

**Non-binding Guide to Good Practice for  
understanding and implementing**

**The 'Construction Sites'  
Directive 92/57/EEC on the  
implementation of minimum safety and  
health requirements at temporary or  
mobile construction sites**

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# Introduction

## Occupational safety and health in the construction sector

The construction sector is one of the largest industrial sectors in Europe. In 2007, the sector employed 16,4 million people (i.e. 7,2 % of Europe's total employment).

The sector consists mostly of small and medium-sized enterprises (SMEs). The European Construction Industry Federation (FIEC) estimates that 95% of these SMEs have fewer than 20 employees.

The occupational safety and health record of the construction sector is very worrying. The human and financial costs are considerable, both for society and for the economy. Although significant progress has been made in improving working conditions and safety in this sector, much still remains to be done. Considering the main economic sectors with a large workforce, the construction sector had the highest incidence rate for fatal and non-fatal accidents at work over the ten-year period from 1995 to 2005<sup>1</sup>.

Workers in the construction sector are twice as likely to be victims of non-fatal injuries as the average worker in other sectors. Slipping, stumbling and falling on the same level and loss of control of hand-held tools and objects are the most recurrent deviations (i.e. causes) leading to non-fatal accidents.

According to the latest available European Accidents at Work Statistics annual data for 2007 there were more than 700,000 accidents at work entailing more than 3 days of absence in the construction sector in the EU-15. The highest incidence rates for fatal and non-fatal accidents at work were registered in the construction sector (5239 for accidents with more than 3 days' absence and 8.1 for fatal accidents)<sup>2</sup>. About 1000 workers are killed each year – more than twice the average in all sectors. Falls of persons from height, falls of objects from above and loss of control of means of transport or handling equipment are the most common deviations leading to fatal accidents in construction sector.

In the ten new Member States (excluding Romania and Bulgaria), 20% of occupational injuries occurred in the construction sector in the year prior to their accession to the European Union.<sup>3</sup>

Lost time from occupational ill health is substantial and is generally held to be several times that from injuries.

In 2005, the Dublin Foundation for the Improvement of Working and Living Conditions carried out its fourth survey on working conditions in Europe<sup>4</sup>. Musculoskeletal problems continue to figure very prominently among occupational illnesses: 24,7% of the people interviewed suffered from back pains and 22,8% from muscular pain, all sectors taken together. Construction sector reports the highest level of exposure to each set of risks: ergonomic risk factors, biological and chemical risk factors and noise/temperature risk factors

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<sup>1</sup> Source: Causes and circumstances of accidents at work in the EU, DG EMPL 2009 - <http://ec.europa.eu/social>

<sup>2</sup> The incidence rate reflects the risk of having an accident at work, i.e. the number of accidents at work occurring in a year for every 100 000 persons in employment.

<sup>3</sup> Construction in Europe, Edition 2008 – FIEC (<http://www.fiec.org>)

<sup>4</sup> Fourth European working conditions survey, European Foundation for the Improvement of Living and Working Conditions, 2007, Office for Official Publications of the European Communities, ISBN 92-897-0974-X

## The Construction Sites Directive, 92/57/EEC

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The Construction Sites Directive 92/57/EEC<sup>1</sup> lays down minimum safety and health requirements for all temporary or mobile construction sites, irrespective of their size and complexity. The Directive does not cover drilling and extraction in the extractive industries. It should be noted that the provisions of the 'Framework Directive,' Directive 89/391/EEC<sup>2</sup>, are fully applicable to temporary and mobile construction sites without prejudice to the more stringent and/or specific provisions contained in Directive 92/57/EEC. Prevention is the guiding principle of European safety and health legislation. In addition to providing protection for workers, it also offers companies operating in the European market the possibility of working on an equal footing. As Directive 92/57/EEC foresees the possibility for Member states to allow flexibility or to introduce limited derogations, and as Member States are allowed to set higher standards than the Directive requires, the national legislation should always be consulted.

Directive 92/57/EEC has brought about major changes in the area of occupational risk prevention in the construction sector:

- By requiring safety and health coordination for both the project preparation stage and during project execution stages;
- By making clear the roles and responsibilities of the various stakeholders;
- By requiring the preparation of a limited number of documents that assist in ensuring good working conditions; and
- By extending to all of the players involved in construction projects the principles that are found in the Framework Directive for undertakings sharing a workplace to cooperate and coordinate in preventing occupational risks.

However, a 2008 Communication from the Commission<sup>3</sup> identified that some aspects of the Directive are not well understood or applied. This communication is based mainly on the national reports supplied by the Member States and an independent experts' report analysing implementation of the Construction Site Directive in all the private and/or public economic sectors concerned. It also draws on the results of European inspection campaigns on safety in the construction sector carried out in the 15 Member States in 2003 and 2004, on recent European statistics on accidents at work, and on the lessons that the Commission has learned from monitoring the transposition and application of the Directive.

Member states have to transpose community directives into their national legislation. It is the national legislation that is applicable to construction projects and the relevant legislation should always be consulted.

## The new Community Strategy

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The prime objective of the new Community Strategy 2007-2012 is the continuous improvement of safety and health conditions for workers, notably through a sustainable reduction in accidents and occupational illnesses. The Commission has identified that, in order to achieve this goal, the correct and effective implementation of Community legislation must be reinforced and that support should be given to SMEs, particularly in "high risk" sectors, such as construction, agriculture, fishing and transport.

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<sup>1</sup> Directive 92/57/EEC of the European Parliament and the Council on the implementation of minimum safety and health requirements at temporary or mobile construction sites (eighth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work) - OJ L 245, 26.8.1992 - See Annex 7 - European Union legislation, p.205

<sup>2</sup> Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work, OJ L 183, 29.6.1989, p. 1-8 - See Annex 7 - European Union legislation, p.204

<sup>3</sup> Communication from the Commission to the Council, the European Parliament, the European Economic and social committee and the Committee of the regions on the practical implementation of Health and Safety at Work Directives 92/57/EEC (temporary and mobile construction sites) and 92/58/EEC (safety signs at work) - COM (2008) 698 - See Annex 7 - European Union legislation, p.209

The Community Strategy includes the drawing up of practical guides on the correct application of the Directives, particularly for Directive 92/57/EEC. This Guide meets that objective.

### **This non-binding good practice guide**

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The Directive 92/57/EEC of the European Parliament and the Council on the implementation of minimum safety and health requirements at temporary or mobile construction sites (the Construction Sites Directive), lays down minimum safety and health requirements for all temporary or mobile construction sites. This non-binding Guide aims to assist all parties involved in construction (including clients, project supervisors, designers, coordinators, contractors and other employers, workers, suppliers etc...) to understand and implement the provisions of the Directive. The Guide includes the text of the Directive setting out its minimum requirements and provides explanatory text. It also includes some good practice suggestions and examples. Readers should take national legislation into account as this may introduce more stringent obligations than does the Directive.

The objectives of this Guide are to assist the various stakeholders:

- In understanding and implementing the general principles of prevention (Chap 1);
- In understanding the safety and health requirements of the Directive including when and to what it applies, the duties and roles of stakeholders and the documentation that is required (Chap 2);
- By identifying some typical hazards and risks during construction work (Chap 3);
- In managing risks throughout the duration of construction projects, from project preparation, during construction, and into the post-construction stage (Chap 4); and
- By summarising the duties of stakeholders by stages (Chap 5).

➤ **The next section How to read the Guide, p. 6, will help you get the best from this Guide.**

# How to read the Guide

There are several ways to read the guide and to find the information of interest to you:

## 1. General Table of contents

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The Guide is divided into 5 chapters which you can consult separately, according to your topic of interest. Every chapter has been printed with different colour bands on the sides of the pages.

Each chapter is divided into numbered paragraphs covering a single item so you can access each item of information.

🔗 **See Table of contents, p. 8**

## 2. Key questions on important topics

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A list of key questions covers essential issues for each stakeholder. You may find it helpful in accessing the text that you require.

🔗 **See Key questions on important topics, p. 9**

## 3. Index by topic

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A list of topics or key words allows you to go directly to the chapters of the guide where references to the topic can be found.

🔗 **See Index by topic, p. 17**

## 4. Table of examples

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You can also find information on specific topics using a reference list for the practical examples contained in the guide. The list identifies the size of the project and the type of risks addressed.

🔗 **See Annex 2 - Table of examples, p. 185**

## 5. Glossary

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The Construction Sites Directive contains a number of definitions (e.g. client) used in the text of the Directive. These definitions are listed in Annex 1 together with some others from the Framework Directive.

🔗 **See Annex 1 - Glossary, p. 183**

## 6. General table of duties

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The duties of stakeholders named in the Directive are summarised in a table.

🔗 **See 5. General Table of duties of each stakeholder during the construction project, p. 179**

## 7. Explanation of text marking

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Extracts of the European Directives, 89/391/EEC and 92/57/EEC, are in blue boxes and accompanied by this logo.



Non binding good practices can be found where this logo is displayed.



Explanatory examples can be found where this logo is displayed.

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## Key questions on important topics

This section has a list of key questions arranged under the following headings.

The questions cover essential issues for each stakeholder. You may find it helpful in accessing the text that you require.

<b>Clients</b>	<b>See questions 30 to 51</b>
<b>Coordinators</b>	<b>See questions 52 to 66</b>
<b>Coordinators for safety and health matters at the project preparation stage</b>	<b>See questions 52 to 59</b>
<b>Coordinators for safety and health matters at the project execution stage</b>	<b>See questions 60 to 66</b>
<b>Designers</b>	<b>See questions 67 to 73</b>
<b>Employers</b>	<b>See questions 74 to 85</b>
<b>Employers who themselves carry out construction work</b>	<b>See question 86</b>
<b>General questions</b>	<b>See questions 1 to 14</b>
<b>Large Sites</b>	<b>See questions 25 to 29</b>
<b>Medium Sites</b>	<b>See questions 20 to 24</b>
<b>Prior Notice</b>	<b>See questions 91 to 93</b>
<b>Project supervisors</b>	<b>See questions 88 to 89</b>
<b>Safety and health plan</b>	<b>See questions 94 to 96</b>
<b>Safety and health file</b>	<b>See questions 97 to 99</b>
<b>Small sites</b>	<b>See questions 15 to 19</b>
<b>Self-employed persons</b>	<b>See questions 87</b>
<b>Workers and workers' representatives</b>	<b>See questions 90</b>

## General questions

- |  |  |       |
|--|--|-------|
| 1. Advice: Where can I get more advice and assistance?                           | See Annex 8, More information  | p.209 |
| 2. Annex IV of the Construction Directive: what is it?                           | See 4.2.1, Article 8 and Annex IV of Directive 92/57/EEC and Article 6 of the Framework Directive 89/391/EEC | p.168 |
| 3. Construction project: What is it?   | See 2.1, What is a "Construction site"?  | p.41  |
| 4. Construction site: what is it?  | See 2.1, What is a "Construction site"?  | p.41  |
| 5. Construction work: what is it?  | See 2.2, What is "construction work"?  | p.42  |
| 6. Competence: what is it and how can I assess it for those I employ or appoint? | See 2.3.5, Qualification of the coordinator for safety and health matters                                    | p.62  |
| 7. Directive: what is it about, why is it needed, how does it affect me?         | See Introduction   | p.3   |
| 8. Directive: will it apply to my construction project or construction work?     | See 2.2, What is "construction work"?  | p.42  |
| 9. General Principles of Prevention: what are they?                              | See 1.2, General principles of prevention  | p.21  |
| 10. Legislation: what are the other occupational safety and health directives?   | See Annex 7, European Union legislation  | p.204 |
| 11. Particular risks: what work is deemed to involve particular risks?           | See 2.5.1, Work involving particular risks to the safety and health of workers                               | p.98  |
| 12. Project team and working together  | See 2.3.1, Preliminary remark  | p.47  |
| 13. Risk assessment: what is it?   | See 1.3, Risk assessment   | p.30  |
| 14. Summary of what everyone should do   | See 5, General table of duties of each stakeholder during the construction project                           | p.179 |

## Small site questions

- |   |                                   |       |
|---|-----------------------------------|-------|
| 15. Does the Directive apply to small projects?             | See Introduction                  | p.4   |
| 16. Where can I find examples applicable to small sites?    | See Annex 2 - Table of examples   | p.182 |
| 17. Do I need a prior notice for a small project?           | See 2.4.1, Prior notice           | p.89  |
| 18. Do I need a safety and health plan for a small project? | See 2.4.2, Safety and health plan | p.91  |

- |   |                                   |      |
|---|-----------------------------------|------|
| 19. Do I need a safety and health file for a small project? | See 2.4.3, Safety and health file | p.96 |
|---|-----------------------------------|------|

### Medium site questions

- |  |                                   |       |
|--|-----------------------------------|-------|
| 20. Does the Directive apply to medium projects?             | See Introduction                  | p.4   |
| 21. Where can I find examples applicable to medium sites?    | See Annex 2 - Table of examples   | p.182 |
| 22. Do I need a prior notice for a medium project?           | See 2.4.1, Prior notice           | p.89  |
| 23. Do I need a safety and health plan for a medium project? | See 2.4.2, Safety and health plan | p.91  |
| 24. Do I need a safety and health file for a medium project? | See 2.4.3, Safety and health file | p.96  |

### Large site questions

- |   |                                   |       |
|---|-----------------------------------|-------|
| 25. Does the Directive apply to large projects?             | See Introduction                  | p.4   |
| 26. Where can I find examples applicable to large sites?    | See Annex 2 - Table of examples   | p.182 |
| 27. Do I need a prior notice for a large project?           | See 2.4.1, Prior notice           | p.89  |
| 28. Do I need a safety and health plan for a large project? | See 2.4.2, Safety and health plan | p.91  |
| 29. Do I need a safety and health file for a large project? | See 2.4.3, Safety and health file | p.96  |

### Clients questions

#### Definition

- |                    |                   |      |
|--------------------|-------------------|------|
| 30. Am I a client? | See 2.3.2, Client | p.50 |
|--------------------|-------------------|------|

#### Documents

- |   |                                     |       |
|---|-------------------------------------|-------|
| 31. Prior notice: what is it and what do I have to do?      | See 2.4.1, Prior Notice             | p.88  |
| 32. What is a safety and health plan?                       | See 2.4.2, Safety and health plan   | p.91  |
| 33. How do I contribute to the safety and health plan?      | See c) Functions of the client      | p.54  |
| 34. What is a safety and health file for?                   | See 2.4.3, Safety and health file   | p.95  |
| 35. What do I do with the completed safety and health file? | See 4.2.3, Post- construction stage | p.176 |

**Duties**

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|--|---|-------|
| 36. What does a client have to do?   | See c) Functions of the client  | p.51  |
| 37. What do I have to do during design of the project?                               | See 4.1.2, Design stage   | p.126 |
| 38. What do I have to do during preparation of the project?                          | See 4.1.3, Concluding preparations before starting construction work        | p.142 |
| 39. What do I have to consider when deciding how much time to allow for the project? | See Coordinating the implementation of the general principles of prevention | p.68  |
| 40. What do I have to do during the execution stage of the project?                  | See 4.2, Execution stage of the project                                     | p.162 |

**Relations with other stakeholders**

- |   |  |      |
|---|--|------|
| 41. What information should I give to those I appoint?  | See 2.4, Documents required for prevention | p.87 |
| 42. How can a client cooperate with other stakeholders? | See 2.3.1, Preliminary remark              | p.47 |

**Contractors**

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|---|---|-------|
| 43. Do I have to appoint them and, if so, how do I do it? | See a) Establishing project teams that have the necessary competences | p.142 |
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**Coordinators**

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| 44. Who is a coordinator?  | See 2.3.5, Coordinators for safety and health matters                              | p.59 |
| 45. Do I have to appoint coordinators and, if so, how do I do it?                    | See Appointment of coordinators for safety and health matters                      | p.53 |
| 46. When I have appointed coordinators, does that relieve me of my responsibilities? | See Responsibilities of clients  | p.57 |
| 47. How many coordinators do I have to appoint?                                      | See Number of coordinators   | p.54 |
| 48. What can I do if the Directive does not require me to appoint coordinators?      | See a) When is it necessary to appoint coordinators for safety and health matters? | p.60 |

**Designers**

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|---|--------------------------|-------|
| 49. Do I have to appoint them and, if so, how do I do it? | See 4.1.2., Design stage | p.126 |
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**Project supervisor**

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|--|-------------------------------------|------|
| 50. Who is a Project Supervisor?   | See 2.3.3, Project Supervisor       | p.57 |
| 51. Project supervisor: Should I appoint one and, if so, how do I do it? | See Appointing a project supervisor | p.52 |

**Coordinator questions**

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|----------------------------|---|------|
| 52. What are coordinators? | See 2.3.5, Coordinators for safety and health matters | p.59 |
|----------------------------|---|------|

#### **Coordinator for safety and health matters during the project preparation stage**

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| 53. How does this coordinator coordinate compliance with the general principles of prevention? | See Ensuring the application of the general principles of prevention  | p.65  |
| 54. How does this coordinator draw up a safety and health plan?                                | See Drawing up safety and health plans  | p.66  |
| 55. How does this coordinator start preparing a safety and health file?                        | See Safety and health file  | p.67  |
| 56. What are site rules?   | See 2.4.3, Safety and health plan   | p.91  |
| 57. What does this coordinator have to do?   | See g) What are the functions of coordinators for safety and health matters during the project preparation stage? | p.65  |
| 58. What does this coordinator have to do in assessing how long the project should take?       | See Coordinating the implementation of the general principles of prevention                                       | p.68  |
| 59. What does this coordinator have to do during the project execution stage?                  | See 5, General table of duties of each stakeholder during the construction project                                | p.179 |

#### **Coordinator for safety and health matters during the project execution stage**

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| 60. How does this coordinator coordinate compliance with the general principles of prevention? | See Coordinating the implementation of the general principles of prevention   | p.68  |
| 61. What does this coordinator have to do?   | See h) What are the functions of coordinators for safety and health matters during the project execution stage?                         | p.68  |
| 62. What does this coordinator have to do during the project preparation stage?                | See f) When should coordinators for safety and health matters be appointed and when do their tasks end?                                 | p.64  |
| 63. What does this coordinator have to do in assessing how long work should take?              | See Estimating adequate periods of time for completing the work involved. Clients or their project supervisors have functions to fulfil | p.124 |
| 64. What does this coordinator have to do during the project execution stage?                  | See h) What are the functions of coordinators for safety and health matters during the project execution stage?                         | p.68  |

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| 65. | What does this coordinator have to do with a safety and health plan during the execution stage of a project? | See Updating safety and health plans | p.73 |
| 66. | What does this coordinator have to do with a safety and health file?   | See Updating safety and health files | p.74 |

### Designer questions

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| 67. | Who is a designer?   | See 2.3.4, Designers  | p.59  |
| 68. | What can a designer do and how?  | See c) Designing for the safety of others   | p.128 |
| 69. | How can a designer take account of the general principles of prevention?                     | See n) Taking account of the General Principles of Prevention   | p.134 |
| 70. | How can a designer cooperate with other project stakeholders?                                | See a) Stakeholders   | p.127 |
| 71. | What information can a designer usefully provide with the design?                            | See i) Hazard Identification and Risk Management  | p.129 |
| 72. | How can a designer contribute towards the safety and health plan and safety and health file? | See m) Identifying hazards that may arise during construction work throughout the whole-life of the facility: and, likewise, when used as a place of work | p.132 |
| 73. | What can I do if the Directive does not require the appointment of coordinators?             | See i) Hazard Identification and Risk Management  | p.129 |

### Employer questions

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| 74. | What do employers of construction workers have to do in the planning and preparation stage? | See 5, General table of duties of each stakeholder during the construction project | p.179 |
| 75. | What is a safety and health plan - and what do I have to do?                                | See 2.4.2, Safety and health plan  | p.91  |
| 76. | What do employers of construction workers have to do in the project execution stage?        | See 5, General table of duties of each stakeholder during the construction project | p.179 |
| 77. | How can an employer cooperate with other project stakeholders?                              | See Organising cooperation between employers including the self-employed           | p.71  |
| 78. | What if I am an employer and I subcontract work to other employers?                         | See 2.3.7, Contractors and subcontractors  | p.82  |
| 79. | What do I have to do as an employer who is a subcontractor?                                 | See 2.3.7, Contractors and subcontractors  | p.82  |

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| 80. What can I do if the Directive does not require the appointment of coordinators? | See 4.2.1, Construction stage   | p.162 |
| 81. What is Annex IV of Directive 92/57/EEC?   | See b) Article 8 and Annex IV of Directive 92/57/EEC and Article 6 of the Framework Directive, 89/391/EEC | p.168 |
| 82. What is a safety and health plan for?  | See 2.4.2, Safety and health plan   | p.91  |
| 83. What is a safety and health file for?  | See 2.4.3, Safety and health file   | p.95  |
| 84. How do my obligations under the Framework Directive relate to this Directive?    | See Implement article 6 of Directive 89/391/EC  | p.76  |
| 85. What are my responsibilities under the Framework Directive                       | See d) Employer's Responsibilities under the Framework Directive, 89/391/EEC                              | p.81  |

#### **Employers who themselves carry out construction work questions**

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#### **Self-employed person questions**

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#### **Project supervisor questions**

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| 89. What does a project supervisor have to do? | See b) Functions of the project supervisor | p.58 |

#### **Workers and workers' representatives questions**

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#### **Prior notice questions**

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| 92. Who prepares it?        | See Prior Notice        | p.52 |

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| 93. When, how and to whom must it be sent? | See 2.4.1, Prior Notice | p.89 |
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#### Safety and health plan questions

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| 95. Who prepares it?                  | See Drawing up safety and health plans | p.66 |
| 96. When and how is it updated?       | See 2.4.2, Update                      | p.94 |

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# 1. GENERAL PRINCIPLES OF PREVENTION (GPP) ON SAFETY AND HEALTH AT WORK

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The general principles of prevention (GPP) are at the core of the European Union's (EU's) legislation approach to worker safety. Directive 89/391/EEC, often called the 'Framework' Directive, introduces measures to encourage improvements in the safety and health of all workers and sets out a broad strategy for controlling risks in all workplaces. It makes the general principles of prevention, risk assessment and risk management the cornerstone in securing occupational safety and health.

This same strategy is embedded in the Construction Sites Directive, 92/57/EEC and the various stakeholders named in the Directive need to take this into account.

So, what is a hazard, what is a risk, and what are the general principles of prevention?

How do they relate to risk assessment and risk management? And what does the construction industry need to do?

## 1.1 What is a hazard? What is a risk?

What does hazard mean?

A hazard is anything that may cause harm, in this instance to the safety and health of people undertaking or affected by work activities.



### Example 1:

Defective surfaces on which people might slip or trip, unguarded edges from which people might fall, falling materials, or moving vehicles that might strike people, sharp edges, electricity, fires, explosions and so on are typical examples of hazards to people's safety.



### Example 2:

There are also work-related hazards that may seriously affect people's health such as carcinogenic agents, dusts (respiratory diseases might be caused from exposure to them), other harmful substances (diseases such as dermatitis might be caused from working with them), noise (might cause work related hearing loss), vibrations, exposure to extreme temperatures, and heavy objects (musculoskeletal problems might be caused from moving them).

Risk is the likelihood that workers (or others) will be harmed by a given hazard together with a measure of the seriousness of the harm caused whether as a result of immediate injury or longer term ill-health.

## 1.2 General principles of prevention



### **What does the Directive 89/391/EEC say?**

Article 6 :

2. The employer shall implement the measures referred to in the first subparagraph of paragraph 1 on the basis of the following general principles of prevention:

(a) avoiding risks;

- (b) evaluating the risks which cannot be avoided:
- (c) combating the risks at source;
- (d) adapting the work to the individual, especially as regards the design of work places, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work and work at a predetermined work-rate and to reducing their effect on health.
- (e) adapting to technical progress;
- (f) replacing the dangerous by the non-dangerous or the less dangerous;
- (g) developing a coherent overall prevention policy which covers technology, organization of work, working conditions, social relationships and the influence of factors related to the working environment;
- (h) giving collective protective measures priority over individual protective measures;
- (i) giving appropriate instructions to the workers.

The general principles of prevention are concerned with the measures that should be taken to protect the safety and health of workers. (They also provide a framework for considering the safety and health of others who may be adversely affected by work activities).

### 1.2.1 Avoiding risks

One way of avoiding risk is to eliminate entirely the hazard that gives rise to the risk.



#### Example 3:

There are hazards from entering confined spaces in sewage treatment plants such as underground chambers associated with surface and foul water systems. However, if the design is changed so that such places are open to the general atmosphere and well ventilated, those hazards will not be present.

