a part of the EIA. If such measurements do not exist, they should be included in the monitoring project; Selection of measurement points shall be made with regard to the assessment of the entity preparing the project on dangers to the environment;
- Locations and description of buildings to be subject to monitoring, and their purpose as well as distance;
- Timetable of measurements, depending on the timetable of work implementation; Measurements during the maximum intensity of work shall be provided for.
- Implementation method of measurements;
- Preparing of reports and list of institutions to which reports are sent and addresses of these institutions;
- Graphic enclosure – plan in 1:5000 scale showing isophonic lines of the zero state, buildings subject to monitoring and the road's layout / road body;
- The report shall include all the required data and results as specified in the *Rules*
- Name of the competent person of the investor (or the contractor, depending on the contractual obligation) responsible for implementing the monitoring plan;
- Other data and provisions relevant for the correct monitoring implementation.

The monitoring plan shall be prepared by a company or individual qualified in that respect and having the licence from the Ministry of the Environment.

**The SF on noise measurements during construction** shall include the following data:

- Entity implementing measurements;
- Responsible entity and its activities;
- Main technical characteristics of the noise source;
- Operational condition of the noise source during measurements;
- Used criteria for noise;
- Meteorological conditions at the time of measurements;
- Immission point and the time of measurements;
- Measurement and calculation of the equivalent noise level method;

- Measurement of the peak, daytime and night time noise levels, and the background level;
- Values of noise measurements with regard to the prescribed limit values.

The person responsible for monitoring during construction in accordance with the project shall on the basis of findings specified in the report on implemented measurements adopt measures for reducing noise emissions on the construction site.

The monitoring plan and the report containing measurement results shall be submitted to:

- Ministry of the Environment and Spatial Planning;
- Environmental Protection Inspectorate;
- Health Inspectorate.

### *12.5.2 Construction's Impact on the Atmosphere and Mitigation Measures for Excessive Emissions*

The SF shall envisage the required measures for reducing negative impacts of construction on the environment. These are related to the used machinery and transport vehicles and to devices installed in temporary facilities on the construction site. The possible measures are specified in the general part hereunder, but they depend on the conditions during the construction and on the nature of work. A textual description of measures and condition for implementation thereof with the name of the responsible person and individuals will suffice.

#### 12.5.2.1 Plan of Monitoring of Air During Construction

**The plan of monitoring** of air pollution during the construction includes in addition to the general part of the project also the following data and annexes:

- Data on zero state measurements carried out as a part of the EIA. If such measurements do not exist, they should be included in the monitoring project; Selection of measurement points shall be made with regard to the assessment of the entity preparing the project on dangers to the environment;
- Locations and description of buildings to be subject to monitoring, and their purpose as well as distance;
- Timetable of measurements, depending on the timetable of work implementation; Measurements during the maximum intensity of work shall be provided for.
- Measurements method, the methodology is not prescribed by Slovene regulations;
- Preparing of reports and list of institutions to which reports are sent and addresses of these institutions;
- Graphic enclosure – plan in 1:5000 scale showing locations of the buildings where the zero state is to be measured, buildings subject to monitoring and the road's layout / road body.

The monitoring plan shall be prepared by a company or individual qualified in that respect and having the licence from the Ministry of the Environment.

**The report** shall include all necessary data and results as specified in:

- Name of the competent person of the investor (or the contractor, depending on the contractual obligation) responsible for implementing the Monitoring Project;
- Other data and provisions relevant for the correct monitoring implementation.

The monitoring plan and the measurements report shall be submitted to the Ministry of the Environment and Spatial Planning within 3 months following the conclusion of the measurements.

### *12.5.3 Construction's Impact on Surface Water*

The SF shall analyse risks, which could have a negative impact on the quality of the watercourse and its erosion stability, which are mentioned in the general part and envisage the measures required to reduce such negative impacts. These include primarily

technical measures reducing the risk of mechanical, chemical and bacteriological pollution of water.

Special attention shall be given to those activities, which are potential sources of pollution (transport and pouring of fuel, storage of dangerous substances and mineral oils, parking spaces for machinery and vehicles, work above water on bridging structures, etc.).

In case the wastewater is polluted in excess of the limit values of parameters for wastewater to be released directly in watercourses or sewage system, such water shall be by technical or chemical measures cleaned to the required level prior to its release in the watercourse (sumps).

Limits for individual areas resulting from local (municipal) ordinances on protection areas for drinking water shall also be taken into account.

#### 12.5.3.1 Monitoring Plan for Surface Waters

**The plan of monitoring** of surface water pollution during the construction includes in addition to the general part of the project also the following data and annexes:

- Data on zero state measurements carried out as a part of the EIA. If such measurements do not exist, they should be included in the monitoring project; Selection of measurement points shall be made with regard to the assessment of the entity preparing the project on dangers to the watercourse;
- Specifying locations of individual watercourses subject to monitoring and their quality class;
- Sampling points for water samples on watercourses;
- Timetable of measurements, depending on the timetable of work implementation; Measurements during the maximum intensity of work shall be provided for.
- Measurement methods – sampling and specification of standards;
- Preparing of reports and list of institutions to which reports are sent and addresses of these institutions;
- Graphic enclosure – plan in 1:5000 scale showing locations of watercourses and measurements of the zero state, watercourses subject to monitoring and the road's layout / road body;
- Hydraulic characteristics of the watercourse (data on high water, medium water and low water);
- Name of the competent person of the investor (or the contractor, depending on the contractual obligation) responsible for implementing the monitoring plan;
- Other data and provisions relevant for the correct monitoring implementation.

The monitoring plan shall be prepared by a company or individual qualified in that respect and having the licence from the Ministry of the Environment of the RS.

Water from the watercourse is sampled downstream from the location where construction work is carried out. Water is sampled from a homogenous part of the water course. Sampling and testing shall be carried out by an institution authorised by the Ministry of the Environment and Spatial Planning.

Sampling shall take into account provisions of the following standards:

EN 25667-1:1996 Water Quality – Sampling – Part 1: Instruction for Planning Sampling Programmes (ISO 5667-1:1980)

EN 25667-2 – Water Quality – Sampling – Part 2: Instruction on Sampling Techniques (ISO 5667-2:1991)

EN 25667-3 – Instruction for Storing and Handling Samples

EN 25667-6 – Instruction for Sampling Rivers and Water Courses

EN 25667-12 – Instruction for Sediment Sampling

The monitoring plan includes parameters, which are determined with regard to the type of work and possible pollutions.

The monitoring plan and reports shall be submitted to:

- Ministry of the Environment and Spatial Planning;
- Environmental Protection Inspectorate;
- Health Inspectorate.

### *12.5.4 Construction's Impact on Underground Water and Mitigation Measures for Reducing Negative Impacts*

The SF shall specify the required measures for protection of water sources on the basis of preliminary hydro geological studies. Hence no single method of protection can be given as the protection depends on numerous factors and the underlying water source. Mostly it involves facilities for retaining harmful substances in wastewater.

In case of an extraordinary event (spillage of dangerous substance in the ground or in a watercourse, or in other cases), which could endanger water sources or underground water itself, the SF shall include the "Instructions on Procedures in Case of an Extraordinary Event". These Instructions shall include the following:

- Method of informing and the institutions to be informed as well as the order in which to do so;
- Method of informing about extraordinary events within the construction site;
- Competent persons of the contractor; and
- Measures for prevention / mitigation of consequences of the extraordinary event.

In case of major accidents, the measures shall be specified by the competent inspectorate.

#### 12.5.4.1 Monitoring plan for underground water

**The plan of monitoring** of underground water pollution during the construction includes in addition to the general part of the project also the following data and annexes:

- Data on zero state measurements carried out as a part of the EIA. If such measurements do not exist, they should be included in the monitoring project; Selection of measurement points shall be made with regard to the assessment of the entity preparing the project on dangers to the watercourse;
- Specified locations of individual piezometers or wells subject to monitoring and sampling points for water samples;
- Timetable of measurements, depending on the timetable of work implementation;
- Implementation method of measurements and regulations complied with;
- Listing of parameters being controlled and their limit values;
- Preparing of reports and list of institutions to which reports are sent and addresses of these institutions;
- Graphic enclosure – plan in 1:5000 scale showing locations of watercourses and measurements of the zero state, watercourses subject to monitoring and the road's layout / road body;
- Name of the competent person of the investor (or the contractor, depending on the contractual obligation) responsible for implementing the Monitoring Project;
- Other data and provisions relevant for the correct monitoring implementation.

Monitoring of underground water includes the following:

- Measurements of underground water level and depth of the monitored borehole;
- Preliminary pumping of water from the monitored borehole;
- Measurement of air and water temperature, electric conductivity, pH value, oxygen content, turbidity, and redox potential on the location of the monitored borehole;
- Sampling of underground water and sample preparation;
- Analysis of the underground water sample;

- Calculation and evaluation of changes of indicative parameters;
- Preparing the report on performed measurements and analyses.

**The report** shall include all necessary data and results as specified in the Rules on Monitoring, namely:

- Entity performing the monitoring;
- Responsible entity for performing the monitoring;
- Type of measurements and the scope of basic and indicative parameters of underground water;
- Location, time and method of sampling;
- Method of preliminary pumping and the measured values of basic parameters;
- Used measurement methods and measurement equipment;
- Results of each individual measurement and calculation of changes of indicative parameters;
- Evaluation of changes of indicative parameters with regard to warning changes thereof.

The monitoring project and the resulting report shall be submitted to:

- Ministry of the Environment and Spatial Planning;
- Inspectorate for the Environment;
- Health Inspectorate.

**Impact of construction on the soil, flora and fauna**

The SF can include analysis of potential consequences of construction to the soil, flora and fauna and envisage the measures required to mitigate negative consequences. Concrete measures shall depend on the level of endangerment and the condition of the environment related to the soil, flora and fauna. Special measures are usually not required except in cases where the route crosses protected areas of natural and animal world. If the route crosses protected areas, the required measures shall usually be specified in the Decree on the Detailed Plan on the basis of studies prepared for such cases, in case these are absent, provisions of the Nature Conservation Act shall apply.

On the basis of requirements provided in the Decree on the Detailed Plan, the plan shall envisage concrete measures for reducing negative impacts. These measures shall completely comply with the requirements specified in the Decree on the Detailed Plan. Any damage to ecosystems and natural value shall be rehabilitated by using the method envisaged in the plan for such a scenario.

#### 12.5.4.2 Monitoring plan for soil and plants

The monitoring plan shall include the following:

- Sampling of soil and mud from wastewater treatment plants, and sample preparation;
- Measurement of parameters;
- Evaluation of emissions and annual quantity of dangerous substances;
- Preparing the report on performed measurements.

The Rules specify the method of sampling, and methods for sampling and preparation of samples are to be specified in the monitoring project. Locations of sampling shall also be specified. Limit values are specified in proper decree.

**The Report** on monitoring shall include the following:

- Entity implementing monitoring;
- Responsible entity for monitoring;
- Main characteristics of the area;
- Main characteristics of the development in a river bed, in case of measuring parameters of silt;

- Purpose and type of measurements and the scope of basic and additional parameters;
- Locations (lot nos.) and time of sampling and measurements of soil or slime from sedimentation reservoirs;
- Used measurement methods and measurement techniques;
- Measurement results for each parameter;
- Evaluation of results with regard to the prescribed limit values.

The responsible entity shall submit the report to:

- Ministry of the Environment and Spatial Planning;
- Ministry of Agriculture.

### *12.5.5 Impact of blasting and other dynamic effects of work implementation on people and buildings*

- In addition to local regulations legislating protection and conservation of the environment, the area is also legislated by regulations related to safety and health at work and by: Nature Conservation Act (Official Gazette of the RS, no. 96/04) and regulations on protected areas issued on the basis thereof
- Directive of European Parliament and Council 2002/49/ES dated on 25. Jun 2002 about assessment and ruling the noise
- DIN 30787 - (1 to 6) Transportbelastungen – Messen und Auswerten von mechanisch -dynamischen Belastungen
- E VDI 3840-2002-09 Schwingungstechnische Berechnungen
- DIN 45669 Messung von Schwingungsimmissionen
- EN ISO 8041:2005 Human response to vibration - Measuring instrumentation (ISO 8041:2005)
- CR 12349:2000 - Mechanical vibration - Guide to the health effects of vibration on the human body

The SF has to establish the following:

- Dynamic effects of traffic and construction work on residential and other buildings and potential consequences;
- Health effects of vibrations on the population.

The SF shall in relation to the characteristics specified above provide the following:

- Establish the expected dynamic effects;
- Determine the location and time of these effects on the environment;
- Envisage measures for reducing dynamic effects;
- Provide for examination of condition of buildings, which could be damaged as the result of dynamic effects of construction and document the condition by description, photograph or video;
- Select such technological procedures for work implementation, which cause minimum dynamic effects;
- Transport routes should be distanced from buildings;
- Work should only be carried out during the daytime;
- Measurement of dynamic effects of construction shall be performed by a competent institution in line with the programme specified in the plan.

The constituent parts of the SF are:

- Plan in 1:5000 scale showing buildings and facilities being in the area of influence of the construction site;
- Documentation on condition of buildings in the area of influence (photographs, examination reports);
- Technological procedures and measures for reducing dynamic effects;
- Programme of monitoring of buildings and measurement / monitoring points.

## 12.6 CONSTRUCTION WASTE MANAGEMENT

### *12.6.1 Content of Guideline*

These instructions specify obligatory management procedures for waste resulting from construction work due to construction, reconstruction, adaptation, rehabilitation or demolition of buildings (hereinafter referred to as: construction waste).

The guidelines apply to waste from waste group with classification number 17 in the classification list of waste. The guidelines do not apply to earth excavations, if the earth excavation is in line with the regulation governing soil pollution by waste deposits. If construction waste contains asbestos, the regulation governing management of waste containing asbestos and the regulation on conditions for disposal of materials containing asbestos in demolition, reconstruction or maintenance of buildings and in maintenance and decommissioning of plants shall also be taken into account.

### *12.6.2 Construction waste management plan*

The investor planning to demolish a building shall enclose to the Construction Permit Project (CPP) the construction waste management plan, if it is evident from the project documentation for building demolition that the area of ground plan of the perimeter of the building exceeds 100 $m^2$.

The construction waste management plan referred to in the previous paragraph hereunder shall with regard to the type and quantity of construction waste include all information on the following:

- Removal of hazardous construction waste prior to demolition;
- Separate collection of construction waste, notably hazardous one, on the construction site itself;
- Processing of construction waste on the point of its production;
- Handling earth excavations notably pollutes ones;
- Quantity and types of construction waste to be handed for processing or removal;
- Envisaged methods for processing and removal of construction waste.

The construction waste management plan shall with regard to envisaged methods and quantity of processing or removal of construction waste take into account the guidelines specified in the operational programme of protection of the environment regarding construction waste handling.

The investor shall provide for the order for accepting construction waste or their transport for processing or removal and their processing or removal prior to commencement of construction work.

If mixing of construction waste cannot be prevented in reconstruction or demolition of a building, the investor shall ensure that prior to demolition all hazardous construction waste classified in the waste group having classification number 17 is removed.

The investor shall for the entire construction site authorise a contractor, who shall in the investor's name hand over construction waste for processing or removal and fulfil upon each handing over of a waste shipment the record statement specified in the regulation governing waste management.

The investor may by themselves provide for processing or removal of construction waste by ensuring handing over of construction waste directly to the entity processing or removing waste.

In case of removal of construction waste, the order for removal of construction waste shall include the address and name of the assessor of waste to be provided by the investor in line with the regulation governing depositing or incineration of waste.

The investor shall not be under obligation to order acceptance from the entity collecting construction waste or handing over of construction waste directly for processing or

removal prior to commencement of work, if construction waste on the site is the result of work for which permit is not required in line with the regulations on building, and if the quantity of construction waste in the entire period of construction work does not exceed the minimum quantity specified in the table below:

| **Waste type** | **Min. quantity** | |
|---|---|---|
| Concrete, bricks, tiles, ceramics and material based on gypsum | 5 | $m^3$ |
| Construction material based on asbestos | 0,5 | $m^3$ |
| Wood, glass, plastic | 5 | $m^3$ |
| Asphalt, tar and tar products | 0,5 | $m^3$ |
| Metals | 20 | $dm^3$ |
| Earth excavation | 500 | $m^3$ |
| Insulation materials | 1 | $m^3$ |

The investor shall provide by themselves transport and handing over to the collection centre for the specified construction waste.

The investor may reuse or remove construction waste by themselves subject to possessing a licence for processing or removal of such waste in accordance with the regulation governing waste management.

The investor may use construction waste by themselves without obtaining the permit for processing or removal of construction waste, if construction waste is used on the point of its production and within the construction site and if it includes concrete, bricks, tiles, ceramics or construction material based on gypsum or a mixture of such waste with earth excavation and if the quantity does not exceed the maximum quantity specified in the table above.

### *12.6.3 Construction Waste Management Report*

The investor wishing to obtain the permit of use shall include in the project of implemented work submitted to the administrative authority the *construction waste management report*, which presents the following information:

- Quantity of construction waste handed over to collectors of construction waste;
- Quantity of construction waste handed over directly to processing or removal;
- Quantity of hazardous waste handed over to collectors or directly to processing or removal;
- Quantity of processed construction waste on the point of its production;
- Quantity of construction waste processed by the investor on the construction site;
- Quantity of earth excavation, notably polluted one, removed from the construction site;
- Firms and registered offices of collectors, entities processing or removing construction waste, to which construction and hazardous waste was handed;
- Overview of prescribed record statements, approved by collectors of construction and hazardous waste upon acceptance, whereby the handing over of waste to waste collectors is guaranteed;
- Overview of prescribed record statements, approved by entities processing and removing construction and hazardous waste upon acceptance, whereby the handing over of waste directly to entities processing and removing waste is guaranteed;

The construction waste management report referred to in the previous paragraph hereunder shall not be required if the quantities of individual types of construction waste resulting from construction do not exceed minimum quantities specified in the table above.

As regards constructions where the quantity of produced construction waste exceeds minimum quantities specified in the table above, it shall be deemed that the application

for issuing the permit of use is incomplete if the project of implemented work does not include the construction waste management report.

If demolition of a building was carried out as a part of construction for which application for issuing the permit of use has been submitted, data on types and quantities of waste resulting from such demolition specified in the construction waste management report referred to in the first paragraph hereunder shall correspond to data on types and quantities of waste specified in the construction waste management plan.

If the construction, the part of which was the demolition of a building, does not require obtaining the permit of use, the investor shall submit the construction waste management report referred to in the first paragraph hereunder together with a copy of the construction waste management plan not later than within thirty days following completion of the construction to the competent inspector for protection of the environment.

### *12.6.4 Obligations of the investor and the contractor during work implementation*

The investor ordering construction of a facility or performing such construction by themselves shall ensure that contractors keep or temporary store waste, resulting from construction work, on the construction site, separately by type of construction waste as specified in the classification list of waste.

If due to the nature of construction work mutual mixing of individual types of hazardous construction waste or mixing with other construction waste cannot be prevented, the investor shall ensure that contractors keep or store hazardous construction waste separately from other waste, and if this is not feasible, to hand it over separately by individual type directly to the collector, or entity processing or removing construction waste.

The investor shall ensure that the contractors keep or temporarily store construction waste on the construction site in such a way so as not to pollute the environment and that the collector of construction waste has access for their acceptance or the entity transporting it for their shipment to the entity processing or removing construction waste.

If safekeeping or temporary storage of construction waste is not possible on the construction site, the investor shall ensure that contractors deposit construction waste directly after its production in containers, placed on the construction site or adjacent to it, which are adapted for transport of construction waste without any reloading.

The investor shall ensure that contractors hand over construction waste to the collector of construction waste.

The documentation on the order for acceptance of construction waste shall show the type of construction waste, the envisaged quantity of production of construction waste and the address of the construction site with reference to the appertaining building permit to which the acceptance of construction waste relates.

The documentation on the order for processing or removal of construction waste shall show the type of waste, the envisaged quantity of processing or removal of construction waste, point of processing or removal, and the address of the construction site with reference to the appertaining building permit to which the processing or removal of construction waste relates.

### *12.6.5 Waste collection*

Collector of construction waste may commence with the collection after obtaining the licence from the ministry competent for protection of the environment (hereinafter referred to as: The Ministry) in accordance with the regulation governing waste management.

The Ministry shall issue the licence referred to in the previous paragraph hereunder to the entity, which is:

- A company or sole proprietor, registered for performing the activity of collection and transport of waste in accordance with the regulation on classification of activities;
- Having means and equipment, and facilities and devices required for collection of construction waste, which comply with technical and other prescribed conditions; and
- Having the possibility for reuse or removal of collected construction waste.

The application for the licence submitted to the Ministry shall include the plan for construction waste collection and providing for their reuse or removal.

The plan for construction waste collection referred to in the previous paragraph hereunder shall include information on the following:

- Area of construction waste collection;
- Types of construction waste for which collection is provided;
- Number and locations of collection centres;
- The estimated total annual quantity of construction waste and annually accepted quantities separately by method of reuse or removal the entity provides;
- Type and capacity of means and equipment for collection and transport;
- Capacity of collection centres and the method of temporary storage and classification or other activities related to construction waste; and
- Measures for protection of the environment aimed at prevention of uncontrolled impacts on the environment during handling of construction waste.

The waste collection plan shall with regard to envisaged methods of reuse or removal of construction waste take into account the guidelines specified in the operational programme of protection of the environment regarding construction waste handling.

The Ministry may in the licence issued to the collector of construction waste specify the areas where a collection centre is to be placed or the areas where provision of acceptance of construction waste is mandatory.

The collector of construction waste shall have at least one collection centre for at least one type of construction waste from the group of waste having the classification number 17 from the classification list of waste specified in the regulation on waste management.

The collection centre shall be arranged so that no pollution of the environment occurs in acceptance, temporary storage or sorting of collected construction waste or in its handing over for processing or removal.

The collector of construction waste shall provide for reuse or removal of the collected construction waste.

The collector of construction waste shall keep records of the following:

- Collected quantity of construction waste by investor and collection centre;
- Total collected quantity of construction waste by type of construction waste and by method of reuse or removal;
- Quantity of construction waste handed over for reuse of removal by contractor of construction work; and
- Total quantity of construction waste handed over.

A constituent part of the records specified in the previous paragraph hereunder shall be the prescribed record statements, which the collector of construction waste receives upon acceptance of construction waste, and the prescribed record statements, returned to the collector of construction waste by entities responsible for reuse or removal of construction waste.

The collector of construction waste shall in accordance with the regulation governing waste management submit to the Ministry a report on collected construction waste and its handling not later than by 31 March for the previous calendar year.

### *12.6.6 Processing and removal of construction waste*

Processing or removal of construction waste may only be performed by entities having the prescribed licence for processing or removal of construction waste in accordance with the regulations governing waste management.

If the entity processing or removing construction waste is also a collector of construction waste, the licence referred to in the previous paragraph hereunder shall also include statement on fulfilment of conditions for collection of construction waste.

The waste management plan to be enclosed to the application for obtaining the licence for processing construction waste and for licence for removal of construction waste shall in addition to conditions specified in the regulation governing waste management also include the following:

- Types and quantities of construction waste for which recycling is provided;
- The envisaged method of use of construction material obtained by recycling of construction waste;
- Reasons for removal of construction waste in case they are removed directly without any processing;
- Method and location of removal of remaining construction waste; and
- Guidelines from the operational programme for protection of the environment with regard to handling of construction waste in relation to the envisaged methods and quantities of processing.

The Ministry shall approve direct removal of construction waste without previous processing, if the waste management plan shows that no technical possibilities exist for processing of this type of construction waste or that costs of reuse are disproportionate when compared to costs of its removal.

### *12.6.7 Handling asbestos containing waste*

#### 12.6.7.1 General

Asbestos is a generic name for a number of mineral fibres. It is resistant to acid, bases and high temperature. Because of these characteristics it was extensively used in industry and construction.

Roughly 3000 products containing asbestos are known. The industry used pure asbestos and materials where asbestos was mixed with other substances acting as the binder for asbestos fibres.

There are two types of asbestos materials:

The first group includes pure asbestos and materials, which are due to their structure easy to crumb and divide into fibres, hence we call them materials with weakly bound asbestos.

The most common products containing weakly bound asbestos are the following:

| *Product* | *Possible location of placement* |
|---|---|
| Shingles from roof pasteboard | Roof |
| Sprayed plasters | Ceilings, walls, steel building frameworks |
| Manually applied plasters | Ceilings, walls |
| Insulation panels | Walls |
| Building chemical products containing asbestos Jointing mixtures, resins, adhesives | Floor, walls |
| Jointing and insulation mixtures | Boilers, heaters, pressure vessels |
| Asbestos linen | Pipes |
| Corrugated cardboard from asbestos | Hot water pipes |
| Paper and rolled paper tapes | Hearths, steam valves, power supply installation |
| Cardboard | Valves |

| | |
|---|---|
| Putties and polishes | Coatings on joints of water supply and hot water pipes |
| Sprayed and manually applied insulation | Fuel reservoirs, reservoirs in oil and gas industry |
| Fabric | Clothes and blankets, felt, tilts, ropes, tapes, yarn, curtains, material for coating of pipes, etc. |

The second group includes materials in which asbestos is mixed with substances, which act as a binder for asbestos fibres. The most commonly used binders were cement, vinyl chloride or asphalt. This group includes products made from asbestos-cement (asbestos is not released from these products unless they are damaged or treated, i.e. drilled, cut, saw, whet) and other asbestos products.

| *Construction products from asbestos cement* | *Other asbestos products* |
|---|---|
| Large format panels (flat or corrugated) | Vinyl asbestos flooring |
| Small format roofing | Asphalt asbestos flooring |
| Façade panels, walls and ceilings | Binders, fillers, putties, polishes, paints and coatings |
| Water supply and sewage piping and elbows | Washers |
| Building chemical products containing asbestos Jointing mixtures, resins, adhesives | Floor, walls |
| Water collectors | Brake linings and clutches, etc. |
| | Flower boxes, etc. |

#### 12.6.7.2 Dangers in use of asbestos

Asbestos is composed of fibres. Fibres tend to easily break longitudinally which results in thinner, needle-like fibres. As they are small enough to be invisible and have no smell, a person can easily inhale them without being aware of it. When inhaled, the fibres can penetrate deep into lungs and cause diseases such as asbestosis and lung cancer (mezzothelium – a rare form of cancer of lungs or stomach is in almost all cases caused by asbestos) As much as 40 years can pass from the initial exposure and occurrence of signs of the disease.