#### Example 4:

On a small domestic extension the architect specified the use of dry lining thus avoiding the need for cutting and chasing masonry for the installation of electrical and other services. This avoided the risks to the health of the workers from dust, noise and vibrations.

If a hazard cannot be eliminated, it may still be possible to avoid some of the risks. For instance, there are hazards associated with many work activities that cannot be entirely eliminated: but there are often alternative ways of completing the work that avoid some, if not all, of the risks. It is useful to think as broadly as possible and not be constrained by custom and practice.



**Example 5:**



Block laying involves repetitive lifting actions. Lifting dense heavy blocks can cause musculoskeletal problems. The risk of injury can be reduced by specifying alternatives such as smaller or lighter blocks.



**Example 6:**

There will always be hazards from the movement of heavy materials but the risks from manual handling can be reduced by careful consideration of the way materials are packaged, unloaded, stored and moved and by introducing mechanized handling methods, e.g. gantries, cranes, hoists, pallet trucks, etc.

## 1.2.2 Evaluating the risks which cannot be avoided

A structured approach should be taken to evaluating risks.



Risk assessment is a 5-step process:

Step 1 – Identify the hazards and those at risk.

Step 2 – Evaluate and prioritise the risks.

Step 3 – Decide of preventative action.

Step 4 – Take action.

Step 5 – Monitor and review.

Having a written record is required so that essential information can be passed to others, so that it is clear what needs to be done and there is an information base from which to carry out reviews.

See 1.3 Risk assessment, p. 30.



**Example 7:**

**A considerable amount of old lead paint has to be removed during restoration work**

Step 1 - Identify the hazards: Existence of lead. Potential exposure to lead might cause health problems. Those at risk are the workers doing the work, other workers

nearby and other people who may be in the vicinity, especially the vulnerable.

**Step 2 - Evaluate and prioritise the risk.** Consider the probability of exposure to lead. Consider who will be harmed and the severity. Consider the possible routes by which the lead might enter the body - (e.g. inhalation, ingestion). Consider the possible means for reducing the exposure of workers and others by the choice of work methods and other related precautions.

**Step 3 - Decide on the preventative action that will secure the occupational health of the workers and others.** Decide the necessary monitoring and review arrangements (e.g. no hot burning, use wet stripping/use of chemical strippers, protective clothing, good welfare and washing arrangements, protective clothing, respiratory protection, instruction and supervision, air monitoring, health monitoring, etc)

**Step 4 - Provide the necessary materials, protective equipment, welfare facilities, instruction, supervision and monitoring regimes.**

**Step 5 - Carry out monitoring as planned.** Review the results from air monitoring and from blood-lead analyses. Reappraise the risks and make any necessary adjustments to the working methods.

### 1.2.3 Combating the risks at source

Combating risk at source requires the control measures to be close to the harm and to be effective in reducing it.



#### Example 8:

Wood dusts can be harmful if inhaled: provide circular saws with mechanical dust extraction systems so that the dust is immediately captured at the point of creation.



#### Example 9:

Dust created during demolition can cause a number of hazards. It may be harmful if inhaled and it may reduce visibility: water sprays directed at working faces helps to prevent dust clouds forming.

### 1.2.4 Adapting the work to the individual

In adapting work to the individual, it is essential to consider the design of workplaces, the choice of work equipment and the choice of working and production methods, with a view, in



particular, to alleviating monotonous work and work at a pre-determined work-rate and to reducing their effect on health.

People have physical limitations on how far they can reach, how much they can lift and how readily they can see in various lighting conditions. People also have limitations on their abilities to analyse cognitive data such as instructions, instrumentation readings etc... The working environment can be an additional stressor such as when it is too hot, too cold or too noisy. Repetitive, monotonous tasks can be a further stressor. It helps to try and put yourself in the place of the person doing the work. Better still, you can ask people who do the work what would make it easier for them.



#### Good Practices:

Recognising that there are limitations on the loads that people can safely lift.

Recognising that people can work more easily if they have suitable workplaces

Rotating tasks within a work team so that repetitive movements do not lead to repetitive strain injuries.



#### Example 10:

Reduce the weights of cement bags and aggregate, that are supplied to a project, so that the likelihood of injury is reduced.

## 1.2.5 Adapting to technical progress

This means keeping informed about and using the latest technical knowledge (when selecting working methods, equipment, materials and work equipment, etc) when carrying out a project. In general, technical progress leads to improved performance, better ergonomics and reduced risks.



#### Example 11:

Work in confined spaces may expose people to non-respirable atmospheres and toxic and flammable gases. Once, monitoring equipment was expensive and required a high degree of expertise to use it. Now, multi-function gas detectors are much less expensive and can be effectively used by most workers.

New technology has led to video systems that can remotely inspect confined spaces

such as sewers.



#### **Example 12**

Mechanically compacting fill materials in trenches can cause health problems due to hand-arm vibration. Now, radio-controlled compactors are available that remove the hazard.

### **1.2.6 Replacing the dangerous by the non-dangerous or the less dangerous**

This is known as substitution. It involves reviewing the choices that are available and then selecting the ones that either pose no danger to workers or selecting the ones where the dangers are reduced and are such that the level of risk is acceptable.

Hazards in the working environment, the task, and the materials, plant and tools should be considered.



#### **Example 13:**

Substitution can involve changing the proposed process, e.g.:

- There may be instances where mechanical fixing systems reduce the overall risk when compared to alternative chemical fixing systems,
- When doing painting works, substituting water-based paints for those that contain harmful solvents
- For road works, using low-temperature asphalt helps to prevent exposure to toxic substances.

### **1.2.7 Developing a coherent overall prevention policy**

In order to control risks, the whole safety system needs to be considered: the individual, the task, the plant and equipment, the management organization and arrangements of the various stakeholders and the management of the whole project, the wider environment and how they interact. Technology, ergonomics and the human sciences can contribute in developing a preventative strategy.

This is not difficult. It is important not simply to focus on the immediate hazards that are common to the industry: there is equally a need to identify the underlying factors that cause injuries. These are invariably associated with the culture in the organisation or on the project. This strongly influences the attitudes and behaviour of everyone involved.

#### **a) Human error and violations**

How and why people make errors and why people deliberately fail to do what was required of them (violations), can raise complex issues.

Errors can be reduced by providing a good working environment and addressing:

- Extreme task demands (High workload, high alertness, time pressure);
- Social and organisational stressors – (Staffing levels, conflicting attitudes);
- Individual stressors – (Training, experience, fatigue); and
- 'Equipment' stressors – (Controls, Instructions, Procedures).

Human violations can be reduced by a positive safety culture which includes:

- Involving the workforce;
- Improving the working environment;
- Having rules that are:
  - o Relevant and practical;
  - o Explained to those who have to follow them;
  - o Kept to the minimum by removing unnecessary ones;
- Providing the necessary work equipment
- Improving relationships between people
- Improved job design and planning;
- Improved supervision and monitoring;
- Reducing time pressures;
- Avoiding alcohol, drugs and substances abuse.

#### b) Organisational errors and systemic failings

Experience shows that the likelihood of failure can be reduced where there is a positive safety culture. This is likely to be present in organisations where there is a wholly committed top management that:

- Provides effective leadership;
- Acknowledges that good occupational safety and health management contributes to business goals;
- Understands the risks;
- Has in place effective risk controls;
- Has clear performance requirements;
- Effectively communicates and
- Is a learning organisation that listens, reviews and learns from past performance.



#### **Example 14:**

A contractor introduced a behavioural change programme that was led from the very top of the organisation. Commitment was demonstrated by managers at every level and site standards were raised. The change initiative formed a significant part of the site induction process so that workers new to the project would appreciate from the outset that commitment and expectations were well above the norm.

## 1.2.8 Giving collective protective measures priority over individual protective measures

Priority should be given to collective protective measures as these can eliminate risks to more than one person and collective protective measures have major advantages over personal protective measures.



#### **Example 15:**

A guard rail at the edge of a working platform protects everyone from falling and requires no actions by the workers who benefit from it.



Safety harnesses require individuals to make use of them, they need suitable anchorages, and fall arrest devices that must be available and suitably maintained. Harnesses often create considerable practical difficulties in their use. Hence, the likelihood of harnesses achieving the same degree of success as a guard-rail in preventing injuries is small.

Moreover, personal protective measures seldom prevent accidents from occurring. Instead, they may mitigate the outcome. For instance, safety helmets might minimise injury from falling material but they do nothing to prevent it happening, as opposed to collective provisions such as protective netting or toe boards on the open edges of working platforms.



### Example 16:

The designer added a parapet to the perimeter of a flat roof so that there would be permanent protection for everyone working on the roof throughout the lifetime of the building. A system of using harnesses and anchorages was ruled out on the grounds of continuing maintenance costs and the limited protection provided.



### Example 17:

A contractor clad the façades of a major scaffold in protective sheeting so as to prevent falling material causing injury. (The enclosure also enabled work to continue in reasonable comfort during adverse weather).



### Example 18:

When constructing the cantilevered deck of a high bridge, safety nets were installed under the falsework to catch falling materials. This collective protective measure reduced the falling material risk to everyone below the bridge.

## 1.2.9 Giving appropriate instructions to workers.

The last of the principles is the giving of instructions to workers so they know how to perform the work safely.

Instructions should describe the risks in the proposed work, and refer to the protective measures that should be in place (e.g. equipment to be used, personal protective equipment to be worn). The instructions should be communicated in a way that is readily understood by the workers.



### Good Practices:

#### Providing:

- Common induction sessions for all new workers prior to start work (There are a number of common matters that workers new to a project need to know).

## **1. General Principles of Prevention (GPP) on Safety and health at work**

### 1.2 General principles of prevention

- Further instruction by trade contractors before their workers start a new task: and daily reminders before work start.
- Routine tool-box talks.
- Keeping records of workers training and their presence at induction sessions.

## 1.3 Risk assessment

Risk assessment is the first step in occupational risk management.

It is a structured means for evaluating risks to workers' (and other people's) safety and health from workplace hazards. All stakeholders should carry out their own risk assessments.

Risk assessment involves a systematic examination that considers:

- What could cause injury or harm;
- Who will be affected and how;
- Whether the hazards can be eliminated or reduced and if not;
- What preventative or protective measures should be in place to control the risks.

We carry out risk assessments as a matter of routine in our daily lives.

When we want to cross the road, we appreciate that we could be injured and we readily take a large number of factors into account, for instance, whether we have sufficient sightlines to oncoming vehicles, whether the drivers can see us, how fast vehicles are travelling, traffic density, the weather conditions, whether it is light, how far we have to cross, the kind of road surface, and so on.

We take into account how we can avoid the hazard altogether such as by using a subway, a bridge or a route that does not involve crossing roads.

If we cannot entirely eliminate the hazard, we consider how we can reduce it such as by crossing at places where pedestrians can use traffic lights to stop the vehicles or by crossing where there are pedestrian refuges in the middle of the highway. And if such measures are not open to us, in the final event, we can make careful observations to determine if and when it might be safe to cross. If we do decide to cross, we will continue to look out for our safety by monitoring what is actually happening.

Once across, we might reflect on whether that is the right thing to have done, especially if we felt uncomfortable or had a near-miss. In doing so, we are reviewing what happened.

There will of course be instances when we will conclude that we cannot reduce the risk any more and the remaining risk is so great that we do not wish to take it. That will be the correct decision but, in reaching it, there may be pressures on us to decide otherwise, perhaps from the fear of being late for work, or from friends who are with us and who do take the risk so leaving us out of the group. Clearly, our long term well-being is important to us and there will be times when we need to make hard decisions.

So, in crossing the road, we break the task into five steps:

- (1) We identify the hazards,
- (2) We evaluate them,
- (3) We decide what we need to do,
- (4) We cross the road and monitor conditions as we do so and afterwards
- (5) We review whether we did the right thing.

If we make such complex decisions in managing risks in our daily lives, it should be possible to apply risk assessment to our daily work. In fact, risk assessment is simply a matter of taking the same five steps.

Risk assessment and management as a five-step approach involves:

- Step 1 - Identifying the hazards and those at risk;
- Step 2 - Evaluating and prioritising the risks;
- Step 3 - Deciding on preventative action;
- Step 4 - Taking action; and
- Step 5 - Monitoring and reviewing what is done.

The task of crossing the road could have been so much easier and the risks reduced, perhaps even entirely eliminated, by good design. The same is equally true for work-related construction hazards.

Article 9(1)(a) of Directive 89/391/EEC requires employers to "be in possession" of risk assessments. Article 9(2) requires Member States to set rules for drawing-up risk assessments. You will need to check the national requirements for your project.



#### **Good Practices:**

Using a simple record sheet that may help in making risk assessments in most straightforward situations. A record is helpful as an aide-memoire of the actions needed and is a means of communicating information to others.

🔗 For all stakeholders, see Annex 3 - Risk Assessment Record Sheet, p.191

🔗 For designers, see Annex 4 - Design Record Sheet, p.183

### **1.3.1 Step 1 - Identifying the hazards and those at risk**

Hazard identification is quite straightforward when you have sufficient knowledge and experience of the activities you are considering.

Nevertheless, it is often helpful to consult other people, including workers and their representatives. If the activity is already happening and you are carrying out a review of an existing risk assessment, you can also observe what happens in practice. In addition to hazards that cause immediate injuries, think about hazards that cause ill-health over the longer-term. Consider also the more complex and often less obvious such as psychosocial and work organisation factors.

🔗 See Annex 3 - Risk Assessment Record Sheet, p.191

Take account of other activities that may be taking place at the same time. Remember also the preparatory and the finishing-off activities that will take place as a part of the main activity. In addition to the initial construction activities, you will probably need to consider further activities involved in maintaining, repairing and in keeping the facility clean and in good order. Activities involved in altering and deconstructing may also be relevant depending on whether you are considering a single activity or 'whole-life' issues.

**Good Practices:**

Consulting sources of information such as:

- Injury and ill-health statistics for your organisation and your industry;
- Websites<sup>8</sup>, help-lines and publications of safety and health organisations, trades unions and trade associations;
- Data from suppliers and manufacturers;
- Technical standards; and
- Safety and health legislation.

Next consider what groups of people may be exposed to the hazard. Remember in particular the vulnerable (for instance, those with disabilities, pre-dispositions due to ill-health or medication, migrant workers, the young and the old, pregnant women and nursing mothers and the inexperienced and untrained).

You must consider all others who are at work, even if they are not your workers and not engaged in your activities. It will normally be necessary to work together with others in the project team when eliminating hazards and managing risks: and such cooperation can usefully start during step 1.

🔗 See Annex 3 – Risk Assessment Record Sheet, p.191

### 1.3.2 Step 2 - Evaluating and prioritising the risks

Step 2 involves evaluating the risks by considering how likely, how serious, how often and how many people may be exposed to the hazard.

Some people, especially those well practised in assessment and knowledgeable of the activity and its hazards might prefer to make a combined assessment of likelihood, seriousness, frequency and the number of people at risk by simply recording a single evaluation for all of the factors that are being taken into account.

The greater the risk, the greater should be the effort devoted to combating it.

🔗 See Annex 3 – Risk Assessment Record Sheet, p.191

### 1.3.3 Step 3 - Deciding on preventative action

Remember that the best option is to entirely eliminate the hazard.

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<sup>8</sup> For further information, see Annex 8 – More information, p.209



Where hazards can be readily eliminated at little or no cost, this should be done no matter how small the risk might be. Do not misdirect yourself by only taking action on what seem to be the bigger risks.

Likewise, do not ignore very serious hazards even if they seem particularly unlikely. Major incidents involving large numbers of casualties are rare: and they will be rarer still if people acknowledge that they can happen and go on to put in place robust preventative actions.

It may be that others can assist in the elimination of hazards and the reduction of risks. This is particularly so on construction projects where stakeholders such as the client, designers and other contractors can work together in managing occupational safety and health risks.

If it is not possible to eliminate the risks, you need to consider what can be done to reduce them so that they do not compromise the safety and health of those exposed.



#### **Good Practices:**

**Consulting widely in considering the options.**

**Eliminating hazards and reducing risks could involve modifying design solutions, choosing other materials that are non-hazardous or less hazardous, and organisational or technical changes.**

Remember that there are some general principles of prevention to follow.

☞ **See 1.2 General principles of prevention, p. 21.**

☞ **See Annex 3 - Risk Assessment Record Sheet, p.191**

### **1.3.4 Step 4 - Taking action**

As the assessment draws near to a close, there is the need to plan and to organise what has to be done. The questions, of what, where, when, who and how need to be answered so that preventative and protective measures are in place. Workers and their representatives need to be engaged and informed.

Training and instruction and supervision are all important topics to consider together with the knowledge and experience that workers will need.

Plant and equipment requirements will need to be resolved together with their timely availability and arrangements for their continuing serviceability.

Access, working space, storage, logistics and the materials that will be used are other matters to consider in addition to the broader working environment.



#### **Good Practices:**

**Using method statements to help identify what needs to be done throughout the activity, especially for high-risk activities.**

**They help to answer the key questions, 'What, Where, When, Who and, most**

importantly, **How** an activity will be performed.

They often contain drawings and illustrations to aid communication and instruction.

Method statements can be used within the management structure of a contractor, as a means of communication with the coordinator and others including discussion with their workers and their representatives, and with other contractors.

Method statements are a useful instructive tool at the commencement of the activity on site and as a regular means for refreshing everyone's memory on what is required.

They should:

- focus on what actions need to be taken when the task is performed,
- set out in sufficient detail the conclusions of 'Step 4 - 'Taking Action'',
- include a copy of the risk assessment.

### 1.3.5 Step 5 - Monitoring and reviewing

#### a) Monitoring

Supervision needs to be in place to provide the necessary degree of monitoring to ensure that hazards and risks are properly addressed as the work proceeds. Monitoring also ensures that new and unforeseen problems are identified and dealt with.

Monitoring regimes need to take account of a number of factors. These include the familiarity of the workers with the activity, their training and competences. The level of risk will be a further factor.

The level of risk may not be a constant over time. Indeed, it seldom is, notwithstanding the fact that many risk assessments presume that it is. A full understanding of how risk may change with time and the rate at which the change will come about can be essential to on-going safety. If the risk is low and the rate of change in risk is equally low, then the level of monitoring can reflect that. However, if the expected level of risk is high and it is possible for the level of risk rapidly to change and put large numbers of people at risk, then the monitoring system must be robust if it is to be effective. Indeed, if such a work activity is proposed, it would be wise to revisit the proposed preventative measures to see if they can be improved. In the extreme, it may be that you will reach the conclusion that the activity has such a potentially high level of risk that it should not go ahead.

#### b) Review

Review is the closing part of step 5. A first 'review' should be by those who have carried out the risk assessment. Before completing the assessment, they should check that they are satisfied with the result. An independent further review as a part of an approvals system may be useful, especially where the risk may be high.

A date for further comprehensive review should be set that takes account of the past experience and the confidence there is in the assessment.

☛ See Annex 3 – Risk Assessment Record Sheet, p.191

### 1.3.6 Integrated risk registers

There will be occasions when project stakeholders are able to contribute to eliminating the hazards and reducing the risks faced by the workers of another stakeholder. Some projects find it helpful to formalise such a cooperative approach and establish an integrated risk register for their project even though the Directive does not require such.



#### Good Practices:

Using integrated risk registers where a number of stakeholders work together jointly to manage the occupational safety and health risks in a project.

In such cases, interested stakeholders can be clients, designers, coordinators, contractors, workers and their representatives, suppliers and so on.

An integrated risk register requires the stakeholders jointly to carry out risk assessment and develop a single over-arching document, the risk register, for the project.

The advantages are that all parties are involved in identifying the hazards and, crucially, they can then jointly share in their elimination, or in risk reduction, throughout the lifetime of the project with those best placed to make the greatest impact having agreed actions assigned to them. The coordinator for safety and health matters at the project preparation stage is best placed to set up an integrated risk register for the stakeholders in the project team. Where there is no coordinator, it can be sensible for clients, designers and contractors to develop simple integrated risk registers that have regard to the nature and scale of the hazards.

## 1.4 Further examples of applying the General principles of prevention

The following table provides examples of how the general principles of prevention can be practically applied during design, construction and subsequent construction work.

General Principle.	During the Design and preparatory stage.	During the Construction stage.	During subsequent construction work.
<b>1. Avoiding risks.</b>	<p><b>Example 19:</b></p> <p>Ensuring sufficient working space for use during the initial construction and subsequent maintenance.</p> <p>Providing permanent lifting beams, etc, for moving heavy machinery during installation and maintenance.</p>	<p><b>Example 20:</b></p> <p>Contractors cooperating to segregate incompatible activities such as: (1) the use of flammable liquids and naked flames: (2) working in areas where structural erection is in progress above.</p>	<p><b>Example 21:</b></p> <p>Performing maintenance activities in normally occupied areas of a department store out of normal working hours so that others are not at risk.</p>
<b>2. Evaluating the risks which cannot be avoided.</b>	<p><b>Example 22:</b></p> <p>A new atrium roof had to be constructed in an existing department store where the client required trading to continue. The hazards to the public of doing so were identified during design and the design work allowed for the possibility of installing a robust temporary working platform under the new roof to provide a working access and to protect the people below. The size of the new components and the ability readily to lift them by crane and safely assemble them was also addressed by design.</p> <p>The installation of the temporary working</p>	<p><b>Example 23:</b></p> <p>In the same atrium example (see to the left) the contractor recognised that passers-by in the street would be at risk when materials were lifted to and from the work area and road transport. A heavy temporary gantry was erected over the pavement and part of the road was closed so as to create sufficient working space and ensure the safety of road-users.</p>	<p><b>Example 24:</b></p> <p>When planning the refurbishment of a small railway bridge in an inaccessible mountainous area, it was recognised that overhead power lines had to be kept live and would be a hazard during excavation. An excavator was rigidly mounted and fixed to a railway truck for both transportation to site and for use.</p> <p>The reach-height of the excavator was mechanically restricted so that it could not pass into the danger area created by the cables. Clear operator instructions were devised and put into effect.</p>

## 1. General Principles of Prevention (GPP) on Safety and health at work

### 1.4 Further examples of applying the General principles of prevention

	platform was planned to take place when the store was closed.		All machinery was connected to earth.
<b>3. Combating the risks at source.</b>	<p><u>Example 25:</u></p> <p>During design of a new multi-storey apartment building, it was decided that pre-fabricated flights of stairs should be included so that suitable safe access would be available at the earliest opportunity. (It also led to a shorter erection cycle for each storey)</p>	<p><u>Example 26:</u></p> <p>Noise: A contractor selected less noisy equipment in compliance with the Machinery Directive 98/37/EC.</p> <p>Falling material: During ground anchor work to improve the stability of a slope and to prevent the risk of falling rock, several levels of anchors had to be installed. The work started at the uppermost level so that workers were protected from the risk of falling materials as the work progressed.</p>	<p><u>Example 27:</u></p> <p>Risks during the periodic maintenance of an in-line turbine at a hydroelectric plant were addressed during design. A floodgate was designed so that it could be used temporarily to close off the intake shaft against water. Additionally, the electrical control systems for the floodgate and turbine were designed to prevent any possibility of starting the turbine in error during maintenance.</p>
<b>4. Adapting the work to the individual, especially as regards the design of workplaces, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work and work at a pre-determined work-rate and to reducing their effect on health.</b>	<p><u>Example 28:</u></p> <p>During design, it was recognised that a service duct would need to be larger to enable workers to maintain a good working posture when installing the services.</p>	<p><u>Example 29:</u></p> <p>Significant runs of parallel pipe work had to be installed at high level in a complex building. The contractor recognised that overhead working at height would create risks and decided to pre-fabricate cradles supporting sections of completed pipe work. Special trolleys with hydraulic lifting devices were used to raise the cradles and to provide working platforms during installation.</p>	<p><u>Example 30:</u></p> <p>A theatre auditorium had a number of large high-level lighting clusters in inaccessible positions. Motorised systems were installed that allowed the clusters to be lowered so they could be safely cleaned and maintained.</p>
<b>5. Adapting to technical</b>	<u>Example 31:</u>	<u>Example 32:</u>	<u>Example 33:</u>

## 1. General Principles of Prevention (GPP) on Safety and health at work

### 1.4 Further examples of applying the General principles of prevention

progress.	A new pedestrian underpass had to be constructed at an existing railway station. The ground was poor and there was risk of collapse putting workers and others (including those on trains) at risk. A design solution involving jacking pre-cast box sections under the tracks was chosen. The design included ground and track monitoring instrumentation and requirements to coordinate jacking with the operation of the railway.	To cut off the heads of cast insitu foundation piles, purpose-designed hydraulic shears were used so avoiding the use of hand-held pneumatic drills.	The external profile of a building created particular risks during routine window cleaning.  The project team had recognised the point and engaged a specialist company that was able to design and install a cradle system that gave access to all windows.
6. Replacing the dangerous by the non-dangerous or the less dangerous.	<u>Example 34:</u>  When tunnelling using sprayed concrete linings, a wet mix was specified rather than a dry one so as to reduce dust. Before work started, the designer advised the client that more time would be needed to allow for trial mixes and for spraying test panels before the tunnelling started but the benefits of using new technologies were significant.	<u>Example 35:</u>  In the same tunnelling example (see to the left) the contractor selected remotely operated spraying machines so removing workers from areas of high exposure.	<u>Example 36:</u>  A specialist company involved in the cleaning of stonework facades changed its working methods from the routine use of sand blasting to fine water spray washing so avoiding worker exposure to fine silica dust altogether.
7. Planning for accident prevention by developing a coherent overall prevention policy which covers technology, organisation of work, working conditions, social relationships and	<u>Example 37:</u>  The stakeholders in a project team at an existing petro-chemical works jointly decided to raise the profile of safety and health on the project by taking an integrated approach to the subject from the	<u>Example 38:</u>  The coordinator for safety and health matters during the project execution stage and the contractors on a project recognised the safety and health benefits of engaging	<u>Example 39:</u>  Those responsible for managing the routine maintenance of a large facility recognised that occasional access by various trades was routinely needed to places that were difficult to reach.