Asbestos in buildings becomes dangerous when the material becomes worn out, is damaged or when asbestos fibres are released in the air because of improper handling of material thereby presenting health risk. Dangerous are thus primarily those products which crumble or turn into dust when used. Crumbly asbestos can be crumbled by hand while non-crumbly asbestos is too hard for manual crumbling. Hence it is best if asbestos products not yet worn out are left alone and if possible protected on the surface.

Their useful life is between thirty and forty years.

Certain products containing weakly bound asbestos are permanently built in buildings.

Namely: sprayed plasters, insulation products, adhesives or insulation mixtures.

The Republic of Slovenia has by the Act on the Prohibition of Production and Trade in Asbestos Products and on the Provision of Funds for Restructuring the Asbestos Industry into Non-asbestos Industry (Official Gazette of the RS, no. 56/1996) and by the Decree Prohibiting and Restricting Production, Trade in and Use of Azbestos and Azbestos products (Official Gazette of the RS, no. 49/2001) completely abolished the production, trade and use of asbestos and asbestos products as of 2003. The only permitted use is for those asbestos products, which have been in use as at 28 June 2001.

A person generally comes into contact with asbestos only when removing materials containing asbestos.

The use of products, which were in use as at the date of coming into force of the Decree (28 June 2001) is not prohibited.

Slovene legislation has not specified the deadline for removal of such products.

#### 12.6.7.3 Rehabilitation of roofing and façade panels from asbestos-cement

The hard bound asbestos waste includes construction materials from asbestos cement, e.g. large format panels, flat or corrugated, small format façade and roof panels, usable products, such as plant boxes, ashtrays, flower boxes and similar objects, and piping for buildings and civil engineering works made from asbestos cement.

In order to prevent or reduce emission of asbestos fibres in the environment, obligatory conduct in disposal of materials containing asbestos in demolition, reconstruction or maintenance of buildings and in maintenance and decommissioning of plants is prescribed.

The obligatory conduct in reconstruction or demolition of buildings and in maintenance of buildings, installations or facilities, when disposing of materials containing asbestos is specified in the Rules on the Conditions for the Disposal of Materials Containing Asbestos in the Demolition, Reconstruction or Maintenance of Buildings and in the Maintenance and Decommissioning of Plants (Official Gazette of the RS, nos. 72/01 and 41/01; hereinafter referred to as: the Rules).

Obligations specified in the Rules depend on whether the work performed is of large or small scale.

Small-scale work is that performed by a maximum of two workers and not lasting more than four hours until the completion of the work procedure including any additional work required in the area of demolition, in:

- Removal of asbestos cement products; or
- Removal of small quantities of material containing weakly bound asbestos, e.g. removal of asbestos cardboards under window sills;
- Removal of sealants on burners or doors; or
- Maintenance of asbestos products, e.g. surfacing of blockages in ventilation or smoke channels or cables or surfacing of weakly bound asbestos panels in good condition, except façade panels by using a cylinder; or
- Removal of façade coatings, roofing and piping made from asbestos cement, if the work is carried out outdoors and the total surface of cement panels does not exceed 1,000 $m^2$ and the total length of asbestos cement piping does not exceed 300 m.

Whereby it is specified what is the meaning of the term "all work", i.e. all work until the completion of the work procedure.

- Entering on premises polluted with asbestos;
- Sampling of air for measuring concentrations of asbestos fibres in the air;
- Vacation of premises polluted with asbestos;
- Cleaning of premises and objects polluted with asbestos;
- Transport on the construction site; and
- Temporary storage of removed material containing asbestos.

Small-scale work can be performed by anyone without requiring the permit for removing asbestos from buildings and facilities issued on the basis of Article 6 of the Rules.

#### 12.6.7.4 Obligations of the investor prior to commencement of removal of roofing

The investor shall ensure that it is established prior to commencement of planning of the reconstruction or removal of a building and maintenance work whether workers will be exposed to asbestos dust or dust from materials containing asbestos when performing their work.

In case of any doubt whether the building or installation or device has any materials built-in, which contain asbestos, a sample of the material shall be given for testing to an expert organisation competent to perform such tests.

#### 12.6.7.5 Procedures for removal of asbestos cement roofing

1. Prior to commencement of removal of asbestos cement panels, panels shall be wetted before any work is performed on them or before they are moved. Wetting shall be performed by spraying or sprinkling with sprays under low pressure, water under high pressure shall not be used under any circumstances. Asbestos fibres deposited in water sinks shall be wetted by water the result of which is a thick mixture, which is removed by a trowel in a PE bag. The bag shall be tightly sealed or glued.
2. In removal, the panels shall be lifted and not pulled or broken. Hooks, screws or nails used for fastening the panels shall be removed in a way not damaging the panels. When fastening elements are removed, the panels shall be protected against sliding. No drills, saws or tools for high-speed scraping shall be used in disassembly. If panels cannot be removed without the use of tools, it is important that manual tools or mechanical instruments for treatment of asbestos cement with installed cleaners having HEPA filters are used exclusively. Panels shall not be pulled over edges or over other products.
3. The removed panels shall not be thrown from the roof. They shall be lowered to the ground by using an appropriate lifting device. 4. When on the ground, panels shall be again wetted on both sides and then piled in a stack on a wood pallet. The pallet shall then be wrapped by a polyethylene foil, which is tightly sealed by adhesive tape.

   The material shall not be crumbled after removal for the purpose of reducing the volume of waste.
5. The area of removal of panels shall be closely inspected for any waste lying around. The roof structure, laths, rafters, and panelling shall be after removal of panels thoroughly cleaned by vacuuming with a cleaner having the HEPA filter. In case the contractor is not in possession of such cleaner, the roof covering shall be wiped by wet cloth. Used cloths shall be placed in a PE bag after completed work. Water in containers used for rinsing cloths shall be poured in the sink after cleaning by placing a wet cloth over the sink to act as a filter. The cloth shall be then placed in a PE bag.
6. On the ground, each bag with waste is placed in another PE bag, which is then tightly sealed and marked by label "Asbestos waste".

#### 12.6.7.6 Storage and transport of asbestos cement products

Strongly bound asbestos waste shall be packaged in tightly sealed bags so that joints of the fabric or foil are welded or glued.

Transport of strongly bound asbestos waste to the disposal site is permitted in closed containers or bags or in covered freight vehicles so that emission of asbestos fibres in the atmosphere is prevented to the greatest possible extent.

Loading and unloading of asbestos waste to or from loading areas of freight vehicles shall be carried out with due care by not throwing or shaking it.

Containers and bags used for storage of asbestos waste in temporary storage sites shall be marked on visible spots by the label "Asbestos waste".

#### 12.6.7.7 Disposal sites

Strongly bound asbestos waste shall be deposited on the disposal site for inert (non-hazardous) waste.

The investor shall for accepted asbestos waste obtain from the managing entity of the disposal site an approved record statement on waste handling, which serves as the proof of handing over of asbestos waste to the disposal site.

If the contractor of construction work handed over asbestos waste to the disposal site, then the approved record statement shall be in the name of the investor. The investor may obtain the approved record statement on handing over of asbestos waste to depositing also from the contractor of construction work if the contractor has the licence for collecting construction waste.

#### 12.6.7.8 Obligations of the disposal site's managing entity

The disposal site's managing entity shall ensure that asbestos waste is deposited on predetermined deposit site for asbestos, which shall be visibly marked and intended solely for depositing of asbestos waste.

Access route to the depositing site for asbestos waste shall be arranged so that the waste may be deposited directly from the freight vehicle in a pit or ditch used for depositing of asbestos waste. If asbestos waste is deposited in the pit or ditch from its edge, it shall be ensured that asbestos waste is not scattered. The waste shall be covered immediately after it was deposited. No freight vehicle or work machinery shall be allowed to drive over deposited asbestos waste not being covered by soil or similar inert material.

The disposal site's managing entity shall in keeping of the prescribed operational logbook ensure that quantity, type and method of treatment of asbestos waste as well as the location of the deposit site are regularly entered.

#### 12.6.7.9 Handing over and collection of construction waste

The investor may give asbestos cement waste for further handling to the collector of construction waste entered in the records of collectors of construction waste.

The investor shall for accepted asbestos waste obtain from the collector of construction waste an approved record statement on waste handling, which serves as the proof of handing over of asbestos waste to the collector.

If the contractor of construction work handed over asbestos cement waste to the collector, then the approved record statement shall be in the name of the investor. The investor may obtain the approved record statement on handing over of asbestos cement waste to collection also from the contractor of construction work if the contractor has the licence for collecting construction waste.

When removing asbestos cement products it is recommended that personal protective equipment, at least for protection of the respiratory system, is used. (semi-face/quarter masks with P2 filter or semi-face masks FFP2 with filtration of particles or masks with vetrile and the filter for particles TM1P)

### *12.6.8 Classification List of Waste*

#### 12.6.8.1 General

Waste is classified by using a six-digit numerical code. The first four digits are used for marking the list of waste type.

Hazardous waste is classified by a six-digit code additionally marked by an asterisk, indicating "hazardous waste".

#### 12.6.8.2 Waste groups classification

01 Waste resulting from exploration, mining, dressing and further treatment of minerals and quarry

02 Waste from agricultural, horticultural, hunting, fishing and aquaculture primary production, food preparation and processing

03 Wastes from wood processing and the production of paper, cardboard, pulp, panels and furniture

04 Wastes from the leather and textile industries

05 Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal

06 Wastes from inorganic chemical processes

07 Wastes from organic chemical processes

08 Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesive, sealants and printing inks

09 Wastes from photographic industry

10 Wastes from thermal processes

11 Inorganic wastes containing metals from metal treatment and coating of metals and hydrometallurgy of non-ferrous metals

12 Wastes from shaping and surface treatment of metals and plastics

13 Oil wastes (except edible oils, and those included in 05, 12 and 19)

14 Wastes from organic substances employed as solvents, coolers and pushing gases (except 07, and 08)

15 Packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified

16 Waste not otherwise specified in the catalogue

**17 Construction and demolition waste (including excavated earth from polluted areas)**

18 Wastes from human or animal health care and/or related research (excluding kitchen and restaurant wastes which do not arise from immediate health care)

19 Wastes from waste treatment facilities, off-site waste water treatment plants and the water industry

20 Municipal wastes and similar commercial, industrial and institutional wastes including separately collected fractions

#### 12.6.8.3 Wastes resulting from construction of civil engineering facilities and production of building products

**01 Waste resulting from exploration, mining, dressing and further treatment of minerals and quarry**

01 01 02 Waste from mineral non-metal-ferrous excavation

*01 04 Waste from further physical and chemical processing of non metal-ferrous minerals*

01 04 07* Waste from further physical and chemical processing of non metal-ferrous minerals containing hazardous substances

01 04 08 Waste gravel not included in 01 04 07

01 04 09 Waste sand and clay

01 04 10 Dust and powder waste not included in 01 04 07

01 04 11 Waste from processing of potassium and rock salt not included in 01 04 07

01 04 12 Tailings and other waste from washing and selection of minerals not included in 01 04 07 and 01 04 11

01 04 13 Waste from cutting and sawing of stone not included in 01 04 07

01 04 99 Wastes not otherwise specified

*01 05 Drilling mud and other drilling wastes*

01 05 04 Fresh-water drilling mud and wastes

01 05 05* Drilling mud and wastes containing oils

01 05 06* Drilling mud and wastes containing hazardous substances

01 05 07 Drilling mud and wastes containing barite not included in 01 05 05 and 01 05 06

01 05 08 Drilling mud and wastes containing chlorides not included in 01 05 05 and 01 05 06

01 05 99 Wastes not otherwise specified

**03 Wastes from wood processing and the production of paper, cardboard, pulp, panels and furniture**

*03 01 Wastes from wood processing and the production of panels and furniture*

03 01 01 Waste bark and cork

03 01 04* Sawdust, shavings, wood chips, cuttings, waste wood, parts of panels and plywood containing hazardous substances

03 01 05 Sawdust, shavings, wood chips, cuttings, waste wood, parts of panels and plywood not included in 03 01 04

03 01 99 Wastes not otherwise specified

*03 02 Wood preservation waste*

03 02 01* Non-halogenated organic wood preservatives

03 02 02* Organochlorinated wood preservatives

03 02 03* Organometallic wood preservatives

03 02 04* Inorganic wood preservatives

03 02 05* Other wood preservatives containing hazardous substances

03 02 99 Other wood preservatives

**05 Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal**

*05 01 Oily sludge and solid wastes*

05 01 17 Asphalt

**06 Wastes from inorganic chemical processes**

*06 05 Sludge from on-site effluent treatment*

06 05 02* Sludge from on-site effluent treatment containing hazardous substances

06 05 03 Sludge from on-site effluent treatment not included in 06 05 02

*06 13 Wastes from other inorganic chemical processes*

06 13 01* Inorganic pesticides, biocides and wood preserving agents

06 13 02* Spent activated carbon (except 06 07 02)

06 13 03 Carbon black

06 13 04* Waste from asbestos processing

06 13 05* Soot

06 13 99 Wastes not otherwise specified

**07 Wastes from organic chemical processes**

*07 02 Waste from the MFSU of plastics, synthetic rubber and man-made fibres*

07 02 13 Waste plastic

07 02 14* Waste additives containing hazardous substances

07 02 15 Waste additives not included in 07 02 14

07 02 16 Waste containing silicones

07 02 99 Wastes not otherwise specified

*07 03 Waste from the MFSU of organic dyes and pigments (excluding 06 11)*

07 03 03* Organic halogenated solvents, washing liquids and mother liquors

07 03 04* Other organic solvents, washing liquids and mother liquors

*07 04 Waste from the MFSU of organic pesticides (except 02 01 08 and 02 01 09), wood preservatives (except 03 02) and other biocides*

07 04 03* Organic halogenated solvents, washing liquids and mother liquors

07 04 04* Other organic solvents, washing liquids and mother liquors

07 04 13* Solid waste containing hazardous substances

**08 Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesive, sealants and printing inks**

*08 01 Wastes from MFSU of paint and varnish*

08 01 11* Waste paint and varnish containing organic solvents or other hazardous substances

08 01 12 Waste paint and varnish not included in 08 01 11

08 01 17* Waste resulting from removal of paint and varnish containing organic solvents or hazardous substances

08 01 18 Waste resulting from removal of paint and varnish not included in 08 01 17

08 01 19* Water suspensions of paint and varnish containing organic solvents or other dangerous substances

08 01 20 Water suspensions of paint and varnish not included in 08 01 19

08 01 21* Waste removers for paint and varnish

08 01 99 Wastes not otherwise specified

*08 04 Wastes from MFSU of adhesives and sealants*

08 04 09* Waste adhesives and sealants containing organic solvents or other hazardous substances

08 04 10 Waste adhesives and sealants not included in 08 04 09

08 04 15* Water solutions of adhesives and sealants containing organic solvents or other hazardous substances

08 04 16 Water solutions of adhesives and sealants not included in 08 04 15

08 04 17* Resin oils (colophony)

08 04 99 Wastes not otherwise specified

**10 Wastes from thermal processes**

*10 01 Wastes from power station and other combustion plants (except 19)*

10 01 01 Bottom ash (except bottom ash included in 10 01 04)

10 01 02 Coal fly ash

10 01 03 Peat fly ash

10 01 04* Oil fly ash

10 01 09* Sulphuric acid

10 01 13* Fly ash from combustion of carbohydrate emulsions

10 01 20* Sludge from on-site effluent treatment containing hazardous substances

10 01 21 Sludge from on-site effluent treatment not included in 10 01 20

*10 12 Wastes from manufacture of ceramic goods, bricks, tiles and constructions products*

10 12 01 Waste preparation mixture before thermal processing

10 12 03 Other particulates and dust

10 12 05 Sludge from gas treatment

10 12 06 Discarded moulds

10 12 07 Spent linings and refractories

10 12 08 Waste ceramics, bricks, tiles and construction products (after heat treatment)

10 12 09* Solid waste resulting from cleaning of waste gases containing hazardous substances

10 12 10 Solid waste resulting from cleaning of waste gases not included in 10 12 10

10 12 11* Waste from glazing containing heavy metals

10 12 12 Waste from glazing not included in 10 12 11

10 12 13 Sludge from on-site effluent treatment

10 12 99 Wastes not otherwise specified

*10 13 Wastes from manufacture of cement, lime and plaster and articles and products made from them*

10 13 01 Waste preparation mixture before thermal processing

10 13 04 Waste from calcinations and hydration of lime

10 13 06 Other particulates and dust

10 13 07 Sludge from gas treatment

10 13 09* Waste resulting from asbestos cement production containing asbestos

10 13 10 Waste from asbestos cement production not included in 10 13 09

10 13 11 Waste from production of composite materials based on cement not included in 10 13 09 and 10 13 10

10 13 12* Solid waste resulting from cleaning of waste gases containing hazardous substances

10 13 13 Solid waste resulting from cleaning of waste gases not included in 10 13 12

10 13 14 Waste concrete and waste sludge from concrete

10 13 99 Wastes not otherwise specified

**11 Inorganic wastes containing metals from metal treatment and coating of metals and hydrometallurgy of non-ferrous metals**

*11 05 Wastes from galvanisation processes*

11 05 01 Raw zinc

11 05 02 Zinc ashes

11 05 03* Solid waste from cleaning of waste gases

11 05 04* Spent liquids

11 05 99 Wastes not otherwise specified

**12 Wastes from shaping and surface treatment of metals and plastics**

*12 01 Wastes from shaping and surface treatment of metals and plastics*

12 01 01 Ferrous metal filings and turnings

12 01 02 Other ferrous metals particles

12 01 03 Non-ferrous metal filings and turnings

12 01 04 Other non-ferrous metal particles

12 01 05 Plastics particles

12 01 06* Waste machining oils containing halogens (not emulsioned)

12 01 07* Waste machining oils free of halogens (not emulsioned)

12 01 08* Waste machining emulsions containing halogens
12 01 09* Waste machining emulsions free of halogens
12 01 10* Synthetic machining oils
12 01 11* Machining sludges
12 01 12* Spent waxes and fats
12 01 13 Welding wastes
12 01 14* Machining sludges containing hazardous substances
12 01 15 Machining sludges not included in 12 01 14
12 01 16* Waste resulting from sandblasting containing hazardous substances
12 01 17 Waste resulting from sandblasting not included in 12 01 16
12 01 18* Machining sludges resulting from buffing and honing containing oils
12 01 19* Easily biodegradable machining oils
12 01 20* Spent buffing objects and buffing materials containing hazardous substances
12 01 21 Spent buffing objects and buffing materials not included in 12 01 20
12 01 99 Wastes not otherwise specified

**13 Oil wastes (except edible oils, and those included in 05, 12 and 19)**

*13 01 Waste hydraulic oils*

13 01 01* Hydraulic oils, containing PCB
13 01 04* Chlorinated emulsions
13 01 05* Non chlorinated emulsions
13 01 09* Chlorinated hydraulic oils based on mineral oils
13 01 10* Non-chlorinated hydraulic oils based on mineral oils
13 01 11* Synthetic hydraulic oils
13 01 12* Easily biodegradable hydraulic oils
13 01 13* Other hydraulic oils

*13 02 Waste engine, gear & lubricating oils*

13 02 04* Chlorinated engine, gear & lubricating based oils on mineral oils
13 02 05* Non-chlorinated engine, gear & lubricating based oils on mineral oils
13 02 06* Synthetic engine, gear & lubricating oils
13 02 07* Easily biodegradable engine, gear & lubricating oils
13 02 08* Other engine, gear & lubricating oils

*13 03 Waste insulating and heat transmission oils and other liquids*

13 03 01* Insulating and heat transmission oils containing PCB
13 03 06* Insulating and heat transmission oils based on mineral oils not included in 13 03 01
13 03 07* Non-chlorinated insulating and heat transmission oils based on mineral oils
13 03 08* Synthetic insulating and heat transmission oils
13 03 09* Easily biodegradable insulating and heat transmission oils
13 03 10* Other insulating and heat transmission oils

*13 04 Bilge oils*

13 04 01* Bilge oils from inland navigation
13 04 02* Bilge oils from jetty sewers
13 04 03* Bilge oils from other navigation

***13 05 Oil/water separator contents***

13 05 01* Oil/water separator solids

13 05 02* Oil/water separator sludges

13 05 03* Interceptor sludges

13 05 06* Oil/water separator oils

13 05 07* Water polluted with oil from oil/water separator

13 05 08* Waste mixture from oil/water separator

*13 07 Liquid fuels waste*

13 07 01* Heating oil and diesel fuel

13 07 02* Petrol

13 07 03* Other fuels including mixtures

**15 Packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified**

*15 01 Packaging including separately collected packaging, which is municipal waste*

15 01 01 Paper and cardboard

15 01 02 Plastic

15 01 03 Wooden

15 01 04 Metallic

15 01 05 Composite packaging

15 01 06 Mixed

15 01 07 Glass

15 01 09 Textile

15 01 10* Packaging containing remainders of hazardous substances or being polluted with hazardous substances

15 01 11* Metallic packaging containing hazardous hard coating (e.g. made from asbestos) including empty pressure vessels

*15 02 Absorbents, filter materials, wiping cloths and protective clothing*

15 02 02* Absorbents, filter materials, wiping cloths and protective clothing polluted with hazardous substances

15 02 03 Absorbents, filter materials, wiping cloths and protective clothing not included in 15 02 02

**16 Waste not otherwise specified in the catalogue**

*16 01 End of life vehicles including non-road transport vehicles and waste resulting from disassembly of end of life vehicles and vehicle maintenance (except waste included in 13, 14, 16 06 and 16 08*

16 01 03 Used tyres

16 01 04* Discarded vehicles

16 01 06 Discarded vehicles from which liquids and other hazardous components have been removed

16 01 07* Oil filters

16 01 08* Components containing mercury

16 01 09* Components containing PCB

16 01 10* Explosive components (e.g. from airbags)

16 01 11* Brake linings containing asbestos

16 01 12 Brake linings not included in 16 01 11

16 01 13* Brake liquids

16 01 14* Antifreeze liquids containing hazardous substances
16 01 15 Antifreeze liquids not included in 16 01 14
16 01 16 Liquefied gas reservoirs
16 01 17 Ferrous metals
16 01 18 Non-ferrous metals
16 01 19 Plastic
16 01 20 Glass
16 01 21* Hazardous components not included in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14
16 01 22 Other similar components
16 01 99 Wastes not otherwise specified

*16 02 Waste resulting from electrical and electronic equipment*

16 02 09* Transformers and capacitors containing PCB
16 02 10* Discarded equipment containing or being polluted with PCB and not included in 16 02 09
16 02 11* Discarded equipment containing chlorofluorocarbons, HCFC and HFC
16 02 12* Discarded equipment containing free asbestos
16 02 13* Discarded equipment containing hazardous components ([2]) and not included in 16 02 09 to 16 02 12
16 02 14 Discarded equipment not included in 16 02 09 to 16 02 13
16 02 15* Hazardous components removed from discarded equipment
16 02 16 Components removed from discarded equipment not included in 16 02 15

*16 03 Off-specification batches*

16 03 03* Inorganic waste containing hazardous substances
16 03 04 Inorganic waste not included in 16 03 03
16 03 05* Organic waste containing hazardous substances
16 03 06 Organic waste not included in 16 03 05

*16 04 Waste explosives*

16 04 01* Waste ammunition
16 04 02* Fireworks waste
16 04 03* Other waste explosives

*16 05 Chemicals and gases in containers*

16 05 04* Gases in pressure vessels (including halons) containing hazardous substances
16 05 05 Gases in pressure vessels not included in 16 05 04
16 05 06* Laboratory chemicals consisting of or containing hazardous substances, including mixtures of laboratory chemicals
16 05 07* Discarded inorganic chemicals consisting of or containing hazardous substances
16 05 08* Discarded organic chemicals consisting of or containing hazardous substances
16 05 09 Discarded chemicals not included in 16 05 06, 16 05 07 or 16 05 08

*16 06 Batteries and accumulators*

16 06 01* Lead batteries
16 06 02* Ni-Cd batteries

16 06 03* Mercury dry cells
16 06 04 Alkaline batteries (except 16 06 03)
16 06 05 Other batteries and accumulators
16 06 06* Electrolyte from batteries and accumulators

*16 07 Waste from transport and storage tank cleaning (except 05 and 13)*

16 07 08* Waste containing oils
16 07 09* Waste containing hazardous substances
16 07 99 Wastes not otherwise specified

*16 09 Oxidative substances*

16 09 01* Permanganates e.g. potassium permanganate
16 09 02* Chromates e.g. potassium chromate or sodium dichromate
16 09 03* Peroxides e.g. hydrogen peroxide
16 09 04* Other similar oxidative substances

**17 Construction and demolition waste (including excavated earth from polluted areas)**

*17 01 Concrete, bricks, tiles and ceramics*

17 01 01 Concrete
17 01 02 Bricks
17 01 03 Tiles and ceramics
17 01 06* Mixtures or separated fractions of concrete, bricks, tiles and ceramics containing hazardous substances
17 01 07 Mixtures of concrete, bricks, tiles and ceramics not included in 17 01 06

*17 02 Wood, glass and plastic*

17 02 01 Wood
17 02 02 Glass
17 02 03 Plastic
17 02 04* Glass, plastic and wood polluted with hazardous substances or containing hazardous substances

*17 03 Asphalt, tar and tarred products*

17 03 01* Asphalt containing tar
17 03 02 Asphalt not included in 17 03 01
17 03 03* Tar and tar products

*17 04 Metals (including their alloys)*

17 04 01 Copper, bronze, brass
17 04 02 Aluminium
17 04 03 Lead
17 04 04 Zinc
17 04 05 Iron and steel
17 04 06 Tin
17 04 07 Mixed metals
17 04 09* Metallic waste polluted with hazardous substances
17 04 10* Cables containing oils, tar and other hazardous substances
17 04 11 Cables not included in 17 04 10

*17 05 Earth (including excavated earth from polluted areas), rock, and earth excavations*

17 05 03* Soil and rock containing hazardous substances

17 05 04 Soil and rock not included in 17 05 03

17 05 05* Earth excavations containing hazardous substances

17 05 06 Earth excavations not included in 17 05 05

17 05 07* Stone chippings from underneath rail tracks and sleepers containing hazardous substances