## 1. General Principles of Prevention (GPP) on Safety and health at work

### 1.4 Further examples of applying the General principles of prevention

the influence of factors relating to the working environment.	<p>outset. The client recognised the needs of the contractors in reducing risks and the contractors acknowledged the particular hazards of working at the site. The client made available their induction training and welfare facilities. The contractors adopted the client's safety and health 'behavioural change' programme.</p>	<p>with the workers as one part of a coherent overall prevention policy. They paid particular attention to developing effective project-wide safety and health communications and established several means for workers to feel involved (open-door policy to managers, suggestions and complaints procedures and a workers' safety committee).</p>	<p>They developed a planned approach so that work could be carried out at the same intervals and so that safe working places (on scaffolds, etc) suitable for all trades could be provided. This increased safety and health - and also reduced their maintenance costs.</p>
8. Giving collective protective measures priority over individual protective measures.	<p><b>Example 40:</b></p> <p>During the design of the pre-cast cladding for a multi-storey structure, the horizontal joints were positioned so that they provided edge protection for workers casting the next floor.</p>	<p><b>Example 41:</b></p> <p>Those using the principal pedestrian routes on the project were variously protected from falling materials by netting and protective fans.</p>	<p><b>Example 42:</b></p> <p>Permanent barriers at the edges of terraces protected everyone from falling during maintenance work.</p>
9. Giving appropriate instructions to workers	<p><b>Example 43:</b></p> <p>The coordinator for safety and health matters during the project preparation stage for repairs and improvements to a hospital developed:</p> <p>an agreed approach for annotating drawings to identify information about essential services that were to be kept functional throughout the construction phase; and,</p> <p>a common system for briefing workers about safety and health risks specific to the project.</p>	<p><b>Example 44:</b></p> <p>Contractors arranged for daily safety and health briefings to be given about work that was to be undertaken that day.</p>	<p><b>Example 45:</b></p> <p>The facility user ensured that the Safety and Health File was readily available at all times so that maintenance workers (including those involved in out-of-hours emergency responses) could know about less obvious hazards.</p>



## 2. SAFETY AND HEALTH REQUIREMENTS AT CONSTRUCTION SITES

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#### What does the Directive 92/57/EEC say?

##### Article 1:

1. This Directive, which is the eighth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC, lays down minimum safety and health requirements for temporary or mobile construction sites, as defined in Article 2 (a).
2. This Directive shall not apply to drilling and extraction in the extractive industries within the meaning of Article 1 (2) of Council Decision 74/326/EEC of 27 June 1974 on the extension of the responsibilities of the Mines Safety and Health Commission to all mineral-extracting industries (12).
3. The provisions of Directive 89/391/EEC are fully applicable to the whole scope referred to in paragraph 1, without prejudice to more stringent and/or specific provisions contained in this Directive.

The provisions of the Framework Directive, Directive 89/391/EEC, are fully applicable to all work activities without prejudice to more stringent and/or specific provisions contained in the Construction Sites Directive.

The Construction Sites Directive, Directive 92/57/EEC, lays down minimum safety and health requirements for temporary or mobile construction sites. It does not apply to drilling and extraction in the extractive industries.

## 2.1 What is a "construction site"?



#### What does the Directive 92/57/EEC say?

##### Article 2 :

- (a) 'temporary or mobile construction sites' (hereinafter referred to as 'construction sites') means any construction site at which building or civil engineering works are carried out; a non-exhaustive list of such works is given in Annex I;

A 'construction site' may cover any place at which processes or activities such as those listed in 2.2 are carried out. Note that it is a non-exhaustive list.

🔗 **For further information, see: 2.2 What is "construction work"?, p. 42.**

The list in Annex I of the Directive gives examples of building and civil engineering work. Other work of a similar nature is also within scope. The Directive is intended to improve the occupational safety and health of workers carrying out work at temporary or mobile construction sites. Therefore, the Directive applies to the protection of all such workers. Workers normally engaged in other kinds of work but whose employers occasionally require them to do construction work are covered by the Directive.

**Example 46:**

Some workers normally employed in a factory on a production line were instructed temporarily to stop that work and repaint part of the factory. As maintenance work (including painting) is an activity mentioned in Annex 1 of the Directive (see below), the Directive was applicable to the work that they were doing.

Those parts of the facility which are not subject to building or civil engineering works and which continue to function as normal are not construction sites.

**Example 47:**

Work is in progress on the external facades of a hospital and in some segregated places within it. These places and the facade are construction sites; but the remaining parts of the hospital that are unaffected by the construction works are not part of a construction site.

## 2.2 What is "construction work"?

**What does the Directive 92/57/EEC say?****Annex I:**
**NON-EXHAUSTIVE LIST OF BUILDING AND CIVIL ENGINEERING WORKS REFERRED TO IN ARTICLE 2 (a) OF THE DIRECTIVE**

1. Excavation
2. Earthworks
3. Construction
4. Assembly and disassembly of prefabricated elements
5. Conversion or fitting-out
6. Alterations
7. Renovation
8. Repairs
9. Dismantling
10. Demolition
11. Upkeep
12. Maintenance - Painting and cleaning work
13. Drainage

The Directive applies to building and civil engineering works no matter how long or short their duration. It applies no matter how many or how few workers are involved.

🔗 **See 2.4 Documents required for prevention, p. 87**

The key point to remember is that it applies to construction work during the 'whole-life cycle' of a facility from its inception to its eventual demolition and any on-site recycling of its materials.

**Example 48:**

The following activities may be considered to be construction work:

- erecting structures for exhibitions;
- erecting spectator seating for open-air festivals.

The Directive applies to the safety and health of those carrying out further construction work such as building maintenance (including cleaning and painting). Indeed, there are as many workers killed and injured during maintenance work as during new construction work. Designers and others should take a 'whole-life' view.

The Directive does not apply to the safety and health of users of the finished project. This may be covered by other directives.

The Directive does not give a definition to the term 'project' or 'construction project' other than by a mention of 'project' in the definition of a client and by other uses of these words in the Directive's articles. For all practical purposes, a construction project is a project that is carried out for a client and which includes building or civil engineering works.

**Good practices:**

It is of course sensible that designs take account of other directives so that the safety and health of users can be secured. Clients have expectations that a completed facility will be safe to use.

The Directive does not apply to the safety and health of other people who are not at work but who may be adversely affected such as passers-by. However, it is sensible that an integrated approach is taken to safety and health and that such people are taken into account. In some Member states legislation requires the protection of other people who might be adversely affected by construction works. National legislation should be consulted.

The Framework Directive, 89/391/EEC, places duties on employers to, amongst other matters, carry out risk assessments and to cooperate and coordinate with other employers sharing the same workplace. That Directive continues to apply to all employers where the Construction Sites Directive is also applicable. Directive 92/57/EEC extends some parts of the Framework Directive (and other directives) to self-employed persons and to employers personally engaged in construction work on a site.

☞ See Framework directive 89/391/EEC, p. 204.

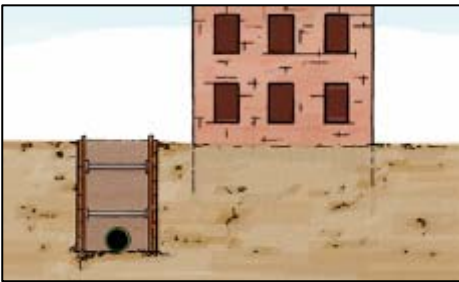
**Example 49:**

An employer engaged a self-employed person to work alongside him and his own workers on a construction project. The employer and the self-employed person had to take steps to ensure their safety and that of other workers.

## 2.2.1 Excavation, earthworks and drainage

Excavation and earthworks are within the scope of the Directive. Excavations and earthworks can be carried out at a wide range of construction projects whether preparatory to other construction work or in their own right. Drainage work is similarly included. Excavation works such as for a shaft or tunnel are within scope. Such work and other complex excavations

require particular attention because of the risks that can arise to those carrying them out and to other people.



#### **Example 50:**

Excavations and earthworks can be carried out at a wide range of construction projects for buildings and for infrastructure projects. Excavations for the foundations of the building shown in the illustration and for the drain in the trench are excavations within the scope of the Directive.

Earthworks include the reshaping of the ground to form a feature such as a dam, an earth bund and the realignment of a waterway.

## **2.2.2 Prefabricated components**

Construction work includes the assembly and disassembly of prefabricated elements on site. The assembly or manufacture of pre-fabricated components on a site where they are then installed is within the scope of the directive.

However, the assembly and disassembly of components carried out at some other place, such as an off-site factory, is not a part of the construction work and is not within the scope of the directive.



#### **Example 51**

A concrete mixing plant set up on a construction project and only supplying that project is subject to the Directive.

A ready-mixed concrete plant at a stand-alone industrial facility and which supplies a wide range of projects is not subject to the Construction Directive.



#### **Example 52**

The routine maintenance of site machinery carried out at the point of use is covered by the Construction Directive.

A large machinery maintenance facility on a very large project may be considered to be a separate industrial undertaking at which no construction work takes place. The Construction Directive would not apply but other directives, such as the Framework Directive, would. National legislation may provide further guidance.



#### **Example 53:**

The logistics of receiving pre-cast concrete cladding components onto site, their

subsequent storage, hoisting and installation is within the scope of the Directive: but their initial manufacture in an off-site pre-cast concrete facility and their transportation to site is not.

### 2.2.3 Fitting-out

The Directive applies to any building or civil engineering work that is a part of the fitting-out of a facility so that it is suitable for occupation.



#### **Example 54:**

To make a school fit for use, the laboratories required some fitted work benches equipped with electrical, gas and water services. This installation work was within the scope of the Directive.

There may be some fitting out operations that are not generally considered to be building or civil engineering work. However, such work should be properly coordinated with the construction work if it is carried out at the same time and in the same place, not least because the Framework Directive requires the coordination of all work activities at the same workplace.



#### **Example 55:**

In the final stages of completing a new hotel, it had to be carpeted and free-standing furniture had to be installed in the kitchens, common areas and bedrooms. The project team ensured that workers engaged on all these tasks were provided with the same protection and had access to the same welfare arrangements as other workers who were working on the site.

Installing free-standing furniture is not construction work within the meaning of the Directive but the carpet flooring is. However, the over-riding principle is that all professionals working on a construction site and sharing the same workplace should cooperate in securing the safety and health of all workers, whether under the Construction Sites Directive or the Framework Directive.

### 2.2.4 Conversion and Alterations

Subsequent construction work to convert or alter an earlier construction is subject to the Directive. This kind of work can pose increased risks due to the often complex nature of the work.

For instance, the original construction may have incorporated hazardous materials such as asbestos that is not immediately identifiable without a thorough survey, the opening up of new service riser ducts can lead to the risk of falls and poorly executed structural alterations can lead to collapses. There may also be tripping hazards due to failure to control the temporary storage of new and waste materials. This kind of work often requires increased resources to properly plan beforehand and manage at site.



#### **Example 56:**

A 40-year old office block that was no longer fit for purpose was converted into apartments and significant alterations were required, including to the common areas

and services. All of the project works were subject to the Directive.

### 2.2.5 Upkeep and Maintenance - Painting and cleaning work

Upkeep and maintenance activities (including repainting) are within the scope of the Directive. Work to services such as passenger lifts, electrical, heating and ventilation require consideration and this is best done during the initial design so that safe access is readily available and safe systems of work can be implemented.

Window cleaning is an activity that should be addressed during design so that a finished project complies with the requirements of the Workplaces Directive 89/654/EEC<sup>9</sup>.



#### Example 57:

The external facades of a building with some delicate stone features required some routine cleaning and redecoration. Water and hand brushing was undertaken to remove the accumulated grime. The window frames were repainted from the same scaffold. All of the work was subject to the Directive.

### 2.2.6 Renovation and Repairs

Renovation and repair work is within the scope of the Directive. The work can often involve the need for short-term access to places where workers will be at risk unless the risks are adequately addressed. Initial good design can limit the need for and the frequency of this kind of work, and so provide the client with a facility that is safer to maintain as well as being more cost efficient over its 'whole life.'



#### Example 58:

The slate roof of a town hall required extensive repairs to the flashings, cappings and other features. Some of the roof timbers required replacing. The integrated clock tower and the clock mechanism also required attention. All of the work was subject to the Directive. However, the clock mechanism was removed from site and the workshop where it was overhauled was not subject to the Directive 92/57/EEC.

### 2.2.7 Dismantling and Demolition

The Directive applies to the closing stage of the 'whole life' of a facility when it is dismantled or demolished. The Directive equally applies to partial dismantling and demolition.



#### Good practices:

Designing a facility so that these deconstruction activities can be safely carried out will reduce the sorts of risks that may otherwise arise.

<sup>9</sup> Council Directive 89/654/EEC of 30 November 1989 concerning the minimum safety and health requirements for the workplace (first individual directive within the meaning of Article 16 (1) of Directive 89/391/EEC)



#### **Example 59:**

A large factory building no longer provided an efficient manufacturing unit but the attached offices were still fit for purpose. The offices were retained and the remainder of the building was demolished. The Directive was applicable to the demolition work.

## 2.3 The stakeholders in a construction project

### 2.3.1 Preliminary remarks

A construction project involves many stakeholders working as a team. They need to cooperate and coordinate with one another to ensure the success of the project. Their cooperation and coordination is needed to ensure the safety and health of workers throughout all stages of the initial construction and, likewise, those involved in subsequent construction work during the 'whole-life' of a facility.

Among the stakeholders, the following have significant roles to play:

- Clients for whom a project is carried out;
- Project Supervisors on whom clients can rely to act on their behalf during design and/or execution of the construction work;
- Coordinators for safety and health matters at the project preparation stages. They have a particular part to play during the preparatory stages of a project on safety and health aspects;
- Coordinators for safety and health matters at the project execution stage who have a particular part to play during the execution stages of a project on safety and health aspects;
- Designers of permanent and temporary works;
- Contractors and sub-contractors who carry out construction works;
- Other employers;
- Self-employed persons;
- Workers and workers representatives (including site managers and foremen); and

- Suppliers of construction materials and substances, construction plant, machinery and equipment, and hand tools.

Users are also key stakeholders. They may be involved in further construction work, such as maintenance work, to which the Construction Sites Directive applies and they may have interests in ensuring that the finished project can safely be used as a place of work. Users may have particular knowledge or experience that can usefully be taken into account by stakeholders such as designers.

The Directive defines the obligations, responsibilities and rights of key stakeholders for safety and health during construction projects.



It is important to note that occupational safety and health is an issue that concerns everyone involved in a construction project.



#### Example 60:

A residential construction project is to be carried out by a developer-contractor enterprise. The enterprise is both the client and the contractor. It is also responsible for the design which will either be carried out by an in-house designer or by an external designer working under the close direction and supervision of the business. The developer-contractor business has a number of roles to fulfil under the directive.

## 2.3.2 Client

### a) Definition



#### **What does the Directive 92/57/EEC say?**

Article 2 :

(b) 'client' means any natural or legal person for whom a project is carried out.

A client is a natural or legal person for whom a project involving construction work is undertaken, whether for profit or not.

Clients include individuals (i.e. natural persons) such as householders and those running small businesses. Clients can also be legal persons (or entities), for example public bodies such as national and local government, and private bodies such as companies and similar undertakings including charities and other 'non profit' organisations.



#### Example 61:

A man has his house enlarged with the construction of a garage. He is a client.



#### Example 62:

A construction company owns a plot of land where it will build a new residential building. The company decides to carry out the construction work and sell the apartments through a specialist company.

The Client is the construction company. The company is also a contractor



#### **Example 63:**

An Entity, called A, was constituted by other public entities (all of whom will be end-users of a new Metro line) to develop a new Metro line in a city. The project is totally financed by the government. The project will be constructed by a private organization and they will then have to operate and maintain the Metro for 5 years. The Client is the Entity A.

### **b) More than one client**

It is possible to have more than one client for a single project, for instance, where a number of businesses jointly fund a large project.

There may also be different clients at different times during a project, for instance, a business may sell or transfer their interests in a project to another business before the project is completed.



#### **Good practices:**

Where there are a number of clients, agreeing in writing that one client will take the lead in coordinating the functions of the others.



#### **Example 64:**

An Entity, called A, was constituted and funded by the government to manage the initial stages of the construction of a new bridge over a river. A was given some government finance to fund the initial stages of the project until a concessionaire called B (a private organization) had been found to complete the project and maintain the bridge).

The Client was initially the Entity A. When Entity B was appointed, it became the client.

### **c) Functions of the client**

Clients may not have sufficient knowledge about construction processes and they may lack expertise in the design and management of construction projects.

However, they should normally be in a position to set the performance criteria for the completed project and be able to provide information about the intended site and its environs. Clients are also in a strong position to determine how their projects will be organised and carried forward. Equally, they will have a keen interest in how easily subsequent construction maintenance can be carried out.

Clients can have a significant influence on occupational safety and health when selecting the stakeholders. They can play a pivotal role in helping to set the safety and health culture for the project and they have a clear opportunity to encourage others to take safety and health properly into account during all stages of the construction process.

All of these factors place clients in a strong position to be a positive influence on occupational safety and health during construction work over the lifetime of the construction work that they commission.

The main functions assigned to clients by the Directive can include the following:

- Appointing project supervisors to assist them if they so wish.
- Sending prior notice to the competent authority;
- Appointing one or more coordinators for safety and health matters when required;
- Ensuring that safety and health plans are drawn up when required; and
- Taking account of the general principles of prevention during design and preparation for a project, including the time that the work will require.

National legislation should be consulted. In some member states, legislation assigns additional functions to clients.



#### **Example 65:**

A client played an important role during procurement. When using “best value for money” rather than “lowest price” the client set a budget for safety and health related to the cost of the project.

A client showed its commitment to occupational safety and health by preparing a comprehensive policy on the issue setting out the organisation and arrangements that had to be put in place.

### **Project supervisors**

Directive 92/57/EC provides that clients may appoint a project supervisor to act on their behalf if they so wish. This is particularly useful where clients do not have the knowledge, experience or resources to carry out the functions assigned to them by the Directive.

🔗 See 2.3.3 Project Supervisor, p. 57.

### **Prior Notice**



#### **What does the Directive 92/57/EEC say?**

Article 3 :

3. In the case of constructions sites:

- on which work is scheduled to last longer than 30 working days and on which more than 20 workers are occupied simultaneously, or
- on which the volume of work is scheduled to exceed 500 person-days,

the client or the project supervisor shall communicate a prior notice drawn up in accordance with Annex III to the competent authorities before work starts.

The prior notice must be clearly displayed on the construction site and, if necessary, periodically updated.

Where there is a need for prior notice, clients should communicate it to the competent authority for occupational safety and health before construction work starts. Note that project supervisors, where appointed, can send prior notice on behalf of their clients.

↳ See 2.4.1 Prior notice, p. 88.

### Appointment of coordinators for safety and health matters



#### What does the Directive 92/57/EEC say?

Article 3:

1. The client or the project supervisor shall appoint one or more coordinators for safety and health matters, as defined in Article 2 (e) and (f), for any construction site on which more than one contractor is present.

In order to co-ordinate the design and construction work being undertaken, clients must designate persons or organisations to oversee the co-ordination of safety and health matters during the project preparation and execution stages. Note that any legal or natural person (including persons fulfilling any of the named roles in the Directive) can carry out the coordinator role provided they are competent and have the resources.

When making appointments, it is essential that clients are as satisfied as they can reasonably be that those appointed are competent to carry out their safety and health related roles and that they intend to devote sufficient resources to such tasks.

The nature, extent and scope of pre-appointment enquiries about competence and resources will depend on the scale, complexity and hazards and risks that are likely to be involved in the project.

↳ See d) Qualification of the coordinator for safety and health matters, p. 62.



#### Good practices:

Appointing coordinators sufficiently early so that decisions taken during the earliest stages of a project can take account of the safety and health implications.

Appointing coordinators in writing and with written acknowledgement from those appointed so that matters are clear. Any changes in appointments should be similarly made and acknowledged.

Where an organisation or company is appointed as a coordinator, it is good practice for a client to ensure that the contract or agreement with that organisation ensures that there is a named natural person who will take the lead in performing the role in order to help ensure continuity.

Keeping records of the appointments made by the client.

Cooperating with coordinators for safety and health matters and other stakeholders in managing construction safety and health risks.

Ensuring that the appointed coordinators have the means and authority to fulfill their duties.

## Number of coordinators

There are two coordinator functions for safety and health matters for a project, one for the project preparation stage and one for the project execution stage. One person (natural or legal) can be appointed to fulfil both functions. There is nothing to prevent more than one person being appointed to carry out either of the coordinator functions and there may be some instances on large, complex projects where multiple appointments would have advantages. However, this is likely to be the exception and it would require careful management by all parties to ensure that there was neither confusing overlaps nor gaps in the work being done.



### Good practice:

On low risk projects, clients may be able to appoint a single coordinator to carry out both coordinator functions and it may be that one of the other project stakeholders might be in a position to fulfil the roles, for instance, where a client has a small extension to a simple building and a contractor is also providing a design service.

## Safety and Health Plan



### **What does the directive 92/57/EEC say?**

Article 3 :

2. The client or the project supervisor shall ensure that prior to the setting up of a construction site a safety and health plan is drawn up in accordance with Article 5 (b).

The Member States may, after consulting both management and the workforce, allow derogations from the provisions of the first subparagraph, except where it is a question of:

- work involving particular risks as listed in Annex II, or - work for which prior notice is required pursuant to paragraph 3 of this Article.

Article 3 requires clients or project supervisors to ensure that safety and health plans are prepared.

Article 5 requires project preparation stage coordinators to draw up or cause to be drawn up safety and health plans.

Safety and health plans are required for all construction projects (whether or not a project requires coordinators) unless a Member State has allowed derogation in accordance with Article 3(2) of the Directive.

Derogations are not permitted if a project involves any of the 'particular risks' listed in Annex II or if a project requires 'prior notice' to the competent authority. Clients and project supervisors will need to clarify whether there is any derogation in national legislation that applies to their projects.

Clients or their project supervisors will need to check with their project preparation stage coordinators whether a suitable and sufficient plan has been prepared before they permit work to start in setting up their site.

Where there is no coordinator (because there is only one single contractor), clients will need to ensure that they, their project supervisor, their contractor or some other person prepares a suitable safety and health plan. In some instances, this may need to be little more than a risk assessment (that includes risk management arrangements) prepared by a contractor under the Framework Directive.



#### **Good practices:**

**Incorporating prevention measures linked to the subject matter of the contract in the technical specifications for invitations to tender and in the contract performance clauses and quality contract management by the contracting authorities.**

↳ For this and other matters concerning the plan, see 2.4.2 Safety and health plan, p. 91.

### **Taking into account the general principles of prevention**



#### **What does the Directive 92/57/EEC say?**

##### **Article 4:**

The project supervisor, or where appropriate the client, shall take account of the general principles of prevention concerning safety and health referred to in Directive 89/391/EEC during the various stages of designing and preparing the project, in particular:

- when architectural, technical and/or organizational aspects are being decided, in order to plan the various items or stages of work which are to take place simultaneously or in succession,
- when estimating the period required for completing such work or work stages.

Account shall also be taken, each time this appears necessary, of all safety and health plans and of files drawn up in accordance with Article 5 (b) or (c) or adjusted in accordance with Article 6 (c).