17 05 08 Stone chippings from underneath rail tracks and sleepers not included in 17 05 07

*17 06 Insulation materials and construction material containing asbestos*

17 06 01* Insulation materials containing asbestos

17 06 03* Other insulation materials consisting of or containing hazardous substances

17 06 04 Insulation materials not included in 17 06 01 and 17 06 03

17 06 05 Construction materials containing asbestos

*17 08 Construction material based on gypsum*

17 08 01* Construction material based on gypsum polluted with hazardous substances

17 08 02 Construction material based on gypsum not included in 17 08 01

*17 09 Other construction waste and waste resulting from demolition of buildings*

17 09 01* Construction waste and waste resulting from demolition of buildings containing mercury

17 09 02* Construction waste and waste resulting from demolition of buildings containing PCB (e.g. washers containing PCB, pavements based on resins containing PCB, capacitors containing PCB)

17 09 03* Other construction waste and waste resulting from demolition of buildings (including mixed waste containing hazardous substances)

17 09 04 Mixed construction waste and waste resulting from demolition of buildings not included in 17 09 01, 17 09 02 and 17 09 03

**19 Wastes from waste treatment facilities, off-site waste water treatment plants and the water industry**

*19 07 Landfill leachate*

19 07 02* Landfill leachate containing hazardous substances

19 07 03 Landfill leachate not included in 19 07 02

*19 08 Wastes from waste water treatment plants not otherwise specified*

19 08 02 Wastes from desanding

19 08 05 Sludges from treatment of urban waste water

19 08 06* Saturated or spent ion exchange resins

19 08 07* Solutions and sludges from regeneration of ion exchangers

19 08 08* Waste from membrane cleaning systems containing hazardous substances

19 08 09* Greases and oil mixtures from oil/water separators containing edible oils and greases

19 08 10* Greases and oil mixtures from oil/water separators not included in 19 08 09

19 08 11* Sludges from biological technological wastewater treatment plants containing hazardous substances

19 08 12 Sludges from biological technological wastewater treatment plants not included in 10 08 11

19 08 13* Sludges from other technological wastewater treatment plants containing hazardous substances

19 08 14 Sludges from other technological wastewater treatment plants not included in 10 08 13

19 08 99 Wastes not otherwise specified

*19 12 Waste resulting from mechanical treatment of waste (e.g. sorting, crushing, compacting, pelleting) not otherwise specified*

19 12 01 Paper and cardboard

19 12 02 Ferrous metals

19 12 03 Non-ferrous metals

19 12 04 Plastic and rubber

19 12 05 Glass

19 12 06* Wood containing hazardous substances

19 12 07 Wood not included in 19 12 06

19 12 08 Textile

19 12 09 Minerals such as rock

19 12 10 Combustible waste (fuel obtained from waste)

19 12 11* Other waste (including mixtures of material) resulting from mechanical treatment of waste containing hazardous substances

19 12 12 Other waste (including mixtures of material) resulting from mechanical treatment of waste not included in 19 12 11

*19 13 Waste resulting from rehabilitation of polluted soil and underground water*

19 13 01* Solid waste resulting from rehabilitation of polluted soil containing hazardous substances

19 13 02 Solid waste resulting from rehabilitation of polluted soil not included in 19 13 01

19 13 03* Sludges resulting from rehabilitation of polluted soil containing hazardous substances

19 13 04 Sludges resulting from rehabilitation of polluted soil not included in 19 13 03

19 13 05* Sludges resulting from rehabilitation of polluted underground water containing hazardous substances

19 13 06 Sludges resulting from rehabilitation of polluted underground water not included in 19 13 05

19 13 07* Waste water solutions and water concentrates resulting from rehabilitation of polluted underground water containing hazardous substances

19 13 08 Waste water solutions and water concentrates resulting from rehabilitation of polluted underground water not included in 19 13 07

**20 Municipal wastes and similar commercial, industrial and institutional wastes including separately collected fractions**

*20 03 Other municipal waste*

20 03 03 Waste resulting from road cleaning

20 03 04 Septic tank sludge

20 03 06 Waste resulting from cleaning of urban waste water

20 03 07 Bulky waste

20 03 99 Wastes not otherwise specified

#### 12.6.8.4 Construction waste for which depositing on disposal sites for inert waste is permitted

The following construction waste may be deposited to disposal sites for inert waste:

| | |
|---|---|
| – Concrete and reinforced cement concrete | – Fibre cement |
| – Silicate concrete | – Asbestos cement |
| – Porous concrete | – Clinker |
| – Clay bricks and other bricks | – Ceramic tiles |
| – Grout and plasters | – Sandstone |
| – Gravel | – Natural stone |
| – Sand | – Broken natural materials |
| – Asphalt, asphalt concrete, sand asphalt | – Clay bricks based on gypsum |
| – Bitumen gravel | – Plastering materials |
| – Bitumen concrete | – Faience |
| – Glass | – Fireplace stones and household fireclay |
| – Brick, concrete and other mineral roof coverings | |

Construction waste specified in the Table shall not be polluted with hazardous substances and may contain a maximum of 10% of the following elements:

- Wood
- Products containing wooden particles and/ore particles such as splinters, fillings, planes, abrasives, wood fibres, wood flour or cellulose fibres, e.g.: Plywood, Strongly bound plywood, Easily installed slabs from wood wool, Wood wool, Slabs based on cellulose bound by cement, Stone coatings, noise protection coatings with mineral bound wood fibres, Noise protection material produced from waste paper
- Plaster – cardboard slabs or gypsum slabs
- Wallpaper
- Cork
- Bark
- Straw
- Window frames made from PVC
- Slabs, foils and strips made from plastic
- Flooring
- Pipes, reinforcements or roofing gutters
- Insulation for wires and cables
- Reinforced fissure mixtures or
- Insulation panels

# GUIDELINES FOR ROAD DESIGN, CONSTRUCTION, MAINTENANCE AND SUPERVISION

## Volume IV: ROAD SUPERVISION

### SUPPLEMENT S2: WORKS CONTRACT SPECIMEN

# 13 S2 WORKS CONTRACT SPECIMEN

Employer No. .....
Contractor No.:. .....

entered into by:

**EMPLOYER:** xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

represented by ……..

Registration number :

Identification Number for VAT:

Certificate proving that the legal entity is identified for VAT under the identification number for VAT: code xxxxxxxxxxxx datedxxxxxxx

Transaction Account No.:xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

and

**CONTRACTOR:** ……

represented by ……

Registration Number ……

Identification Number for VAT: ……

Certificate proving that the legal entity is identified for VAT under the identification number for VAT: code ……..dated ……

Transaction Account No. for the Employer to pay for completed works ……at ……

**CONTRACTOR: (to be completed by a Bidder who is a foreign legal entity)**

Headquarter (in the Bidder's country) ……

represented by……

Registration number (in the Bidder's country)

Tax number (n the Bidder's country) ……

Transaction Account No. on which the Employer transfers payment for the Works completed …… at ……

## INTRODUCTORY PROVISIONS

Clause 1

The Contracting Parties find that:

the Employer…….published in the Official gazette no……a public tender for the selection of contractor, according to an open procedure for the Construction of:…… on the basis of which the Contractor named above was selected as the most favorable Bidder.

## 1. SUBJECT OF THE CONTRACT

Clause 2

By signing this Contract the Employer hereby grants and the Contractor accepts the implementation of:

(works)

A detailed programme of Works is evident from Section 1 – Instruction to Bidders, Item……

## CONTRACTUALVALUE OF WORKS

Clause 3

The contractual value of the works specified in Clause 1 hereof is set on the basis of the Contractor's Bid No.: ..... of ..... and on the basis of the approved and accepted cost estimated by the Employer, which amounts to:

excluding VAT .....KM
VAT amount .....KM

The contractual value inclusive of VAT amounts to:
.....KM
in words: .....KM

The Contractor's Bid and all Appendices to the Bid form an integral part of the Contract hereof.

## METHOD OF CALCULATING COMPLETED WORKS

Clause 4

Completed works (Works defined in clause 1.1 of Instructions to Bidders), shall be billed by the Contractor in accordance with the Bid and as per (the "Turn-Key Lump-Sum" principle), with the exception of the deep foundations and anchoring of the sheet pile wall which will be billed in accordance with the unit prices from the Bill of Quantities and the actually executed quantities recorded and confirmed in the Book of Quantities.

For any works additionally ordered by the Employer, registered in the construction diary and approved by the Engineer, the two contracting parties shall, prior to the disbursement of proceeds under this contract or upon the Employer's request, sign an Annex to this Contract whereby they shall set the price for this work on the basis of mutually agreed bases of calculation.

Annex to the Contract shall be made upon previous certification of the Contractor's request, submitted in accordance with the provisions of Sub-Clauses from 13.1 of the General Conditions of Contract by the Engineer in accordance with the provisions of Sub-Clauses from 13.2 of the General Conditions and upon obtaining a special permission by the Employer in accordance with the provisions of Sub-Clause 3.1 of Conditions of Particular Application.

The Contractor shall carry out calculations for the works performed based on interim monthly statements to be submitted to the Employer for approval by the 5th of each month for the previous month. The draft final statement shall be submitted within 56 days of the completion of the works and upon the issuance of a Bank Guarantee for an Extended Liability Period pursuant to the provisions of the "General Conditions of Contract", "Instructions to Bidders for the Preparation of the Bid" and "Conditions of Particular Applications".

Price Adjustments shall be calculated as defined in the "Instructions to Bidders" and in the "Conditions of Particular Applications "on the base of previously signed Annex.

The value of the monthly statements for the works awarded according to the "Turn Key/Lump Sum" principle shall be expressed as a percentage of the contract price according to the "Turn Key/Lump Sum" principle. The percentage of the completed works shall be defined according to the Book of Quantities.

## METHOD OF PAYMENT

Clause 5

The completed works shall be paid to the Contractor by the Employer according to interim monthly statements.

The Contractor is obliged to submit the statement within 5 days of the billing period (end of the month), i.e. by the 5th of the following month for the previous month.

The Employer shall confirm the statement within 8 days of its receipt and shall also pay the interim statement within the following 20-day period.

Should the Employer be late with the payment for the confirmed statement, the Contractor shall be entitled to the payment of penalty interest for all his claims towards the Employer calculated from the date he was entitled to such payment pursuant to this Contract.

The Contractor binds himself, as the party taking over the public procurement works, to withdraw his claims towards the Employer in favour of the suppliers of goods, co-operating partners and sub-contractors with claims towards the Contractor of the works.

The Contractor binds himself to use the same payment deadlines for settling his liabilities towards suppliers of goods, co-operating partners and subcontractors as those specified in the Contract on the Acceptance of the Works concluded with the Employer relating to the granted implementation of the works.

The Contractor binds himself to accept, and calculate and pay to suppliers of goods, co-operating partners and subcontractors, all due liabilities and legal penalty interests for every day of delay in the payment of due and approved liabilities on the basis of invoices issued for services provided by subcontractors and co-operating partners and goods delivered by suppliers of goods.

Clause 6

The Contractor binds himself to prepare within 28 days, at the latest, upon signing the contract, a detailed work progress schedule and an expenditure program by months, what shall be approved by the Engineer.

Clause 7

Prior to the issuance of the Defects Liability Certificate, the Contractor shall deliver a Guarantee for Extended Liability Period amounting to 5% of the value of the works under contract, to be adjusted once the final statement is approved and, if necessary, supplemented. Until such a Guarantee for Extended Liability Period and a Defects Liability Certificate are issued, the Employer shall retain the valid Performance Security issued in relation to contractual obligations. If the Performance Security for appropriate execution of contractual obligations expires, the Employer shall, until the receipt of the Guarantee for Extended Liability Period, and from the value of the works already completed, retain as a security 10 percent of the value of the works.

If, until the issuance of the Defects Liability Certificate, the Contractor fails to deliver the Guarantee for Extended Liability Period, the Employer is entitled to realize the Performance Security at a level defined for the Guarantee for elimination of deficiencies in relation to the Extended Liability Period.

## OBLIGATIONS OF THE EMPLOYER

Clause 8

Prior to the commencement of the works, the Employer shall be obliged to submit to the Contractor:

1. two copies of Drawings according to which the Works shall be performed of which one copy shall be certified by the managing authority, unless the Contractor is obliged to prepare such Drawings by himself,
2. site or part of the site, required for the execution of construction Works being the subject of this Contract,
3. data for the setting out
4. a building permit, except in case such permit should be obtained on the basis of drawings to be prepared by the Contractor,
5. compliance with other obligations pursuant to the provisions of this Contract and its constituent parts, referring to the commencement of Works.

## OBLIGATIONS OF THE CONTRACTOR

Clause 9

The Contractor binds himself to deliver, prior to the commencement of the works, to the Employer or the engineer appointed by the Employer, all necessary documents which apply to the implementation of the works under this Contract and which are specified in the General Conditions and Conditions of Particular Applications.

In addition to the Contractor, the following Subcontractors will participate in the implementation of works:.

…….

…….

For the purpose of insuring his liabilities arising from payments to his Subcontractors, the Contractor must, within 10 days of the conclusion of this Contract, deliver to the Employer a Performance Security for appropriate execution of contractual obligations, which shall also cover the confirmed obligations of the Contractor to his Subcontractors from subcontracts that the Contractor for any reason fails to pay on the due date. In the event that the performance security is cashed, the Contractor must immediately deliver to the Employer another guarantee (security).

Clause 10

Relating to the execution of works under this Contract, the Contractor undertakes to:

- ensure high quality implementation of the works in accordance with Section 4 (General Technical Conditions, and Special Technical Conditions with supplements and Technical specifications);
- deliver all evidence on built-in materials and constructions to the Employer;
- make a setting out;
- prepare drawings as required under Item 14.3 of the Instructions to Bidders for the Preparation of Bid;
- keep a construction diary and co-operate in the up-to-date Book of Quantities for the works completed throughout the implementation thereof in accordance with the Conditions of Particular Applications and instructions by the Engineer;
- within 10 days of the conclusion of the Contract on the Implementation of the Works, deliver the Performance Security in the form of a Guarantee at 10% of the Contractual Price to the Employer in accordance with the terms and conditions specified in the Contract and the integral parts thereof (Clause 20);
- prior to the payment of the final statement, deliver to the Employer the completed form VC-2 and VK 01, including data on completed works for the road databank;
- in the event that there are several Contractors at the construction site, sign with these Contractors a written agreement on the implementation of the works, co-ordination of work schedules, implementation of safety measures at the construction site, implementation of measures for the protection of the property of the Employer and of other contractors, and on the maintenance of access roads within the construction site area and to the construction site;
- complete the works in accordance with the drawings (designs) approved by the Employer and for which a building permit has been obtained;
- prepare Drawings for As-Built Works and geodetic plan of the new status of the land plot after the completion of the construction and to deliver them to the Employer prior to the issuance of the Taking-Over Certificate:
- create a maintenance project and all procedural rules for use and maintenance of structures prior to the issuance of the Taking-Over Certificate:
- comply with the Employer's general regulations and the regulations of the Republic of Slovenia if not otherwise determined in the tender conditions;
- within 28 days from the receipt of the notice on the commencement of works to design and deliver to the Employer the Technological Reports on the implementation of the works which are the subject of this Contract, the work schedules and cash flows shall be prepared in MS Project computer application;
- perform the works during the whole daylight part of the day and all the working days in a week.

## DEADLINES FOR THE COMPLETION OF WORKS

Clause 11

The Contractor undertakes to commence the implementation of the works immediately after the provisions of Sub-Clause 8.1 which govern the Conditions of Particular Applications are fulfilled,

and after the Employer's fulfillment of the obligations under Clause 8 hereof, and to complete them within the following period:

……..

or in compliance with the Cash Flow under Sub-Clause 8.4 of the Conditions of Particular Application.

## LIQUIDATED DAMAGES

Clause 12

If the Contractor, by his own fault, fails to implement the contractual works within the agreed or, by mutual agreement, extended time limit, he shall be obliged to pay the Employer liquidated damages of 5‰ (five per thousandth) of the final value of the contractual works per day of delay.

The total amount of the liquidated damages may not exceed 5% (five per cent) of the final value of the contractual works.

Clause 13

The final value of the contractual works, as defined in the preceding Clause, shall be determined on the basis of the Final Statement. The liquidated damages shall be calculated on the basis of the Final Statement.

The Employer and the Contractor hereby agree that the right to charge liquidated damages shall not necessarily apply to any damage suffered by the Employer. The Employer will seek compensation for this kind of damage in accordance with the general rules applying to liability for damages, irrespective of the enforcement of the liquidated damages.

Clause 14

The Contractor shall, according to the General Conditions of Contract and Instructions to Bidders for the Preparation of Bid and the Conditions of Particular Applications (Part II), prepare the required drawings and carry out all activities necessary for them.

## EXTENDED LIABILITY PERIOD

Clause 15

The Contractor shall be responsible to the Employer for eventual defects and deficiencies, which arise during the Extended Liability Period, being **10 years** for all the Works, in the production of the works, and devices, which are the subject of this Contract pursuant to Clause 11.3 of the Conditions of Particular Applications.

Clause 16

Upon the taking-over of the works and the issuance of a "Taking-Over Certificate", the Employer shall examine the completed works in accordance with the provisions of the General Terms and Conditions of the Contract and with the Special Technical Conditions. The Contractor shall be obliged to rectify all determined insufficiencies within 365 days. The Engineer will issue the "Defects Elimination Certificate" only upon the elimination of all such deficiencies.

Clause 17

The Contractor is obliged to eliminate deficiencies, which might occur during Extended Liability Periods.

Should the Contractor not eliminate the deficiencies within the agreed period, the Employer is entitled to eliminate them at the expense of the Contractor according to the principle of good business practice.

## CONSTRUCTION MANAGEMENT AND THE EMPLOYER'S REPRESENTATIVE

Clause 18

In accordance with the General Conditions of Contract, the Employer hereby appoints as engineer:

……

, The Engineer hereby appoints as its project manager::…….

The Contractor hereby appoints as its representative::

.....

## CONTENT OF CONTRACTUAL DOCUMENTATION

Clause 19

The Contracting Parties hereby agree that in addition to the Contractor's Bid specified in Clause 3, the following documents, which will be interpreted in the order specified below, shall form an integral part of this Contract:

1. The Contract
2. A Letter of Acceptance of the Bid
3. The Bid and Appendix "A" to the Bid
4. Conditions of Particular Applications
5. General Conditions of the Contract
6. General Technical Conditions with Supplements
7. Drawings (Designs)
8. Bill of Quantities with measurements
9. Time schedules and cash flows

Other documents which form an integral part of this Contract

## FINAL PROVISIONS

Clause 20

The Contracting Parties agree that this Contract shall be concluded with postponed implementation and becomes effective only when a Performance Security is submitted, to also cover insuring the liabilities of the Contractor arising from payment to Subcontractors. The Contractor shall submit to the Employer a Bank Guarantee within 10 days of concluding this Contract.

The rights and obligations under the Contract shall become effective on the day the conditions from the previous paragraph of this Clause are fulfilled

Clause 21

The Contracting Parties shall settle any possible dispute that may arise from the implementation of this Contract by agreement.

In the event that the Contracting Parties cannot settle a disputable issue by agreement, the settlement of the dispute shall fall within the jurisdiction of the competent court in …….

Clause 22

This Contract consists of six identical copies and shall be concluded on the day it is signed by the Contracting Parties; it shall enter into force on the day when the conditions from Clause 20 hereof are met. Each of the Contracting Parties shall receive three copies.

The date of conclusion of the Contract shall be deemed to be the last date signed.

| | |
|---|---|
| Signed on: | Signed on: |
| _____ | _____ |
| CONTRACTOR: | EMPLOYER: |

# GUIDELINES FOR ROAD DESIGN, CONSTRUCTION, MAINTENANCE AND SUPERVISION

## Volume IV: ROAD SUPERVISION

## SUPPLEMENT S3: FORMS OF CONSTRUCTION DIARY AND LEDGER OF QUANTITIES

# 14 S3 FORMS OF CONSTRUCTION DIARY AND LEDGER OF QUANTITIES

## CONSTRUCTIOJN DIARY:

## Contents of introductory and daily forms

### *Form of Introductory cover page*

cover page

| | |
|---|---|
| 1. | Information on the works:<br>– name of works .....<br>– locality .....<br>– type of works ..... |
| 2. | Information on Investor:<br>– name, address of headquarter.....<br>..... |
| 3. | Information on contractor(s):<br><br>– name and address of headquarter.....<br>.....<br>– name and address of headquarter .....<br>.....<br>– name and address of headquarter .....<br>.....<br>– responsible executor of works:<br>construction ..... machine installation.....<br>electrical installation.....<br>telecommunications..... technology .....<br>excavation and basic subworks.....<br>(first and last name, degree of education)<br>– responsible construction site manager (if nominated) .....<br>(first and last name, degree of education)<br>– responsible executor of individual works:<br>construction .....<br>machine installation.....<br>electrical installation.....<br>telecommunications .....<br>excavation and basic subworks.....<br>(first and last name, degree of education) |

| | |
|---|---|
| 4. | Information on the project for acquiring the building permit and on project designer:<br>– name and address of project designer's headquarter ……<br>– ref. no.: ……<br>– responsible design manager ……<br>(first and last name, degree of education, identification no.)<br>– responsible project designer:<br>architecture plans ……<br>landscape architecture plans……<br>construction plans and other building plans……<br>electrical installation and electrical equipment plans……<br>machine installation and machinery plans……<br>telecommunications plans……<br>technological plans ……<br>excavation and basic subworks plans for underground works……<br>land surveying plans ……<br>other plans ……<br>(first and last name, degree of education, identification no.) |
| 5. | Information on building permit:<br>– name of relevant administrative body:……<br>– ref. no. and date of issuing……<br>……<br>(original, eventual modifications and adaptation) |

(second page)

| | |
|---|---|
| 6. | Information on auditor (for demanding works):<br>– name and address of auditor's headquarter ……<br>– responsible auditors of:<br>architecture plans ……<br>landscape architecture plans……<br>construction plans and other building plans……<br>electrical installation and electrical equipment plans……<br>machine installation and machinery plans……<br>telecommunications plans……<br>technological plans ……<br>excavation and basic subworks plans for underground works……<br>land surveying plans ……<br>other plans ……<br>(first and last name, degree of education, identification no.) |
| 7. | Information on the project for execution and on project designer:<br>– name and address of project designer's headquarter ……<br>– ref. no.: ……<br>– responsible design manager ……<br>(first and last name, degree of education, identification no.)<br>– responsible project designer of:<br>architecture plans ……<br>landscape architecture plans……<br>construction plans and other building plans……<br>electrical installation and electrical equipment plans……<br>machine installation and machinery plans……<br>telecommunications plans……<br>technological plans ……<br>excavation and basic subworks plans for underground works……<br>land surveying plans ……<br>other plans ……<br>(first and last name, degree of education, identification no.) |

| | |
|---|---|
| 8. | Information on supervisor:<br>– name and address of supervisor headquarter……<br>– responsible supervisor ……<br>– responsible supervisors of individual works:<br>construction ……..<br>machine installation……..<br>electrical installation…….<br>telecommunications ……<br>excavation and basic subworks…….<br>(first and last name, degree of education) |
| 9. | In the case of reconstruction of a building protected by the regulation on safeguarding cultural heritage or a construction within range of archeological findings<br>– name and headquarter of competent directorate for protection of cultural heritage…….<br>– information on responsible conservator or archeologist……<br>(first and last name, degree of education) |
| 10. | handing over the design for acquiring the building permit to contractor:<br>– description and content ……<br>– ref, no., date, signatures …… |
| 11. | The responsible administrator of :<br>- construction diary: ……<br>- ledger of quantitative measurements……<br>(first and last name, degree of education) |
| 12. | Measures for health, safety and fire protection:<br>– ref. no. of safety plan ……<br>– responsible contractor for implementation of safety plan and regulation of site…….<br>– coordinator for safety on site……..<br>(first and last name, degree of education) |

***Form of daily pages***

cover page

Contractor:……(logotype)
Works ……..
Employer…….. page…….

**Daily report** no.:…… on day: ……
working hours : from……to……

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| weather conditions at ..o'clock: | | | | | | | | | | | | |
| – weather | | | | | | | | | | | | |
| – air temperature °C | | | | | | | | | | | | |
| – amount of precipitations | | | | | | | | | | | | |
| – water level | | | | | | | | | | | | |
| – wind speed (m/s) in direction: | | | | | | | | | | | | |
| – other conditions | | | | | | | | | | | | |
| **Workers on site** | | | administration | | construction workers | | trades men | | installers | | other workers | total |
| – contractor's workers | | | | | | | | | | | | |
| – hired workers | | | | | | | | | | | | |
| – subcontractors, cooperators | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **Machinery** | | | | | | | | | | | | |
| – contractor's | | | | | | | | | | | | |
| – other | | | | | | | | | | | | |
| | | | | | | | | | | | | |

**Description of work:**

(1)

commenced work:

completed work:

Notices, statements, instructions, outlines, remarks, etc.
(2) to (6)

| | | |
|---|---|---|
| composed by:<br>……<br>(first and last name, signature, seal) | responsible supervisor (responsible supervisors of individual works):<br>……<br>(first and last name, signature, seal) | responsible executor of works (responsible construction site manager - if nominated)<br>……<br>(first and last name, signature, seal) |

second page

| |
|---|
| DAILY FORM – completion<br>page no.:. …. |
| 6. Additional statements, instructions, information and notes, outlines: |
| Note:<br>This page may be net figured in raster 1 mm by 1 mm |
| 6.a Remarks and instructions of responsible conservator or archaeologist<br>(In the case of reconstruction of a building protected by the regulation on safeguarding cultural heritage or a construction within range of archeological findings) |
| 7. Contractor's statements<br>reasons of delays, quantities of supplied construction products and basic material and equipment |
| |

***Instructions to Fill the Daily Form of CD***

1. The construction diary shall be filled and signed:
   - in the case of demanding works: every working day
   - in the case of less demanding works: twice a week
   - in the case of simple works: at the end of working week.
2. The rubric "Weather conditions" shall be filled with the specification of climatic conditions in the early morning, morning and afternoon when the conditions are changed. Weather conditions would be important to make clear the reasons for delays.
3 The rubric "Description of work" shall be filled with technical description of daily work:
   - mark (1) indicates contracted work (contract and annexes)
   - mark (2) indicates additional work not provided by priced bill of quantities.
   - mark (3) indicates changes to the quantity of contracted work"
   - mark (4) indicates variation or modification of work caused by changes to the project design.
   - mark (5) indicates overhead expenses needed for successful completion of construction
   - mark (6) other work
4 When the extent of information needs more pages they shall be paged with the same number but sub numerated.