Project supervisors or clients have to take account of the general principles of prevention during the preparative stages of their projects. This is a general obligation but two issues are particularly highlighted in Article 4.

The first addresses design, technical or organizational decisions that affect the planning of the construction work. Such decisions have to take account of the general principles of prevention, whether the activities involved in the construction work take place at the same time or successively.



#### **Example 66:**

**A project supervisor for a bridge replacement project may foresee the possibility of building a new one alongside an existing bridge and then sliding the new facility into place during a night-time operation. The temporary stages of construction may require close investigation into matters of stability, necessary propping and false work.**

The second issue is the time reasonably allowed to complete a project or, where the work is in stages, the various work stages. Periods set need to be realistic and experience from other projects with similar construction methods may be helpful.

Depending on procurement strategies, clients may allow contractors to propose alternative designs and construction methods. The obligations placed on project supervisors or clients by



article 4 then need to be considered afresh in the light of the proposals suggested by contractors. Note also that safety and health plans and files are likely to require revision.

While all of the principles in the general principles of prevention are applicable, clients may wish particularly to consider (i) the risk-based approach of avoiding risks and assessing and managing those risks that cannot be avoided, and (ii) the need to develop coherent overall prevention policies. The former is central to controlling hazards and risks. The latter provides the foundations on which to build effective strategies so that project stakeholders can jointly work together in managing project hazards and risks.

Where clients believe that they do not have the competence to make such decisions, they should consider appointing a project supervisor. Other stakeholders in a project may also be able to advise them, especially where the project is small and straightforward.

↳ See 1.2 General principles of prevention, p. 21. and 2.3.3 Project Supervisor, p. 57.

#### Responsibilities of clients



##### What does the directive 92/57/EEC say?

Article 7:

1. Where a client or project supervisor has appointed a coordinator or coordinators to perform the duties referred to in Articles 5 and 6, this does not relieve the client or project supervisor of his responsibilities in that respect.

Appointing coordinators does not relieve clients of their responsibilities.

### 2.3.3 Project Supervisor

#### a) Definition



##### What does the Directive 92/57/EEC say?

Article 2 :

(c) 'project supervisor' means any natural or legal person responsible for the design and/or execution and/or supervision of the execution of a project, acting on behalf of the client;

A person (legal or natural) is a project supervisor by virtue of the meaning given to that title by this definition. There are two elements to consider: whether they are responsible for design or for the execution of a project or for supervising the execution of a project and, if so, whether in doing so they are acting on behalf of a person (legal or natural) who is the client.

Project Supervisors for those matters delegated to them act as representatives of clients, and clients should ensure that they have given their project supervisors the authority and the means to act on their behalf.

Where clients only delegate certain of their functions to project supervisors, they should ensure that there is clarity about whom is to perform the various functions. Clients and project supervisors need to cooperate to ensure that the functions assigned to them by the directive are carried out.

Appointing project supervisors does not relieve clients of their responsibilities.



#### **Example 67:**

A private client needs to build a house for their own use. They do not have the knowledge about how to manage the process (e.g. selection of a designer and a contractor, etc.). In this case, they deal with their responsibilities by appointing a project supervisor.

### **b) Functions of the project supervisor**



#### **What does the Directive 92/57/EEC say?**

##### **Article 4:**

The project supervisor, or where appropriate the client, shall take account of the general principles of prevention concerning safety and health referred to in Directive 89/391/EEC during the various stages of designing and preparing the project, in particular:

- when architectural, technical and/or organizational aspects are being decided, in order to plan the various items or stages of work which are to take place simultaneously or in succession,
- when estimating the period required for completing such work or work stages. Account shall also be taken, each time this appears necessary, of all safety and health plans and of files drawn up in accordance with Article 5 (b) or (c) or adjusted in accordance with Article 6 (c).

The functions of Project Supervisors are the same as those of their clients.

🔗 See 2.3.2 Client, p. 50.



#### **Good practices:**

Checking that designers have sufficient time to fully develop the design.

Providing pre-construction information to designers and contractors, in essence, initial information from clients for safety and health plans.

Checking that those appointed as designers and contractors (employers and the self-employed) are competent and adequately resourced to carry out their duties.

Ensuring how to apply the general principles of prevention (e.g. the client through their own staff, designers, and those preparing and planning the project) where a project supervisor is not appointed.

### 2.3.4 Designers



#### What does the Directive 92/57/EEC say?

Article 2 :

(c) 'project supervisor' means any natural or legal person responsible for the design and/or execution and/or supervision of the execution of a project, acting on behalf of the client;

The functions of designers are not separately mentioned in the Directive. However, the definition of a project supervisor specifically mentions persons (legal or natural) responsible for design and acting on behalf of a client.

Whether a designer is acting as a project supervisor on behalf of a client is a matter to be decided on the facts of each particular case. A designer engaged by a client to carry out design work for that client's construction project has certain obligations under the Directive. In particular, they have to take account of the general principles of prevention during the various stages of designing the project.

↪ See 2.3.3 Project Supervisor, p. 57.

Designers acting on behalf of other stakeholders named in the Directive (e.g. employers such as contractors and subcontractors) should equally take account of the general principles of prevention so that they reduce the on-site risks to which workers (and others) would otherwise be exposed (although, the Directive doesn't address such situations).

Designers of standard items of equipment (e.g. motors, pumps, fans and common assemblies of parts used in building services, etc...) that are incorporated into construction projects should similarly take account of the general principles of prevention when they consider the ways in which their products could be used.

See 4.1.2 Design stage, p. 126.

### 2.3.5 Coordinators for safety and health matters



#### What does the Directive 92/57/EEC say?

Article 2 :

(e) 'coordinator for safety and health matters at the project preparations stage' means any natural or legal person entrusted by the client and/or project supervisor, during the project preparation stage, with performing the duties referred to in Article 5;

(f) 'coordinator for safety and health matters at the project execution stage' means any natural or legal person entrusted by the client and/or project supervisor, during execution of the project, with performing the duties referred to in Article 6.



#### Good practices:

**Both coordinator functions may be by the same natural or legal person on low risk projects.**

Coordinators have specific functions assigned to them by the Directive. Who carries out these roles and how that is done will reflect the nature and scale of a project and its hazards and risks. The objective is to add value to the successful management and control of occupational safety and health hazards and risks in a project and not simply to add unnecessary bureaucracy to the project management process.

Some fundamental issues include:

- When is it necessary to appoint coordinators for safety and health matters?
- Who should appoint these coordinators?
- Who can be appointed as a coordinator?
- Can other stakeholders act as coordinators?
- When should these coordinators be appointed and when do their tasks end?
- What are the functions of these coordinators?

#### **a) When is it necessary to appoint coordinators for safety and health matters?**



#### **What does the Directive 92/57/EEC say?**

Article 3 :

1. The client or the project supervisor shall appoint one or more coordinators for safety and health matters, as defined in Article 2 (e) and (f), for any construction site on which more than one contractor is present.

Coordinators for safety and health matters are required when more than one contractor is expected to be involved in the execution of the construction stage.

↳ **See 2.3.7 Contractors and subcontractors, p. 82, for the definition of contractor.**

The fragmented nature of the construction industry means that there will be few projects where a single contractor will be involved. In reality, every trade is likely to be a separate contractor other than in the most unusual of circumstances. Where it is obvious that there is a single, straightforward activity, such as internal redecoration or some minor works by a local contractor who is known to have all of the necessary skills within a directly employed team, it might be safe to conclude that a single contractor will be involved. Otherwise the expectation must be that there will be more than one contractor.



#### Good practices:

**Requiring some expert assistance even if only one Contractor is expected to be involved in the project.**

**Considering appointing designers or contractors to carry out coordinator functions provided they have the knowledge, skills, experience and resources.**

**Ensuring that coordinators are able to act without any conflicts of interest.**

**Ensuring that coordinators have the means and the authority to fulfil their duties.**

Appointing project preparation stage coordinators for safety and health matters at an early stage so they can:

- Assist clients or project supervisors with feasibility studies on safety and health matters;
- Help project teams to identify, eliminate or avoid hazards and risks;
- Provide expert advice and assistance that clients or project supervisors require.

#### b) Who should appoint coordinators for safety and health matters?



##### What does the Directive 92/57/EEC say?

Article 3 :

1. The client or the project supervisor shall appoint one or more coordinators for safety and health matters, as defined in Article 2 (e) and (f), for any construction site on which more than one contractor is present.

Responsibility for appointing coordinators rests with clients or project supervisors.

In practice, it is generally clients who pay a coordinator's fees and it is generally sensible for clients to make the appointments relying, as needed, on the advice of their project supervisors where appointed.

↳ See 2.3.7 Contractors and subcontractors, p. 82, for the definition of contractor.



##### Example 68:

A person wants to build his/her/its own house. A small contractor, who requires help from specialised contractors (for the electrical and plumbing installations), will be engaged. There will be more than one contractor on site. Safety and health coordinators should be appointed.

#### c) Who can be appointed as a coordinator for safety and health matters?



##### What does the Directive 92/57/EEC say?

Article 2 :

- (e) 'coordinator for safety and health matters at the project preparations stage' means any natural or legal person entrusted by the client and/or project supervisor, during the project preparation stage, with performing the duties referred to in Article 5;
- (f) 'coordinator for safety and health matters at the project execution stage' means any natural or legal person entrusted by the client and/or project supervisor, during execution of the project, with performing the duties referred to in Article 6.

It is a matter of competence and resource. It is best to consider the nature, size and complexity of the project and the risks that will need to be addressed.

A sensible approach is to consider the safety and health needs of the project and make appointments accordingly.

Coordinators may come from:

- The client company or entity,
- One or more designing and engineering companies,
- The main contractor,
- The coordinator as a "self-employed consultant,"
- Specific companies entrusted with safety and health advice or offering coordination tasks,
- Any other competent person.



#### **Example 69:**

For a small project (such as a single storey extension to a house), where the construction method is straightforward and the risks will be low, it may be that a natural person will have the competencies and sufficient time and other resources to perform the coordinator role.



#### **Example 70:**

Where the project is expected to be more complex and the risks are of a greater magnitude, it is probable that an individual person working alone would not have the competencies and resources to carry out the coordinator role satisfactorily. It would then be sensible for a business or professional practice (i.e. a 'legal' person) to perform the role.

Even then a natural person or natural persons from this company, etc, should be identified so that people know with whom to deal.

In all but exceptional circumstances, there should only be one coordinator for each of the stages (preparation and execution). Where needed, they can be assisted by other experts.

If there are more than one coordinator for each of the stages, steps should be taken to ensure working properly together

🔗 **See Number of coordinators, p.54.**

Note that some national laws may require that a legal person should always be appointed whatever the size or complexity of the project. Where this is the case, such laws should be taken into account.

#### **d) Qualification of the coordinator for safety and health matters**



#### **Good practices:**

The competencies of coordinators for safety and health matters on a project should take into account the need to:

- have the requisite knowledge to act as a coordinator;
- have demonstrable skills and experience of similar projects;
- have sufficient knowledge of design and construction work, and of occupational safety and health issues specific to the project under consideration having



regard to its size and complexity; and

- be able to satisfy the client that they have the resources successfully to manage the project's occupational safety and health risks for the work in question.

When assessing the competencies of a legal person, it is necessary to consider the competencies both of the organisation and the people whom it proposes to use on the project in question.

When assessing other stakeholders, the same broad issues of competence and resources are applicable.



#### Example 71:

In the case of the construction of a multi-residential building, the following legal or natural persons may potentially be able to meet the aforementioned criteria:

- An architect, a civil/structural engineer or other building professional as the coordinator for safety and health matters during the project preparation stage, i.e. someone with the qualifications, experience and skills for the management of the design of facilities of a similar type and size provided that they are sufficiently competent on safety and health issues.
- A qualified and experienced construction management professional or civil/structural engineering or other experienced building professional as the coordinator for safety and health matters during the execution stage, i.e. someone with the qualifications, experience and skills for managing the construction of facilities of a similar type and size provided that they are sufficiently competent on safety and health issues.



#### Good practices:

Considering the competencies of these experts, their record of past performance

and the resources that they will be able to devote to the project.

Naming a project representative with adequate qualifications, when the coordinator for safety and health matters is a legal person (i.e. a company).

Involving other experts if there is a need for complex specialities (e.g. large excavations in an environment that may involve special hazards).

#### e) Can other stakeholders act as coordinators for safety and health matters?

Clients, project supervisors or other stakeholders can also act as coordinators for safety and health matters where they have the necessary competences and resources.

Moreover, both coordinators for safety and health matters (preparation and execution stage) may be the same person provided they have the necessary competences and resources.

Where a person (legal or natural) is appointed to carry out more than one function, it should be ensured that both functions will be carried forward without detriment to other stakeholders, and safety and health.



#### Good practices:

Ensuring that coordinators are able to act without any conflict of interest from other stakeholders in the same project.

#### f) When should coordinators for safety and health matters be appointed and when do their tasks end?

Coordinators for safety and health matters at project preparation stages should be appointed at the earliest opportunity so that they can advise their clients from the outset of the project.

Such coordinators need to continue their involvement until all preparatory work for starting the project on site is completed (including the preparation of safety and health plans and the first steps in preparing/updating safety and health files) and all design work is similarly completed.

Coordinators for safety and health matters for project execution stages should be involved as soon as they can make a significant contribution to the project having regard to the functions that they have and the advantages of their involvement prior to construction work commencing on site.

They can usefully be appointed before any contractors are involved so that they can advise their clients on the safety and health aspects of such selections. Such coordinators often have extensive knowledge about construction processes that can be of significant benefit to designers and early appointments can be beneficial, especially for complex high-risk projects.

They should remain involved until the construction work has been completed and a satisfactory safety and health file has been handed to the client.

Note that further construction work such as renovation, repair and demolition will normally be new projects with their own design and preparation, and execution stages.

In lengthy projects it is not uncommon for clients to want to obtain the most recent technology available up to the time of commissioning of the facility. This can lead to last-minute design changes. These may create new risks that have to be addressed under considerable time pressures. In such cases the project preparation stage coordinator may



need to assess the emerging issues. This may result in advice to the client that more time is required safely to complete the project and, perhaps, to advising a client not to press for changes, especially where the technology and the benefits are unproven.



#### Good practices:

Involving a coordinator for safety and health matters during the project execution stage sufficiently early so that they are able to work seamlessly together with a coordinator for safety and health matters during the project preparation stage.

Introducing close liaison between coordinators during periods of parallel working when different people or organisations are fulfilling the two coordinator roles on a project.

Ensuring that all relevant information related to the project is transferred from one coordinator to the other in a smooth way.

Taking account of the fact that design can continue long after a project has commenced on site, most notably in more complex or lengthy projects.

Taking a view on low risk projects on whether to continue with two persons fulfilling the two coordinator roles or whether to appoint the project execution stage coordinator also to deal with any residual issues that would have otherwise been within the functions of the project preparation stage coordinator.

#### **g) What are the functions of coordinators for safety and health matters during the project preparation stage?**

The main functions of coordinators for safety and health matters for the project preparation stage are to:

- Ensure that the general principles of prevention are applied during this stage;
- Draw up, or cause to be drawn up, safety and health plans;
- Take the first steps in preparing or updating safety and health files.

This part of the Guide summarises these functions.

#### **Ensuring the application of the general principles of prevention**



##### **What does the Directive 92/57/EEC say?**

Article 5 :

Project preparation stage: duties of coordinators

The coordinator(s) for safety and health matters during the project preparation stage appointed in accordance with Article 3 (1) shall:

(a) coordinate implementation of the provisions of Article 4;

↳ Advice about Article 4 can be found in Taking into account the general principles of prevention, p.55.

The way in which this function is carried out will depend on the particular project and the hazards and risks that may arise. Coordinators will need to work with clients, project supervisors, designers and those preparing for the start of construction work on site.

The key to this function is a concentration on coordination. This requires working at the interfaces between the various stakeholders so that the best solution for occupational safety and health during all subsequent construction work is achieved in the particular circumstances.

A focus on a project's occupational safety and health hazards and risks and how they can best be addressed by the project team working together will pay dividends.



#### **Good Practices:**

On the smallest of low risk projects informal stakeholder meetings and discussions may well suffice.

Large complex projects will require a more structured approach so that the identification of hazards and risks, and their elimination or reduction to acceptable levels can be achieved.

Coordinators can usefully agree the approach they propose to take with other stakeholders at the outset.

Liaison during project preparation stages with other stakeholders, including designers, capable of making contributions to eliminating hazards and reducing risks.

Close liaison with the project execution stage coordinator is normally essential.

### **Drawing up safety and health plans**



#### **What does the Directive 92/57/EEC say?**

Article 5 :

Project preparation stage: duties of coordinators

The coordinator(s) for safety and health matters during the project preparation stage appointed in accordance with Article 3 (1) shall:

(b) draw up, or cause to be draw up, a safety and health plan setting out the rules applicable to the construction site concerned, taking into account where necessary the industrial activities taking place on the site; this plan must also include specific measures concerning work which falls within one or more of the categories of Annex II;

The development of safety and health plans should be seen as an ongoing process, requiring updates during the project preparation stage as well as the project execution stage.

A key point is that plans should set out rules that will be applied during construction work to help secure occupational safety and health. Plans need to take into account any other industrial activities that are taking place at the site of the construction works where there may be safety and health implications for either the construction work or for the other industrial activities.

Plans must set out specific measures that will need to be taken during construction to address safety and health risks where 10 specified types of work activities are to be undertaken. These are listed in Annex II to the Directive.



#### **Good Practices:**

**It is good practice to consult other stakeholders and interested parties when preparing plans.**

Once construction work commences, it is the coordinators for safety and health during project execution stages who have to update safety and health plans.

This Guide contains further advice on safety and health plans.

🔗 **See 2.4.2 Safety and health plan, p. 91.**

### **Safety and health file**



#### **What does the Directive 92/57/EEC say?**

Article 5 :

Project preparation stage: duties of coordinators

The coordinator(s) for safety and health matters during the project preparation stage appointed in accordance with Article 3 (1) shall:

(c) prepare a file appropriate to the characteristics of the project containing relevant safety and health information to be taken into account during any subsequent works.

Coordinators for safety and health matters during project preparation stages should initiate the preparation of safety and health files.



#### **Good Practices:**

**Where there is an existing file, it may be more appropriate to extend and update that file rather than create a new one.**

Files should include information that is relevant and will be helpful to others preparing for and carrying out subsequent construction works during the whole-life of the project once the current construction works have been completed.

The expectation is that coordinators will take the lead and that others involved in project preparation stages will cooperate in providing them with information.

Files are handed to project execution stage coordinators for completion. This Guide contains further advice on safety and health files.

🔗 **See 2.4.3 Safety and health file, p. 95.**

🔗 **For examples of the information to be included in the safety and health file, see Annex 6 - Safety and health file: suggested contents, p. 202.**

#### h) What are the functions of coordinators for safety and health matters during the project execution stage?

The main functions of coordinators for safety and health matters for the project execution stage are to:

- Coordinate implementation of the general principles of prevention during execution stages;
- Coordinate implementation of the principles in Article 8 of the Directive by employers and the self-employed;
- Coordinate implementation of the safety and health plan by employers and the self-employed;
- Organise cooperation between employers and the self employed; (including safety meetings and tool-box talks),
- Coordinate arrangements to check that working procedures are being correctly implemented;
- Take steps to ensure that only authorised persons are allowed onto their construction sites;
- Update safety and health plans; and
- Update safety and health files.

This part of the Guide summarises these functions. Further useful information is also provided elsewhere in the Guide.

#### Coordinating the implementation of the general principles of prevention



##### What does the Directive 92/57/EEC say?

Article 6 :

Project execution stage: duties of coordinators

The coordinator(s) for safety and health matters during the project execution stage appointed in accordance with Article 3 (1) shall:

- (a) coordinate implementation of the general principles of prevention and safety:
- when technical and/or organizational aspects are being decided, in order to plan the various items or stages of work which are to take place simultaneously or in succession,
  - when estimating the period required for completing such work or work stages;

Pre-planning is essential to the safe completion of construction works. Coordinators have key roles to play during project execution stages, whether construction work by different persons is to take place simultaneously or in succession. Coordinators have to coordinate the implementation of safety as well as the general principles of prevention. They must do this during the project execution stage when:

- decisions are being made about how the construction work is to be organised;
- when technical issues are being decided; and
- when deciding how long is required to complete stages of the construction work and the work in its entirety.

Coordinators are only concerned with safety and health issues and the Directive does not require them to plan construction works for other purposes such as for generally progressing the works (although the Directive does not prohibit them from carrying out other functions as the parties may agree provided that any such additional commitments do not compromise

their abilities effectively to act as coordinators). Their functions under the Directive are specifically related to ensuring that such planning takes full account of safety and of the general principles of prevention and that sufficient time is allowed for the various stages of the construction work. This requires close liaison and good working relationships between coordinators and those planning and managing the construction works.

Coordinators are required to pay particular regard to decision-making affecting how the construction work will be organised and when technical issues are being decided.

Coordinators may need to liaise with those taking broader decisions during the project execution stage (such as clients, projects supervisors and others) should they be taking decisions about how much time will be available for the completion of the construction works or should they be making managerial or technical decisions that have implications for the general principles of prevention or safety.



#### **Good practices:**

Agreeing at an early stage with project supervisors, employers and the self employed how the coordinator will work with them to fulfil the coordinator functions.

Working closely with those having the major influence on how the construction work will be carried out.

Ensuring that sufficient time is allowed in work schedules and plans so that work can be safely carried out.



#### **Good practices:**

Contributing to planning activities to ensure that incompatible activities are not carried out at the same time.

Liaising with project preparation stage coordinators when they are taking decisions about how long should be allowed for the project (and any stages) and when they are preparing the safety and health plan

Liaising during the execution stage with other stakeholders, including designers, where they are able to make a contribution to eliminating hazards and reducing risks.

↳ See 1. General Principles of Prevention (GPP) on Safety and health at work, p.20.

### **Coordinating the implementation of the principles in Article 8 of the Directive by employers and the self-employed**



#### **What does the Directive 92/57/EEC say?**

Article 6 :

Project execution stage: duties of coordinators

The coordinator(s) for safety and health matters during the project execution stage appointed in accordance with Article 3 (1) shall:

(b) coordinate implementation of the relevant provisions in order to ensure that employers and, if necessary for the protection of workers, self-employed persons:

- apply the principles referred to in Article 8 in a consistent manner,

Coordinators have to take steps to coordinate implementation by employers (i.e. contractors, subcontractors) and, where necessary, self-employed persons to ensure that they apply in a consistent manner the principles mentioned in Article 8 of the Directive.

Article 8 requires employers and, where necessary, the self-employed to apply the principles set out in Article 6 of the 'Framework' Directive, 89/391/EEC. Briefly, Article 6 of the 'Framework' Directive obliges them to:

- Take measures to ensure the safety and health protection of workers, to prevent risks and to provide information, training and the organisation and means for achieving these objectives, including the need to adjust measures to take account of changing circumstances and to improve current situations;
- Implement the general principles of prevention;
- Carry out risk assessments and take preventative measures to improve safety and health by action in all their activities and at all managerial levels;
- Take into consideration workers' safety and health capabilities;
- Consult workers (and/or their representatives) when new technologies are being introduced;
- Adequately instruct workers before they enter areas of serious and specific danger;
- Cooperate and coordinate their activities, and exchange information for the purposes of safety and health with other employers sharing the same workplace; and
- Ensure that workers do not bear any financial costs for work-related safety, hygiene and health measures.

The prime function of coordinators is to coordinate the implementation of these obligations by others and not to perform those obligations for them.



#### **Good Practices:**

**Coordinators agreeing with other stakeholders at the outset how they will carry out this coordinating function.**

**Taking a risk-based approach that avoids unnecessary bureaucratic burdens.**

**Agreeing ways that will be effective on the particular project.**

**Agreeing common approaches and actions to secure safety and health - and so reduce burdens.**

### **Coordinating implementation of the safety and health plan by employers and the self-employed**



#### **What does the Directive 92/57/EEC say?**

Article 6 :

Project execution stage: duties of coordinators

The coordinator(s) for safety and health matters during the project execution stage appointed in accordance with Article 3 (1) shall:

- (b) coordinate implementation of the relevant provisions in order to ensure that employers and, if necessary for the protection of workers, self-employed persons:
  - where required, follow the safety and health plan referred to in Article 5 (b);

Similarly, coordinators also have to coordinate implementation by employers and the self-employed to ensure that they follow a project's safety and health plan.



#### Good Practices:

Coordinators agreeing with other stakeholders at the outset how they will carry out this coordinating function.

Coordinators making sure that employers and the self-employed have access to and have opportunities to comment upon the safety and health plan prepared by the project preparation stage coordinator.

Coordinators arranging start-up meetings immediately before execution stages begin. All employers should be invited and further similar meetings arranged throughout execution stages should be held, especially whenever there are major changes in the employers on site.

Coordinators should regularly call for safety meetings involving both employers, representatives of employees and self-employed persons.

Coordinators carrying out regular reviews with employers and the self-employed to ensure that safety and health plans are followed.

Coordinators giving particular attention to high-risk activities.

Coordinators adding value (and not bureaucracy) to the implementation of plans.

#### Organising cooperation between employers including the self-employed



#### **What does the Directive 92/57/EEC say?**

Article 6 :

Project execution stage: duties of coordinators

The coordinator(s) for safety and health matters during the project execution stage appointed in accordance with Article 3 (1) shall:

(d) organize cooperation between employers, including successive employers on the same site, coordination of their activities with a view to protecting workers and preventing accidents and occupational health hazards and reciprocal information as provided for in Article 6 (4) of Directive 89/391/EEC, ensuring that self-employed persons are brought into this process where necessary;

In brief, Article 6(4) of the Framework Directive, 89/391/EEC requires employers sharing the same workplace to cooperate and coordinate their activities, and exchange information for the purposes of safety and health with other employers sharing the same workplace. This is extended so that the same obligations apply to self-employed people as they do to employers: and also where employers (and the self-employed) are successively on a site.





#### Good practices:

Coordinators agreeing with other stakeholders at the outset how they will carry out this coordinating function.

Coordinators working in close harmony with those who are managing projects at large.

Coordinators taking a risk-based view when deciding what they need to do.

Coordinators giving particular attention to high-risk activities.

### Coordinating arrangements to check that working procedures are being correctly implemented



#### **What does the Directive 92/57/EEC say?**

Article 6:

Project execution stage: duties of coordinators

The coordinator(s) for safety and health matters during the project execution stage appointed in accordance with Article 3 (1) shall:

(e) coordinate arrangements to check that the working procedures are being implemented correctly;

It is not the function of coordinators to check that working procedures are being correctly followed: but it is their function to coordinate the arrangements by which such checks are made. While the distinction may be a fine one on smaller simpler sites, it becomes more significant as projects become larger in size and more complex.

The focus should initially be on coordinating the arrangements that will be in place, and then seeing that those arrangements are put into practice and that they are effective. It may be that coordinators will wish to monitor or audit how the arrangements are working. As one part of this, they may wish directly to see what happens when working procedures are being developed and also to see what happens on site when those working procedures are put into effect: but that does not mean that they have direct responsibility for the way in which work is being carried out. That remains the responsibility of employers and the self-employed.

Coordinators may wish to pay particular attention to high-risk activities including those listed in Annex II of Directive 92/57/EEC.



#### Good practices:

Coordinators agreeing with other stakeholders at the outset how they will carry out this coordination function.

Coordinators working in close harmony with those who are managing projects at large.

Coordinators taking a risk-based view when deciding what they need to do.

Coordinators giving particular attention to high-risk activities.



#### Taking steps to ensure that only authorized persons are allowed onto construction sites



##### What does the Directive 92/57/EEC say?

Article 6 :

Project execution stage: duties of coordinators

The coordinator(s) for safety and health matters during the project execution stage appointed in accordance with Article 3 (1) shall:

(f) take the steps necessary to ensure that only authorized persons are allowed onto the construction site.



The steps that coordinators need to take will depend on the particular project, its location and the surrounding environment.

It is helpful for coordinators to agree with clients or project supervisors at the outset what is required and how it will be achieved. Normally, the practical implementation (such as the erection of boundary fencing, the issuing of authorisation permits and on-site security) will be delegated to a contractor. The coordinator's role is then one of checking that the function is being satisfactorily performed by the contractor.

See 4. Managing risks during construction projects, p. 119.



##### Good practices:

If there is no national standard of general safety and health requirements ( e.g. the Irish Safe Pass) before persons are permitted access to construction sites, coordinators and clients can determine alternative rules about who is permitted to enter their construction site.

Coordinators agreeing with clients/project supervisors security specifications that will prevent site access by the unauthorised.

Coordinators monitoring that the agreed precautions are being taken and that they are effective.

#### Updating safety and health plans



##### What does the Directive 92/57/EEC say?

Article 6 :

The coordinator(s) for safety and health matters during the project execution stage appointed in accordance with Article 3 (1) shall:

(c) make, or cause to be made, any adjustments required to the safety and health plan referred to in Article 5 (b) to take account of the progress of the work and any changes which have occurred;

Coordinators should ensure that safety and health plans are regularly reviewed having regard to the nature and scale of a project and the safety and health risks that it poses.

Reviews can typically be carried out when additional employers carrying out high-risk work are selected for a project so that their observations can be taken into account, before commencing major stages of a project, at intermediate intervals as may be necessary having regard to the particular project and whenever it is apparent that a plan is not achieving its intended purpose.

Relevant stakeholders should be consulted to avoid the possibility that changes to the plan to suit one employer do not inadvertently disadvantage the safety and health of another's workers.

Adjustments to plans should be brought to the attention of those employers and self-employed persons who may be affected.



#### **Good Practices:**

**Coordinators agreeing with other stakeholders at the outset how they will carry out this coordination function.**

**Coordinators making sure that employers and the self-employed have opportunities to influence adjustments to the plan through regularly addressing safety at meetings, and through introductory meetings when new employers are introduced to the project.**

**Coordinators giving particular attention to high-risk activities.**

#### **Updating safety and health files**

Project preparation stage coordinators will pass incomplete safety and health files to project execution stage coordinators so that files can be adjusted in the light of further information that later becomes available. The expectation is that coordinators will take the lead in completing files and that others involved in the project execution stage will cooperate in providing them with information.

🔗 **See 2.4.3 Safety and health file, p.95.**

### **2.3.6 Employers**

#### **a) Definition**



#### **What does the Directive 89/391/EEC say?**

Article 3 :

(b) employer: any natural or legal person who has an employment relationship with the worker and has responsibility for the undertaking and/or establishment;

A construction project may involve one or more employers.  
Contractors and subcontractors, designers, etc may be employers and have workers on a construction site.

**Example 72:**

A company 'A' has entered into a works contract for installing a heating and ventilation system with a private client who is constructing an office building. This company employs 10 employees or workers on this project. The company 'A' is an employer and a contractor.

The company 'A' subcontracts the thermal insulation work to a company 'B' which employs one worker on the site. Company B is also an employer.

Companies A and B are responsible for the safety and health of their respective employees and they have further obligations where their work may adversely affect other workers.

**b) Functions of employers**

The obligations of employers under Directive 92/57/EEC, are explained in this Guide. Employers will have further obligations under a range of safety and health directives, most notably the 'Framework' Directive, 89/391/EEC and its individual directives. These are beyond the scope of this Guide although some mention is made of some Framework Directive Articles where they are specifically mentioned in Directive 92/57/EEC.

**What does the Directive 92/57/EEC say?****Article 9:****Obligations of employers**

In order to preserve safety and health on the construction site, under the conditions set out in Article 6 and 7, employers shall:

- (a) in particular when implementing Article 8, take measures that are in line with the minimum requirements set out in Annex IV;
- (b) take into account directions from the coordinator(s) for safety and health matters.

Article 6 sets out how construction work should be carried out on a construction site to secure safety and health by placing functions on project execution stage coordinators. Briefly, employers need to note that the conditions set out by Article 6 give a number of important functions to coordinators and that employers need to cooperate with coordinators so that those functions can be successfully performed. For advice on what these functions are, see Article 6.

Article 7 makes clear that the principle of employers' responsibilities under the 'Framework' Directive 89/391/EEC, for the safety and health of their workers is unaffected by the responsibilities and functions of other stakeholders in a construction project.

Employers have to implement the requirements of Article 8 insofar as their activities affect the safety and health of their workers and other construction workers. Article 8 comprehensively covers the issues that are likely to secure the safety and health of construction workers on a project. Annex IV sets minimum requirements for a wide range of

issues specific to construction work and employers have to meet these minimum requirements when taking steps to comply with Article 8.

Employers have to take into account directions from coordinators on matters of safety and health. These can be wide-ranging given the functions that coordinators have, including for safety and health plans and files and for coordination functions in securing safety and health during construction works. Employers should note that they need to take account of directions from project preparation stage coordinators as well as project execution stage coordinators.

🔗 **See h) What are the functions of coordinators for safety and health matters during the project execution stage?, p.68.**



Employers who are personally engaged in work activities on construction sites have additional obligations.

🔗 **See c) Employer personally engaged in work activity, p.80.**



#### **Example 73:**

A company specialises in repairing the facades of buildings. It employs 4 workers with specialist skills.

This employer normally carries out work at height using working platforms suspended from roof level.

The safety and health plan prepared for the project specifies that the work should be performed using traditional scaffolding placed around the periphery of the building because other trades need to follow on after the repairs have been carried out and so that workers using the building will not be at risk from falling material and, likewise, members of the public.

The employer therefore takes the safety and health plan into account and adopts working methods using traditional scaffolding. The employer is therefore acting in conformity with The Directive and Annex IV.

### **Implement article 6 of Directive 89/391/EC**



#### **What does the Directive 92/57/EEC say?**

##### **Article 8**

##### **Implementation of Article 6 of Directive 89/391/EEC**

When the work is being carried out, the principles set out in Article 6 of Directive 89/391/EEC shall be applied, in particular as regards:

- (a) keeping the construction site in good order and in a satisfactory state of cleanliness;
- (b) choosing the location of workstations bearing in mind how access to these workplaces is obtained, and determining routes or areas for the passage and movement and equipment;

- (c) the conditions under which various materials are handled;
- (d) technical maintenance, pre-commissioning checks and regular checks on installations and equipment with a view to correcting any faults which might affect the safety and health of workers;
- (e) the demarcation and laying-out of areas for the storage of various materials, in particular where dangerous materials or substances are concerned;
- (f) the conditions under which the dangerous materials used are removed;
- (g) the storage and disposal or removal of waste and debris;
- (h) the adaptation, based on progress made with the site, of the actual period to be allocated for the various types of work or work stages;
- (i) cooperation between employers and self-employed persons;
- (j) interaction with industrial activities at the place within which or in the vicinity of which the construction site is located.

The principles set out in Article 6 of the Framework Directive, 89/391/EEC, are the general principles of prevention.

↳ **See 1. General Principles of Prevention (GPP) on Safety and health at work, p.20.**

Items (a) to (j) set out above cover the general activities that occur on construction sites and require no further explanation in this Guide.

Employers have to apply the general principles of prevention to when they carry out such activities. They additionally have to ensure that the measures they take are in line with the minimum requirements set out in Annex IV of Directive 89/391/EEC.

↳ **See 4.1.3 Concluding preparations before starting construction work, p.142; and a) Managing projects for safety and health, p.163.**

#### Information for workers



#### What does the Directive 89/391/EEC say?

##### Article 11

##### Information for workers

1. Without prejudice to Article 10 of Directive 89/391/EEC, workers and/or their representatives shall be informed of all the measures to be taken concerning their safety and health on the construction site.
2. The information must be comprehensible to the workers concerned.



Briefly, Article 10 of Directive 89/391/EEC requires employers to provide information to workers and/or their representatives about:

- safety and health risks;
- the protective and preventive measures that will be taken by their employer; and
- which people have been designated to deal with first-aid, fire fighting and emergency evacuation.

## 2. Safety and health requirements at construction sites

### 2.3 The stakeholders in a construction project – Employers

Article 11 of Directive 92/57/EEC requires workers to be informed more generally about what is to be done to secure their safety and health while they are working at particular construction sites. Employers need to ensure that the information is provided. They can arrange for others to do this so long as the function is properly discharged. For instance, projects may wish to have a common approach to the provision of general information that is applicable to all workers on the site. In such instances, individual employers would then provide further information particular to their own workers.

Comprehension is an issue raised by the Article. Those providing information need to ensure that it is comprehensible. Information needs to be clear and concise: and people need to be given time to absorb and understand it. It need not be in written form. Word of mouth, illustrations and video presentations may achieve equal or better results. Care needs to be taken that workers on sites where the common language is not their native tongue fully understand the information they are given.



#### Good Practices:

Coordinators making campaigns on specific topics (e.g.: personal protective equipment, noise, etc...).

Having short weekly tool-box talks where safety and health is an integrated item.

On larger or more complex construction sites requesting a specific introductory course before any worker can enter the site.



#### Example 74:

The coordinator and employers on the project agree that a common video induction presentation will be given to all workers before they are authorised to enter the construction site. This presentation deals with issues that affect all workers on the project (e.g. general safety and health risks at the project and what collective measures are being taken to combat them, emergency procedures and the site rules that are applicable to all. Workers will also be given small durable cards with essential reminders.

The coordinator and employers agree to have a 'hazards' board that is updated with information about particular 'hazards of the day.'

They also agree to arrange regular 'toolbox talks' for all workers that focus on topics relevant to the stage of construction.

Employers understand that they need to complement this information with further safety and health information that is particular to their own workers during the

activities that they are to undertake before the activities start and during them. They include short reviews by each gang before work starts on every working day.



#### **Example 75:**

A small contractor employs a range of trades to carry out short-term repair work that often lasts less than a few hours. This business has safety and health information that is likely to apply to nearly all of its work: and this is explained to all new workers as a part of their initial induction. Regular safety briefings are arranged to remind workers. Succinct job cards are issued for all work activities and these contain any additional information that is unique to the particular job.

See Training, Information, Consultation and Participation, p. 153; Information, consultation and participation - Workers and/or their representatives, p. 167; and Site access points and routes, p. 148.

### **Consult workers**



#### **What does the Directive 89/391/EEC say?**

##### Article 12

##### Consultation and participation of workers

Consultation and participation of workers and/or of their representatives shall take place in accordance with Article 11 of Directive 89/391/EEC on matters covered by Articles 6, 8 and 9 of this Directive, ensuring whenever necessary proper coordination between workers and/or workers' representatives in undertakings carrying out their activities at the workplace, having regard to the degree of risk and the size of the work site.

Article 11 of the Framework Directive, 89/391/EEC sets out in detail how workers and their representatives should be consulted on safety and health issues. It is beyond this Guide to provide detailed advice on the generalities of what that Directive requires.

Briefly, workers are entitled to be consulted on matters related to their safety and health and to make proposals for the improvement of any preventive measures that are to be implemented by the employer. This consultation and participation can typically include:

- Selection of personal protective equipment;
- Collective protective equipment (e.g. guardrails, safety nets, etc.);
- Safety and health training programs; and
- A range of other issues relevant to the workplace.

Article 12 of Directive 92/57/EEC requires that this consultation and participation is extended to the following issues, briefly, the:

- Coordination of the implementation of the general principles of prevention and other provisions at the construction site (Article 6);
- The possible need to make adjustments to safety and health plans (Article 6);
- Cooperation, coordination and the sharing of information between employers (Article 6);
- Coordination of arrangements for checking working procedures (Article 6);
- Exclusion of unauthorised people from the construction site (Article 6);



## 2. Safety and health requirements at construction sites

### 2.3 The stakeholders in a construction project – Employers

- Core employer functions in Article 6 of the Framework Directive, 89/391/EEC (Article 8); and
- Employer obligations in Directive 92/57/EEC (Article 9).

Article 12 requires that there is coordination between workers and/or workers' representatives. Regard can be had to the degree of risk and the size of the work site when deciding what coordination there should be.



#### Good Practices:

The coordinator and employers on the project agree that a common approach will be taken to worker consultation and participation. Opportunities for consultation and participation are introduced into all induction presentations and toolbox talks. A 'safety suggestions' box is provided, regular 'open door' opportunities to speak to senior managers are introduced and a safety and health committee is established for the project with membership reflecting the state of progress and the hazards.

Representatives of all contractors and other employers executing the works on the site will participate in the committee.

Employers understand that they need to complement this consultation and participation as necessary with their own company arrangements.

The employer integrates consultation and participation into initial worker induction, and regular safety briefings.

↳ See Training, Information, Consultation and Participation, p. 153; and Information, consultation and participation - Workers and/or their representatives, p. 167.

### c) Employer personally engaged in work activity



#### **What does the Directive 92/57/EEC say?**

Article 10:

2. In order to preserve safety and health on the site, where employers are personally engaged in work activity on the construction site, they shall:

(a) comply in particular with the following, mutatis mutandis:

- (i) Article 13 of Directive 89/391/EEC;
  - (ii) Article 4 of Directive 2009/104/EC and the relevant provisions of Annex I thereto;
  - (iii) Articles 3, 4 (1), (2), (3), (4), (9) and 5 of Directive 89/656/EEC;
- (b) take account of the comments of the coordinator(s) for safety and health.

Employers who are personally engaged in work activity on a construction site are a separate group of persons with certain specific obligations. They have to:

- Take care as far as possible for their own safety and health and that of other persons affected by their work activities;
- Comply with certain requirements of Directive 2009/104/EU relating to the safe use of work equipment;
- Comply with certain requirements of Directive 89/656/EEC relating to personal protective equipment; and
- Take account of the comments of coordinators for safety and health.



Guidance on these other directives is beyond the scope of this Guide.

#### d) Employer's Responsibilities under the Framework Directive, 89/391/EEC



##### What does the Directive 92/57/EEC say?

Article 7:

2. The implementation of Articles 5 and 6, and of paragraph 1 of this Article shall not affect the principle of employers' responsibility as provided for in Directive 89/391/EEC.

The functions assigned to coordinators by Directive 92/57/EEC do not relieve employers from their responsibilities under the 'Framework' Directive, 89/391/EEC.

Directive 92/57/EEC assigns additional responsibilities to employers to reflect the nature of construction work and the requirements in the Directive for addressing hazards and risks.

### 2.3.7 Contractors and subcontractors

In common usage, a contractor is a person (natural or legal) who undertakes or manages construction works: and a subcontractor is a person who undertakes or manages construction work assigned to them by a contractor.

The Directive specifically refers to contractors in determining whether coordinators are required (i.e. more than one contractor) and in the information required by the 'prior notice.'

The Directive makes no mention of subcontractors because they are considered to be contractors.

For the purposes of this Directive, contractors and subcontractors will either be employers or self-employed people; and they should fulfil the functions assigned to them.

### 2.3.8 Self-employed persons

#### a) Definition



#### What does the Directive 92/57/EEC say?

Article 2 :

(d) 'self-employed person' means any person other than those referred to in Article 3 (a) and (b) of Directive 89/391/EEC whose professional activity contributes to the completion of a project;

For the purposes of this Directive, self-employed persons are not persons employed by an employer and they are not employers: but they are other persons whose professional activities contribute to the completion of a project at whatever stage. Other definitions of self-employed persons are of no relevance.

Self-employed persons have particular functions to perform under this Directive. In many respects, they are treated as though they were both employees and employers.

#### b) Duties



#### What does the Directive 92/57/EEC say?

Article 10 :

1. In order to preserve safety and health on the construction site, self-employed persons shall:

(a) comply in particular with the following, mutatis mutandis:

- (i) the requirements of Article 6 (4) and Article 13 of Directive 89/391/EEC and Article 8 and Annex IV of this Directive;
- (ii) Article 4 of Directive 2009/104/EU and the relevant provisions of Annex I thereto;
- (iii) Article 3, Article 4 (1) to (4) and (9) and Article 5 of Directive 89/656/EEC;

(b) take into account directions from the coordinator(s) for safety and health matters.

Briefly, self-employed persons have to:

- Cooperate and coordinate their activities, and exchange information for the purposes of safety and health with employers, other workers and other self-employed people sharing the same workplace;
- Take care as far as possible for their own safety and health and that of other persons affected by their work activities;
- Comply with the requirements of Article 8 of this Directive.
- Comply with the requirements of Annex IV of this Directive.
- Comply with the requirements of Article 4 of Directive 2009/104/EU and the relevant provisions of Annex I thereto relating to the safe use of work equipment;
- Comply with the requirements of Article 3, Article 4 (1) to (4) and (9) and Article 5 of Directive 89/656/EEC relating to personal protective equipment; and
- Take into account directions from the coordinators for safety and health matters.

For further information, see relevant parts of this Guide.



#### Good Practices:

**Coordinator taking steps to ensure that self-employed persons are sufficiently informed and have sufficient training, knowledge and experience of safety and health issues relevant to their work.**

**Self-employed persons ensuring that they sufficiently plan, organise and monitor their work for their safety and health and for that of others according to provisions included in safety and health plans.**

### 2.3.9 Workers and their representatives

#### a) Definition



##### What does the Directive 89/391/EEC say?

Article 3 :

worker:

- any person employed by an employer, including trainees and apprentices but excluding domestic servants;

workers' representative with specific responsibility for the safety and health of workers:

- any person elected, chosen or designated in accordance with national laws and/or practices to represent workers where problems arise relating to the safety and health protection of workers at work;

These definitions are self-explanatory.

Formal elections of workers' representatives may perhaps create problems where the turnover of workers is high due to the nature of the project. Selection by other permitted means might provide an alternative way forward, subject to national legislation.



##### Good practices:

**On large projects, agreeing at the outset with employers, workers and/or their representatives how workers' representatives will be selected according to national legislation.**

**On smaller projects considering the selection of a common workers' representative working across different contractors.**

**Considering the selection of regional representatives for the workers.**

#### b) Information of workers



##### What does the Directive 92/57/EEC say?

Article 11 :

Information for workers

1. Without prejudice to Article 10 of Directive 89/391/EEC, workers and/or their representatives shall be informed of all the measures to be taken concerning their safety and health on the construction site.

2. The information must be comprehensible to the workers concerned.



Workers have the right to be informed of the measures that will be taken to address safety and health risks including on matters such as first-aid, fire-fighting and emergency evacuation.

🔗 **See Information for workers, p. 77.**

#### c) Consultation of workers



##### **What does the Directive 92/57/EEC say?**

Article 12 :

Consultation and participation of workers

Consultation and participation of workers and/or of their representatives shall take place in accordance with Article 11 of Directive 89/391/EEC on matters covered by Articles 6, 8 and 9 of this Directive, ensuring whenever necessary proper coordination between workers and/or workers' representatives in undertakings carrying out their activities at the workplace, having regard to the degree of risk and the size of the work site.

Article 11 of the Framework Directive, 89/391/EEC sets out in detail how workers and their representatives should be consulted on safety and health issues. It is beyond this Guide to give good practice advice on the generalities of what it requires.

For advice on consultation and participation of workers under Article 12 of Directive 92/57/EEC:

🔗 **For further information on consultation and participation of workers under Article 12 of Directive 92/57/EEC, see Consult workers, p. 79.**

#### d) Duties of workers

The main obligations placed on workers can be found in Article 13 of the Framework Directive, 89/391/EEC. Practical advice on that Directive is beyond the scope of this Guide. However, the text of the Directive is contained in Annex 7. Directive 92/57/EEC places no additional duties on workers.

### 2.3.10 Suppliers

Suppliers to construction projects typically supply services including professional services, products, technical equipment and utilities. Those providing services (such as design, deliveries and project management) need to be clear whether they have duties under the Directive. This Guide will help them to find out if they do.

Suppliers may be subject to Directives other than the Construction Site Directive. (e.g.: the internal market directives such as the Machinery Directive 98/37/EEC<sup>10</sup>).



#### **Good Practices:**

Involving suppliers of products in projects in a number of ways. They may design, manufacture or import products that they supply to a number of projects; or they may carry out the same functions where the product is unique to a particular project. If the latter, it may be that the design element is covered by the Directive (e.g. the supply of specially designed pre-cast concrete cladding panels).

Suppliers of products can usefully assist projects by the information they can provide about the safe transportation, storage, assembly and use of their products (including substances) to those developing designs, and to those co-ordinating and carrying out on-site activities.

Suppliers of utilities such as water, gas, electricity and telecoms, may be involved in the temporary or permanent installation and maintenance of services for use during the execution stage of projects as well as for completed projects. Their work may be covered by the scope of the Directive, typically as designers and employers: and this guide will assist them in finding out what they need to do.



#### **Good Practices:**

Where suppliers and their employees are present on construction sites, they need to be able to take account of safety and health plans, in particular the applicable rules. Those arranging for the supply of products and project coordinators need to have this issue in mind when they organize cooperation between employers and coordinate their activities. Logistical issues for transportation routes near to and on construction sites, dedicated storage areas (whether on site or nearby) and mechanical handling systems are typical of the factors that may need to be considered. The on-site safety implications should be considered where suppliers provide their own mechanical handling equipment (e.g. truck-mounted lifting devices and tail-mounted fork lift trucks).