## LEDGER OF QUANTITATIVE MEASUREMENTS

***Form of Introductory Page***

Name of works: ……..
Investor: …….
Contractor: ……..

| | | |
|---|---|---|
| Priced bill of quantities no.: | Date | Total amount |
| contract – annex | Date | Total amount |
| responsible supervisor or responsible supervisors of individual works | In the period from ...to...: | Signature |
| responsible executor of works | In the period from ...to...: | Signature |
| Composer: | In the period from ...to...: | Signature |

The ledger contains:
…. …measurement pages .. ……. measurement supplements ……. measurement plans
Start date of administering: ……
End date of administering: …….

| | |
|---|---|
| responsible executor of works or responsible construction site manager: | responsible supervisor or. responsible supervisors of individual works |
| …… | …… |
| (first and last name, signature, seal) | (first and last name, signature, seal) |

In the case of reconstruction of a building protected by the regulation on safeguarding cultural heritage or a construction within range of archeological findings:

responsible conservator:
……
(first and last name, signature, seal)

***List of inserted pages***

| parts of work | number of inserted pages at the end of interim payment period | | | | | | | | | | | | | | | | | | | | | | | total no. at the completion of works |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | |
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| Total | | | | | | | | | | | | | | | | | | | | | | | | |

Contractor: .....

***Measurment page***

no.: …….. page no.: ……

<table>
<tr><td>Works:</td><td colspan="3">Description of work – item:</td><td colspan="2">item of BoQ</td></tr>
<tr><td rowspan="2">measurment plan:</td><td colspan="3" rowspan="2"></td><td colspan="2"></td></tr>
<tr><td colspan="2">Account:</td></tr>
<tr><td rowspan="2">Priloga:</td><td>unit</td><td>contracted quantity:</td><td>price for unit:</td><td colspan="2">Quantity</td></tr>
<tr><td></td><td></td><td></td><td>monthly</td><td>total</td></tr>
<tr><td colspan="4">transfer from page: ……<br>mesures,<br>calcualtions:<br>outlines<br><br>Transfer to page: ……</td><td></td><td></td></tr>
<tr><td colspan="2">Composer:<br><br>……<br>(first and last name, signature, seal)</td><td colspan="2">Employer’s representative:<br>supervisor:<br>……<br>(first and last name, signature, seal)</td><td colspan="2">Contractor:<br>responsible executor:<br>……<br>(first and last name, signature, seal)</td></tr>
</table>

In the case of reconstruction of a building protected by the regulation on safeguarding cultural heritage or a construction within range of archeological findings:

responsible conservator: ……

(first and last name, signature, seal)

***Instructions to fill the ledger***

1. The ledger is administered by contractor’s responsible composer.
2. The number of pages must correspond to the number of items of BoQ. They are inserted in a folder in the sequence of items of BoQ. If an itemized part of works is not realised the page shall be inserted without quantity definition and noticed:”This works are nor realised because of:.... »
3. The signature of responsible Investor’s representative is an attestation that the quantity of works signed is completed.

# GUIDELINES FOR ROAD DESIGN, CONSTRUCTION, MAINTENANCE AND SUPERVISION

## Volume IV: ROAD SUPERVISION

### SUPPLEMENT S4: FORMS AND CONTENT OF EXECUTED WORKS PROJECT

# 15 S4 FORMS AND CONTENT OF PROJECT OF EXECUTED WORKS

**Form of statement of supervisor and design manager of design of executed works:**

**STATEMENT OF SUPERVISOR AND DESIGN MANAGER OF DESIGN OF EXECUTED WORKS**

Supervisor and Design Manager of Design of Executed Works

.....
(first and last name)

.....
(first and last name)

**C E R T I F Y**

1. that any changes that occurred during construction are recorded with the design of executed works
2. that the changes that occurred during construction and are recorded with the design of executed works are in compliance with the project for acquiring the building permit and with the building permit(s) no.:..... and no.:.....
3. that the design of executed works is in accordance with the legislation of the construction region.
4. that all the solutions of the design of executed works are in mutual compliance
5. that all the recorded variations during construction are carried out in accordance with essential requirements what is confirmed by the responsible designer' signature of individual schemes

Supervisor:

.....
(first and last name, degree of education, register no.)

.....
(personal seal, signature)

Responsible design Manager of design of executed works:

.....
(first and last name, degree of education, register no.)

.....
(personal seal, signature)

.....
(design evid. no.)

.....
(place and date)

***Form of title page of introductory folder:***

**INVESTOR:**

.....

(investor's name and surname, company, headquarters' address)

**WORKS:**

.....

(denomination of the structure to be constructed)

**TYPE OF TECHNICAL DOCUMENTATION**

(project execution design, project for the maintenance and operation of the works, project for entry in official records)

.....

**TYPE OF WORKS:**

.....

(new construction, horizontal or vertical extension, reconstruction, removal, change of intended use, substitutive construction)

**DESIGN COMPANY*:**

.....

(title, address, name and signature of responsible person, stamp)

**RESPONSIBLE DESIGN PROJECT MANAGER*:**

.....

(name of responsible design project manager, professional education, identification number, personal stamp, and signature)

**NUMBER OF DESIGN AND COPY, PLACE AND DATE OF DESIGN COMPLETION:**

.....

(number of design recorded by design company, place and date of design completion)

* In the case of Project for the maintenance and operation of the works and Project for entry in official records the information on "design company" is omitted; for "responsible design project manager" the information on "composer of technical documentation

Table of contents:

0 – Introductory folder

0.1 Title page of leading folder of technical documentation
0.2 Table of content of the design
0.3 General information on works
0.4 Statement of supervisor and of design of executed works design manager
0.5 Verification documents

Schemes

1 Scheme (plan) no.....
- 1.1. Title page
- 1.2. Table of contents of scheme
- 1.3. Table of content of the design
- 1.4. Drawings

2 Scheme (plan) no.....
- 1.1. Title page
- 1.2. Table of contents of scheme
- 1.3. Table of content of the design
- 1.4. Drawings

3 Scheme (plan) no.....
- 1.1. Title page
- 1.2. Table of contents of scheme
- 1.3. Table of content of the design
- 1.4. Drawings

4. .....

etc

**General information on the completed construction**

Type of works:

.....

(description of the type of construction or works: new structure, horizontal or vertical extension, reconstruction, removal, change of intended use, substitutive construction)

Name of the works, which the intended construction relates to:

.....

(indication of the name of the structure, which this evidence relates to)

Structure classification:

.....

(indication of the classification designation in accordance with the relevant regulation if any; if a multipurpose structure is intended, portions of serviceable surfaces occupied by individual structural parts of the same purpose shall also be indicated)

Other classifications.....

(indication of classifications in compliance with other regulations)

Works complexity:

.....

(indication of structure complexity: simple, less complex, complex)

Location:

.....

.....

.....

(indication of location, parcel numbers, and cadastral municipality of the intended construction, as well as identification numbers from the cadastre of buildings and cadastre of public infrastructure)

Building dimensions or dimensions/capacity of civil engineering structure.....

.....

(dimensions of a building or dimensions/capacity of a civil engineering structure)

Presentation of construction value.....

(indication of estimation of construction costs taken from the design documents, and calculation of actual construction costs taken from the technical documents, i.e. as-built design, respectively)

(leave out or add as appropriate)

Notes:

a. When a design relates to several intended constructions, the information shall be entered for all of them.
b. The design data on dimensions and capacity of a building shall be:
   - calculated, assessed or measured for buildings in compliance with the standard ISO 9836, and shall comprise at least the area of the building in plan, gross area in plan, net area in plan, gross volume, and net volume.
   - indicated for civil engineering structures; in addition, other features of such structures shall be mentioned as well.

**Information on design company and responsible designers**:

| | | |
|---|---|---|
| Graphical presentation of placing in space: | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Architectural scheme: | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Landscape architecture scheme: | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Structural scheme: | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Scheme of electrical installations and equipment: | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Scheme of mechanical installations and equipment: | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Scheme of telecommunication installations: | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Technological scheme: | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Scheme of excavations, blasting, and geotechnical structures: | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Other constructional schemes | Design company: | (title, address, telephone, e-mail) |
| | Responsible designer: | (name and surname, professional education, identification number, personal stamp, signature) |
| Expert's report | Expert(s): | (name and surname, professional education, identification number, personal stamp, signature, if available for the particular expert) |
| Other technical document: | Expert(s): | (name and surname, address of the expert and/or title and address of the company) |
| Land surveying scheme: | Survey company: | (title, address, telephone, e-mail) |
| | Responsible surveyor: | (name and surname, professional education, identification number, personal stamp, signature) |
| Responsible design project manager: | Design company: | (title, address, telephone, e-mail) |
| | Responsible design project manager: | (name and surname, professional education, identification number, personal stamp, signature) |

# GUIDELINES FOR ROAD DESIGN, CONSTRUCTION, MAINTENANCE AND SUPERVISION

## Volume IV: ROAD SUPERVISION

### SUPPLEMENT S5: ENTRY IN OFFICIAL RECORDS

# 16 S5 ENTRY IN OFFICIAL RECORDS

**Contents and forms of files:**

### *16.1.1 Report for entry in the cadastral register*

*Definitions:*

**Minutes** means a record containing all facts and statements significant to carry out the administrative procedure at geodetic direction.

**Outline** contais the following data:

- land parcel borders including the coordinates of land cadastral points and landmarks,
- data of land cadastral point:
    - evidence number and coordinates,
    - level
    - a method of determination of horizontal coordinates
    - the accuracy of coordinates determination
    - status
    - administrative number of procedure originating or modifying the point
    - date of entry to cadastral register
- evidence number of land parcel,
- topografic outline of fixing the borders,
- distances among points, landmarks and other fixed natural points,
- positions of geodetic points and
- data about the land parcel owners in procedure.
- land manager, in the case of state administration of land parcel, an agency competent to manage the parcel;
- actual estate usage.

**List of coordinates** contains:

- list of geodetic points attached to state coordinate system (evid. no., x, y coordinates, level – if defined) and
- list of new, modified or given up atributed points.

**Cadastral plan with modifications** means original graphical survey of cadastral register and a state after modification.

**Surface area** means original calculated area of land parcel and an area after modification.

**Digital data for modifications evidence** means digital computer files of cadastral register containing the data of modifications. They shall be delivered to a competent geodetic agency simultaneously with the completion of the Project for entry in the cadastral register.

**Cover page of the documentation** produced as a geodetic service contains the following general information's:

- type of report
- title and the address of survey agency producing the report
- first and last name of responsible surveyor and his registration code
- first and last name of assistant surveyor producing the report
- cadastral municipality and the land parcel evidence number included in the procedure,

- content of documentation,
- digital plans for evidence of land register modifications
- other supplements

There are different reports with the following content:

**Report of fixing the boundaries:**

- minutes of proceedings,
- outline of fixing the border,
- list of coordinates,
- cadastral plan with delineated modifications and
- area of land parcel(s).

**Report of parcelling out:**

- outline of parcelling out including the date of marking out the landmarks,
- list of coordinates,
- cadastral plan with delineated modifications and
- area of land parcel(s),

**Report of border compensation:**

- agreement of the owners about compensation of the border and a minute of the declaration on it,
- outline including the survey of the border before and the date of marking out the landmarks
- list of coordinates,
- cadastral plan with delineated modifications and
- area of land parcel(s) including the difference of area before and after compensation,

**Report of contracted commassation:**

- outline of fixing the new borders of land parcel originating from commasation,
- list of coordinates,
- cadastral plan with delineated modifications,
- area of land parcel(s)
- List of comparing data on offered and received land areas inside the territory of commassation for every owner.

**Report of fixing the borders of administrative regime[1]:**

- minutes of fixing the border of administrative law,
- data base used for procedure,
- outline of fixing the border representing the marking out on land,
- list of coordinates and
- graphic plans of modifications within range of administrative law before and after the procedure.

**Report of modification of actual use**:

- minutes of statement of actual use of land,
- outline if the area of modificated kind of use is changed,

[1] Administrative regime is a rule of civil law, which regulates placing the real estate on mrket and its ownership.

- list of coordinates of land cadastral points,
- cadastral plan with modifications of areas of parts of land parcels.

Evidence of kind of use and the rang of cadastre is carried out in the case when it is prescribed for cadastre evidence.

### *16.1.2 Report for entry in the register of buildings*

*Definitions:*

**Report for first entry** in the register of buildings means different forms filled as follows:

- cover page: form no. 1
- linking to the cadastral register and space units register: form no. 2
- position and geometry of building: form no. 3
- drawings, form no. 4
- drawings of an unit of building: form no. 5
- modified data on units of building: form no. 6

The project for entry may be carried out only by a competent survey company.

***Forms:***

**Form 1**

Cover page:

Entry in the register of buildings

| | |
|---|---|
| Title of cadastral municipality | |
| Code of cadastral municipality | |
| Evidence no. of building | |

| | |
|---|---|
| Type of project | |

Survey agency

| | |
|---|---|
| Title of agency | |
| Evidence no. of agency | |

| | |
|---|---|
| Total no. of pages..... | |

The responsible surveyor

| | |
|---|---|
| Name and last name | |
| Date | |
| Seal | |
| Signature | |

**Form 2**

Linking to the cadastral register and space units register:

Date:

| | |
|---|---|
| Title of cadastral municipality | |
| Code of cadastral municipality | |
| Evidence no. of building | |

Land parcels data

| | |
|---|---|
| Code of cadastral municipality | |
| Title of cadastral municipality | |
| Ev. no. of land parcel | |
| linkage of building and parceled | |

Address

| | |
|---|---|
| settlement: | |
| street | |
| house number | |

**Form 3**

Position and geometry of the building: Date:

| | |
|---|---|
| Title of cadastral municipality | |
| Code of cadastral municipality | |
| Evidence no. of building | |

| | |
|---|---|
| plan of building<br>Scale 1: _____ | |

| Coordinates of points in plan (m) | | | | | |
|---|---|---|---|---|---|
| No.: | X | Y | No.: | X | Y |
| | | | | | |
| | | | | | |

| Height of building<br>Height above sea level (m) | | | Vertical cross section |
|---|---|---|---|
| Ground level | H1 | | |
| Top level | H2 | | |
| Land height above sea level | H3 | | |
| No. of floors | | | |

| | | | |
|---|---|---|---|
| Year of building up | | Year of the last reconstruction | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Communal infrastructure of building | water supply | | electrical installation | | phone line | |
| | sewage system | | gas installation | | cable TV | |
| | purifying plant | | remote controlled heating | | house controlled heating | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Material of bearing construction | brick | | timber | | mixed materials | |
| | concrete, reinforced conc. | | stone | | other materials | |

**Form 4**

Drawings of building or its parts Date:

| | |
|---|---|
| Title of cadastral municipality | |
| Code of cadastral municipality | |
| Evidence no. of building | |

Building units

| ev. no. of unit | area m2 | actual unit usage | ev. no. of floor | number of rooms | kitchen | bathroom | toilet | settlement | street | house no. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |

Area of the building (m2)

| Residential | Non residential | Common usage | Total area |
|---|---|---|---|
| | | | |

Owners / managers of building units

| ev. no. of unit | name, last name, (agency) | owner, manager | register no. | address |
|---|---|---|---|---|
| | | | | |

**Form 5**

Drawing of building unit Date:

| | |
|---|---|
| Title of cadastral municipality | |
| Code of cadastral municipality | |
| Evidence no. of building | |

| | |
|---|---|
| ev. no. of floor | |
| ev. no. of unit | |
| | |

**Form 6**

Drawing of building unit Date:

| | |
|---|---|
| Title of cadastral municipality | |
| Code of cadastral municipality | |
| Evidence no. of building | |

Units of building

| Original state | | New state | | | | | | | | | | | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| building evid. no.: | unit evid. no.: | unit evid. no.: | Area (m2) | actual unit usage | evid. no. of floor | number of rooms | kitchen | bathroom | toilet | settlement | street | house no. | |
| | | | | | | | | | | | | | |

Owners/managers of unit

| unit evid. no.: | name, last name (agency) | owner, manager | register no. | address |
|---|---|---|---|---|
| | | | | |

**Form 7**

Entry in registry data Date

| | |
|---|---|
| Title of cadastral municipality | |
| Code of cadastral municipality | |
| Evidence no. of building | |

Land parcels data:

| Code of cadastral municipality | name of cadastral municipality | parcel no. | Linkage between building and land parcel |
|---|---|---|---|
| | | | |

House number data

| | | | |
|---|---|---|---|
| Settlement | | | |
| Street | | | |
| hose no. | | | |

| | |
|---|---|
| Plan of building<br>Scale 1:<br>_____ | |
| | |

| Coordinates of points in plan | | | | | |
|---|---|---|---|---|---|
| no.: | X | Y | no.: | X | Y |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Form 8**

Entry in register

| | |
|---|---|
| Settlement | |
| Street | |
| house no. | |

As the owner of the building/ owner of a building unit/tenant of the building – unit/building manager/Investor of building/ – apply for entry the data of the building and its parts.

| | |
|---|---|
| Address of the building | |
| cadastral municipality, no. of parcel | |

| | | | |
|---|---|---|---|
| The year of completion the building | | The year of last reconstruction | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Communal infrastructure of building | water supply | | electrical installation | | phone line | |
| | sewage system | | gas installation | | cable TV | |
| | purifying plant | | remote controlled heating | | house controlled heating | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Material of bearing construction | brick | | timber | | mixed materials | |
| | concrete, reinforced conc. | | stone | | other materials | |

Building units

| ev. no. of unit | area m2 | actual unit usage | ev. no. of floor | number of rooms | kitchen | bathroom | toilet | settlement | street | house no. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Owners / managers of building units

| ev. no. of unit | name, last name, (agency) | owner, manager | register no. | address |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Date: Signature:

### *16.1.3 Report for entry in the register of public infraworks*

The managing of database of public works and public infraworks (cadastre collection) is regulated with Space management law and its sub regulations.

The managing is carried out by a competent municipal or ministry's direction.

### *16.1.4 Codes of works and public infraworks*

| Code | definition | description |
|---|---|---|
| **1000** | **TRAFFIC INFRAWORKS** | |
| 1100 | roads | highways, main roads, regional roads, local roads, public ways, forest ways, road infrastructure |
| 1200 | railway | main lines, regional lines, railway infrastructure |
| 1300 | airports with infrastructure, plant and systems of air traffic navigation | infrastructure, plant and means of service |
| 1400 | harbors | infrastructure and navigation lines |
| **2000** | **ENERGETICS** | |
| 2100 | electric energy | network and plant for transmission and distribution of electric power |
| 2200 | natural gas | network and plant for transmission and distribution of gas |
| 2300 | heat energy | pipelines for hot water, steam and compressed air, infrastructure |
| 2400 | oil and its derivatives | pipelines, infrastructure |
| **3000** | **COMMUNAL INFRASTRUCTURE** | |
| 3100 | water supply | main, primary, secondary and tertiary water pipelines with structures |
| 3200 | sewage system | main, primary, secondary and tertiary sewage system with structures |
| 3300 | waste management | waste management plants and structures |
| **4000** | **WATER INFRASTRUCTURE** | structures, plant and means of managing with water and water monitoring |
| **5000** | **MEANS OF MANAGING WITH NATURAL RESOURCES AND ENVIRONMENT PROTECTION** | structures, plant and means of managing with natural resources and environment protection |
| **6000** | **OTHER WORKS AND PUBLIC INFRASTRUCTURE** | |
| 6100 | telecommunication | transmission and distribution telecommunication system and structures |

### *16.1.5 Kinds of land actual use*

| Code | Name of actual use | Description |
|---|---|---|
| **1000** | **Rural land** | - Cultivable rural land**:** fields, gardens, greenhouses, meadows, fruit gardens, vineyards, olive groves, fields of hops, forestry and bush plantation, industrial wood plantation<br>- Uncultivable rural land: pastureland, land under and around farms of livestock, field ways, hedges, land overgrown with natural grass and low bushes. |
| **2000** | **Forest** | - conifer forest –. more than 75% of coniferous tree |

| Code | Name of actual use | Description |
|---|---|---|
| | | - mixed forest<br>- broad-leafed forest– more than 75% of broad-leafed trees<br>- low forest and bushes<br>- forest ways |
| **3000** | **Water estate** | Bottom of:<br>- water flow<br>- stagnant or intermittent water<br>- sea<br>- periodic inundated waterbed<br>- gravel pit when periodically flooded<br>- sands rising within natural stagnant or flowing water<br>- island within natural stagnant or flowing water<br>- swamp<br>- retarding basins<br>- reservoir<br>- brackish water |
| **4000** | **Residential areas** | Plot of ground of:<br>- housing estate,<br>- commercial and other business buildings, service and recreation buildings, restaurants (camps are not included),<br>- manufactory, plant, reservoir structures, silos, storehouses and nonresidential agricultural buildings,<br>- educational buildings and research institutes, buildings for health service, museums, libraries, entertainment buildings , worship and cultural centers, archaeological locations and monuments,<br>- cemeteries,<br>- sports and entertainment ground, public parks,<br>- traffic and telecommunication infrastructure and structures,<br>- energetic works,<br>- waste dump<br>- mining industry<br>- military infrastructure |
| **5000** | **Unfertile land** | Unfertile land is land, which is not classified as rural land or forest, water estate and residential areas. |

### *16.1.6 The report for modifications entry in the register of public infraworks*

Modifications are addition, cancellation and alteration of locating data and estate conditions.

It contains:

- original and modified locating data of infrastructure,
- code of evidence, if it exists,
- new geometrical data
- information on manager or administrator

# GUIDELINES FOR ROAD DESIGN, CONSTRUCTION, MAINTENANCE AND SUPERVISION

## Volume IV: ROAD SUPERVISION

## SUPPLEMENT S6: TAKING OVER OF CONSTRUCTION PRODUCTS

# 17 S6 TAKING OVER OF CONSTRUCTION PRODUCTS

## 17.1 SCOPE OF THE GUIDELINE

In the near future, European technical specifications will regulate performances of the most of construction products, particularly the adopted European standards (EN) and European technical approvals (ETA). EN and ETA, consistently in accordance with CPD, respectively Construction Products Act or decree, will lay down the conformity attestation system.

Until the date of publication of technical specifications BAS EN, the national technical specifications for public roads were mandatory for assessment and attestation of conformity of construction products intended for use in the road works or applied for road maintenance in BiH.

Actually the requirements and the procedures of assessment of required performances of products, fit for use in public road works, are regulated by various technical specifications. There are various systems of assessment and attestation of products conformity with a technical specification. Some areas were temporarily regulated by:

- Still legal decrees of mandatory attesting of products, issued according to Standardization Act, passed in former SFRJ,
- Public Roads Act , and
- Standardization Act

Surveillance of the implementation of construction or other products, installations, plant and equipment fit for use in structures is a part of technical surveillance regulated with the provisions of Construction Act.

## 17.2 TAKING OVER OF THE CONSTRUCTION PRODUCTS SUPPLIED TO THE SITE

### *17.2.1 Construction products taken over when supplied to the site*

The products, which need to be taken over when supplied to the site or plant, prompt for use in works:

- Mixtures of stone aggregates,
- Binders: - bitumen and bituminous emulsion,
  - cement,
  - epoxy resin,
- Admixtures for concrete, shotcrete, mortar and grout,
- Hot mix asphalt,
- Cement concrete mixtures,
- Steel for reinforcement and prestressing (reinforcing bars and welded fabric, wire rods and wires, ties, anchors…),
- Products of waterproofing (bituminous tapes, coating materials, bitumen binder and socketing mixtures),
- Geotextile,
- Cement concrete products and precast concrete semi products,
- Members of drainage and telecommunication systems (pipes, manholes, fittings…),
- Members of road traffic noise reducing devices (products made of wood, concrete, metal, synthetic materials…),
- Products of road equipment (traffic signs, road marking materials, coating for tunnels...)

- Products of bridge equipment (structural bearings, expansion joints, bridge and safety fences),
- Other products and materials whose performances must fulfil the essential requirements for incorporation in a permanent manner in construction works.

### *17.2.2 Takeover procedure*

The takeover procedure includes:

- The control of validity of conformity evidence of a product, which the contractor (manufacturer) is obliged to submit at the first and, if so required, at every subsequent supply of products and
- The performance of identity tests, defined by the scheme of factory production control or third party control.

The evidence of the above-mentioned assessments is a part of the Scheme of elaborating of works, when it is carried out for a part of works, when not, it has to be submitted to the Supervisor at the site.

The Institution selected and nominated by the Client through a procedure of public procurement for a part of works, is included before the first incorporation of a product, especially during the performance of identity tests and when a conformity evaluation, validity and completeness of conformity evidence are required. A particular technical assessment of national technical approvals must be carried out with regard to national regulations.

## 17.3 INCORPORATION CONTROL AND TAKING OVER OF THE BUILT IN PRODUCTS

### *17.3.1 Construction products taken over during incorporation in the works*

The control of incorporation in works and taking over of a product after incorporation is required for:

- Soil and other unbounded materials incorporated in earth works and road bases,
- Cement concrete, and grout incorporated in reinforced, prestressed or anchored structures, and wearing and sealing courses of roads
- Bituminous mixtures incorporated in wearing and sealing courses.

### *17.3.2 Takeover procedure*

The procedure of built in products takeover includes:

- The control examination of conformity evidence of a supplied product or semi product being incorporated in works, such as: prepared cement concrete mixture, prepared asphalt mixture or mixture of unbound aggregates,
- The control examination of declarations of factory (plant) production control and audit tests during incorporation,
- Conformity assessment in accordance with the rules of corresponding technical specification

Contractor (manufacturer) is obliged to carry out the factory (plant) production control but the Institution, nominated by the Client, performs audit tests.

The Institution draws up interim reports about the performed control of incorporation of products and conformity assessment of a product, regarding to the amount of incorporated products (by parties) or to a period of incorporation. At the end of performance of works Institution draws up the final report about the conformity of all incorporated products fit for use in works.

Chapter 17.5 provides the detailed description of work of Institution carrying out external control of incorporation of cement concrete mixtures, waterproofing products, bituminous mixtures for wearing and sealing courses and mixtures of unbound stone aggregates.

Chapter 17.5 provides also the regulations and other guidelines being considered during the process of incorporation and internal production control of the following products:

- Structure cement concrete,
- Cement concrete for wearing courses of roads,
- Cement shotcrete,
- Waterproofing products,
- Asphalt mixtures for wearing course of road,
- Products of stabilized materials,
- Unbound stone aggregates.

## 17.4 TECHNICAL REGULATIONS ON CONFORMITY ATTESTATION

Mandatory implementation of BAS EN standards rules Stanandardisation Act or decrees of compulsory implementation. The investor's right is to contract the implementation of the BAS technical specifications

### *17.4.1 Harmonised stndards hEN*

| Product | | (BAS) EN | Conformity attestation system | Required EC certificate or PpL |
|---|---|---|---|---|
| 1 | Cement | SIST EN 197: 2001 | 1+ | EC-CSP |
| 2 | Concrete admixtures | SIST EN 934-2:2002 | 2+ | EC-CKP |
| 3 | Concrete | SIST EN 206-1:2000 | 2+ | EC-CSP |
| 4 | Admixtures for grout for prestressing tendons | SIST EN 934-4:2002 | 2+ | EC-CKP |
| 5 | Geotextile and geotextile-related products | SIST EN 13249-13257: 2001 | 2+ | EC-CKP |
| 6 | Kerbs of natural stone for external paving | SIST EN 1343:2002 | 4 | |
| 7 | Precast concrete products - Elements for fences | SIST EN 12839:2002 | 4 | |
| 7 | Concrete manholes and inspection chambers, unreinforced, steel fibred and reinforced | SIST EN 1917:2003 | 4 | |
| 8 | Concrete pipes and fittings, unreinforced, steel fibred and reinforced | SIST EN 1916:2003 | 4 | |
| 9 | Drainage channels for vehicular and pedestrian areas | SIST EN 1433:1996 | 3 | PpL |
| 10 | Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas | SIST EN 13043:2002 | 2+ | EC-CKP |
| 11 | Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction | SIST EN 13242:2003 | 2+ | EC-CKP |
| 12 | Aggregates for concrete | SIST EN 12620:2002 | 2+ | EC-CKP |
| 13 | Aggregates for mortar | SIST EN 13139:2002 | 2+ | EC-CKP |
| 14 | Lightweight aggregates - Part 1: Lightweight aggregates for concrete, mortar and grout | SIST EN 13055-1:2002 | 2+ | EC-CKP |
| 15 | Lighting columns - Part 5: Requirements for steel lighting columns | SIST EN 40-5:2002 | 1 | EC-CSP |
| 16 | Lighting columns - Part 6: Specification and requirements for aluminium lighting columns | SIST EN 40-6:2002<br>SIST EN 40-6:2001 | 1 | EC-CSP |
| 17 | Fibre-cement pipes for drains and sewers - Part 2: Manholes and inspection chambers | SIST EN 588-2:2002 | 4 | |

| | Product | (BAS) EN | Conformity attestation system | Required EC certificate or PpL |
|---|---|---|---|---|
| 18 | Structural bearings - Part 7: Spherical and cylindrical PTFE bearings | SIST EN 1337-7:2001 | 1 or 3 | EC-CSP or PpL |
| 19 | Slabs of natural stone for external paving - Requirements and test methods | SIST EN 1341:2002 | 4 | |
| 20 | Sets of natural stone for external paving - Requirements and test methods | SIST EN 1342:2002 | 4 | |
| 21 | Armour stone - Part 1: Specification<br>Armour stone - Part 2: Test methods | SIST EN 13383-1:2002<br>SIST EN 13383-2:2002 | 2+ | EC-CSP |

### *17.4.2 The guidelines of European technical approval (ETAG)*

| | Product | ETAG | Conformity attestation system | Required EC certificate or PpL |
|---|---|---|---|---|
| 1 | Metal anchors for use in concrete-part 1: Anchors in general | ETAG 001-1 | 1 | EC-CKP |
| 2 | Metal anchors for use in concrete-part 2: Torque-controlled expansion anchors | ETAG 001-2 | 1 | EC-CKP |
| 3 | Metal anchors for use in concrete-part 3: Undercut anchors | ETAG 001-3 | 1 | EC-CKP |
| 4 | Metal anchors for use in concrete-part 4: Deformation-controlled expansion anchors | ETAG 001-4 | 1 | EC-CKP |
| 5 | Metal anchors for use in concrete-part 5: Bonded anchors | ETAG 001-5 | 1 | EC-CKP |
| 6 | Post tensioning kits for prestressing of structures | ETAG 013 | 1+ | EC-CKP |

### *17.4.3 Decrees on compulsory certification*

| | Product | Technical specification | Certificate of conformity | To be implemented until the date of publication of decree on mandatory use of: |
|---|---|---|---|---|
| 1 | Cement with low hidratation temperature | Sl. list SFRJ br. 34/85 | CSP | BAS EN 1916:2003 |
| 2 | Granulated stone material for concrete and bituminous mixtures | Sl. list SFRJ br. 41/87 | CSP | BAS EN 12620:2002<br>i BAS EN 13043:2002 |
| 3 | Bituminized products and flexible sheets for waterproofing | Sl. list SFRJ br. 46/87 | CSP | Odgovarajući BAS hEN |

### *17.4.4 Standards whose implementation is voluntary, unless they become a contractual requirement*

| | Product | BAS or BAS EN | Conformity attestation system | Conformity certificates |
|---|---|---|---|---|
| 1 | Mixing water for concrete | EN 1008 | - | |
| 2 | Grout for prestressing tendons | EN 446,<br>EN 447 | 1+ | |
| 3 | Gully tops and manhole tops for vehicular and pedestrian areas | EN 124:1996 | 1+ (A) | PSP |
| 4 | Hydraulic road binders | EN 13282 | 2+ (B) | PKP |
| 5 | Bitumen and bituminous binders | SEN 12591 | 2+ (B) | PKP |
| 6 | Polymer modified bitumen | pr EN 14023 | 2+ (B) | PKP |
| 7 | Admixtures for shotcrete | EN 934-5 | 2+(B) | PSP |
| 8 | Fly ash for concrete | pr EN 450 | 1+(A) | PSP |
| 9 | Silica fume for concrete | pr EN 13263-1 | 1+(A) | PSP |
| 10 | Products and systems for the protection and repair of concrete structures | EN 1504:1-10 | 2+(B) | PKP |
| 11 | Hydraulic road binders | pr EN 13282-1 | 1+(A) | PSP |
| 12 | Ductile iron pipes, fittings, accessories and their joints for water pipelines | pr EN 545:2002 | 1+(A) | PSP |

| | Product | Technical specification | Conformity attestation system | Conformity certificates |
|---|---|---|---|---|
| 1 | Manufactured bituminous mixtures: | EN 13108 | | |
| | - for stabilized sub base | | B | PSP |
| | - for stabilized road base | | B | PSP |
| | - for wearing/sealing course: | | B | PSP |
| | - for bituminous concrete | | B | PSP |
| | - for gravel with mastic asphalt | | B | PSP |
| | - for drainage asphalt | | B | PSP |
| | - for poured asphalt | | B | PSP |
| | - for micro asphalt | | B | PSP |
| | - for road surface treatment<br>- for cold asphalt mixtures | | B | PSP |

| | | | | |
|---|---|---|---|---|
| 2 | Road traffic noise reducing devices | EN 1317, EN 1793, EN 1794 | B | PSP |
| 3 | Mineral binders for construction of public roads | JUS | | |
| 4 | Liquid products for preservation of fresh concrete | JUS | | |

### *17.4.5 Various technical specifications*

| Product | | Technical specification | Notes about anticipated (EN or ETAG) |
|---|---|---|---|
| 1 | Steel for reinforcement and steel for prestressing | JUS | EN 10080<br>EN 10138 |
| 2 | Execution of special geotechnical works<br>Permanent prestressed geotechnical anchors | SIA V 191 | EN 1537 |
| 3 | Steel fibres | TSC 04.320 | |
| 4 | Bituminous emulsion for roads | ÖN B 3503 | |
| 5 | Epoxy resins | TP-BEL-EP | |
| 6 | Steel products:<br>- bars, nuts and sub plates for tunnel anchors<br>- tunnel arches<br>- sheets | <br>EN 10027<br>DIN 21544, DIN 21545<br>EN 10027 | |
| 7 | Sawn wood | EN 1611 | |
| 8 | Products for waterproofing:<br>- bituminous mixtures for coating (emulsions, solutions), pastes<br>- bituminous binders and sealants<br>- joint tapes<br>- sprayed sealing courses<br>- liquid polymers / resins | <br>ZTV BEL B 1,2/87<br><br><br>ZTV BEL B 3/95 | <br>DIN 52130, DIN 52131,<br>DIN 52132,<br>DIN 52133<br>ETAG 025<br>DIN 52143 |
| 9 | Members of drainage and telecommunication systems:<br>- Plastics piping systems | <br>DIN 4262 | <br>EN 1115, EN 1401, EN 13476, EN 12666, EN 1852, |
| | - Steel pipes and cast iron pipes and fittings | DIN EN 877 | |
| | - Plastic manholes | | EN 13598 |
| | - Concrete kerbs<br>- Concrete slabs for external paving<br>- Concrete gutters and ditches<br>- Concrete pavers | JUS | EN 1340<br>EN 1339<br><br>SIST EN 1338 |

| Product | | Technical specification | Notes about anticipated (EN or ETAG) |
|---|---|---|---|
| 9 | Products for road equipment:<br>- Safety fences<br>- Anti-glare systems for roads<br>- Steel safety fences<br>- Guardrails / wire meshes<br>- Paints for road markings | JUS | <br><br>EN 12676<br>EN 1317<br>ETAG no. 023<br>EN 1871 |
| 10 | Products for bridge equipment:<br>- Steel fences<br><br>- Expansion joints<br><br>- Metal manholes<br>- Construction bearings<br>- PVC waterproofing tunnel foils | <br><br>RVS 15.45<br>And German additional regulations ZTV-ING part 8 and TL/TP-Fü 92<br><br>Tender conditions for tunnels | <br><br><br>ETAG no. 02, EN 1337-1 |
| 11 | Post tensioning kits for prestressing of structures | | ETAG no. 013 |
| 12 | Steel strip sheaths for prestressing tendons and polyethylene sheaths for prestressing tendons | | EN 523:2003<br>pr EN 12201 |
| 13 | Coalescent filters for light liquids (e.g. oil and petrol) | ÖN B 2503 | EN 858 |
| 14 | Bentonit felt | SIST EN 12127 and SIST EN 29073 | |
| 15 | Construction and testing of buried and above-ground drainage and sewerage | SIST EN 1610: 2001 | |
| 16 | Natural asphalts | | EN 1427:1999, EN 1426:2000, EN 12593:1999, EN 933-1:1997, EN 12697-1: 2001, EN 12697-1:2002 |

Abbreviations:

ISP – Declaration of product conformity
EC-CSP – EC–certificate of conformity
EC-CKP – EC-certificate of factory production control
PpL – report of notified laboratory
CSP – certificate of conformity
PL – report of accredited laboratory
PSP – attestation of product conformity
PSP in PKP issues an Institution.

CKP - certificate of factory production control
ISP submits the manufacturer.
EC-CSP in EC-CKP issues notified certification body.
PpL issues notified testing laboratory.
CSP in CKP issues accredited certification body according to ZGPro
PL issues accredited laboratory
PKP – attestation of factory production control

## 17.5 WORK OF THIRD PARTY INSTITUTION PERFORMING CONTROL OF INCORPORATION

### *17.5.1 Concrete works*

Work of Institution:

- *Inspection* and approval of technological design of cement concrete, including the conformity testing.
- *Surveillance of contractor's internal control* – monthly or upon request of the Supervisor – including sampling and audit conformity testing. The medium compressive strengths must be tested on 10% to 15% of planned routine tested samples of all types of cement concrete intended to be incorporated in a structure. The number of other conformity tests is fixed by conformity assessment plan for a part of works.
- *Conformity assessment of internal control* once a year or when a new technology is introduced,
- *Assessment and attestation* of conformity evaluation of planned types of cement concrete,
- *Audit testing* and attestation of the required performances of hardened cement concrete, according to the current technical specifications and
- *Issuing of interim (if required) and final reports of conformity assessment* of hardened cement concrete in accordance with the provisions of proper technical specification (SIST EN 206-1)

### *17.5.2 Asphalt mixtures and asphalt works*

Work of Institution:

- *Inspection and approval of*
  - Hot asphalt mixtures and
  - Conformity assessment and evaluation time schedule,
- *Conformity testing of components of construction products* (stone aggregates and bituminous binder) according to provisions of technical regulations,
- *Inspection and evaluation of initial type tests and incorporation of products*, including the conformity of spoil dumps, the means of transport and construction equipment,
- *Surveillance of internal contractor's control once* a year or when a new technology is introduced,
- *Tests of hot and incorporated asphalt mixture regarding to the provisions of current technical regulation*, including conformity assessment and evaluation of test results and conformity attestation, and
- *Issuing of interim (if required) and final reports of conformity assessment* of incorporated asphalt mixtures, considering the results of internal and external control, based on assessment and evaluation of tests mentioned in paragraph 5 and time schedule of conformity testing and according to the requirements of current technical regulations.

### *17.5.3 Water proofing products and works*

Work of Institution:

- *Inspection of* conformity evidence for incorporation of water proofing products,
- *Surveillance* of works and incorporated water proofing product conformity, including:
  - *Conformity assessment of internal control* during construction regarding to

conformity assessment scheme and current technical regulations,
- *Assessment and evaluation of conformity tests and measurements and*
- *Sampling,* according to time schedule of conformity control.

Institution represents the work issuing the:
- Interim conformity report about waterproofing works (if required) and
- Final conformity report about waterproofing works.

### *17.5.4 Unbound stone aggregates*

Work of Institution:
- *Inspection and evaluation of initial type field test* indicating the depth of effectiveness of compaction equipment, when required, including products incorporation conformity evaluation,
- Audit conformity tests and measurements, according to time schedule of conformity control and
- *Issuing of interim (if required) and final reports of conformity assessment* of works.

## 17.6 CONSTRUCTION PRODUCTS DIRECTIVE (CPD)

### *17.6.1 Introduction*

Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relates to construction products.[2]

The consistent consideration of Construction Product Directive – CPD* and additional directives, interpretations and guidelines for its implementation is required in the processes of public roads construction. The provisions of additional documents are not compulsory, their implementation is only strongly recommended, but when not implemented, the CPD provisions are not nearly performable. The provisions of CPD will be permanently upgraded.

It must be taken into consideration especially by:
- Project designers, determining the requirements of products presumed fit for use in buildings and civil engineering works,
- Users of construction products or services, providing the requirements relating with purchased construction products, performing conformity and serviceability assessment, and on taking over
- Manufacturers of construction products, designing and manufacturing the construction products, performing factory production control and other activities relating to conformity attestation and
- Conformity attestation bodies, performing the third party conformity attestation.

### *17.6.2 Council Directive 89/106/EEC*

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100a thereof,

Having regard to the proposal from the Commission (1),

In cooperation with the European Parliament (2),

[2] CPD is a »new approach« directive which establishes the relation between required performances of structures (works) and construction products and enables harmonisation of technical regulation on construction product field. The Member States remain free to regulate or not the construction works. The national regulation prescribe the rules of project designing and the process of construction, regarding to adopted but not harmonized European standards like Eurocodes for project designing.

* International abbreviation of Directive

Having regard to the opinion of the Economic and Social Committee (3),

Whereas Member States are responsible for ensuring that building and civil engineering works on their territory are designed and executed in a way that does not endanger the safety of persons, domestic animals and property, while respecting other essential requirements in the interests of general well-being;

Whereas Member States have provisions, including requirements, relating not only to building safety, but also to health, durability, energy economy, protection of the environment, aspects of economy, and other aspects important in the public interest;

Whereas these requirements, which are often the subject of national provisions laid down by law, regulation or administrative action, have a direct influence on the nature of construction products employed and are reflected in national product standards, technical approvals and other technical specifications and provisions which, by their disparity, hinder trade within the Community;

Whereas paragraph 71 of the White Paper on completing the internal market, approved by the European Council in June 1985, states that, within the general policy, particular emphasis will he placed on certain sectors, including construction; whereas the removal of technical barriers in the construction field, to the extent that they cannot be removed by mutual recognition of equivalence among all the Member States, should follow the new approach set out in the Council resolution of 7 May 1985 (4) which calls for the definition of essential requirements on safety and other aspects which are important for the general well-being, without reducing the existing and justified levels of protection in the Member States;

Whereas the essential requirements constitute both the general and specific criteria with which construction works must comply; whereas such requirements are to be understood as requiring that the said works conform with an appropriate degree of reliability, With one, some or all of these requirements when and where this is laid down in regulations;

Whereas, as a basis for the harmonized standards or other technical specifications at European level and for the drawing up or granting of European technical approval. Interpretative documents will be established in order to give concrete form to the essential requirements at a technical level.

Whereas these essential requirements provide the basis for the preparation of harmonized standards at European level for construction products whereas, in order to achieve the greatest possible advantage for a single internal market. To afford access to that market for as many manufacturers as possible, to ensure the greatest possible degree of market transparency and to create the conditions for a harmonized system of general rules in the construction industry, harmonized standards should be established as far as, and as quick as, possible; Whereas these standards are drawn up by private bodies and must remain non-mandatory texts; whereas, for that purpose, the European Committee for Standardization (CEN) and the European Committee for Electro technical Standardization (Cenelec) are recognized as the competent bodies for the adoption of harmonized standards in accordance with the general guidelines for cooperation between the Commission and those two bodies signed on 13 November 1984; whereas, for the purposes of this Directive, a harmonized standard is a technical specification (European standard or harmonized document) adopted by, one or both of those bodies upon a mandate given by the Commission in accordance with the provisions of Council Directive 83/189/EEC of 28 March 1983 laying down a procedure for the provision of information in the field of technical standards and regulations (5);

Whereas the special nature of construction products requires the precise formulation of these harmonized standards; whereas it is therefore necessary to draw up interpretative documents in order to establish links between mandates for standards and the essential requirements; whereas harmonized standards, expressed as far as possible in terms of product performance, take account of these interpretative documents, which shall be drawn up in cooperation with the Member States;

Whereas performance levels and requirements to be fulfilled by products in future in the Member States shall be laid down in classes in the interpretative documents and in the harmonized technical specifications in order to take account of different levels of essential requirements for certain works and of different conditions prevailing in the Member States;

Whereas harmonized standards should include classifications that allow construction products which meet the essential requirements and which are produced and used lawfully in accordance

with technical traditions warranted by local climatologically and other conditions to continue to be placed on the market,

Whereas a Product is Presumed fit for use if it conforms to a harmonized standard, a European technical approval or a non-harmonized technical specification recognized at Community level; whereas, in cases where products are of little importance with respect to the essential requirements and where they deviate from existing technical specifications, their fitness for use can be certified by recourse to an approved body;

Whereas products thus considered fit for use are easy recognizable by the EC mark; whereas they must be allowed free movement and free use for their intended purpose throughout the Community;

Whereas, in the case of products where European standards cannot be produced or foreseen within a reasonable period of time or of products which deviate substantially from a standard, the fitness for use of such products may be proved by recourse to European technical approvals on the basis of common guidelines; whereas the common guidelines for the granting of European technical approvals will be adopted on the basis of the interpretative documents;

Whereas, in the absence of harmonized standards and European technical approvals, national or other non-harmonized technical specifications may be recognized as providing a suitable basis for a presumption that the essential requirements are met;

Whereas it is necessary to ensure the conformity of products with harmonized standards and with non-harmonized technical specifications recognized at European level by means of procedures of production control by manufacturers and of supervision, testing assessment and certification by independent qualified third parties, or by the manufacturer himself.

Whereas a special procedure should he provided as an interim measure for products where standards or technical approvals recognized at European level do not yet exist; whereas this procedure should facilitate recognition of the results of tests performed in another Member State according to the technical requirements of the Member State of destination.

Whereas a Standing Committee on Construction should be set up comprising experts designated by Member States to assist the Commission on questions arising from the implementation and practical application of this Directive.

Whereas the responsibility of Member States for safety, health and other matters covered by the essential requirements on their territory should be recognized in a safeguard clause providing for appropriate protective measures,

**has adopted this directive:**

## CHAPTER 1: Field of application - Definitions - Requirements -Technical specifications - Free movement of goods

### Article 1

1. This Directive shall apply to construction products in so far as the essential requirements in respect of construction works under Article 3 (1) relate to them.

2. For the purposes of this Directive, 'construction product' means any product, which is produced for incorporation in a permanent manner in construction works, including both buildings and civil engineering works.

'Construction products' are hereinafter referred to as 'products'; construction works including both buildings and civil engineering works are hereinafter referred to as 'Works'.

### Article 2

1. Member States shall take all necessary measures to ensure that the products referred to in Article 1, which are intended for use in works, may be placed on the market only if they are fit for this intended use, that is to say they have such characteristics that the works in which they are to be incorporated, assembled, applied or installed, can, if properly designed and built, satisfy, the essential requirements referred to in Article 3 when and where such works are subject to regulations containing such requirements.

2. (a) When products are subject to other Directives with regard to other aspects and which also provide for the affixing of the CE conformity marking, referred to in Article 4 (2), the latter shall indicate that the products are also presumed to conform to the provisions of those other Directives.

(b) However, where one or more of these Directives allow the manufacturer, during a transitional period, to choose which arrangements to apply, the CE marking shall indicate conformity only to the Directives applied by the manufacturer. In this case, particulars of the Directives applied, as published in the Official Journal of the European Communities, must be given in the documents, notices or instructions required by the Directives and accompany such products.

3. When a future directive concerns mainly other aspects and only to a minor extent the essential requirements of this Directive, that subsequent directive shall contain provisions ensuring that it also covers the requirements of this Directive.

4. This Directive shall not affect the right of Member States to specify - with due observance of the provisions of the Treaty - the requirements they deem necessary to ensure that workers are protected when using products, provided it does not mean the products are modified in a way unspecified in this Directive.

**Article 3**

1. The essential requirements applicable to works, which may influence the technical characteristics of a product, are set out in terms of objectives in Annex I. One, some or all of these requirements may apply; they shall be satisfied during an economically reasonable working life.

2. In order to take account of possible differences in geographical or climatic conditions or in ways of life as well as different levels of protection that may prevail at national, regional or local level, each essential requirement may give rise to the establishment of classes in the documents referred to in paragraph 3 and the technical specifications referred to in Article 4 for the requirement to be respected.

3. The essential requirements shall be given concrete form in documents (interpretative documents) for the creation of the necessary links between the essential requirements laid down in paragraph 1 and the standardization mandates, mandates for guidelines for European technical approval or the recognition of other technical specifications within the meaning of Articles 4 and 5.

**Article 4**

1. Standards and technical approvals shall, for the purposes of this Directive, be referred to as 'technical specifications'.

For the purposes of this Directive, harmonized standards shall be the technical specifications adopted by CEN, Cenelec or both, on mandates given by the Commission in conformity with Directive 83/189/EEC on the basis of an opinion given by the Committee referred to in Article 19 and in accordance with the general provisions concerning cooperation between the Commission and these two bodies signed on 13 November 1984.

2. Member States shall presume that products are fit for use if they enable works in which they are employed, provided the latter are properly designed and built, to satisfy the essential requirements referred to in Article 3 where such products bear the CE marking indicating that they satisfy all the provisions of this Directive, including the conformity assessment procedures laid down in Chapter V and the procedure laid down in Chapter III. The CE marking shall indicate:

(a) that they comply with the relevant national standards transposing the harmonized standards, references to which have been published in the Official journal of the European Communities. Member States shall publish the references of these national standards;

(b) that they comply with a European technical approval, delivered according to the procedure of Chapter III, or

(c) that they comply with the national technical specifications referred to in paragraph 3 in as much as harmonized specifications do not exist; a list of these national specifications shall be drawn up according to the procedure in Article 5 (2).

3. Member States may communicate to the Commission the texts of their national technical specifications, which they regard as complying with the essential requirements, referred to in Article 3. The Commission shall forward these national technical specifications forthwith to the other Member States. In accordance with the procedure provided for in Article 5 (2), it shall

notify the Member States of those national technical specifications in respect of which there is presumption of conformity with the essential requirements referred to in Article 3.

This procedure will be initiated and managed by the Commission in consultation with the committee referred to in Article 19.

Member States shall publish the references to these technical specifications. The Commission shall also publish them in the Official Journal of the European Communities.

4. Where a manufacturer, or his agent, established in the Community, has not applied, or has applied only in part, the existing technical specifications referred to in paragraph 2, which require, according to the criteria set out in Article 13 (4), the product to be submitted for a declaration of conformity as defined in Annex III (2) (ii), second and third possibilities, the corresponding decisions under Article 13 (4) and Annex III shall apply and such a product's fitness for use within the meaning of Article 2 (1) shall he established in accordance with the procedure set out in Annex III (2) (ii), second possibility..

5. The Commission, in consultation with the committee referred to in Article 19, shall draw up, manage and revise periodically a list of products which play a minor part with respect to health and safety, and in respect of which a declaration of compliance with the 'acknowledged rule of technology', issued by the manufacturer, will authorize such products to be placed on the market.

6. The CE marking signifies that products satisfy the requirements of paragraphs 2 and 4 of this Article. It is for the manufacturer or his authorized representative established within the Community to take responsibility for affixing the CE marking on the product itself, on a label attached to it, on its packaging, or on the accompanying commercial documents.

The model of the CE Marking and conditions of its use are given in Annex III.

Products referred to in paragraph 5 shall not bear the CE Marking.

**Article 5**

1. Where a Member State or the Commission is of the opinion that the harmonized standards or European technical approvals referred to in Article 4 (2), points (a) and (b), or the mandates referred to in Chapter 11, do not satisfy the provisions of Articles 2 and 3, that Member State or the Commission shall notify the committee referred to in Article 19, setting out its reasons. The committee shall deliver an urgent opinion.

In the light of the opinion of the committee, and after consultation with the committee set up under Directive 83/189/EEC where it concerns harmonized standards, the Commission shall inform Member States if the standards or approvals concerned should be withdrawn in the publications referred to in Article 7 (3).