### **2.3.11 Others**

Others may also be at risk on construction sites, for instance visitors, clients' employees and the employees of those entitled to enter construction projects. Where this is the case, site rules and the arrangements for coordination and cooperation will need to take such persons into account. Such people should be informed about site rules and how they can comply before they enter areas of risk.

All visitors to site should be informed of and comply with site rules.

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<sup>10</sup> Directive 98/37/EC of the European Parliament and of the Council of 22 June 1998 on the approximation of the laws of the Member States relating to machinery - OJ L 207, 23.7.1998, p. 1–46

Specific information about these rules should be prepared and be available to them before entering onto the construction site.



#### **Good Practices:**

The workers of other nearby employers and people invited into their workplaces (e.g. consider schools, hospitals, shops and offices, transportation interchanges, etc) may be at risk from construction activities. While not sharing the same workplace as the construction project, there will be cases where good practice requires cooperation and coordination of their activities so that risks to people are properly controlled.

Ensuring that site visitors and other workers not engaged in construction work but who enter a site have been informed of relevant site rules and have the necessary instruction and training to secure their safety and health

## 2.4 Documents required for prevention

Directive 92/57/EEC introduces the following three documents:

- Prior Notice,
- Safety and Health Plan,
- Safety and Health File.

In brief, 'prior notices' give notification to the competent authorities of new projects, while safety and health plans and safety and health files aim to identify and prevent occupational safety and health risks, the first during project execution stages and the second during subsequent construction work over the 'whole life' of a facility.

The preparation of safety and health plans and safety and health files should be commenced during a project's preparation stage. Where appropriate, they should be included in any tendering or similar pre-contract document exchanges so that all prospective contractors may take them into account when preparing their proposals.

Both are open and dynamic documents. They should be updated throughout the life of the project so that they serve their intended purposes.

There are other documents that may typically be created during a project. These include:

- Pre-construction information that clients, assisted by project supervisors and coordinators for safety and health matters at project preparation stages, put together to assist designers and contractors carrying out their work; and
- Risk assessments made by project stakeholders under the Framework Directive or as a means for fulfilling functions stakeholders have under Directive 92/57/EEC.

## 2. Safety and health requirements at construction sites

### 2.4 Documents required for prevention

The following Table summarises when 'prior notice' and safety and health plans and files are required. It also indicates when coordinators should be appointed.

Conditions for the provision of documents required for prevention and appointment of coordinators					
Number of Contractors (including subcontractors)	Prior Notice		Safety and Health Plan	Safety and Health File	Appointment of Coordinators
	Less than 31 working days and 21 workers, and less than 501 person days.	More than 30 working days and 20 workers, or more than 500 person days.			
One Contractor			Note that national derogations are permissible if there is no particular risk.		
More than one contractor (including subcontractors)			Note that national derogations are permissible if there is no particular risk.		

Red indicates that there is no need to prepare the requisite document or to appoint coordinators.



Green indicates that there is.





## 2.4.1 Prior notice

### a) Definition



#### What does the Directive 92/57/EEC say?

Article 3 :

3. In the case of constructions sites:

- on which work is scheduled to last longer than 30 working days and on which more than 20 workers are occupied simultaneously, or
- on which the volume of work is scheduled to exceed 500 person-days,

the client or the project supervisor shall communicate a prior notice drawn up in accordance with Annex III to the competent authorities before work starts.

The prior notice must be clearly displayed on the construction site and, if necessary, periodically updated.

Prior notice aims to inform competent authorities (normally Labour Inspectorate) when work is to commence on construction sites. In order that the competent authority can be aware of projects from their inception, some member states require the prior notice to be sent as soon as a coordinator has been appointed.

Clients or project supervisors can send prior notices. The format of such notification (in paper or electronically) is defined at national level. Work cannot start on site unless such notice has been given.

Once construction work starts, the prior notice must be clearly displayed at site and it should be periodically updated, if necessary.



#### Good practices:

**Sending prior notice to the competent authority at the time design and other preparatory work is commenced so that the competent authority has the opportunity to meet with the project stakeholders during design and preparatory work: and then updating this notification before commencing work on the construction site. Sending further notice to the competent authorities where there are significant changes to the information that has been provided (e.g. duration, nature of the works, etc).**

### b) Application

Prior notice is required if work on a site is scheduled to last more than 30 working days and on which more than 20 workers are occupied simultaneously. A working day is a day on which any construction work is carried out no matter how much or how little. The simultaneous working of more than 20 workers is not required throughout the construction work: it simply has to be scheduled at some point during the work.

Prior notice is also required if the work is scheduled to exceed 500 person-days. A 'person-day' means a day on which a construction worker works on the project. For instance, if 10

workers are scheduled to be engaged in construction work for 10 days, that would equate to 100 person-days and would not require prior notice. 15 workers for 40 days would equate to 600 person-days and would require prior notice as it is above the threshold of 500 person-days.

Clients should seek advice from other parties involved in their projects if they are unsure whether the thresholds for prior notice will be exceeded.

### c) Requirements



#### What does the Directive 92/57/EEC say?

##### ANNEX III

##### CONTENT OF THE PRIOR NOTICE REFERRED TO IN ARTICLE 3 (3), FIRST PARAGRAPH OF THE DIRECTIVE

1. Date of forwarding:
2. Exact address of the construction site:
3. Client(s) (name(s) and address(es)):
4. Type of project:
5. Project supervisor(s) (name(s) and address(es)):
6. Safety and health coordinators(s) during the project preparation stage (name(s) and address(es)) .
7. Coordinator(s) for safety and health matters during the project execution stage (name(s) and address(es)):
8. Date planned for start of work on the construction site:
9. Planned duration of work on the construction site:
10. Estimated maximum number of workers on the construction site:
11. Planned number of contractors and self-employed persons on the construction site:
12. Details of contractors already chosen:

The information that is required is self-explanatory. Its display is also important not least to inform emergency and rescue services about the possible number of workers that could be involved. Some information can only be given after contractors have been chosen. It is important for competent authorities to know the key contractors as well as the estimated number of workers on the construction site and it is very important to update the 'prior notice' if these are not known sufficiently early.

## 2.4.2 Safety and health plan

### a) Preliminary remarks

Safety and health plans:

- Aim to identify and put in place arrangements for preventing occupational safety and health risks during the execution stages of projects;
- Place risk assessment and risk management at the core of improved safety and health performance; and
- Are essential tools for managing safety and health issues on construction sites.

All projects require safety and health plans (whether or not there is a coordinator) unless the Member State has decided to introduce derogations that are permitted by the directive. For small low risk projects with a single contractor, a risk assessment made under the Framework Directive may be sufficient for a safety and health plan.

A derogation is not permitted if the project involves work involving 'particular risks' or 'prior notice' is required. You will need to clarify the national requirements for your project.

Early recognition of occupational safety and health risks enables clients and other stakeholders to plan, organise and put in place measures to protect the safety and health of workers who would otherwise be exposed to uncontrolled risks.

This means in particular that:

- Risks to all those involved in construction and risks to third parties from the construction site can be identified, eliminated where possible and, where they cannot, the remaining risks can be effectively managed; and
- The likelihood of personal injury, property damage and delay can be reduced.
- Costs can be reduced by better management and increased efficiency in the use of labour and plant.

Experience shows that a planned approach to occupational safety and health has other benefits such as better project management, improved quality, reduced costs and increased efficiency. Planning therefore creates opportunities for a safe project that is on schedule, of the right quality and within costs.

Plans should not simply be a bureaucratic exercise. Rather, they should add real value to project management functions in combating risks to the safety and health of people exposed to construction work. It is important to ensure a broad ownership of the safety and health plan among all stakeholders involved in the construction project.

### b) Definition



What does the Directive 92/57/EEC say?

Article 3 :

2. The client or the project supervisor shall ensure that prior to the setting up of a construction site a safety and health plan is drawn up in accordance with Article 5 (b).

The Member States may, after consulting both management and the workforce, allow derogations from the provisions of the first subparagraph, except where it is a question of:

- work involving particular risks as listed in Annex II, or - work for which prior

notice is required pursuant to paragraph 3 of this Article.

### What does the Directive 92/57/EEC say?



Article 5 :

Project preparation stage: duties of coordinators

The coordinator(s) for safety and health matters during the project preparation stage appointed in accordance with Article 3 (1) shall:

(b) draw up, or cause to be drawn up, a safety and health plan setting out the rules applicable to the construction site concerned, taking into account where necessary the industrial activities taking place on the site; this plan must also include specific measures concerning work which falls within one or more of the categories of Annex II;

Plans set out rules that have to be applied during construction work to help secure occupational safety and health. Plans need to take into account any other industrial activities that are taking place at the site of the construction works where there may be safety and health implications for either the construction work or for the other industrial activities. Plans must set out specific measures that will need to be taken during construction to address safety and health risks as regards any activities that are to be carried out at site, inter alia those that are mentioned in Annex II to the Directive.



#### Good practices:

**Preparing safety and health plans that are proportionate to the size of the site and the risks involved.**

**Preparing safety and health plans that take into account the risks to which workers and other people may be exposed.**

**Plans can be beneficial even in the case where a member state does not require one. In such cases, a client and their contractor can record their agreements about how the construction work will be carried out in a simple plan.**

**Where there is no coordinator, clients, designers and contractors should agree who will prepare the plan and what will be included. As plans relate to construction activities, contractors would normally be expected to take the lead.**

### c) Application

Coordinators for safety and health during the project preparation stage have to ensure that safety and health plans are drawn up. They can prepare plans themselves or they can take steps to ensure others do so in which case they need to ensure that plans are satisfactory.

☞ **See g) What are the functions of coordinators for safety and health matters during the project preparation stage?, p. 65.**

Others who may be in a position to draw up a plan or parts of a plan will generally be one or more of the other project stakeholders. It is important to clarify who is to contribute to the preparation of a plan at the earliest opportunity as the start of construction work could otherwise be delayed.

Whoever takes the lead in preparing a plan, others should be consulted. These include:

- Clients;
- Designers;
- Project execution stage coordinators as they will be more directly involved during the construction stage;
- Utilities companies;
- The contractors involved in the project;
- Certain suppliers, for instance of concrete elements or ventilation equipment.

A sensible risk-based approach should be taken so that the plan contributes towards improving occupational safety and health including through cooperative and collaborative working between the project stakeholders. Plans should be comprehensible, clearly expressed and proportionate to the risks.

They should be prepared in a way so that they are a dynamic or 'living' document that can be expanded during the construction process according to the characteristics and the risks that will be present.

Plans enable stakeholders to:

- Identify and review the hazards and risks from the work and from the working environment;
- Decide how these can best be addressed;
- Organise and make necessary arrangements before the work starts;
- Take a structured approach during the work; and
- Have a benchmark against which to monitor and review performance.

Clients or their project supervisors will need to check with their project preparation stage coordinators whether a suitable and sufficient plan has been prepared before they permit work to start in setting up the site.

Plans should be made available to clients and project supervisors, coordinators for safety and health matters during construction stages, contractors and employers, self-employed persons and workers' and their representatives so that they may appreciate what contributions they are expected to make during project execution stages.

#### **d) Requirements**

Safety and health plans are required for all construction sites unless a member state has allowed derogation in accordance with Article 3(2) of the Directive.

A derogation is not permitted if the project involves work involving 'particular risks' or 'prior notice' is required. You will need to clarify the national requirements for your project.

🔗 **See 2.4.1 Prior notice, p.88; and 2.5.1 Work involving particular risks to the safety and health of workers, p. 98.**

The Directive's requirement for safety and health plans does not release employers and other persons from any obligations they may have under this or other directives.

#### **e) Contents of safety and health plans**

Safety and health plans serve primarily to set out the rules applicable to the construction site concerned and must specifically deal with any activities that are to be carried out at site including those that are mentioned in Annex II of the Directive. They should take into account

any other industrial activities taking place at the site. Plans can assist in co-ordinating measures that are relevant to a number of contractors.

Plans can usefully cover other matters. A comprehensive plan for a large complex might include the sorts of issues set out in Annex 5 to this Guide. However, it is important that the contents, format and style of a plan is appropriate having regard to the hazards and risks on the project.

Annex 5 may also serve as a checklist for smaller projects provided a sensible approach is taken in determining a plan's contents.

Plans can be arranged under the following major headings:

- General information about the project;
- Project specific information and information sources;
- Information on how the project will be managed;
- Arrangements for controlling significant risks; and
- Arrangements for contributing for the safety and health file.

Plans may be developed at the outset to cover all of the construction work that will be involved. However, it is probable that such an approach is unrealistic for major projects, not least because final designs and contractor selection for some of the high-risk activities may not be sufficiently advanced or complete. Where this is so, plans can be structured so that they can be updated and extended to cover such activities provided that they are initially suitable for the early construction work.



#### **Good Practices:**

**Agreeing at an early stage who will prepare, who will be consulted and who will contribute to a plan.**

**Ensuring plans are comprehensible, clearly expressed and proportionate to the risks.**

**Making plans readily available so that others can consult them.**

**Keeping plans up to date.**

➤ See Annex 5 - Safety and health plan: suggested contents, p. 193, for further detailed suggestions on the kinds of issues that might be included in a plan.

## **f) Update**



### **What does the Directive 92/57/EEC say?**

Article 6 :

The coordinator(s) for safety and health matters during the project execution stage appointed in accordance with Article 3 (1) shall:

c) make, or cause to be made, any adjustments required to the safety and health plan referred to in Article 5 (b) and the file referred to in Article 5 (c) to take account of the progress of the work and any changes which have occurred;

Once construction work has commenced, it is the coordinators for safety and health during project execution stages who have to update safety and health plans.

Plans should be regarded as dynamic working aids that have to be adapted and updated so that they can contribute to further project planning and execution.



#### Good Practices:

Updating might be necessary when:

- The means for hoisting materials changes. Often cranes are removed once structural work has been completed and hoists are installed. New risks, such as falls, arise:
- The nature and scope of the work changes;
- Design changes are made;
- Contractors change or additional ones are appointed;
- Clients' requirements change;
- The surrounding environment changes;
- Additional information relevant to safety and health becomes available;
- Method statements or tasks change.
- New legal requirements and technical standards are introduced.

## 2.4.3 Safety and health file

### a) Definition



#### **What does the Directive 92/57/EEC say?**

Article 5 :

c) prepare a file appropriate to the characteristics of the project containing relevant safety and health information to be taken into account during any subsequent works.

Safety and Health Files are the principal documents for assisting in identifying and managing risks during subsequent design and construction work after a project has been completed and throughout the 'whole-life' of the finished work until its eventual dismantling or demolition.

Files should contain relevant occupational safety and health information that might usefully be taken into account.



#### Example 76:

During the maintenance or replacement of operational equipment in tunnels, special hazards arise from the road or rail traffic if the tunnel cannot be closed. A particular risk is posed, for instance, when working in smoke evacuation galleries, if their activation in case of a tunnel fire is not precluded. The safety and health file must prescribe organisational mitigation procedures; better still would be technical precautions such as double-key systems hindering the activation of dangerous functions during maintenance.

Files help clients and others by

- Providing a single document containing essential safety information about a completed project;
- Making it easier to understand how routine maintenance and repairs can be carried out in safety; and
- Making the design and planning of subsequent construction work easier to achieve.

There is no single detailed list of contents that is applicable to all projects. The contents of a file must reflect the hazards and risks of the project under consideration.

🔗 See Annex 6 - Safety and health file: suggested contents, p. 202.

## b) Application

A safety and health file is mandatory for all construction projects where there are coordinators.

The Directive requires coordinators for safety and health matters at the project preparation stage to start the preparation of the safety and health file. Coordinator for safety and health matters at the project execution stage update and complete files as construction work is carried out.



### Good practices:

Updating and extending an existing file for a facility when alterations, etc, are being made rather than starting a new file.

Having a file even where there is only a single contractor and no coordinator to prepare it. Clients can make arrangements with other project stakeholders so that files are prepared and updated.

Clients and coordinators agreeing in the early project stages the contents, form (e.g. paper, electronic) and layout of a file.

Ensuring that files are comprehensible, clear, concise and well indexed.

Excluding information that adds no value to a file.

Considering whether the information in a file might usefully be an integral part of other building records, such as maintenance and repairs manuals.

Coordinators letting other stakeholders know what and when they will be expected to contribute to the preparation of a file.

Coordinators agreeing who will take the lead at particular times in the preparation of the file, how best to make the handover and how to deal with any outstanding information. Decisions about the best way forward are best taken on a project basis having regard to keeping the interfaces between coordinators as simple as possible.

Completing files at the earliest opportunity so that clients have information that they need.

Having a system for ensuring that there is a 'controlled' master copy and for the controlled issue of updates.

Passing files on when ownership changes.

Passing copies to others where a number of people are separately responsible for the



upkeep of a part of a facility.

### c) Contents of safety and health files

The contents of the file should be determined by the foreseeable needs of other people designing, planning or carrying out further construction work on the finished project. Foreseeable high-risk activities should be given particular attention (e.g. work at height, the replacement of heavy plant items).

Unnecessary text should be excluded. It makes finding essential information more time consuming and difficult.

The contents, form and format will necessarily vary depending on the project, the client, and the foreseeable hazards and risks. Annex 6 provides a checklist for the suggested contents but each case should be decided on its merits.

Account should be taken of any existing files and whether it is better to update them or create a new file. Such decisions will necessarily need to have regard to the future needs of clients, designers and contractors in readily identifying the information they will require having regard to the key hazards and risks.

Contractors should pass to coordinators all the information required to complete or update a file. This transfer of information should happen as early as possible so that there is no delay in completing files. Delay generally leads to increased costs being incurred by all stakeholders and a reduction in the quality of the information provided.

Procedures should be in place to ensure that information from changes during the execution stage is available on time to coordinator.

Files should be handed to clients as soon as they are completed. Ideally, this should be at the conclusion of construction or, failing that, as soon as practicable thereafter.

🔗 **See Annex 6 - Safety and health file: suggested contents, p. 202, for further detailed suggestions on the kinds of issues that might be included in a file.**

### d) Updating files

Safety and health files will be used during the whole life of the facilities to which they relate. It is therefore helpful for a file to be kept up to date even if the further work does not require a file. A file that provides an incomplete record can create dangerous situations if it is relied upon. Retrospective surveys and other work to update a poorly maintained file is liable to prove expensive and can be avoided where there are effective arrangements for keeping files up to date.



#### **Example 77:**

**Any removal or encapsulation of asbestos or asbestos-containing materials should be noted in the file.**

## 2.5 Works involving particular/special risks

### 2.5.1 Work involving particular risks to the safety and health of workers



#### What does the Directive 89/391/EEC say?

##### ANNEX II

NON-EXHAUSTIVE LIST OF WORK INVOLVING PARTICULAR RISKS TO THE SAFETY AND HEALTH OF WORKERS REFERRED TO IN ARTICLE 3 (2), SECOND PARAGRAPH OF THE DIRECTIVE

1. Work which puts workers at risk of burial under earth falls, engulfment in swampland or falling from a height, where the risk is particularly aggravated by the nature of the work or processes used or by the environment at the place of work or site (\*).
2. Work which puts workers at risk from chemical or biological substances constituting a particular danger to the safety and health of workers or involving a legal requirement for health monitoring.
3. Work with ionizing radiation requiring the designation of controlled or supervised areas as defined in Article 20 of Directive 80/836/Euratom <sup>(1)</sup>.
4. Work near high voltage power lines.
5. Work exposing workers to the risk of drowning.
6. Work on wells, underground earthworks and tunnels.
7. Work carried out by divers having a system of air supply.
8. Work carried out by workers in caissons with a compressed-air atmosphere.
9. Work involving the use of explosives.
10. Work involving the assembly or dismantling of heavy prefabricated components.

(\*) In implementing point 1, Member States have the option of setting figures for individual situations.

<sup>(1)</sup> OJ No L 246, 17. 9. 1980, p. 1. Last amended by Directive 84/467/Euratom (OJ No L 265, 5. 10. 1984, p. 4).

The Directive identifies in Annex II certain works involving particular risks that require safety and health plans to be prepared before site work commences. The Directive also requires that safety and health plans to include specific measures concerning such work.

The first category of work identified in Annex II concerns the work where the risk is particularly aggravated by the nature of the work or processes used or by the environment at the place of work or site. Member States have the option of setting figures for individual situations and you will need to check national legislation to find out how this affects your project. The activities covered by this first category are three in number and are listed in

point 1 to Annex II: they are risk of burial under earth falls, engulfment in swampland, falling from a height.

#### a) Burial under earth falls<sup>1</sup>



These can occur for a number of reasons such as the geology, adjacent facilities, previous disturbance of the ground by earlier excavations or by the work that is proposed, for instance, if vehicles and plant are to be used close by to excavations, and if the structure of the ground will be adversely disturbed by the work. The best approach is to identify the hazards and avoid the risks by good design. Where the risk cannot be entirely eliminated, it is usual to provide temporary supports to the vertical sides of excavations or to slope the sides so that they will be stable without support. Complex excavations require particular consideration.

#### b) Engulfment in swampland

Some ground will not be able to support the loads imposed by workers, plant and materials. These need to be identified before work starts and they should then be clearly demarcated and avoided. Safe working methods using special plant and vehicles must be devised where it is necessary to work over swampland.

#### c) Falling from a height



This is the most common cause of fatal injuries during construction work. Serious falls, occasionally fatal, can occur from the lowest of heights. Falls can occur due to a number of causes such as untidy workplaces, slippery surfaces and, most importantly, the failure to provide common protective measures such as suitable guard-rails or to use personal protective equipment. Falls through fragile materials are a common cause of serious and fatal injuries.

Work at height therefore requires particular consideration in construction site safety and health plans. Again, the best solution is through good design that eliminates the hazard and the application of good management to any residual risks that remain. For instance, off-site manufacture, pre-assembly at ground level (or in other well controlled environments) can reduce work at height. The provision of suitable and well maintained temporary working platforms and mechanised access platforms help in reducing risks.

A further Directive, 2009/104/EC<sup>2</sup>, concerning the minimum safety and health requirements for the use of work equipment by workers at work particularly addresses the issue in its Annex II. You will find comprehensive practical advice in the Non-binding Guideline on "How

<sup>1</sup> This is one of the three work types where Member States have the option of setting figures for individual situations. See Annex II of the Construction sites Directive.

<sup>2</sup> Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ 3.10.2009 L 260

to choose the most appropriate work equipment for performing temporary work at a height.”<sup>1</sup>

#### d) Chemical or biological substances

Work which puts workers at risk from chemical or biological substances that constitute a particular danger to the safety and health of workers or involving a legal requirement for health monitoring always requires the preparation of a construction site safety and health plan.

Employers and the self-employed already have obligations due to a number of other directives, in particular, the Chemical Agents<sup>2</sup>, Biological Agents<sup>3</sup> and other substance specific directives – Asbestos<sup>4</sup>.



The directives require a risk-based approach and those assessments need to be taken into account in construction site safety and health plans.

In principle there are 3 different ways of coming into contact with chemical substances: first, as substances specified for use in a construction project – e.g. paint, glue, surface coatings, etc. - second, from the cutting or degradation of construction materials – e.g. wood-dust, quartz particles from concrete, etc., - and third, as residues from the past – e.g.: asbestos, lead, contaminated land and PCBs, etc.

Asbestos continues to damage the health of construction workers. While it is no longer used in new construction, it is liable to be found in many locations during work on existing facilities and pre-construction surveys will normally be required. Maintenance and demolition workers need to be alert to the risks.

Lead is still used in new construction, such as for roofing and decorative cladding, and in repairs and renovation work. Dust from such work poses a health risk. Lead fume can be a hazard when hot cutting through surfaces that have been coated with lead-based paints.

A wide range of chemicals is used in modern construction work. This requires designers and users to consider the hazards and select materials and working methods that give the best opportunities for preventing harmful exposure. There can also be exposure to chemicals from contaminated ground and from contaminated facilities and plant due to industrial processes, whether or not they are still active or ceased many years ago.

Biological agents can be present in the soil, in sewers and drains, in water-cooling towers, in attics, in basements, in certain workplaces such as biohazard laboratories and so on.

#### e) Ionizing radiation

<sup>1</sup> <http://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=140&type=2&furtherPubs=yes>

<sup>2</sup> Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work (fourteenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ 5.5.98 L 131/11

<sup>3</sup> Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work (seventh individual directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ 17.10.2000 L 22/21

<sup>4</sup> Directive 2003/18/EC of the European Parliament and of the Council of 27 March 2003 amending Council Directive 83/477/EEC on the protection of workers from the risks related to exposure to asbestos at work - OJ 15.4.2003 L 97/48

Work with ionizing radiation requiring the designation of controlled or supervised areas as defined in Directive 96/29/Euratom<sup>1</sup>.