2. On reception of the communication referred to in Article 4 (3), the Commission shall consult the committee referred to in Article 19. In the light of the opinion of the committee, the Commission shall notify Member States whether the technical specification in question should benefit, from the presumption of conformity and, if so, publish a reference to it in the Official Journal of the European Communities.

If the Commission or a Member State believes that a technical specification no longer fulfils the conditions necessary. For presumption of conformity with the provisions of Articles 2 and 3, the Commission shall consult the committee referred to in Article 19. In the light of the opinion of the said committee, the Commission shall notify the Member States whether the national technical specification in question should continue to benefit from presumption of conformity, and, if not, whether the reference to it referred to in Article 4 (3) should be withdrawn.

**Article 6**

1. Member States shall not impede the free movement, placing on the market or use in their territory of products which satisfy the provisions of this Directive.

Member States shall ensure that the use of such products, for the purpose for which they were intended, shall not be impeded by rules or conditions imposed by public bodies or private bodies acting as a public undertaking or acting as a public body on the basis of a monopoly position.

2. Member States shall, however, allow products not covered by Article 4 (2) to be placed on the market in their territory if they satisfy national provisions consistent with the Treaty until the European technical specifications referred to in Chapters II and III provide otherwise. The

Commission and the committee referred to in Article 19 will monitor and review the development of the European technical specifications on a regular basis.

3. If the relevant European technical specifications, either themselves or on the basis of the interpretative documents referred to in Article 3 (3), distinguish between different classes corresponding to different performance levels, Member States may determine the performance levels also to be observed in their territory only within the classifications adopted at Community level and only subject to the use of all or some classes or one class.

## CHAPTER II: Harmonized standards

### Article 7

1. In order to ensure the quality of harmonized standards for products, the standards shall be established by the European standards organizations on the basis of mandates given by the Commission in accordance with the procedure laid down in Directive 83/189/EEC and, after consulting the committee referred to in Article 19, in accordance with the general provisions concerning cooperation between the Commission and these bodies signed on 13 November 1984.

2. The resulting standards shall be expressed as far as practicable in product performance terms, having regard to the interpretative documents.

3. Once the standards have been established by the European standards organizations, the Commission shall publish the references of the standards in the 'C series of the Official Journal of the European Communities.

## CHAPTER III: European technical approval

### Article 8

1. European technical approval is a favourable technical approval is a favourable technical assessment of the fitness for use of a product for an intended use, based on fulfilment of the essential requirements for building works for which the product is used.

2. European technical approval may be granted to.

(a) products for which there is neither a harmonized standard, nor a recognized national standard, nor a mandate for a harmonized standard, and for which the Commission, after consulting the committee referred to in Article 19, considers that a standard could not, or not yet, be elaborated; and

(b) products that differ significantly from harmonized or recognized national standards.

Even in the case where a mandate for a harmonized standard has been issued, the provisions referred to in (a) do not exclude the granting of European technical approval for products for which guidelines for such approval exist. This shall apply until the entry into force of the harmonized standard in the Member States.

3. In special cases, the Commission may, as a derogation from paragraph 2 (a), authorize the issue of European technical approval, after consulting the committee referred to in Article 19, for products for which there is a mandate for a harmonized standard, or for which the Commission has established that a harmonized standard can be elaborated. The authorization shall be valid for a fixed period.

4. European technical approval shall in general be issued for a five Year period. This period may be extended.

### Article 9

1. European technical approval for a product shall be based on examinations, tests and an assessment on the basis of the interpretative documents referred to in Article 3 (3) and of the guidelines referred to in Article 11 for this product or the corresponding family of products.

2. Where guidelines referred to in Article 11 do not or not yet exist, European technical approval may be issued by reference to the relevant essential requirements and the interpretative documents where the assessment of the product is adopted by the approval bodies acting jointly in the organization referred to in Annex II. If the approval bodies cannot agree, the matter shall be referred to the committee referred to in Article 19.

3. The European technical approval for a product shall be issued in a Member State in accordance with the procedure laid down in Annex II at the request of the manufacturer or his agent established in the Community.

**Article 10**

1. Each Member State shall notify the other Member States and the Commission of the names and addresses of the bodies, which it has authorized to issue European technical approvals.

2. The approval bodies must satisfy the requirements of this Directive and in particular must be able:

- to assess the fitness for use of new products on the basis of scientific and practical knowledge,
- to take impartial decisions in relation to the interests of the manufacturers concerned or their agents, and
- to collate the contributions of all the interested parties in a balanced assessment.

3. The list of approval bodies which are competent to issue European technical approvals, is well as any amendments to that list, and shall be published in the 'C' series of the Official Journal of the European Communities.

**Article 11**

1. The Commission shall, after consulting the committee referred to in Article 19, issue mandates for establishing guidelines for European technical approval for a product or family of products to the organization of approval bodies designated by the Member States.

2. The guidelines for European technical approval for a product or family of products should contain the following, in particular:

(a) a list of the relevant interpretative documents referred to, in Article 3 (3);

(b) specific requirements for the products within the meaning of the essential requirements referred to in Article 3 (1);

(c) the test procedures;

(d) method of assessing and judging the results of the tests;

(e) the inspection and conformity procedures which must correspond to Articles 13, 14 and 15;

(f) the period of validity of the European technical approval.

3. The guidelines for European technical approval shall, after consultation with the committee referred to in Article 19, be published by the Member States in their official language or languages.

## CHAPTER IV: Interpretative documents

**Article 12**

1. The Commission shall, after consulting the committee referred to in Article 19, instruct technical committees in which the Member States participate to draw up the interpretative documents referred to in Article 3 (3).

2. The interpretative documents shall:

(a) give concrete form to the essential requirements laid down in Article 3 and in Annex 1 by harmonizing the terminology and the technical bases and indicating classes or levels for each requirement where necessary and where the state of scientific and technical knowledge so permits;

(b) indicate methods of correlating these classes or levels of requirement with the technical specifications referred to in Article 4, for example, methods of calculation and of proof, technical rules for project design, etc.;

(c) serve as a reference for the establishment of harmonized standards and guidelines for European technical approval and for recognition of national technical specifications in accordance with Article 4 (3).

3. The Commission shall publish the interpretative documents in the 'C' series of the Official Journal Of the European Communities after soliciting the opinion of the committee referred to in Article 19.

## CHAPTER V: Attestation of conformity

### Article 13

1. The manufacturer, or his agent established in the Community, shall be responsible for the attestation that products are in conformity with the requirements of a technical specification within the meaning of Article 4.

2. Products that are the subject of an attestation of conformity shall benefit from the presumption of conformity, with technical specifications within the meaning of Article 4. Conformity shall he established by means of testing or other evidence on the basis of the technical specifications in accordance with Annex III.

3. The attestation of conformity of a product is dependent on:

(a) the manufacturer having a factory production control system to ensure that production conforms with the relevant technical specifications; or

(b) for particular products indicated in the relevant technical specifications, in addition to a factory production control system, an approved certification body being involved in assessment and surveillance of the production control or of the product itself.

4. The choice of the procedure within the meaning of paragraph 3 for a given product or family of products shall be specified by the Commission after consultation of the committee referred to in Article 19, according to:

(a) the importance of the part played by the product with respect to the essential requirements, in particular those relating to health and safety.

(b) the nature of the product;

(c) the effect of the variability of the product's characteristics on its serviceability;

(d) the susceptibility to defects in the product manufacture;

in accordance with the particulars set out in Annex III.

In each case, the least onerous possible procedure consistent with safety shall be chosen.

The procedure thus determined shall be indicated in the mandates and in the technical specifications or in the publication thereof.

5. in the case of individual (and non-series) production, a declaration of conformity in accordance with Annex III (2) (ii), third possibility, shall suffice, unless otherwise provided by the technical specifications for products, which have particularly important implications for health and safety.

### Article 14

1. In accordance with Annex III, the procedures described shall lead:

(a) in the case of Article 13 (3) (a), to the production of a declaration of conformity for a product by the manufacturer, or his agent established in the Community; or

(b) in the case of Article 13 (3) (b), to the issue by an approved certification body of a certificate of conformity for a system of production control and surveillance or for the product itself.

Detailed rules for the implementation of the procedures of attestation of conformity are given in Annex III.

2. The manufacturer's declaration of conformity or the certificate of conformity shall entitle the manufacturer, or his agent established in the Community, to affix the corresponding CE Marking on the product itself, on a label attached to it, on its packaging or on the accompanying commercial documents. The model of the CE Marking and the rules for its use in respect of each of the procedures of attestation of conformity are given in Annex III.

### Article 15

1. Member States shall ensure that the CE Marking is correctly used.

2. Without prejudice to Article 21: (a) where a Member State establishes that the CE marking has been affixed unduly, the manufacturer or his agent established within the Community shall be obliged to make the product conform as regards the provisions concerning the CE marking and to end the infringement under conditions imposed by the Member State; (b) where non-conformity continues, the Member State must take all appropriate measures to restrict or

prohibit the placing on the market of the product in question or to ensure that it is withdrawn from the market in accordance with the procedures laid down in Article 21.

3. Member States shall take the measures necessary to prohibit the affixing to products or their packaging of markings, which are likely to deceive third parties as to the meaning and form of the CE marking. Any other marking may be affixed to the construction products on a label fixed to the product packaging or on the accompanying commercial documents provided that the visibility and legibility of the CE marking is not thereby reduced.

## CHAPTER VI: Special procedures

### Article 16

1. In the absence of technical specifications, as defined in Article 4, for any given product, the Member State of destination shall, on request in individual cases, consider the product to be in conformity, with the national provisions in force if they have satisfied tests and inspections carried out by an approved body in the producing Member State according to the methods in force in the Member State of destination or recognized as equivalent by that Member State.

2. The producing Member State shall inform the Member State of destination, in accordance with whose provisions the tests and inspections are to be carried out, of the body it intends to approve for this purpose. The Member State of destination and the producing Member State shall provide each other with all necessary information. On conclusion of this exchange of information the producing Member State shall approve the body, thus designated. If a Member State has misgivings, it shall substantiate its position and inform the Commission.

3. Member States shall ensure that the designated bodies afford one another all necessary, assistance.

4. Where a Member State establishes that an approved body is not carrying out the tests and inspections properly in conformity with its national provisions, it shall notify the Member State in which the body is approved thereof. That Member State shall inform the notifying Member State within a reasonable time limit of what action has been taken. If the notifying Member State does not consider the action taken to be sufficient. it may prohibit the placing on the market and use of the product in question or make it subject to special conditions. It shall inform the other Member State and the Commission thereof.

### Article 17

Member States of destination shall attach the same value to reports and attestations of conformity issued in the producing Member State in accordance with the procedure referred to in Article 16, as they, do to their own corresponding national documents.

## CHAPTER VII: Approved bodies

### Article 18

1. Member States shall notify the Commission and the other Member States of the certification and inspection bodies and the testing laboratories which they have designated for the tasks which must be carried out for the purposes of technical approval, certificates of conformity, inspections and tests, in accordance with this Directive, together with their names and addresses and the identification numbers assigned to them beforehand by the Commission. The Commission shall publish in the Official Journal of the European Communities a list of the notified bodies and laboratories with their identification numbers and the tasks and products for which they have been notified. The Commission shall ensure that this list is kept up to date.

2. Certification bodies, inspection bodies and testing laboratories shall comply with the criteria laid down in Annex IV.

3. Member States shall indicate the products, which fall within the competence of the bodies, and laboratories referred to in paragraph 1 and the nature of the tasks to be assigned to them.

## CHAPTER VIII: Standing Committee on Construction

### Article 19

1. A Standing Committee on Construction is hereby set up.

2. The committee shall be made up of representatives appointed by the Member States. A representative of the Commission shall chair it. Each Member State shall appoint two representatives. Experts may accompany the representatives.

3. The committee shall draw up its own rules of procedure.

**Article 20**

1. The committee referred to in Article 19 may, at the request of its chairman or a Member State, examine and question posed by the implementation and the practical application of this Directive.

2. The provisions necessary for:

(a) the establishment of classes of requirements in so far as they are not included in the interpretative documents and the establishment of the procedure for attesting conformity in mandates for standards pursuant to Article 7 (1) and guidelines for approvals pursuant to Article 11 (1);

(b) the giving of instructions for the drawing-up of interpretative documents pursuant to Article 12 (1 ) and decisions on interpretative documents pursuant to Article 12 (3);

(c) the recognition of national technical specifications in accordance with Article 4 (3);

shall be adopted in accordance with the procedure laid down in paragraphs 3 and 4.

3. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft within a time limit, which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148 (2) of the Treaty in the case of decisions, which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The chairman shall not vote.

4. The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to he taken. The Council shall act by qualified majority.

If, within three months of the proposal being submitted to it, the Council has not acted, the Commission shall adopt the proposed measures.

## CHAPTER IX: Safeguard clause

**Article 21**

1. Where a Member State ascertains that a product declared to be in conformity with the terms of this Directive does not comply with Articles 2 and 3, it shall take all appropriate measures to withdraw those products from the market, prohibit the placing thereof on the market or restrict free movement thereof.

The Member State concerned shall immediately inform the Commission of any such measure, indicating the reasons for its decision, and in particular whether non-conformity is due to:

(a) failure to comply with Articles 2 and 3, where the product does not meet the technical specifications referred to in Article 4;

(b) incorrect application of the technical specifications referred to in Article 4;

(c) shortcomings in the technical specifications referred to in Article 4 themselves.

2. The Commission shall carry out a consultation of the parties concerned as soon as possible. Where the Commission finds, after this consultation, that the action is justified, it shall immediately so inform the Member State that took the action as well as the other Member States.

3. Where the decision referred to in paragraph 1 is attributed to shortcomings in the standards or technical specifications, the Commission, after consulting the parties concerned, shall bring the matter before the committee referred to in Article 19, as well as the committee set up under Directive 83/189/EEC in the case of shortcomings in a harmonized standard. within two months if the Member State, which has taken the measures, intends to uphold them and shall start the procedures referred to in Article 5 (2) .

4. The Member State concerned shall take appropriate action against whomsoever made the declaration of conformity and shall inform the Commission and the other Member States thereof.

5. The Commission shall ensure that the Member States are kept informed of the progress and outcome of this procedure..

## CHAPTER X: Final provisions

### Article 22

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with the provisions of this Directive within 30 months of its notification (1). They shall forthwith inform the Commission thereof.

(1)This Directive was notified to the Member States on 27 December 1988.

2. Member States shall communicate to the Commission the texts of the provisions of national law, which they adopt in the field governed by this Directive.

### Article 23

At the latest by 31 December 1993, the Commission, in consultation with the committee referred to in Article 19, shall re-examine the practicability of the procedures laid down by this Directive and, where necessary, submit proposals for appropriate amendments.

### Article 24

This Directive is addressed to the Member States.

Done at Brussels, 21 December 1988.

For the Council

The President : V. PAPANDREOU

## ANNEX 1: ESSENTIAL REQUIREMENTS

The products must be suitable for construction works which (as a whole and in their separate part s) are fit for their intended use, account being taken of economy, and in this connection satisfy the following essential requirements where the works are subject to regulations containing such requirements. Such requirements must, subject to normal maintenance, be satisfied for an economically reasonable working life. The requirements generally concern actions, which are foreseeable.

### 1. Mechanical resistance and stability

The construction works must be designed and built in such a way that the loadings that are liable to act on it during its constructions and use will not lead to any of the following:

(a) collapse of the whole or part of the work;
(b) major deformations to an inadmissible degree;
(c) damage to other Parts of the works or to fittings or installed equipment as are result of major deformation of the load-bearing construction;
(d) damage by an event to an extent disproportionate to the original cause

### 2 Safety in case of fire

The construction works must be designed and built in such a way that in the event of an outbreak of fire:

- the load-bearing capacity of the construction can be assumed for a specific period of time,
- the generation and spread of fire and smoke within the works are limited.
- the spread of the fire to neighbouring construction works is limited,
- occupants can leave the works or be rescued by other means.
- the safety of rescue teams is taken into consideration.

### 3. Hygiene, health and the environment

The construction work, must be designed and built in such a way that it will not be a threat to the hygiene or health of the occupants or neighbours, in particular as a result of any of the following:

- the giving-off of toxic gas,
- the presence of dangerous particles or gases in the air.
- the emission of dangerous radiation
- pollution or poisoning of the water or soil,

- faulty elimination of waste water, smoke, solid or liquid wastes,
- the presence of damp in parts of the works or on surfaces within the works.

### 4. Safety in use

The construction work must be designed and built in such a way that it does not present unacceptable risks of accidents in service or in operation such as slipping. falling, collision, burns, electrocution, injury from explosion.

### 5. Protection against noise

The construction works must he designed and built in such a way that noise perceived by the occupants or people nearby is kept crown to a level that will not threaten their health and will allow them to sleep, rest and work in satisfactory conditions.

### 6. Energy economy and beat retention

The construction works and its heating, cooling and ventilation installations must be designed and built in such a way that the amount of energy required in use shall be low, having regard to the climatic conditions of the location and the occupants.

## ANNEX II: EUROPEAN TECHNICAL APPROVAL

1. A request for approval may be made by a manufacturer, or his agent established in the Community, only to a single body, authorized for this purpose

2. The approval bodies designated by the Member States form an organization. In the performance of its duties, this organization is obliged to work in close coordination with the Commission, which shall consult the committee referred to in Article 19 of the Directive on important matters. Where a Member State has designated more than one approval body, the Member State shall be responsible for coordinating such bodies; it shall also designate the body, which shall be spokesman in the organization.

3. The common procedural rules for making the request, the preparation and the granting of approvals are drawn up by the organization comprising the designated approval bodies. The Commission on the basis of the opinion of the committee in accordance with Article 20 adopts the common procedural rules.

4. In the framework of the organization comprising them, the approval bodies shall afford each other all necessary support. This organization is also responsible for coordination on specific questions of technical approval. If necessary, the organization shall establish sub-groups for this purpose.

5. The European technical approvals are published by the approval bodies, which notify all other approved bodies. At the request of an authorized approval body, a complete set of supporting documents for an approval, which has been granted, is to be forwarded to the latter for information.

6. The costs arising from the European technical approval procedure shall be paid by the applicant in accordance with national rules.

## ANNEX III: ATTESTATION OF CONFORMITY WITH TECHNICAL SPECIFICATIONS

## 1. METHODS OF CONTROL OF CONFORMITY

When the procedures for attestation of conformity of a product with technical specifications pursuant to article 13 are being determined, the following methods of control of conformity shall be used; the choice and combination of methods for any given system shall depend on requirements for the particular product or group of products according to the criteria indicated in Article 13 (3) and (4):

(a) initial type testing of the product by the manufacturer or an approved body;
(b) testing of samples taken at the factory in accordance with a prescribed test plan by the manufacturer or an approved body;
(c) audit-testing of samples taken at the factory, on the open market or on a construction site by the manufacturer or an approved body;
(d) testing of samples from a batch which is ready for delivery, or has been delivered, by the manufacturer or an approved body;

(e) factory production control; (f) initial inspection of factory and of factory production control by an approved body;
(g) continuous surveillance, judgment and assessment of factory production control by an approved body.

In the Directive, factory production control means the permanent internal control of production exercised by the manufacturer. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures. This production control system documentation shall ensure a common understanding of quality assurance and enable the achievement of the required product characteristics and the effective operation of the production control system to be checked.

## 2. SYSTEMS OF CONFORMITY ATTESTATION

Preference is given to application of the following systems of conformity attestation.

**(i) Certification of the conformity of the product by an approved certification body on the basis of:**

(a) (tasks for the manufacturer)

(1) factory production control;
(2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;

(b) (tasks for the approved body)

(3) initial type-testing of the product;
(4) initial inspection of factory and of factory production control;
(5) continuous surveillance, assessment and approval of factory production control;
(6) possibly, audit-testing of samples taken at the factory, on the market or on the construction site.

**(ii) Declaration of conformity of the product by the manufacturer on the basis of:**

First possibility:

(a) (Tasks for the manufacturer)

(1) initial type-testing of the product;
(2) factory production control;
(3) possibly, testing of samples taken at the factory in accordance with a prescribed test plan;

(b) (tasks for the approved body)

(4) certification of factory production control on the basis of:

- initial inspection of factory and of factory production control,
- possibly, continuous surveillance, assessment and approval of factory production control.

Second possibility:

(1) initial type testing of the product by an approved laboratory ;
(2) factory production control.

Third possibility:

(a) initial type testing by the manufacturer;
(b) factory production control.

## 3 BODIES INVOLVED IN THE ATTESTATION OF CONFORMITY

With respect to the function of the bodies involved in the attestation of conformity, distinction shall be made between

(i) certification body, which means an impartial body, governmental or non-governmental, possessing the necessary competence and responsibility to carry out conformity certification according to given rules of procedure and management;

(ii) inspection body, which means an impartial body having the organization, staffing, competence and integrity to perform according to specified criteria functions such as assessing, recommending for acceptance and subsequent audit of manufacturers' quality

control operations, and selection and evaluation of products on site or in factories or elsewhere, according to specific criteria;

(iii) testing laboratory, which means a laboratory, which measures, examines ,tests, calibrates or otherwise determines the characteristics or performance of materials or produces.

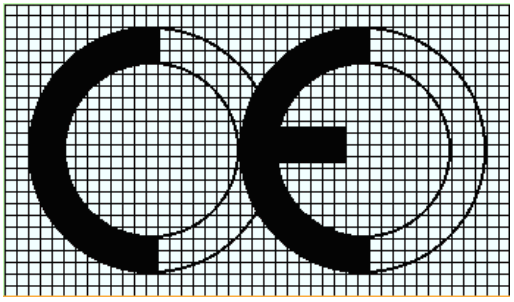
In case (i) and (ii) (first possibility) of paragraph 2, the three functions 3 (i) to (iii) may be performed by one and the same body or by different bodies, in which case the inspection body and /or the testing laboratory involved in the attestation of conformity carries our its function on behalf of the certification body.

For the criteria concerning the competence, impartiality and integrity of certification bodies, inspection bodies and testing laboratories, sec Annex IV.

## 4. EC CONFORMITY MARK, EC CERTIFICATE OF CONFORMITY, EC DECLARATION OF CONFORMITY

### 4.1. CE conformity marking

- The CE conformity marking shall consist of the initials "CE " taking the following form:



- - If the CE marking is reduced or enlarged the proportions given in the above graduated drawing must be respected.
- - The various components of the CE marking must have substantially the same vertical dimension, which may not be less than 5 mm.
- - The identification number of the body involved in the production control stage shall follow the CE marking.
- Additional information
- - The CE marking shall be accompanied by the name or identifying mark of the producer, the last two digits of the year in which the marking was affixed, and where appropriate, the number of the EC certificate of conformity and, where appropriate, indications to identify the characteristics of the product on the basis of the technical specifications.

### 4.2. EC certificate of conformity

The EC certificate of conformity shall contain in particular

- name and address of the certification body
- name and address of the manufacturer or his agent established in the Community
- description of the product (type, identification, use...)
- provisions to which the product conforms,
- particular conditions applicable to the use of the product,
- the certificate's number,
- conditions and period of validity of the certificate, where applicable,
- name of, and position held by, the person empowered to sign the certificate.

### 4.3. EC declaration of conformity

The EC declaration of conformity shall contain in particular:

- name and address of the manufacturer or his agent established in the Community,
- description of the product (type, identification, use ...),
- provision to which the product conforms,
- particular conditions applicable to the use of the product,

- name and address of the approved body, where applicable,
- name of, and position held by, the person empowered to sign the declaration on behalf of - the manufacturer or of his authorized representative.

**4.4.** The certificate and declaration of conformity shall be presented in the official language or languages of the Member State in which the product is to be used

## ANNEX IV: APPROVAL OF TESTING LABORATORIES, INSPECTION BODIES AND CERTIFICATION BODIES

The testing laboratories, the inspection bodies and the certification bodies designated by the Member States must fulfil the following minimum conditions:

1. availability of personnel and of the necessary means and equipment;

2. technical competence and professional integrity of personnel;

3. impartiality, in carrying out the tests, preparing the reports, issuing the certificates and performing the surveillance provided for in the Directive, of staff and technical personnel in relation to all circles, groups or persons directly or indirectly concerned with construction products;

4. maintenance of professional secrecy by personnel:

5. subscription of a civil liability insurance unless that liability is covered by the State under national law Fulfilment of the conditions under 1 and 2 shall be verified at intervals by the competent authorities of Member States.

Fulfilment of the conditions under 1 and 2 shall be verified at intervals by the competent authorities of Member States.

### *17.6.3 Interpretative documents – ID*

#### 17.6.3.1 General introduction

1. The Construction Products Directive (89/106/EEC) sets out in Articles 3 and 12 that Interpretative Documents give concrete form to the Essential Requirements referred to in Annex I of the same Directive interpreted in accordance with the preamble to that Annex.

Article 12(3) lays down that the Interpretative Documents, after the opinion of the Standing Committee for Construction has been solicited, shall be published in the Official Journal of the European Communities, series C.

2. The principal objective of the Interpretative Documents (IDs) is to establish the link between the Essential Requirements and the mandates, which the Commission gives to European standardization bodies to establish harmonized standards and to the European Organization for Technical Approvals to establish Guidelines for European Technical Approvals. In order that this can be achieved the following aspects have to be taken into account :

- harmonization of terminology and the basic technical concepts or identification of the need for such harmonization
- indication of classes or levels for each Essential Requirement, in so far as is necessary and possible
- indication of the methods of correlation between classes or levels and the technical specifications(2)
- use as a reference for the establishment of harmonized standards and guidelines for European Technical Approvals.

3. Even if the Construction Products Directive (CPD) lays down in an exhaustive way the essential requirements applicable to the works, it does not require Member States to impose them in the works; in other words the Member States remain free to regulate or not the construction works.

Nevertheless, if they regulate those works, and regulations have an impact on the construction products, Member States must comply with the provisions of the Directive and, in consequence, adapt their national regulations; therefore they cannot impose essential requirements applicable to the works other than those laid down in the Directive and they can permit the placing on the market of construction products intended by the manufacturer to be incorporated in the works only if they are fit for use.

A construction product is fit for the intended use when it permits the works in which it is incorporated to satisfy the applicable essential requirements; a construction product is presumed to be fit for its intended use if it bears the CE marking which attests the conformity of the construction product to technical specifications (harmonized standards, European Technical Approvals, national technical specifications recognized through Community procedures - art. 4(2)(c).