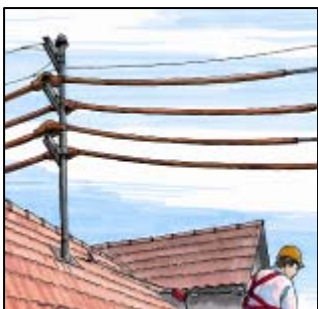


Ionizing radiation can be used for on-site non-destructive testing when examining welds and carrying out other investigations. Special exposure prevention measures will be required under that Directive and these should be taken into account in construction site safety and health plans.

Once more, there are ways of avoiding such hazards altogether. Alternative non-destructive testing methods can be used on site and, if there is no alternative to these kinds of examinations, off-site testing in purpose-built facilities may be an option.

Workers may also be at risk of radiation exposure due to the working environment, for instance at nuclear facilities (e.g. defence establishments, power stations, research facilities, universities, hospital nuclear medicine facilities, etc) and from equipment containing ionizing sources such as density gauges and smoke detectors.

#### f) Work near high voltage power lines or near to the high voltage installations



Work near high voltage power lines can cause serious and fatal injuries due to direct contact with live lines or arcing from those lines to nearby plant and equipment. These hazards can be avoided by good design, by making the lines dead for the duration of the work, (clearly the best option), or by effective management controls involving safe working methods and the clear demarcation of zones (in consultation with the line operators) from which plant and machinery should be excluded.

Work in close proximity to high voltage lines during their installation and maintenance is a highly specialised activity that should only be undertaken by employers and the self-employed who have the necessary knowledge and experience.

#### i) Risk of drowning



This risk can arise when crossing water to reach a place of work, and when working over or nearby water. These risks can be managed by the provision of suitable systems of work and equipment together with effective means for rescuing and treating workers in the event of an incident.

It is possible to 'drown' in other situations. Silos containing grain and fine powders are typical examples.

#### j) Work on wells, underground earthworks and tunnels

<sup>1</sup> Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation - OJ L 159, 29.6.1996,



Unless properly designed, planned and managed, these kinds of work have the potential for ground collapses that will trap or bury workers underground. The risks are often exacerbated by the lack of alternative means of escape. Those on the surface can also be at risk due to the development of swallow-holes and risks from collapsing surface structures. (Note that the Construction Sites Directive does not apply to drilling and extraction in the extractive industries. See instead Directive 92/104/EEC)<sup>1</sup>.

When working in tunnels or sewers there can also be risks from suffocation, water ingress and explosion in addition to the more generic risks described elsewhere such as compressed air.

#### k) Diving using air supply systems



Diving is normally done to get to underwater places of work. It requires expertise in planning, managing and conducting the work so that the safety and health of the divers is protected. Diving project plans, diving supervisors and divers whose health is monitored are required together with the correct plant and equipment for the planned dives and for emergencies. Member states are likely to have their own laws on diving. You will need to clarify the national requirements for your project.

#### l) Work in caissons in compressed air



Working in compressed air creates the risk of decompression sickness, an acute condition that causes pains around joints such as the knees and, more rarely, it can be life-threatening through adverse effects on the central nervous system. Other risks include damage to air-containing body cavities such as the ears and sinuses and long-term chronic conditions that damage hip and shoulder joints.

There is an increased risk of fire because compressed air contains increased quantities of oxygen and this requires special consideration.

Like diving, it requires specialist expertise, safe systems of work, competent workers, medical surveillance, effective compression and decompression procedures and emergency procedures.

Good design can eliminate the need for work in compressed air.

#### m) Work using explosives

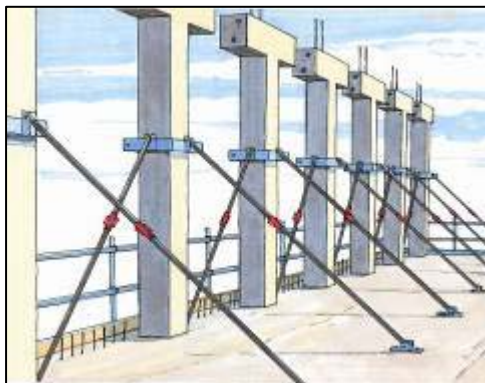
Work involving the use of explosives creates risks from the explosive over-pressure forces, uncontained flying materials and toxic fumes. Premature detonation, the failure to achieve the intended collapse and the failure to detonate all of the explosive materials are further hazards that have to be addressed together with the safe storage and transportation of explosives. Once more, this work requires expert contractors and consideration when developing the construction site safety and health plan.

<sup>1</sup> Council Directive 92/104/EEC of 3 December 1992 on the minimum requirements for improving the safety and health protection of workers in surface and underground mineral-extracting industries (twelfth individual Directive within the meaning of article 16 (1) of Directive 89/391/EEC - OJ L 404 , 31.12.1992



➡ See Explosion risks, p.116.

### n) Work involving heavy prefabricated components



Work involving the assembly or dismantling of heavy prefabricated components creates risks to those working with the components and others as the components are moved and secured in place.

The work needs to be carefully considered and planned.

Workplaces used for very short periods are the norm in this kind of activity. Planning needs to ensure that safe access and egress is provided to them and that the workplaces are themselves safe.

There can be opportunities to reduce risks by pre-assembly on the ground (a process that can be reversed when disassembling) so reducing work at height.

The provision of suitable barriers to prevent falls from edges is often feasible as is the provision of powered articulating working platforms, for instance, when erecting steel framed facilities. Designers can make major contributions to risk reduction by taking full account during design of the need for safe erection methods.

## 2.5.2 New risks

All new and emergent technologies, processes and activities require particular attention by all of the stakeholders who influence the risks that will be met in a project. These stakeholders include clients, project supervisors, safety and health coordinators, designers, workers, suppliers of items (e.g. materials, components, plant and equipment) that are needed for the permanent and temporary works, employers, contractors and sub-contractors. Such technologies, processes and activities should be subject to a sufficiently in-depth hazard/risk analysis.

It may be that there will be the experience of others to consider from past and current practice throughout the world: and it may equally be that the new proposal can reasonably be considered as an extension of a known approach. In such cases hazard analysis can be assisted by researching past practical experience and by the direct involvement of those with expert knowledge, expertise and experience. However, caution is required when relying on past experience elsewhere especially when information is unclear, incomplete, or is solely or mainly coming from a supplier or other stakeholder who has a commercial interest.

An apparently good track record does not mean that there are no risks in the new approach: it may simply reflect good luck or a paucity of information about past problems and failures. Likewise, the particular circumstances of use may be different (e.g. ground conditions).

Crucially, the lack of familiarity, knowledge and expertise in designer and contractor teams and in that of their workers involved in the proposed project will need to be fully addressed when there are new or unfamiliar hazards and risks. Depending on the nature of the hazards, it may be that representative small-scale trials will be required to better understand what the hazards and risks might be.

Hazard and consequence analysis and risk control proposals should be based upon a full understanding of what is proposed so that the process hazards can be properly considered. A mechanistic and overly simplistic approach that focuses on generic hazards will not be

sufficient. Consideration must be given to hazards that may arise during all stages of design and construction, including during intermediate stages of construction from the plant, equipment, any temporary works that may be required and from repairs/making good. Organisational as well as technical factors must be considered.

Any major hazard potential that may put numbers of workers or the public at risk must be explored and fully addressed.

It is likely that a number of stakeholders need to be involved in hazard and consequence analysis and in the subsequent steps of hazard elimination and risk management. A project risk register that identifies what individual stakeholders are to do and that is regularly reviewed and updated is a useful tool in such circumstances.



#### **Example 78:**

1. The off-site prefabrication of complete bathrooms, the construction of a skeletal structure on site and the subsequent installation of the bathrooms.
2. New substances, such as adhesives and surface finishes, that provide increased in-use performance but which may have added occupational safety and health risks during construction.
3. New machinery and plant for gaining worker access at greater height.
4. The adoption of tunnelling methods that are well proven in hard rock for use in other geological formations.



### **3. HAZARDS AND RISKS DURING ALL STAGES OF A CONSTRUCTION PROJECT – SOME EXAMPLES**

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## 3.1 Falls

### a) Work at height

Falls from height are the main causes of fatal accidents in the construction industries of the member states of the European Union.



The risks related to work at height may be subdivided in two groups:

- those that may arise from the fall of workers; and
- those that may arise from the fall of objects onto those working below.

The first group of risks is identified as "particular risks" under Appendix II of the Directive.

These risks may arise at most construction sites. The consequences are generally more severe the greater the falling height. Falls generally occur from unguarded edges or openings at height, through fragile materials, into excavations, from ladders, from temporary platforms, from places of work on an existing facility and on stairways.<sup>1</sup>

There are additional requirements in the Directive 2009/104/EC<sup>2</sup>.

### b) Erecting and dismantling of scaffolding or any other similar equipment



Risks related to scaffolding may be subdivided in two groups:

- (i) Those involved during the assembly, alteration and dismantling of the scaffolding; and
- (ii) Those related to the use of the scaffolding (e.g. risk of slipping).

These risks can be present whenever scaffolds are used. Similar risks arise when systems similar to scaffolding are used in falsework. Directive 2009/104/EC applies to scaffolds. It requires that an assembly, use and dismantling plan should be drawn up by competent persons.

Standardised forms and documents can assist when checking scaffolds on a large project.

Some small system scaffolds (e.g. small mobile tower scaffolds) can be safely erected following limited training and competence assessment provided strict controls are maintained.

<sup>1</sup> You will find comprehensive practical advice in the Non-binding Guideline on "How to choose the most appropriate work equipment for performing temporary work at a height."

<http://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=140&type=2&furtherPubs=yes>

<sup>2</sup> Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ 3.10.2009 L 260

#### c) Falls on the same level



Risks related to falls on the same level generally come about by tripping and slipping. They are likely to be more prevalent on untidy sites.

## 3.2 Risks related to electricity

The major risks related to electricity are electrocutions and burns.



Many deaths and injuries arise from:

- use of poorly maintained electrical equipment;
- work near overhead power lines;
- contact with underground power cables during excavation work or horizontal boring or drilling;
- mains electricity supplies;
- use of unsuitable electrical equipment in explosive areas;
- fires started by poor electrical installations and faulty electrical appliances
- untested worksite distribution boards and defective residual-current-operated protective devices.

Working near high voltage power lines can cause serious and fatal injuries due to direct contact with live lines or arcing from those lines to nearby equipment.

Electrical injuries can be caused by a wide range of voltages but the risk of injury is generally greater with higher voltages.

Alternating current (AC) and Direct Current (DC) electrical supplies can cause a range of injuries including:

- Electric shock
- Electrical burns
- Loss of muscle control
- Thermal burns

There are additional requirements in the Directive 1999/92/EEC<sup>1</sup>.

## 3.3 Risks related to gas

Natural gas is usually distributed through network of buried transmission and distribution pipes.

<sup>1</sup> Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (15th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ L 23, 28.1.2000,



Gas releases can occur as a result of mains failures but also as a result of accidental damage. Leaks can also occur from bulk storage tanks and from smaller cylinders stored and used on construction sites.

Under certain circumstances, these leaks can result in a fire or explosion.

## 3.4 Risks related to traffic

### a) Work performed on existing traffic roads

Risks related to working on existing roads with live traffic depend on the type of work to be performed.

They may include:



- Collisions between vehicles working inside the site, and between vehicles passing close to the site.
- Collisions by passing vehicles with site machinery, equipment (i.e. scaffolds) and workers (perhaps where the site is not adequately signed and physically protected).
- Asphalt fumes produced during paving works. These may affect different parts of the body (skin, eyes, throat, etc.) and may cause cancer.
- Exhaust fumes and diesel particles.

Work in existing tunnels can present particular risks from and to moving traffic.

Other risks may also be involved as for example, heat (manipulating the asphalt), dust (during the excavations for the preparation of the pavement base), etc.

Directive 92/58/EEC<sup>1</sup> provides additional requirements for the provision of safety and/or health sign.

<sup>1</sup> Council Directive 92/58/EEC of 24 June 1992 on the minimum requirements for the provision of safety and/or health signs at work (ninth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)- OJ L 245, 26.8.1992

##### b) Traffic on sites (machinery and pedestrians)



Risks to pedestrians from on-site traffic can be reduced by providing segregated pedestrian and vehicular routes that are properly demarcated and by providing added protection for pedestrians at places of particular risk. Crossing points require particular attention.

## 3.5 Risks related to construction machinery



Risks from construction machinery depend upon the type of equipment under consideration (e.g. earthmoving equipment, lifting equipment, etc.) and the work activities.

Risks related to earthmoving equipment (backhoes, loader shovel excavators, etc. including their accessories) may include: roll-over of the equipment, objects falling onto the equipment, and from malfunctioning safety and other warning devices, etc...

The risks related to lifting equipment (e.g. tower cranes, mobile cranes, etc. including accessories such as slings) may include: workers falling from height during the installation, operation and dismantling of the equipment, collapse of the equipment during use due to overloading or during erection and dismantling, and failures due to poor slinging techniques, etc. Demonstrable operator competence following training specific to the machinery, proper planning and supervision of the work, and effective inspection, maintenance and repair arrangements are some of the measures that can be taken to reduce the likelihood of accidents.

Directive 2009/104/EC<sup>1</sup> concerning the minimum safety and health requirements for the use of work equipment by workers at work addresses these kinds of issues.

Internal market directives (e.g. Directive 2000/14/EC<sup>2</sup> on Noise emission by equipment used outdoors, and directive 2006/42/EC<sup>3</sup> on machinery) are applicable in addressing risk.

<sup>1</sup> Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ 3.10.2009 L 260

<sup>2</sup> Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors - OJ L 162, 3.7.2000,

<sup>3</sup> Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast) - OJ L 157, 9.6.2006

## 3.6 Risks related to manual handling operations

Manual handling generally involves lifting and moving loads by hand or other bodily force. Many people hurt their backs, arms, hands or feet when routinely lifting everyday loads and not just when lifting a single load proves to be too heavy.

Upper limb disorder refers to the neck, shoulders, arms, wrists, hands and fingers. Repetitive strain injuries (RSI) can happen in almost any workplace where people do repetitive, manual activities with awkward postures for prolonged periods of time.

These can cause muscular aches and pains, which may initially be temporary but, if such work is not properly managed and the early symptoms are not recognised and treated, can progress to chronic and disabling disorders.

Cumulative damage can build up over time causing pain and discomfort in people's backs, arms, hands and legs. Most cases can be avoided by providing suitable lifting equipment together with relevant training on both manual handling and in using the equipment safely.

Directive 90/269/EEC<sup>1</sup> on the manual handling of loads where there is a risk particularly of back injury to workers also applies.

## 3.7 Risks related to bad postures



These are risks of occupational injury or disease due to constraining postures and intense or repetitive physical efforts. Cumulative damage can occur and there are other similarities to the preceding risk example.

In many instances, a full consideration of work station layout, and the materials and equipment provided for use can reduce risks.

## 3.8 Risks related to the use of explosives

Explosives create risk of injury from the explosion, from projected or flying material, from toxic fumes and from over pressures.

Explosives should be stored, transported and used safely and securely. Safe systems of work are required to prevent injury from explosions and from projected or flying material.

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<sup>1</sup> Council Directive 90/269/EEC of 29 May 1990 on the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers (fourth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC) - OJ L 156, 21.6.1990



## 3.9 Risks related to instability



Risk of injury may be created by falling objects from an upper level or from the collapse of structures, earthworks and equipment.

Instability can adversely affect existing facilities at or nearby the project, new structures under construction and temporary structures erected as a part of the construction work. Loss of structural integrity can be due to a number of causes. These include failures in design especially of temporary works, failures in correctly executing the works as designed and failures in properly monitoring the work

being undertaken to take account of the unforeseen.

Complex excavations such as tunnels, shafts and deep excavations in urban areas require particular care. Earthworks such as earth dams can also suffer from instability.

## 3.10 Risks related to health

### a) Physical risks (noise, vibration, burns, extreme temperatures, weather conditions etc.)

#### Noise



Exposure to loud noise can permanently damage a person's hearing. This is most likely if high noise exposure is a regular part of the job.

Occasional or low-level exposure is less likely to cause ill health although a single exposure to an extremely loud noise can cause instantaneous damage. Noise can also create a safety risk if it makes it difficult for workers to communicate effectively or stops them hearing warning signals.

Hearing loss can be temporary or permanent.

Noise exposure may not just be from the equipment being operated - it might be produced by fixed plant (e.g. a generator) or the activities of another worker.

Who might be affected?

- Workers who use power tools, such as:
- concrete breakers, pokers and compactors;
- sanders, grinders and disc cutters;
- hammer drills;
- chipping hammers;
- chainsaws;
- cartridge-operated tools; and
- scabblers or needle guns.
- Workers who operate heavy plant or control machines on site, and anyone in close proximity to them.



The Noise Directive 2003/10/EEC<sup>1</sup> requires particular steps to be taken to reduce risk from exposure to noise.

#### Vibrations

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Vibration from work with powered hand-held tools, equipment or processes can damage the hands and arms of users causing 'hand-arm vibration syndrome'. This is a painful, irreversible condition which includes 'vibration white finger.' The effects can be impaired blood circulation, damage to the nerves and muscles, and loss of the ability to grip properly.

The main sources of vibration from powered hand-held tools are demolition hammers, drills, hammer drills, angle grinders, chain saws and hand-held circular saws

Back pain can be caused by or aggravated by vehicle or machine vibrations that pass through the vehicle's seat and into the driver's body through the buttocks. This is known as whole body vibration. Whole-body vibration can also be caused by standing on a vibrating platform of a vehicle or machine. In this case, vibration passes into the operator through their feet.

The main sources for vibration are excavators, wheel loaders, caterpillars, graders, scrapers, site dumpers, articulated dump trucks, wheeled (motor) scrapers and rough terrain fork-lift trucks.

Directive 2002/44/EEC<sup>2</sup> requires risks from vibration to be addressed.

#### Burns

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Touching high temperature objects when working in close proximity to them creates a risk of burning. The escape of hot liquids, vapours and gases are other ways of suffering high temperature burns. Exposure to chemicals can cause burns as can electricity.

#### Temperature

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Temperatures must be appropriate having regard to the working methods and the physical demands of the work. The temperature in rest areas, welfare accommodation and first aid facilities should also be appropriate to the particular purpose of such facilities. If forced ventilation systems are used, they should be maintained in working order and should not expose workers to draughts that are harmful to health.

Construction workers might be exposed to extremes of temperatures due to the work that they are doing.

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<sup>1</sup> Directive 2003/10/EC of the European Parliament and of the Council of 6 February 2003 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise) (Seventeenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ L 42, 15.2.2003

<sup>2</sup> Directive 2002/44/EC of the European Parliament and of the Council of 25 June 2002 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration) (sixteenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - Joint Statement by the European Parliament and the Council - OJ L 177, 6.7.2002

Workers can face high temperatures and be at risk of heat stroke during work such as:

- The demolition of metal melting tanks;
- Welding, especially in confined spaces;
- Work in live plant rooms especially where additional stressors are present, such as the use of respiratory equipment when, say, stripping asbestos; and
- Blast furnace reconstruction.

Work is best planned to avoid such situations. Where that is not possible, temperatures should be kept as low as possible, such as by allowing more time for an installation to cool down and by introducing increased ventilation by cooling air.

Workers can face extremely cold temperatures in places such cold stores. Again, work is best planned to avoid such situations. Where that is not possible, temperatures should be moderated as far as possible.

Expert advice should be sought to determine what reduced working periods are possible in extreme conditions and what additional precautions are required. You should check what particular requirements apply due to the laws of the relevant member state.

#### **Weather conditions**

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Workers should be protected against atmospheric influences which could adversely affect their safety and health.

Weather conditions that may increase risks to safety and health include:

- High winds;
- Precipitation –rain and snow;
- Icy conditions;
- High humidity;
- Exposure to the adverse effects of the sun; and
- Extremes of temperature.

Strong winds can adversely affect the operation of cranes and other lifting gear, especially when handling large sheet items such as cladding and roofing sheets and formwork panels. Strong winds can also adversely affect workers handling large lightweight panels, for instance when fixing sheet roofing and metal decking.

Bad weather is a general body stressor. High temperatures in the summer might lead to heat stroke or burns by ultraviolet radiation.

Low temperatures may increase the adverse effects of vibratory tools and may increase colds and infections.

You should check how the relevant member state has put these requirements of the Directive into national law.

#### **Dust**

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Dusts are harmful to the respiratory tract and respiratory system. Some dusts are carcinogenic (e.g. asbestos).

Dust may arise, for example, from:

- removing asbestos structure during refurbishment;
- cutting wood;
- chasing and cutting brickwork, blockwork, concrete and stone;
- manipulation of cement and other powders.

Two directives are of particular interest regarding dust exposure. They require the application of control measures Directive 2004/37/EC<sup>1</sup> on exposure to carcinogens or mutagens at work and Directive 2009/148/EC<sup>2</sup> on exposure to asbestos.

#### b) Chemical and biological risks

##### Chemical risks



Chemical risks on construction sites have different sources including:

- The chemicals that are already there, before the construction process starts. Such sources might be natural or man made;
- The chemicals that are a part of the construction process; and
- Chemical risks as a by-product of a construction process.

Risks of the first kind arise mainly during demolition work and the clean-up of former waste deposits and abandoned sites. Asbestos may be found in existing facilities where it was used for structural fire protection or insulation purposes. A wide range of chemicals can result from former industrial processes. e.g. at the sites of old coke oven plants, contaminated facilities as well as contaminated ground can be expected.

The possible presence of chemicals must be considered in detail and the appropriate protective measures should be determined before any work starts. Often the measures include the protection of the environment as well.

Chemical risks of the second kind arise from chemicals used during the construction process. These might typically be from the evaporation of solvents used in paints, varnishes, lacquers and adhesives. Solvents are harmful to the nervous system and might cause brain damage. Isocyanates and epoxy resins found in paints, adhesives and bonding agents may irritate skin and lungs and may lead to severe allergic reactions and asthma. These examples are indicative and are not an exhaustive listing.



Generally, chemical risks of this kind can be avoided if less harmful materials are used. In the design and planning stage, substitute materials should be considered so that chemical risks can be reduced. Protective measures against the remaining risks depend on the particular agent and possible work methods.

Examples of chemical risks arising as a by-product of a construction process include the dust made when drilling, sawing or hammering. Exposure is related to working methods and the equipment being used. Priority should be given to avoid the risks, e.g. by using safe methods.

<sup>1</sup> 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) - OJ L 158, 30.4.2004

<sup>2</sup> Directive 2009/148/EC of the European Parliament and of the Council of 30 November 2009 on the protection of workers from the risks related to exposure to asbestos at work - OJ L 330, 16.12.2009

Directive 98/24/EC<sup>1</sup> on the risks related to chemical agents at work requires action to be taken to protect workers from chemical risks.

#### Biological risks

Biological agents can typically be present in the soil, in sewers and drains, in roofing voids, attics and basements, in water-cooling towers, rotten materials and in certain workplaces such as hospitals and biohazard laboratories. Agents can be airborne. They can be released by disturbance such as during the demolition of contaminated facilities and the removal of contaminated plaster.



Pigeon droppings are a further example of biological risk as is Weill's disease from water contaminated by rats.

The possible existence of biological agents should be considered and the appropriate protective measures determined before any work starts.

Often measures to protect the environment are also required. Directive 2000/57/EC<sup>2</sup> adds particular requirements.

#### c) Fire-explosion-asphyxia risks

##### Fire risks

Fire risks on a construction sites have many sources such as:



- the use of flammable liquids;
- welding or abrasive cutting techniques used in places not specially prepared for such works;
- liquid gases used with an open flame; and
- Flammable and combustible materials, e.g. petroleum, timber and packaging.

Work in compressed air creates an increased risk of fire. Fire risks when working in confined spaces where escape may be difficult similarly requires careful consideration.

##### Explosion risks



Explosive atmospheres can be present at construction sites because of the processes being undertaken by those carrying out the construction works and by others carrying out other industrial processes.

<sup>1</sup> Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work (fourteenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ L 131, 5.5.1998

<sup>2</sup> Commission Directive 2000/57/EC of 22 September 2000 amending the Annexes to Council Directives 76/895/EEC and 90/642/EEC on the fixing of maximum levels for pesticide residues in and on fruit and vegetables and certain products of plant origin, including fruit and vegetables respectively - OJ L 244, 29.9.2000

The Explosive Atmospheres Directive 1999/92/EEC<sup>1</sup> requires particular precautions to be taken.