Harmonized standards for construction products and guidelines for European Technical Approvals are established on the basis of mandates given to the standards organizations and EOTA; these mandates are established by reference to the Interpretative Documents in which the relevance to the essential requirements applicable to the works, in relation to products, has been taken into account.

4. The case of the recognition of national technical specifications, in so far as a harmonized standard does not exist (Articles 4(2)(c) and 4(3) of the CPD), is not explicitly dealt with in the structure and terminology of this first edition of the IDs. Nevertheless, if the case arises, the arrangements contained in the IDs would apply to the recognition of national technical specifications under Article 12(2)(c) of the CPD, as far as their application is relevant, taking into account the essential requirements, the type of construction product in question and its intended use.

5. Within the framework of the implementation of the CPD, the IDs also represent a reference for the assessment of a construction product in the two following cases:

- Article 4(4) of the Directive (assessment of the fitness for use by an approved laboratory, in the case where a manufacturer has not applied, or has applied only in part, the existing technical specifications)
- Article 9(2) of the Directive (assessment of the fitness for use given in a European Technical Approval, carried out by approval bodies acting jointly within EOTA when Guidelines for European Technical Approvals do not, or not yet, exist.

6. The Interpretative Documents are of an evolutive nature and they are therefore capable of further development. In fact, they are based on a combination of:

- the essential requirements as they are developed in Annex I to the Directive.
- the knowledge of existing national regulations applicable to the works, including in the field of public procurement, taking into account possible differences in geographical or climatic conditions or in ways of life as well as possible different levels of protection (Article 3(2)) which could render necessary the establishment of classes or levels of requirement and/or of performance.
- the state of the art concerning construction products existing at the time of their establishment.
- the intended use of construction products.

These different elements may evolve.

As the essential requirements are expressed in terms of objectives, the understanding given in the Interpretative Documents at a certain moment could evolve due mainly to technological development and the state of the art. These evolutive elements may, therefore, justify the adaptation of Interpretative documents and affect the understanding of the essential requirements.

A Member State may request the revision of one or more Interpretative Documents in

order to accommodate proposed additional regulatory requirements for the performance of construction works within the scope of the Essential Requirements. The Commission and the Standing Committee will deal with such requests as a matter of high priority without prejudice to the process of formal notification under Directive 83/189/EEC (OJ No L109, 26.4.1983,p8).

7. In the present interpretative documents classes or levels of performances have been established in the Interpretative Document No 2 (Safety in case of fire).

The Directive lays down that classes or levels of requirements and/or of performance, when necessary, can also be determined outside of the Interpretative documents.

As far as the presence of dangerous substances in construction products is concerned, classes and/or levels of performance which technical specifications will refer to, shall allow the levels of protection needed by the works to be guaranteed, taking into account the purpose of the works.

8. As the purpose of the Directive is to eliminate obstacles to trade coming from existing legal, regulatory or administrative provisions, the technical specifications deriving from the Directive should take fully into account the justifiable technical traditions in Member States. This means that technical specifications should not hinder or prevent the use of construction products which enable works to conform to the essential requirements and which are in use in the Member States

#### 17.6.3.2 Scope of interpretative documents:

ID No. 1: Mechanical resistance and stability.

ID No. 2: Safety in case of fire.

ID No. 3 : Hygiene, health and the environment.

ID No. 4 : Safety in use.

ID No. 5 : Protection against noise.

ID No. 6 : Energy economy and heat retention.

#### 17.6.3.3 Standard subjects of interpretative documents:

- Levels or classes for essential requirements and for related product performances.
- Meaning of the general terms used in the Interpretative documents.
- Explanation of the essential requirement.
- Basis for verification of the satisfaction of the essential requirement.
- General statements concerning technical specifications and Guidelines for European Technical Approvals.
- Provisions concerning products and works in Interpretative document
- Products, Performances and attestation of Conformity.
- Working life and durability.
- Annexes

### *17.6.4 GUIDANCE PAPERS A to L*

#### 17.6.4.1 Introduction

Article 20 of the Construction Products Directive (89/106/EC) states that the Standing Committee may, "at the request of its Chairman or a Member State, examine any question posed by the implementation and the practical application of this Directive".

In order to ensure as far as possible a common understanding between the Commission and the Member States as well as among the Member States themselves as to how the Directive will operate, the competent services of the Commission, assuming the chair and secretariat of the Standing Committee, may issue a series of

*Guidance Papers* dealing with specific matters related to the implementation, practical implementation and application of the Directive.

These papers are not legal interpretations of the Directive.

They are not judicially binding and they do not modify or amend the Directive in any way. Where procedures are dealt with, this does not in principle exclude other procedures that may equally satisfy the Directive.

They will be primarily of interest and use to those involved in giving effect to the Directive, from a legal, technical and administrative standpoint.

They may be further elaborated, amended or withdrawn by the same procedure leading to their issue.

#### 17.6.4.2 The guidance papers

**Guidance Paper A.**
The Designation Of Approved Bodies In The Field Of The Construction Products Directive.

**Guidance Paper B.**
The Definition Of Factory Production Control In Technical Specifications For Construction Products.

**Guidance Paper C.**
The Treatment Of Kits And Systems Under The Construction Products Directive.

**Guidance Paper D.**
CE Marking Under The Construction Products Directive.

**Guidance Paper E.**
Levels And Classes In The Construction Products Directive.

**Guidance Paper F.**
Durability And The Construction Products Directive.

**Guidance Paper G.**
The European Classification System For The Reaction To Fire Performance Of Construction Products.

**Guidance Paper H.**
A Harmonized Approach Relating To Dangerous Substances Under The Construction Products Directive.

**Guidance Paper I.**
The Application Of Article 4(4) Of The Construction Products Directive.

**Guidance Paper J.**
Transitional Arrangements Under The Construction Products Directive. Issued following consultation of the Standing Committee on Construction at the 49th meeting on 28/29 March 2000, as document CONSTRUCT 99/382 Rev.1 Updated April 2001 following changes to publication procedure.

**Guidance Paper K**
The Attestation of Conformity Systems and the role and tasks of the Notified Bodies in the field of the Construction Products Directive.

**Guidance Paper L**
APPLICATION AND USE OF EUROCODES (issued following consultation of the Standing Committee on Construction at the 53rd meeting on 19 December 2001 and written procedure ended on 25 January 2002, as document CONSTRUCT 01/483 Rev.1) This Guidance Paper "application and use of Eurocodes" has been prepared by the European Commission services in close co-operation with the authorized Representatives of the Member States (Eurocode National Correspondents). The Commission will monitor the matters related to this Guidance Paper. When necessary, the Guidance Paper will be reviewed in the light of the experience made in its application.

Guidance papers are published on Web site:

http://europa.eu.int/comm/enterprise/construction/internal/guidpap/l.htm

### 4.2 Standing Committee on Construction.

Article 19 of the CPD sets up a Standing Committee on Construction in order to examine any question posed by the implementation and the practical application of the Directive. The Committee is made up of representatives appointed by the Member States who may also be accompanied by experts. The Standing Committee is consulted for, *inter alias*:

- the establishment of the procedures for the attestation of conformity;
- the establishment of classes of requirements;
- decisions on interpretative documents;

The draft decisions of the Commission are submitted to the SCC and the Commission adopts the measures envisaged if they are in accordance with the opinion of the Committee, by the majority laid down in Art. 148(2) of the Treaty. If the measures are not in accordance with the opinion of the Committee, the proposal is submitted to the Council, which acts by qualified majority. If the Council has not acted after three months, the measures are adopted by the Commission.

## *17.6.5 European standards and technical approvals*

### 17.6.5.1 European standards

European standard is defined as a document, established by consensus and approved by a recognized body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results. They are administered by CEN, CENELEC (European Committee for Electro technical Standardization) and ETSI (European Telecommunications Standards Institute) The International Organization for Standardization (ISO) establishes and harmonizes International standards.

Subsequent to a long-term plan, a Technical committee (CEN TC) prepares a draft EN by cooperation of the representatives of all interested members of CEN. A completed draft standard is adopted by qualified majority of CEN members.

The European Standards for road construction products are currently under development within the CEN Technical Committee CEN/TC 227. Some draft documents are near or at the approval stage. These include:

- Concrete pavements - Test methods - Part 1: Determination of the thickness of a concrete, prEN 13863-1
- Concrete pavements - Test methods - Part 2: Determination of saturated density of cores, prEN 13863-2
- Concrete pavements - Test methods - Part 3: Determination of bond between two concrete layers, prEN 13863-3
- Slurry surfacing - Specifications - Part 2: Aggregates, prEN 12273-2
- Unbound and hydraulically bound mixtures - Part 44: Test methods for binder activity - Determination of alpha coefficient of vitrified blast furnace slag, prEN 13286-44
- Unbound and hydraulically bound mixtures - Part 46: Test method for the determination of compatibility, the Moisture Condition Value (MCV), prEN 13286-46
- Unbound and hydraulically bound mixtures - Part 47: Test methods for the bearing capacity, California Bearing Ratio (CBR), Immediate Bearing Index (IBI) and linear swelling, prEN 13286-47

The European product standards will specify the tests to be carried out and the performance characteristics to be achieved before CE marking may be affixed, according to the requirements of the Construction Products Directive.

#### 17.6.5.2 CEN TC, active on the field of construction products:

| | |
|---|---|
| CEN/TC 33 | Doors, windows, shutters, building hardware and curtain walling |
| CEN/TC 38 | Durability of wood and derived materials |
| **CEN/TC 50** | **Lighting columns and spigots** |
| **CEN/TC 51** | **Cement and building limes** |
| CEN/TC 53 | Temporary works equipment |
| CEN/TC 67 | Ceramic tiles |
| CEN/TC 88 | Thermal insulating materials and products |
| CEN/TC 89 | Thermal performance of buildings and building components |
| CEN/TC 99 | Wallcoverings |
| **CEN/TC 104** | **Concrete and related products** |
| CEN/TC 112 | Wood-based panels |
| CEN/TC 124 | Timber structures |
| CEN/TC 125 | Masonry |
| CEN/TC 126 | Acoustic properties of building products and of buildings |
| CEN/TC 127 | Fire safety in buildings |
| CEN/TC 128 | Roof covering products for discontinuous laying and products for wall cladding |
| CEN/TC 129 | Glass in building |
| CEN/TC 134 | Resilient, textile and laminate floor coverings |
| **CEN/TC 135** | **Execution of steel structures and aluminium structures** |
| **CEN/TC 154** | **Aggregates** |
| CEN/TC 163 | Sanitary appliances |
| CEN/TC 166 | Chimneys |
| **CEN/TC 167** | **Structural bearings** |
| CEN/TC 175 | Round and sawn timber |
| CEN/TC 177 | Prefabricated reinforced components of autoclaved aerated concrete or lightweight aggregate concrete with open structure |
| **CEN/TC 178** | **Paving units and kerbs** |
| CEN/TC 187 | Refractory products and materials |
| **CEN/TC 189** | **Geosynthetics** |
| CEN/TC 217 | Surfaces for sports areas |
| **CEN/TC 226** | **Road equipment** |
| **CEN/TC 227** | **Road materials** |
| **CEN/TC 229** | **Precast concrete products** |
| CEN/TC 241 | Gypsum and gypsum based products |
| **CEN/TC 246** | **Natural stones** |
| CEN/TC 247 | Building automation, controls and building management |
| **CEN/TC 250** | **Structural Eurocodes** |
| **CEN/TC 254** | **Flexible sheets for waterproofing** |
| CEN/TC 277 | Suspended ceilings |
| CEN/TC 284 | Greenhouses |
| **CEN/TC 288** | **Execution of special geotechnical works** |
| CEN/TC 297 | Free-standing industrial chimneys |

CEN/TC 303 Floor screeds and in-situ floorings in buildings
CEN/TC 315 Spectator facilities
CEN/TC 323 Raised access floors
CEN/TC 325 Prevention of crime by urban planning and building design
**CEN/TC 336 Bituminous binders**
**CEN/TC 339 Slip resistance of pedestrian surfaces - Methods of evaluation**
**CEN/TC 340 Anti-seismic devices**
**CEN/TC 341 Geotechnical investigation and testing**

**CEN/SS B02 Structures**

**CEN/SS B99 Building and construction - Undetermined**

The members of CEN are obliged to implement the adopted standards in an appointed time, namely as national standard (e.g. SIST EN) three month after ratification (publication of standard by CEN) and to withdraw eventual conflicting technical specifications in the period of six month.

### *17.6.6 EN standards designed for voluntary implementation*

pay regard to minimal requirements accepted by qualified majority of a CEN TC, which may be in the process of adoption completed with national preamble and national addendum or a guideline for implementation. The provisions of a national addendum may be:

- National or foreign technical specifications or the provisions of national technical regulations if referenced by an EN, but there is no applicable international technical specification;
- Different level of protection or possible differences in climatic and geographical conditions in a member state;
- General principals of EN may be explicated, complemented or stated in a concrete form;
- Consideration to traditional national practices.

This field of standards could become internationally mandatory when an agreement of CEN members, administrative or legal act or a contract binding the interested partners of member states is resolved.

### *17.6.7 Harmonized EN (hEN) standards*

are mandatory implemented in member states of EU or EEA, which are not entitled to change or to fix more stringent levels of harmonized requirements provided in normative Annex Z. Some provisions of harmonized standards may not consider to essential requirements

Levels or classes may be categorized. The method of classification, publication and CE marking of classes or levels are provided in *Guidance Paper E.*

### *17.6.8 Added value of a product and voluntary certification*

Eventual additional or more stringent levels of harmonized requirements or exacting conformity attestation system to access an added value of a product can be asserted:

- On request of a manufacturer intending to place a product with added value on a market on a cost-effective and competitive way.
- On request of a Client when a product must fit additional requirements for intended use, contracting the provisions with a contractor, when it is not a matter of public procurement.
- When predetermined with a legal national provision issued by a competent national Secretary when the supplied product is the matter of public procurement and

added value being of public importance and provided with national regulations determining protection levels of a structure or climatic and geographical conditions; such a regulation must be considered by Commission

CE marking approves conformity with harmonized standards only, for products placed on common market. Conformity attestation system of unregulated field of product standards is foreseen as voluntary certification.

The time limits and phases of hEN adoption by CEN are provided by *Transitional Arrangements Under The Construction Products Directive Guidance paper J – Transitional Arrangements Under The Construction Products Directive.*

European standard contains following mandatory chapters:

- Preliminary Informative Elements (status, time limits for adoption and withdrawal of conflicting standards (DOW)
- General Normative Elements: the scope shall be specific and state clearly which product(s) material(s), form(s) (if relevant) and use(s) are covered,
- Normative references: This lists documents (in most cases European or international standard(s)), with their titles and, when the reference is dated, the year of availability, referred to in the text in such a way as to make them indispensable for the application of the standard.
- Technical normative elements:
  - Definitions, symbols and abbreviations
  - Requirements: All relevant requirements of the products should be included in this clause, whether related to directives or not. All requirements on characteristics from directives should be normative.
  - Testing, assessment and sampling methods
  - Evaluation of conformity
  - Classification and designation
  - Marking, labelling and packaging
- Normative annexes
- Informative annexes
- Annex ZA (added to harmonized standards - full guidance on the principles and preparation of Annex ZA is given in the text of BT Resolution C139/2000
- Annex ZB (Other New Approach directives)

### *17.6.9 European technical approval*

Any Approval body of EEA member states, notified at EU Commission, grants an ETA. The body must be accredited for type testing, conformity evaluation and impartial attestation. The product conformity to requirements of a granted technical approval must be evaluated according to a mandatory system of attestation and surveillance.

There are two ways of ETA granting:

- In product areas where an ETAG exists, EOTA award an ETA considering the provisions of ETAG for the products of more than one manufacturer.
- In product areas where no ETAG exists, ETAs can be awarded, subject to the agreement of all EOTA bodies and the European Commission, through what is known as the Common Understanding of Assessment Procedure (CUAP),in which the assessment criteria for the product and its intended use are set out.

EOTA working groups and areas of work:

| | **Active Working Groups** |
|---|---|
| 1 | Metal anchors for use in concrete<br>Part 1: Anchors in general |

| | |
|---|---|
| | Part 2: Torque-controlled expansion anchors<br>Part 3: Undercut anchors<br>Part 4: Deformation-controlled anchors<br>Part 5: Bonded anchors |
| 2 | Part 6: Metal anchors for use in concrete for fixing lightweight systems |
| 3 | Plastic anchors for use in concrete and masonry |
| 4 | Metal injection anchors for use in masonry |
| 5 | Structural Sealant Glazing Systems<br>Part 1: Supported and Unsupported Systems<br>Part 2: Coated Aluminium<br>Part 3: Thermal Breaks<br>Part 4: Opacified Glazings |
| 6 | External Thermal Insulation Composite Systems/kits with rendering |
| 7 | Non-loadbearing permanent shuttering systems based on hollow blocks or panels of insulating materials and, sometimes, concrete |
| 8 | Systems of mechanically fastened flexible roof waterproofing membranes |
| 9 | Liquid applied roof waterproofing kits |
| 10 | Internal partition kits |
| 11 | Self-supporting translucent roof kits (except glass-based kits) |
| 12 | Prefabricated stair kits |
| 13 | Post-tensioning kits for the prestressing of structures |
| 14 | Light composite wood-based beams and columns |
| 15 | Timber Frame Building Kits |
| 16 | Log Building kits |
| 17 | Fire stopping, fire sealing and fire protective products<br>a. Fire stopping, fire sealing products<br>b. Fire protective products<br>- part 1: General<br>- part 2<br>- part 3<br>- part 4: Fire protective Board, Slab and Mat Products and Kits |
| 18 | Pre-fabricated wood-based loadbearing stressed skin panels |
| 19 | Self-supporting composite light-weight panels<br>- part 1: General<br>- part 2: For use in Roofs<br>- part 3: For use in External Walls and Claddings<br>- part 4 |
| 20 | Expansion joints for road bridges |
| 21 | Three-dimensional nailing plates |
| 22 | Vetures (prefabricated) insulation Kits and Cladding Kits<br>a. Vetures<br>b. Cladding Kits |
| 23 | Falling Rock Protection Kits |
| 24 | Prefabricated Building Units |
| 25 | Liquid Applied Bridge deck Waterproof Systems |
| 26 | Concrete and Metal Frame Building Kits |

| | |
|---|---|
| | a. Concrete Frame Building Kits<br>b. Metal Frame Building Kits |
| 27 | Cold Storage Rooms and Building Kits<br>a. Kits for prefabricated Cold Storage Rooms<br>b. Kits for prefabricated Cold Storage Buildings |
| 28 | Pins for Structural Joints |
| 29 | Watertight coverings for bathroom walls and floors |
| 30 | Ultra Thin Layer Asphalt Concrete |
| 31 | Insulation Products for Inverted Roof Systems |

### *17.6.10 5.7 Attestation of conformity*

Products falling within the scope of "road construction products", in the context of the Construction Products Directive, include pure bitumen, polymer modified bitumen, fluxed bitumen, fluxed polymer modified bitumen, cut-back bitumen, emulsions, bituminous mixtures, naturally occurring asphalt/bitumen and surface treatments

The attestation of conformity system applicable to road construction products is 2+ i.e. certification of factory production control with surveillance.

The manufacturer is required to operate a factory production control (FPC) system in accordance with the specification for the FPC system defined within the relevant harmonized European product standard.

Attestation of Conformity system 2+ procedures include the involvement of a Notified Body to certify the factory production control system operated by the manufacturer and the issue of an EC Certificate of Conformity for the FPC system. In addition, the Notified Body is required to carry out surveillance of the FPC system on a regular basis.

For initial type testing, samples representative of each product type are to be selected by the manufacturer from each production facility supplying products. These samples are to be tested to the requirements detailed in the relevant product standard.

Before affixing the CE marking, the manufacturer is required to prepare an EC Declaration of Conformity, based on the initial type test results and compliance with the Directive, in all respects

The *Guidance paper K* provides definitions, methods and procedures of conformity attestation.

### *17.6.11 Guidance Paper K*

### *The Attestation of Conformity Systems and the role and tasks of the Notified Bodies in the field of the Construction Products Directive.*

#### 17.6.11.1 Scope

1. This Guidance Paper goes into detail on the various attestation of conformity (AoC) systems within the context of the implementation of Council Directive 89/106/EEC (hereafter referred to as the Construction Products Directive or CPD), as amended by Council Directive 93/68/EC.
2. It also addresses the relation between the AoC systems and the Notified Bodies. It clarifies the role of the relevant Notified Body/Bodies under the different AoC systems.
3. The Guidance Paper refers, in particular, to Articles 13 and 18 and to Annex III of the CPD. The full text of these provisions can be found on the Internet site of DG Enterprise Construction.
4. The Guidance Paper is intended for a number of different audiences, particularly

Notified Bodies and Regulators and enforcement authorities within the European Economic Area (EEA). It is also of interest to technical specification writers (CEN/CENELEC and EOTA members), for consideration together with the respective mandates, manufacturers and other users for information purposes.

5. This document gives information which complements Guidance Paper A because it describes the practical role of the notified bodies. It does not specify the criteria to be used by Member States to examine bodies wishing to be considered for notification (covered by Guidance Paper A).

   Note: Guidance Paper A: THE DESIGNATION OF NOTIFIED BODIES IN THE FIELD OF THE CONSTRUCTION PRODUCTS DIRECTIVE

### 17.6.11.2 Underlying principles

1. The CPD identifies a complete set of attestation of conformity systems including all the actors with their respective roles and tasks. Voluntary European or international standards [ISO 9000 series, EN 45000 series], or documents produced on a horizontal level [CERTIF series, including Guide to the Implementation of Directives based on the New Approach and the Global Approach (2000 edition)] for new or global approach directives, describing practices similar to those under the CPD, can be used as a starting point where appropriate but are not obligatory.
2. This document is limited to aspects relating to CE marking under the Construction Products Directive. Voluntary aspects that might be addressed in the technical specifications are not dealt with.
3. The producer is *fully* responsible for the attestation that products are in conformity with the requirements of a technical specification. The involvement of a third party, even to provide an EC certificate of conformity, does not relieve the producer of *any* of his obligations. However, under the CPD, responsibility for specific actions is given to a third party for all systems of attestation of conformity (AoC) except system 4.
4. Whether or not there is third party intervention in attestation of conformity, all of the tests and procedures required by the CPD and the technical specifications must be performed and documented correctly. The documentation shall be available for notifying authorities and surveillance authorities where relevant.
5. In specifying the systems of AoC it has been recognized that the importance of the part played by a product with respect to the essential requirements will not usually be the same for each ER. Thus, within a given system of AoC certain tests of a product's performance have usually been allocated to the notified bodies and the rest to the producer. Details of this allocation of tests shall be specified in the technical specifications, elaborated on the basis of mandates from the Commission.
6. In addition, many Commission Decisions relating to the attestation of conformity of construction products are based on a cumulative procedure, in which different systems of AoC are allocated to the various possible intended uses of a product. The type of notified bodies involved, if any, therefore depends upon the range of intended uses [Intended use is defined in the IDs as referring to the roles(s) that the product is intended to play in the fulfilment of the essential requirements] that the producer chooses to make his product available for.
7. The term "Notified Body" is used only for organizations notified under article 18 of the CPD to avoid confusion with the terminology used for organizations designated by member states under article 10 of the CPD (i.e. EOTA Approval Bodies).

### 17.6.11.3 Methods of control of conformity

***Initial type-testing (ITT) of the product (by the manufacturer or a notified body) applicable to all AoC systems***

1. An Initial Type test is the complete set of tests or other procedures described in the harmonized technical specification, determining the performance of samples of products representative of the product type.
2. An ITT verifies that a product complies with the harmonized technical specification. It defines the performance of all harmonized characteristics to be declared.
3. Depending on the limitations of intended uses chosen by, and the specific markets envisaged by the manufacturer, the scope of the ITT could be limited to those applicable to the uses foreseen.
4. A product type may cover several versions of the product, provided that the differences between the versions do not affect the level of safety and the other requirements concerning the performance of the product.
5. An initial type test (ITT) is not an assessment of the fitness for use of a product. The ITT is rather a determination of the performance of a product, on the basis of tests or other procedures described in the technical specifications.
6. The ITT is only one element which determines whether or not a product can be attested to be in conformity with a technical specification. However, the ITT does play a fundamental role under the CPD as it provides the reference for the declared performance of the product.

***Audit-testing of samples taken at the factory, on the open market or on a construction site by the manufacturer or an notified body;***

1. Commission Decisions generally limit audit testing by Notified Bodies, under the attestation of conformity procedures, to the premises of the manufacturer or his authorized representative.
2. A proper "audit-test " assumes that:
    - *The construction product is tested in accordance with the test methods specified in the technical specification and the initial type test.*
    - *The test results are compared with the declared performances of the product derived from the initial type test.*
    - *A test report is delivered, confirming that the findings are in conformity with the technical specifications, the ITT and FPC provisions.*

***Factory production control***

1. In the CPD, factory production control means the permanent internal control of production exercised by the manufacturer. Normally this includes testing by the manufacturer, to assure compliance of the manufactured products with the declared performances of the initial type test.
2. Further details on factory production control can be found in Guidance Paper B: "The definition of factory production control in technical specifications for construction products."

### 17.6.11.4 Systems of conformity attestation

1. According to Article 13 of the CPD, the manufacturer, or his authorized representative established in the Community, is responsible for the attestation that products are in conformity with the requirements of a technical specification within the meaning of Article 4. Conformity shall be established by means of testing and/or other evidence on the basis of the technical

specifications in accordance with Annex III where preference is given to the application of two procedures of conformity attestation, namely:

(i) Certification of the conformity of the product by an approved certification body on the basis of 2 alternative systems)

(ii) Declaration of conformity of the product by the manufacturer…(on the basis of four alternative systems)

2. The certification body in procedure [The involvement of the certification body is not intended to relieve any of the responsibilities for the manufacturer but to reassure the users and the authorities that everything is satisfactory.] (i) has to perform conformity assessment of the product, and in procedure (ii), first possibility, has to do the assessment of the capabilities of the manufacturer to assess ITT and FPC outcomes against the product specifications and, when surveillance is required, periodically review this.
3. Under procedure (i) and procedure (ii), first possibility, notified bodies (other than the certification body) may work as sub-contractor to the certification body.
4. Under procedure (ii) second possibility, the tests to be carried out in respect of any one Essential Requirement must be the responsibility of one notified test laboratory (see 4.2.2 (3) below). However, that laboratory may subcontract specific tests to other laboratories.
5. To facilitate referencing the various AoC systems in the Commission Decisions on the Attestation of Conformity and in the corresponding mandates, the systems have been given a number. Annex 1 recapitulates this numbering scheme.

***Certification of the conformity of the product by a notified certification body on the basis of different tasks for the manufacturer and notified bodies (CPD Annex III.2(i) (Systems 1 and 1+)).***

1. Under systems 1 and 1+, responsibility for the certification of the conformity of the product (on the basis of tasks by the producer and the notified body) is given to a third party.
2. It is normal practice that the individual tasks required to enable product certification to take place are carried out by various parties – e.g. producer, certification body, inspection body, and laboratory. The certification body is responsible for assembling all of the relevant information, verifying that tasks have been carried out according to the technical specification and assessing and certifying the conformity of the product.
3. Product certification can therefore be considered to be an umbrella activity, making use of information from various sources. Within this overall scheme, the producer has a significant role to play, including the testing of certain product characteristics as part of an initial type test (see paragraph 3.1 above). The allocation of such tests to the producer shall be indicated in the technical specifications, elaborated on the basis of the mandates from the Commission.
4. Under systems 1 and 1+, responsibility for product sampling for the ITT, in accordance with the rules laid down in the technical specification [In the absence of sampling rules (and other initial type testing or factory production control details) in the technical specification, the Group of Notified Bodies shall provide appropriate common instructions to producers. These common instructions will be communicated to the SCC for endorsement. Specification writers could use these as basis for future amendments of the specifications], lies with the certification body (often delegated to an inspection body), rather than the producer.

5. The result of the actions of the notified body under CPD Annex III.2(i) (*Systems 1 and 1+*) is in all cases a product conformity certificate. The only difference between the commonly used terms 'system 1' and 'system 1+' are the methods used by the notified body to assess the product (i.e. 1+ includes audit testing).

***Declaration of conformity of the product by the manufacturer (CPD Annex III.2(ii)).***

1. Under systems 2, 2+, 3 and 4, the responsibility for product sampling for the ITT test, in accordance with the rules laid down in the technical specification, lies with the manufacturer.

This second system (Annex III of the CPD) distinguishes between 3 possibilities:

***first possibility (Systems 2 and 2+)***

1. The result of the actions of the notified body under this first possibility is in all cases a factory production control certificate. The only difference between the commonly used terms 'system 2' and 'system 2+' are that whereas both 2 and 2+ involve assessment of Factory Production Control, system 2+ also involves surveillance.
2. The certification of factory production control (FPC) refers to an evaluation of the permanent internal control of production exercised by the producer (to enable achievement of the required product characteristics to be checked). Thus, both initial inspection and continuous surveillance are general activities relating to a particular production facility, in order to demonstrate that the FPC is in conformity with the requirements of the technical specification and the CPD.
3. Given the general character of FPC certification, there is no one-to-one relationship with the individual product characteristics, even if some aspects of a product's performance may warrant particular attention (to be specified in the technical specifications if this is the case). Hence, the allocation of tasks to the notified body or the producer on the basis of individual product characteristics does not have any practical value. The assessment of FPC concerns all of the elements, requirements and provisions adopted by the producer to fulfil his obligations under the CPD.
4. Certification of FPC does not involve assessment of the overall conformity of a product with a technical specification – this remains the responsibility of the producer.

***second possibility (system 3).***

1. Under system 3, responsibility for the Initial Type Test (ITT) is given to a third party or parties, rather than to the producer. All other responsibilities fall on the producer.
2. The responsibility for sampling of the products to be tested, in accordance with the rules laid down in the technical specification, lies with the producer. The producer has a duty to ensure that the samples are representative of the product to be placed on the market and to keep satisfactory records of this (i.e. as part of his factory production control).
3. Having responsibility for the ITT does not necessarily mean that the third party (or parties) has to carry out all of the tests required for a given product type. It is quite normal for the producer to carry out some of the testing himself. The technical specifications, elaborated on the basis of the mandates from the Commission, will indicate which of the tests on individual product characteristics may be performed by the producer, as opposed to the notified laboratories *(reports will always indicate who has performed the test).*

4. For the tests to be carried out by a third party, the producer may approach one or more notified laboratories, although the tests to be carried out in respect of any one Essential Requirement must be carried out by the same laboratory (i.e. a maximum of 6 notified laboratories may be used, one per ER). This practice will allow highly specialized laboratories (e.g. for fire or acoustical testing) to be notified and brought within the Group of Notified Bodies co-ordination process. The producer shall inform each notified laboratory of the identity of any other notified laboratories used and shall keep appropriate records.
5. Any tests carried out by the producer himself *(or the notified bodies)* must be performed and reported in accordance with the technical specification(s). The test reports shall make reference to the sample identities referred to above.
6. The complete ITT Report, assembled by the producer, shall include all of the test reports from the notified laboratories and the producer. Any notified laboratory involved in the ITT may request to examine the full ITT Report, in order to satisfy him that all of the sample identities correspond with those provided to it for testing. If they are not from the same batch, identification testing shall allow comparing the results with the other parts of the testing [This to allow the use of test results from different times during the development of new products].

***third possibility (system 4)***

1. No compulsory intervention of a third party in attestation of conformity. This does not, of course, prevent producers from having the necessary tests done by outside laboratories if they so choose (e.g. if they lack the facilities or expertise to carry out the tests and procedures themselves).

### 17.6.11.5 Notified bodies involved in the Attestation of Conformity

1. Currently, different attestation and market surveillance systems are operational in the Member States. Many of the 'third parties' involved in these schemes will become Notified Bodies under article 18 of the Construction Products Directive. In each national system, a certain terminology is used for these bodies.
2. Many Commission Decisions relating to the attestation of conformity of construction products are based on a cumulative procedure, in which different systems of AoC are allocated to the various possible intended uses [Intended use is defined in the Interpretative Documents as referring to the roles(s) that the product is intended to play in the fulfilment of the essential requirements.] of a product. The type of notified body involved, if any, therefore depends upon the range of intended uses that the producer chooses to make his product available for.
3. It is not relevant to compare the role and tasks of the types of Notified Bodies under the CPD with existing terminology or practices in Member States as the functions of the latter are not necessarily equal to traditions under national systems.
4. The Notified Bodies for one and the same product(s) or product characteristic (or type of test) shall regularly exchange their experience and the information necessary to perform their tasks in a way that the procedures are consistent and transparent and that the results are reproducible. This exchange shall take place in the respective Sector Group of the Group of Notified Bodies (GNB). Matters of general interest shall be put forward to the Advisory Group of the GNB.

***Division of tasks***

1. For various reasons Notified Bodies can appoint sub-contractors that will perform tasks on their behalf. Annex 2 details the different types of Notified

Bodies as defined in Annex III of the CPD and their roles under the various AoC systems.

2. A sub-contracting notified body remains responsible for all the activities covered by the notification. Sub-contracting does not entail the delegation of powers or responsibilities. Certificates and reports are always issued in the name and under the responsibility of the sub-contracting notified body but will indicate who has performed the actual tasks. Serial sub-contracting is prohibited in order to avoid undermining the coherence of the system and the confidence in it.
3. A notified body can sub-contract strictly limited technical tasks (e.g. tests, factory production control audits), as long as these can be defined as substantial and coherent parts of the technical operation.

Two mechanisms for sub-contracting can be identified.

***On basis of a long-term contract:***

1. Sub-contracting is permissible where a body, applying for notification, identifies clearly its sub-contractors and the role these are going to play in the attestation of conformity system.
2. This kind of sub-contractor does not need notification but should demonstrate to the respective Member State technical competence and impartiality by fulfilling the requirements of annex IV of the CPD for the tasks that are contracted to them.
3. The notified body must in all cases have a direct private-law contractual link with its sub-contractors to ensure the fulfilling of its general responsibilities.
4. This mechanism provides an answer where notified bodies seek solutions to enable them to give a complete service to Industry. Council Decision 93/465/EC [Council decision 93/465/EC concerning the modules for the various phases of the conformity assessment procedures and the rules for affixing and use of the CE conformity marking, which are intended to be used in the technical harmonization directives] defines a number of conditions on sub-contracting.

Adapting this to the specific case of the CPD we can say that the sub-contracting of work shall be subject to certain conditions guaranteeing:

- the competence of the establishment operating as a sub-contractor, on the basis of conformity with the requirements of Annex IV of the CPD, Guidance paper A and the respective harmonized technical specification, and the capability of the Member State that has notified the sub-contracting body to ensure effective monitoring of such compliance
- the ability of the body notified to exercise effective responsibility for the work carried out under sub-contract."

***Sub-contracting to other Notified Bodies***

1. In many cases, the notified bodies will look for sub-contractors to solve isolated problems (lack of capacity in their own laboratories, inspections in a plant across the border…).
2. Notified Bodies can make use of the services of other Notified Bodies (that have been notified in the relevant area) to perform tasks. The certificates or reports produced must clearly indicate who has performed a particular task. The overall responsibility remains with the sub-contracting Notified Body.
3. This second type of sub-contracting assures transparency by public knowledge of the assessment of all the bodies involved by the respective Member State, involves all actors in the European co-ordination within the GNB and offers more possibilities to Industry.

### 17.6.11.6 Sample marking and Reporting

***Marking of samples***

1. All samples to be used for testing purposes shall be suitably marked to allow a subsequent verification that the producer has fulfilled his obligations. This demonstrates that the manufacturer has followed the rules in the harmonized EN or ETA, that all tests have been carried out on the same batch of samples, if this is specified, and that the samples are representative for the product to be placed on the market.
2. Sample-marking on the product will at least include production line, date and time of the taking of the sample. The sample identity shall be recorded in all test reports to enhance traceability.
3. Products declared by the manufacturer to be defective shall only then be excluded from sampling if they have been set aside and marked accordingly.
4. In the case of sampling by a Notified Body, the sampler shall prepare and sign a record on sampling that shall be countersigned by the manufacturer or his representative (when relevant). The record should at least include the following information:
    - *Manufacturer and manufacturing plant*
    - *Place of sampling*
    - *If necessary, stock or batch quantity (from which the samples have been taken)*
    - *Number or quantity of samples*
    - *Identification of the construction product in accordance with the technical specification*
    - *Marking of the product by the manufacturer*
    - *Marking of the samples by the sampler (when relevant)*
    - *Where necessary, properties to be tested*
    - *Place and date*
    - *Signatures*
    - *Registration number of the Notified Body*

***Test Reports***

1. The results of each test, independent of whether this test is part of the initial type test or audit testing by the manufacturer or a third party, shall be recorded in a *"test report"*. The test report should at least include the following information:
    - *Manufacturer and manufacturing plant*
    - *Identification of the construction product in accordance with the relevant technical specification*
    - *Information about*
    - sampling
    - date of testing
    - involved personnel
    - applied testing methods according the relevant technical specification
    - *Identification of the organization and personnel executing the test*
    - *Place and date*
    - *The results of the test, including analysis of these when relevant.*
    - *Place and date of the delivery of the test report*

- *Registration number of the Notified Body (when relevant)*
- *Signature of the head of the testing laboratory and stamp (when relevant).*

The test report must comply with the relevant clauses of the technical specifications. The complete set of test reports will be kept by the manufacturer and the certification body (when relevant) and will be made available to the inspection body (where relevant) and market surveillance authorities on demand.

Test laboratories will keep the test reports that they have issued.

***Note***

Where possible, model reports and other model documentation should be developed by the specification writers and should be included in the technical specifications.

As an interim solution and to avoid extra work for the specification writers, the test reports may need to appear as separate documents developed by the relevant sector groups and/or the Advisory Group of the Group of Notified Bodies. Suitable common presentation should be assured by close collaboration between specification writers and the GNB.

***Reference***

The Construction Products Directive.

CONSTRUCT 99/345 REV.3: THIRD PARTY INTERVENTION IN AoC

CONSTRUCT 99/342: Discussion paper on the notification of bodies by Member States and the relation with sub-contracting of tasks by Notified Bodies

Guidance paper A: The Designation Of Approved Bodies In The Field Of The Construction Products Directive.

Guidance Paper B: The Definition Of Factory Production Control In Technical Specifications For Construction Products.

Position papers of working group 1 from the Advisory Group of the Group of Notified Bodies (NB-CPD-001/NB-CPD-002 rev4)

The Guide to the implementation of Directives based on the New Approach and the Global Approach.

## Annex 17.1: Attestation of Conformity Systems.

| Syst. | Task for manufacturer | Task for notified body | Basis for CE marking |
|---|---|---|---|
| **4** | Initial type testing of product<br>Factory production control | | Manufacturers conformity Declaration |
| **3** | Factory production control | Initial type of testing of product | |
| **2** | Initial type of testing of product<br>Factory production control | Certification of factory production control on basis of initial inspection | Manufacturers conformity Declaration<br>**+**<br>certification of factory production control |
| **2+** | Initial type testing of product<br>Factory production control<br>Testing of samples according prescribed test plan | Certification of factory production control on basis of<br>initial inspection<br>continuous surveillance, assessment and approval of production control | |
| **1** | factory production control<br>Further testing of samples according prescribed test plan | Certification of product conformity on basis of tasks of the notified body and the tasks assigned to the manufacturer<br>Tasks for notified body:<br>- initial type-testing of the product;<br>- initial inspection of factory and of factory production control;<br>- continuous surveillance, assessment and approval of factory production control; | Manufacturers Conformity Declaration accompanied by Certificate of product conformity |
| **1+** | Factory production control<br>Further testing of samples according prescribed test plan | Certification of product conformity on basis of tasks of the notified body and the tasks assigned to the manufacturer<br>Tasks for notified body:<br>- initial type-testing of the product;<br>- initial inspection of factory and of factory production control;<br>- continuous surveillance, assessment and approval of factory production control;<br>- audit-testing of samples taken at the factory, on the market or on the construction site | |

## Annex 17.2: Attestation of Conformity Systems and Tasks of the Notified Bodies

| Text extract from CPD Annex III | Task | Attestation systems | | | | | | Certification required |
|---|---|---|---|---|---|---|---|---|
| Preference is given to application of the following systems of conformity attestation | | 1+ | 1 | 2+ | 2 | 3 | 4 | |
| **(i) Certification of the conformity of the product by an notified certification body on the basis of:** | | | | | | | | |
| (a) (tasks for the manufacturer) | | | | | | | | |
| (1) factory production control; | 1 | M | M | | | | | |
| (2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan; | 2 | M | M | | | | | |
| (b) (tasks for the notified body) | | | | | | | | |
| (3) initial type-testing of the product; | 3 | A | A | | | | | CP |
| (4) initial inspection of factory and of factory production control; | 4 | A | A | | | | | CP |
| (5) continuous surveillance, assessment and approval of factory production control; | 5 | A | A | | | | | CP |
| (6) audit-testing of samples taken at the factory , on the open market or on a construction site | 6 | A | | | | | | CP |
| **(ii) Declaration of conformity of the product by the manufacturer on the basis of:** | | | | | | | | |
| First possibility: | | | | | | | | |
| (a) (tasks for the manufacturer) | | | | | | | | |
| (1) initial type-testing of the product; | 7 | | | M | M | | | |
| (2) factory production control; | 8 | | | M | M | | | |
| (3) testing of samples taken at the factory in accordance with a prescribed test plan (*); | 9 | | | M | | | | |
| (b) (tasks for the notified body) | | | | | | | | |
| (4) certification of factory production control on the basis of: | | | | | | | | |
| initial inspection of factory and of factory production control, | 10 | | | A | A | | | CF |
| continuous surveillance, assessment and approval of factory production control. | 11 | | | A | | | | CF |
| Second possibility: | | | | | | | | |
| (1) initial type-testing of the product by an notified laboratory; | 12 | | | | | L | | Report only by L |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| (2) factory production control | 13 | | | | | M | | |
| Third possibility: | | | | | | | | |
| (a) initial type-testing by the manufacturer; | 14 | | | | | | M | |
| (b) factory production control | 15 | | | | | | M | |

KEY (see also annex 17.3 for definitions):
CP -certification body required for certification of the conformity of the product
CF - certification body required for certification of the factory production control
A - certification body or, when acting on behalf of a certification body, an inspection body and/or testing laboratory.
L - testing laboratory
M - manufacturer
(*) when required

## Annex 17.3: Bodies involved in Attestation of Conformity and their functions

| Text extract from CPD Annex III | Tasks | Attestation systems | | | | | |
|---|---|---|---|---|---|---|---|
| BODIES INVOLVED IN THE ATTESTATION OF CONFORMITY | | 1 | 1+ | 2 | 2+ | 3 | 4 |
| With respect to the function of the bodies involved in the attestation of conformity, distinction shall be made between | | | | | | | |
| (i) certification body, which means an impartial body, governmental or non-governmental, possessing the necessary competence and responsibility to carry out product conformity certification or FPC certification according to given rules of procedure and management; | 3 to 6, 10 and 11 | Y | Y | Y | Y | | |
| (ii) inspection body, which means an impartial body having the organization, staffing, competence and integrity to perform according to specified criteria functions such as assessing, recommending for acceptance and subsequent audit of manufacturers' factory production control system | 4, 5, 6,10, and 11 | s | s | s | s | | |
| (iii) testing laboratory, which means a laboratory which measures, examines, tests, calibrates or otherwise determines the characteristics or performance of materials or products. | 3, 6 and 12 | s | s | | | Y | |
| In case (i) and (ii) (first possibility) of paragraph 2, the three functions 3 (i) to (iii) may be performed by one and the same body or by different bodies, in which case the inspection body and/or the testing laboratory involved in the attestation of conformity carries out its function on behalf of the certification body. | Note: Inspection Bodies and Testing Laboratories can undertake the tasks but under systems 1, 1+, 2 and 2+ they do so on behalf of the certification body. | | | | | | |

KEY: Y - Body is involved in these tasks or in certification based on them. s - Body can undertake these tasks on behalf of a certification body.

# GUIDELINES FOR ROAD DESIGN, CONSTRUCTION, MAINTENANCE AND SUPERVISION

## Volume IV: ROAD SUPERVISION

### SUPPLEMENT S7: FIRE SAFETY PERFORMANCE OF CONSTRUCTION PRODUCTS

# 18 FIRE SAFETY PERFORMANCE OF CONSTRUCTION PRODUCTS

## 18.1 TECHNICAL REGULATIONS AND EU DIRECTIVES

This supplement covers rules and construction products control systems with regard to their fire resistance

- Fire Services Act
- Safety, Health and Welfare at Work Act
- Pravilnik o obveznem atestiranju elementov tipskih gradbenih konstrukcij glede odpornosti proti požaru in o pogojih, ki jih morajo izpolnjevati organizacije združenega dela, pooblaščene za atestiranje the proizvodov (Ur.l. SFRJ, št. 24/90)
- 96/603/EC: Commission Decision of 4 October 1996 establishing the list of products belonging to Classes A 'No contribution to fire' provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products (Text with EEA relevance)
- CORRIGENDUM TO: 96/603/EC: Commission Decision of 4 October 1996 establishing the list of products belonging to Classes A 'No contribution to fire' provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products (Text with EEA relevance)

  2000/605/EC: Commission Decision of 26 September 2000 amending Decision 96/603/EC establishing the list of products belonging to Classes A 'No contribution to fire' provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products (notified under document number C(2000) 2640) (Text with EEA relevance)
- 98/457/EC: Commission Decision of 3 July 1998 concerning the test of the Single Burning Item (SBI) referred to in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products (notified under document number C(1998) 1743) (Text with EEA relevance)
- 2000/147/EC: Commission Decision of 8 February 2000 implementing Council Directive 89/106/EEC as regards the classification of the reaction to fire performance of construction products (notified under document number C(2000) 133) (Text with EEA relevance)
- 2000/367/EC: Commission Decision of 3 May 2000 implementing Council Directive 89/106/EEC as regards the classification of the resistance to fire performance of construction products, construction works and parts thereof (notified under document number C(2000) 1001) (Text with EEA relevance)
- 2003/43/EC: Commission Decision of 17 January 2003 establishing the classes of reaction-to-fire performance for certain construction products (Text with EEA relevance) (notified under document number C(2002) 4807)
- EN 13823:2002: Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.

**Symbols used:**

| | |
|---|---|
| $\Delta T$ | temperature rise |
| $\Delta m$ | mass loss |
| $t_f$ | duration of flaming |
| PCS | gross calorific potential |
| FIGRA | fire growth rate |
| $THR_{600s}$ | total heat release after 600 s |
| LFS | lateral flame spread |
| SMOGRA | smoke growth rate |
| $TSP_{600s}$ | total smoke production after 600 s |
| Fs | flame spread |

## 18.2 CLASSIFICATION OF CONSTRUCTION PRODUCTS ON REACTION TO FIRE

When the end-use application of a construction product is such that it may contribute to the generation and spread of fire and smoke within the area of origin or beyond, the

product shall be classified on the basis of its reaction to fire performance, having regard to the classification system set out in Tables 1 and 2.
Products shall be considered in relation to their end-use application.
If the classification based on the standardised tests and criteria listed in Tables 1 and 2 is not appropriate, one or more reference scenarios (representative scale test(s) typifying agreed hazard scenario(s) may be called on, within the context of a procedure providing for alternative tests.

### *18.2.1 Classes of Reaction to Fire Performance for Construction Products*

The classes defined and specified by Commission Decision 2000/147/EC (Table 1 and 2) are: A1, A2, B, C, D, E, and F
No reaction-to-fire testing of the materials and products classified as A1 and A2 shall be required. Their performances are specified by Commission Decision 96/603/EC

### *18.2.2 Assessment of Reaction to Fire Safety Performance of Construction Products*

As premises covered by this Document can vary greatly in size and layout, the risk of fire can also vary considerably from one situation to another, particularly in industrial and storage buildings where widely differing processes may be carried out and hazardous substances are stored or used. It is essential, therefore, that the fire precautions to be provided should be determined having regard to all relevant circumstances.
It should be noted that it is not possible to set out precise rules or other criteria that will be adequate to clearly establish the risk category in all cases. It is possible, however, to describe in broad terms the kind of factors which will need to be considered to determine if a building can be described as "high risk".
The details contained in the following paragraphs should be treated as broad indicators. It does not necessarily follow that the presence (or indeed the absence) of one of the factors mentioned in the description of the "high risk" category inevitably means that the premises or part of the premises have to be placed in that category. It is likely that in many engineering works there will be a mixture of risks. It is emphasised that all factors should be considered. At the building design stage, it may be difficult to determine the exact nature of the processes or storage involved. However, the basis for the assessment should always be established in order to provide for adequate fire safety measures.
Attention is drawn to obligations under the Fire Services Act, and the Safety, Health and Welfare at Work Act, The measures to be provided under the Building Regulations are intended to cater for fire safety in buildings generally and may not be adequate for the range of process and industrial hazards that could arise when the building is in use. The measures provided may therefore need to be supplemented accordingly.

**Assessment of High Risk**

Factors which lead to the assessment of premises or parts of the premises as being of high risk include the following:-
(a) the presence of materials likely, when ignited, to cause the rapid spread of fire, smoke or fumes. The materials (products) may be solid, liquid, or gaseous and as well as the normal forms may be present as dust, spray, mist or vapour;
(b) the presence of highly flammable or explosive materials (other than in small quantities);
(c) the products are placed on certain areas which, due to their function, may present a greater risk of fire occurring and developing than elsewhere such as manufacturing processes handling highly flammable liquids;
(d) the storage of hazardous products or materials and the storage of vehicles containing hazardous goods or materials;
(e) manufacturing, processing, repairing, cleaning, washing, breaking up or otherwise treating any hazardous product.

### Hazardous Materials and Products

Materials falling within the following general descriptions should be considered as hazardous materials:

(i) Explosives;
(ii) Compressed or liquefied gases;
(iii) Flammable liquids with a flash point below 65°C including whisky or other spirituous liquor;
(iv) Substances which becomes dangerous by interaction with either water or air;
(v) Corrosive substances;
(vi) Oxidising agents;
(vii) Substances liable to spontaneous combustion;
(viii) Substance that changes or decomposes readily giving out heat when doing so;
(ix) Combustible solid substance with a flash point less than 120°C;
(ix) Any substance likely to spread fire by flowing from one part of a building to another.

The above list is not necessarily exhaustive. There are a number of classification systems for hazardous materials and products such as EU, ISO standards, the U.S Department of Transport (DOT) or that produced by the United Nations Committee of Experts for the Transport of Dangerous Goods which may also be used for this purpose.

### Risk Classification system referred to Harmonised European Standards

Column 2 of the table sets out the reaction to fire test standards which are deemed to satisfy in accordance with Commission Decision 2000/147/EC of 8/2/2000 implementing Council Directive 89/106/EEC as regards the classification of the reaction to fire safety performance of construction products defines the classes of the essential requirement "Safety in case of fire".

prEN 13501-1 2000 provides the reaction to fire classification procedure for all construction products within the scope of the Construction Products Directive

| Reaction to Fire | |
|---|---|
| Column 1 | Column 2 |
| Risk | European Standards |
| *Non-combustible* | The material has achieved a classification of A1 when tested in accordance with EN ISO 1182 and EN ISO 1716; or<br>The material has achieved a classification of A2 when tested in accordance with EN 13823 and EN ISO 1182 or EN ISO 1716; or<br>Products made from only 1 or more of the materials considered as Class A1 without the need for testing, as defined in Commission Decision 96/603/EC of 4/10/1996 (amended 26/9/2000) establishing the list of products belonging to Class A1 "No contribution to fire" provided for in the Decision 94/611/EC implementing Article 20 of the Council Directive 89/106/EEC on the construction products. None of the materials contain more than 1.0% by weight or volume (whichever is the lower) of homogeneously distributed organic material. |
| Low risk | The material has achieved a classification of B or better when tested in accordance with EN 13823 and EN ISO 11925-2 |
| Medium risk | The material has achieved a classification of C or better when tested in accordance with EN 13823 and EN ISO 11925-2 |
| High risk | The material has achieved a classification of D or better when tested in accordance with EN 13823 and EN ISO 11925-2 |
| Very high risk | A material which does not meet the criteria for high risk |