Explosion risks can typically occur from:

- the use of solvents and ignition by sparks;
- static electricity (e.g. it might ignite blasting agents);
- explosive atmospheres in sewers;
- damage to pipes containing explosive gases; and
- unexploded ordinance in the ground.

Substitution of explosive materials as far as possible, good ground exploration and trained workers reduce the likelihood of explosions.

#### Asphyxia risks

Asphyxia risks exist in those places where either toxic gases are present or where gases have displaced oxygen leading to a non- respirable atmosphere. Sewer systems, including those designed to carry surface water, need to be checked before entering as do other confined spaces. Acute intoxication by hydrogen sulphide (H<sub>2</sub>S) can lead to death as can oxygen deficiency.

Fine dusts can also cause a risk of asphyxia.

#### Risks of drowning



Risks of drowning exist when:

- crossing water to reach a place of work;
- working over or nearby water;
- falling into silos containing grain or fine powders; and
- performing underwater work such as underwater concreting.

Even good swimmers are at risk of drowning if they are injured during falls. Chilling in cold waters and hazards from strong currents and dangerous vortices are typical causation factors in drowning incidents.

## 3.11 Transport

Transport risks can arise during travel to and from work when workers perform distant assignments on behalf of their employers. Increased safety can be secured by advanced driver training, limiting working hours and the provision of high quality, well maintained vehicles.

On-site transport creates further risks to pedestrians. The public can be at risk at vehicular access points. Well prepared transport plans that take such risks into account will reduce injuries.

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<sup>1</sup> Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (15th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ L 23, 28.1.2000

## 3.12 Hygiene



A lack of general hygiene on a construction site can lead to unnecessary risks to health. There is a need to:

- provide decent washing facilities (including showers where needed) to enable workers to clean themselves effectively from contaminants;
- provide in particular cases special clothing so that ordinary clothing and exposed skin does not become contaminated with anything harmful;
- instruct workers about the precautions that are required to combat particular risks;
- keep work areas and welfare facilities in a good state of cleanliness; and
- ensure adequate food hygiene and the safe disposal of unwanted food stuffs that might otherwise attract vermin.

## 3.13 Other risks

Other risks may include, but are not limited to:

- Pressurized fluids (compressed air, hydraulic circuit),
- Work in confined spaces (crawl space, tank),
- Work related stress (imbalance between workers' capability and work constraints),
- Workplace violence (e.g. mugging),
- Ionising and non-ionising radiation (laser, radio communication),
- Nanoparticles,
- Electromagnetic fields<sup>1</sup>,
- Artificial optical radiation<sup>2</sup>,
- Increased risk of injury and ill-health due to the combined effects of a number of different hazards (i.e. synergistic/multi-factor effects).

Reference should be made to other European directives concerning the protection of workers.

These and other risks may arise from construction activities and from other industrial processes close to the construction works (e.g. works in or near by an oil refinery, a nuclear power plant etc.).

<sup>1</sup> Directive 2008/46/EC of the European Parliament and of the Council of 23 April 2008 amending Directive 2004/40/EC on minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) (18th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ L 114, 26.4.2008

<sup>2</sup> Directive 2006/25/EC of the European Parliament and of the Council of 5 April 2006 on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation) (19th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ L 114, 27.4.2006



## 4. MANAGING RISKS DURING CONSTRUCTION PROJECTS

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This chapter gives practical guidance about how the various stakeholders can effectively manage risks throughout the various stages of construction projects, from inception to completion of construction work and during the post-construction stage.

It is important to remember that the Directive applies to all construction work and that all construction work will be a part of a project. This means that, for example, the simplest and quickest building maintenance and repairs will be a construction project. The trick is to take a pragmatic and practical approach to applying the Directive so that the obligations on stakeholders are met and occupational safety and health is secured without imposing unnecessary burdens on stakeholders. This Chapter of the Guide should be read accordingly, especially by those involved in very small projects.

The Directive mentions two principal stages:

- The preparation stage, which includes inception, design, and preparation prior to commencing on site; and
- The execution stage: which essentially involves construction work on site until the project is completed.

There can be further activities after the project is completed. This is often known as the post-construction stage. In practice, it mostly involves new projects as the Directive applies to all construction work, no matter how limited in scope.

## **4.1 The project preparation stage**

### **4.1.1 Start of a project**

The project preparation stage is the period of time from the inception of the project to the point where a start can be made on site.

It can include the inception, the selection by clients of other stakeholders, planning, studies and investigations, programming, design and preparations before starting the construction work.

All those involved in construction projects should take into account safety and health matters within their areas of influence and control, starting at the project preparation stage. When designing and planning a project, the safety and health of the workers should always be to the fore. It is a key issue for a successful project. The protection of others, such as the public, should be similarly considered.

Clients or project supervisors and project preparation stage coordinators have particular functions to perform at this point in their projects.

🔗 **See 2.3 The stakeholders, p.47.**

On many projects, the project preparation stage will overlap with the project execution stage, for instance, where design work continues after the start of construction work on site.

#### **a) Who are the stakeholders involved during the initial project preparation activities?**

Clients initiate projects by their decisions to carry out or commission others to carry out tasks involving construction work. Other stakeholders involved at an early stage include, project management advisers, designers and other experts. (e.g. specialist consultants). Businesses that specialise in providing completed facilities for clients to use without their further direct

involvement in construction procurement and similar businesses, who will then also maintain such new facilities, are other stakeholders who can be involved at this time as can contractors and suppliers of goods and services. All such parties need to be clear on the responsibilities that they have, in particular under the 'Framework Directive,' 89/391/EEC, Directive 92/57/EEC that is the subject of this Guide, and other worker protection directives.

Clients may appoint project supervisors for construction works. The Directive requires that they appoint coordinators for any construction site on which more than one contractor is present.

↳ See 2.3 The stakeholders, p.47.



#### Good practices:

Appointing a leading coordinator when more than one coordinator is appointed for each stage (i.e. preparation and execution).

### **b) What are the main issues/concerns to pay attention to during the early project preparation stage?**

The main issues and concerns in taking a structured approach to occupational safety and health include in particular:

**Establishing project teams that have the necessary competences (knowledge, expertise, skills and experience) in occupational safety and health and resources to successfully complete the project**



#### Good Practices:

Large projects: Clients who take expert advice on who should be a part of the project team, what competences and resources they should possess for the purposes of occupational safety and health: and who then develop and use selection criteria as a consequence.

Micro projects (i.e. projects involving only one contractor and lasting no more than a few days): Clients who use contractors that they know from previous experience have the capabilities safely to carry out the proposed work.

**Establishing overarching project management arrangements for occupational safety and health so that all stakeholders know the part that they have to play and how they should cooperate and coordinate with others**

Clients or project supervisors have important functions to discharge under Article 4.

**Ensuring that suitable arrangements are in place during design and other project preparation activities is one crucial step**



#### Good Practices:

Large projects: Clients who take expert advice on how their projects should be managed for occupational safety and health: and who then ensure that such

arrangements are put in place.

Micro projects: Clients who agree with their contractors some simple liaison rules that will ensure safety.

#### Identifying client needs so that they can be met at the same time as minimising the risks to construction workers



##### Good Practices:

Large projects: Studies to consider client needs and the options involving construction solutions and selecting possible solutions that do not lead to unnecessary risks.

Micro projects: Ditto but more pragmatically. (e.g. rather than partially replace a failing roof over time, replace the whole roof so that a suitable scaffold is only erected once, so increasing safety and reducing costs over the longer term).

#### Identifying other people whose safety and health may be adversely affected by the project and establishing working arrangements with them or suitable intermediaries



##### Good Practices:

Large projects: Formal reviews and the establishment of working relationships (e.g. neighbouring enterprises, user enterprises (hospitals, schools etc.), highway authorities, tenants, etc...

Micro projects: Contacting such persons and talking through problems and solutions.

#### Assembling information about current site conditions, its environs and possible technical and design solution



##### Good Practices:

Large projects: Working up a schedule of information needs and assigning team members/commissioning others to collect and then analysing the information collected to determine possible options.

Micro projects: Discussions with the designer and/or contractor at the proposed work site.

#### As design develops and other decisions fall to be made applying risk assessment to foreseeable occupational safety and health issues and, likewise, applying the general principles of prevention



##### Good Practices:

Large projects: Individual stakeholders carrying forward their individual contributions to eliminating hazards and reducing risks: and formal structured reviews by the wider team as designs and other preparatory work develops.

**Micro projects:** Discussions with designers/contractors recording only what is essential for securing occupational safety and health.

↳ See 1. General Principles of Prevention (GPP) on Safety and health at work, p.20.

#### Estimating adequate periods of time for completing the work involved.



##### Good Practices:

**Large projects:** Formal expert project planning analysis informed by safety and health considerations.

**Micro projects:** making use of the expertise of the contractor when discussing and agreeing a reasonable period. Being flexible when unanticipated safety or health considerations occur.

↳ See 2.4.2 Safety and health plan, p.91.

#### Ensuring that safety and health plans are drawn up, where required (and that the need for a similar document is considered when one is not required according to national legislation)



##### Good Practices:

**Large projects:** Preparation by the coordinator taking fully on board advice elsewhere in this Guide.

**Micro projects:** Identifying someone to prepare a brief plan that has full regard to the hazards and the level of risk.

↳ See 2.4.2 Safety and health plan, p.91.

#### c) Advance works

Where hazards are identified that will take an extended time to deal with (e.g. services and utilities, asbestos removal, etc), it is often helpful to deal with them in advance of the remainder of the construction works.

For instance, a high voltage electrical transmission cables interfering with the construction of a new road, could have been identified during the design stage in order to implement action so that workers wouldn't be at risk.

d) Examples on 3 different types of projects



**Example 79:**

Construction of a multi-residential new building of 7 floors above ground, ground floor for commercial use and 2 underground floors for garages close to a school and a busy road.

Solutions: The proximity of the school and the busy road require safety netting for the scaffold to prevent the fall of objects outside the site. Suitable boundary fencing with gate security will also be required to prevent access by unauthorised people, especially school students.



**Example 80:**

Construction of an individual garage for a private (family) owner involving less than 500 person days.

The owner of the house is the client and a number of contractors/ subcontractors will be needed to carry out the work (e.g. a contractor to build the facility, another to undertake the electrical installation).

Solutions: As more than one contractor will be involved, coordinators for safety and health matters are required. The designer agrees to fulfil the pre-construction role and one of the contractors is appointed for the execution stage.



**Example 81:**

Constructing a new railway line in a rural area involving different specialist designers and also different specialist contractors.

The construction work is broken down to finite packages, (e.g. ground works (excavations, ballast, sleepers, and rails) and electrification (posts, electric cables, catenaries). Each of these contractors will have subcontractors.

Solutions: The Railway Enterprise (the client) needs to appoint coordinators for safety and health matters as the project will involve more than one contractor.

Typical concerns in this kind of project during the early project preparation stages include access to the site. Temporary roads may be needed. The project should consider such temporary works and its design as their construction may involve additional hazards.

### 4.1.2 Design stage

It should be noted that the definition of project supervisor is widely drawn and includes those designers acting on behalf of a client (Art. 2.c of the "Construction Sites" Directive). The Directive refers to design in Article 4 which deals with general principles during the preparation stages of projects.

☛ **See e) Who is a designer, p.129; and Taking into account the general principles of prevention, p.55.**

The Directive requires project supervisors or clients to take account of the general principles of prevention during the various stages of designing a project. Coordinators for safety and health matters during project preparation stages are required, amongst other matters, to coordinate the implementation of such requirements.

It is therefore reasonable for designers to recognise the design-related functions of clients, project supervisors and such coordinators, and for designers to play their part in helping to reduce occupational ill-health and injuries in the construction industry.

The following text will assist project supervisors, clients and coordinators for safety and health matters at project preparation stages to better understand what designers can do, and it will assist designers in meeting the expectations that other project stakeholders will have of them.



#### Good practices:

Unlike the approach that the Directive takes when setting minimum safety and health requirements for work carried out on construction sites (see Annex IV of the Directive), the Directive simply requires the project supervisor or the client to take account of the general principles of prevention. This gives those developing designs considerable scope to use their professional skills in developing satisfactory design solutions rather than being constrained by prescription. The following text on design explains some of the underlying issues and provides a 'good practice' framework through which design work can be taken forward.

It is essential that those selecting designers are as satisfied as they can reasonably be that those they have selected are competent to carry out their safety and health related roles and that they intend to devote sufficient resources to such tasks. The nature, extent and scope of pre-appointment enquiries will depend on the scale, complexity, and the hazards and risks that are likely to be involved in the project.

Designers are in a position to make major contributions to occupational safety and health by hazard identification and elimination, and by risk reduction during all stages of design.

Addressing occupational safety and health issues should be considered an integral part of good design practice alongside aesthetics, functionality, buildability, cost etc....

It is not helpful to complete a design and then consider occupational safety and health issues. If such an approach was taken, there is a risk that some initial decisions would be found to be unsatisfactory and that additional work involving redesign would then be required resulting in additional costs.

Understanding the potential hazards and risks that might arise from design decisions is one essential part of the competence that a designer needs to have. It requires sufficient knowledge about the work activities (including any temporary works that their designs will require or may adversely affect).

Designers should take a sensible approach to occupational safety and health hazards and risks so that they add value through good design. The more serious the hazards and the greater the potential risks, the more other stakeholders will look to designers to do all they can to eliminate them through design.

The design of temporary works (such as temporary supports, or temporary access and working places) that may be required during construction work should similarly take account of the general principles of prevention.

### **a) Stakeholders**

There are a number of stakeholders who can make contributions at the design stage of a project.

These may include:

- Designers who develop designs that take account of the general principles of prevention;
- Clients or project supervisors who ensure that designers do so in accordance with the Directive;
- Coordinators for safety and health matters at the project preparation stage who coordinate the work of designers and others during design development to ensure that designs take account of the general principles of prevention;
- Coordinators for safety and health matters at the project preparation stage who may have contributions to make so that finished designs take account of the needs of those carrying out the construction works as they seek to comply with the general principles of prevention;
- Contractors, employers and the self-employed who are to carry out the construction work may likewise have contributions to make;
- Suppliers of materials and plant (whether for incorporation or for use during construction);
- Those responsible for any continuing work activities at the site of the construction works and, similarly, those responsible for any new activities once the project is completed;
- Those responsible for nearby places of work and work activities (including other construction sites, transport systems, etc), whether fixed or transient, who will wish to ensure that their work activities are not placed at risk and that they do not place the construction workers at risk;
- Those responsible for other nearby places and activities that are not work related and which need to be taken into account for safety and health purposes; and
- Representatives of local communities, elected officials, their officers and other community groups.

When possible, those dealing with designs can usefully take account of such a wide range of stakeholders so that:

- There is cooperation between them;
- Appropriate design decisions are made; and
- Essential information is made available for the benefit of the project as a whole.

Clients or project supervisors, their coordinators for safety and health matters at the project preparation stage and designers will need to decide how this can sensibly be done so as to assist in the development of designs. There is no common solution to this issue. Regard should be given to the nature and scale of the project, and the hazards to construction workers and others that will need to be addressed and managed throughout the life of the project.

Coordinators for safety and health matters during the project preparation stage have roles to play in coordinating design for the purposes of safety and health.



**Example 82:**

Having all designers work on the same BIM (Building Information Model, that is, a computer aided design tool that integrates the work of a number of designers and, amongst other functions, identifies some incompatibilities in the designs) to minimise risk from non-compatible designs.

**b) Whole life**

Designers need to take a 'whole life' view so that they not only consider how the design will be initially constructed but also how it can be safely kept in good order, maintained, redecorated, renovated, repaired and finally deconstructed. Consideration should also be given to other stages in the 'whole-life' of the design when activities such as fitting out, alteration and conversion may be designed and carried out by others.

This means that designers need to consider persons who may be exposed to hazards when:

- Undertaking the proposed construction work; and
- Carrying out further construction work during the life of the facility for the intended use of the building ending with its deconstruction.

Under the Construction Sites Directive, designers have no obligations to consider the safety and health of those people not involved in construction work and who use a completed design in other ways. However, there are clearly benefits in doing so, not least to fulfil the wider expectations of clients.

**c) Designing for the safety of others****Good practices:**

In addition, designers may usefully consider:

- Members of the public and others who are not involved in construction work but may be exposed to hazards as a consequence;
- Those using the finished project as a place of work (see below); and
- Those carrying out work for the upkeep of the facility that might not strictly be considered as construction work.

**d) Designing for 'use'**

At some stage in design, a full account of how a completed project will be used as place of work will need to be made so that the design enables people (such as owners, occupiers, and users) to comply with other EU Directives such as the Workplace Directive and other individual directives made under the Framework Directive (89/391/EEC).

While there is no specific duty on designers to do so under the Construction Sites Directive (92/57/EEC), it is clearly in clients' interests for completed projects to be such that they can be put into use without costly alterations. The users or those with experience of their likely needs are additional stakeholders who can usefully be consulted for the purposes of occupational safety and health.



Designers should refer to relevant member state legislation for further advice about what may be required.

### e) Who is a designer

Any stakeholder might make design decisions. It is not only typical designers such as architects, civil and structural engineers who take design decisions. There are often other specialists, and also designers including mechanical and electrical services, lifts, cladding, and others who are 'design, supply and fit' specialists and also temporary supports works designers. Someone who makes a choice about the selection of a certain material or substance would be taking a design decision. Clients, contractors and others can be designers insofar as they carry out design work or take design decisions. Where designers present a number of options to other persons, say clients, designers should be satisfied that every option is suitable for use.



#### **Example 83:**

**In planning a wastewater treatment plant, it will make sense for the design lead to be taken by the process engineer who is familiar with the biological purification steps and the mechanical equipment. Such a lead designer will of course need the competencies that will enable them to develop designs that take account of the Construction Sites Directive.**

Designers are not only involved in new work. Those designing works associated with fitting out, alteration, conversion, maintenance, redecoration, renovation, repair and deconstruction are also designers.

### f) Empirical designs

While designs are normally committed to a record, whether on paper or electronically, some designs are not. This is typically the case for empirical design decisions frequently taken on site, whether for the permanent or temporary works (including temporary supports and temporary working platforms). Nevertheless, they are still designs that need to take account of the general principles of prevention.

### g) Hazard Identification and Risk Management

Hazard Identification and Risk Management are essential processes for designers to understand and adopt throughout the design process.

National legislation addresses the point in a number of ways: but there is a common underlying theme that designs will take account of the general principles of prevention, that is:

- By identifying and eliminating hazards; and, where elimination is not wholly possible;
- By reducing risks from any remaining hazards to acceptable levels; and
- By taking full account of the 'hierarchy' within the general principles of prevention.

The key objective is to develop designs so that, as far as possible, construction work can be safely carried out throughout the 'whole life' of the facility.

🔗 **See 1.3 Risk assessment, p.30.**

**Good practices:**

Good design is often an iterative process that produces records in the form of design briefs, assumptions made, drawings, calculations, notes for other designers, etc.

Producing written records during the design process as a part of a well managed approach, although the Directive does not explicitly require any written record to be made. There will be situations where the advantages of written records are limited, for instance for simple projects where a single designer deals with all the design issues over a limited time span.

**Good practices:**

Creating records for occupational safety and health matters just as records are created for other issues where projects involve other designers and design teams over extended periods.

## Stages of design

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There are a number of ways in which designers divide the design process into distinct stages.

These include:

- Initial and detailed;
- Concept, Scheme and Detailed design; and
- A five-step approach of 1.appraisal, 2.design brief (as two preparatory stages); 3.concept design, 4.design development, 5.technical or detailed design.

Equally, there may be only a single stage for the simplest of projects.

For the purposes of occupational safety and health, it does not generally matter what stages or processes are adopted in carrying out a design. The key is to ensure that the approach taken is structured and sensible and that relevant safety and health issues are addressed at every stage of design.

**Example 84:**

Moving the proposed locations of facilities to uncontaminated or less contaminated parts of a site during concept design to avoid working in contaminated ground.

## Structuring the design process

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Designers should take a structured approach to safety and health during design.

**Good practices:**

**Determine client needs.**

Determine who needs to be a part of the design team and who needs to be consulted or otherwise involved as the design develops.

**Determine design information needs.**

Identify hazards that may arise as a result of the design during construction work throughout the whole-life of the facility: and, likewise, when used as a place of

work.

Eliminate hazards where possible and reduce risks from remaining hazards by following the General Principles of Prevention (consider/change design solutions, work methods, materials).

Provide information with the design about project risks not likely to be obvious to others.

Provide information for the Safety and Health File.

The Directive flags up some work activities involving particular risks to the safety and healthy of workers at Annex II. These should be given special attention by designers.

#### h) Determining client needs

These may relate solely to the use to be made of the finished facility but there may also be other essential information that should be sought from the client.



##### Example 85:

Subsequent fitting out requirements and longer term plans for further developing the facility through planned alterations and anticipated conversions to other uses.

In such cases, the design can be developed so that subsequent design and construction work is not made unnecessarily complex and difficult.

#### i) Determining who needs to be a part of the design team and who needs to be consulted or otherwise involved as the design develops

The expectation is that the design team has within it the knowledge, skills, expertise and experience to carry out the work, not least because one obvious fundamental step before a client provides a commission and a designer accepts it is for the designer to satisfy the client on issues of competency.

In most cases there will be the need to work with others to make sure that occupational safety and health issues are properly addressed. A wide range of people might need to be involved. These may include specialist designers, those with particular knowledge about possible construction methods and those from the client team who are to use and maintain the finished facility, and safety and health specialists.

It will also be necessary to take account of how the client or project supervisor want to be involved so that they can be assured that designers will design that take into account the general principles of prevention. Where and how the coordinator for safety and health matters at the project preparation stage will work with the design teams will also need to be taken into account where the project requires their appointment.



##### Good practices:

Including contractors, when appointed, to be a part of the consultation process so that their occupational safety and health expertise can contribute to the design process.

Involving those who will be involved in its subsequent use, upkeep and maintenance as they may be able to add further insights into the hazards that may arise and the possible ways of addressing them during design.

**j) Determining design information needs**

There are generally three elements to consider when determining design information needs:

- Information about the general environment in which the facility will be constructed and the proposed construction site (including any existing safety and health files)

This will normally have been brought together in the initial stages of the project. The design team should review the information and any shortcomings should be identified. Steps should then be taken to make good any deficiencies.

- Information about specific client needs and expectations of the design and construction stakeholders:

This needs to have been resolved with the client before design work commences. Client expectations may extend to the occupational safety and health standards that they expect stakeholders to achieve throughout the project in its preparations, in its design, during its construction and during its 'whole-life' use. Designers should be aware of the likelihood of such wider expectations and of the need to ensure that they play their part in meeting them.

- Information about possible construction methods that may be used:

This last element will depend upon the design solutions that are explored. Designers will need to know the occupational safety and health implications related to the possible construction methods. Other stakeholders in the project team may be able to assist and designers should actively involve them so as to gain a better understanding of the potential hazards and increased knowledge about alternative design solutions.

**k) Identifying hazards that may arise during the whole-life of the facility**

Hazards to which people are exposed during construction work throughout the 'whole-life' of the built environment created by the project need to be considered so that designers can make the fullest contribution to improving occupational safety and health. Likewise, designers can sensibly consider those hazards and risks that may be present during use as a place of work and which can be eliminated or reduced by good design.

Hazard identification should take place at each step of the design process and should involve people with the necessary expertise. For the simplest of projects, one person may have all the necessary knowledge and experience. For the most complex projects, a more formal approach involving a team drawn from the project's stakeholders and a system of structured analyses may be appropriate.

Hazard identification at each stage should be sufficiently robust to ensure that the correct decisions are taken. The approach to occupational safety and health should be integrated into routine design practice, and into checking and approval systems. It can be very wasteful of resources if it is later found necessary to revisit earlier decisions and to have to carry out redesign.

Hazard identification at each stage of design (e.g. concept, scheme and detailed) should focus on the decisions that are being taken at that time and on the implications that they may have for occupational safety and health. A structured approach is best taken so that the implications of each of the design options being considered can be explored. Many design organisations will have established systems as part of their quality assurance to address hazard identification. Where this is not the case designers may find generic hazard lists helpful as aide-memoirs.

See 3. Hazards and risks during all stages of a construction project – Some examples, p.105.

Hazard identification can be from 'first principles' whereby a generic list of hazards is consulted for each issue. However, this may prove unsatisfactory due to the time and resources that are taken up and the possibility that more complex hazards may well be missed.

Hazard identification during the design stage is best carried out by those doing the design: they should possess sufficient knowledge and experience on safety and health at work issues and they should be able to identify the key hazards that need to be addressed at each stage of design.



#### Good practices:

#### Example of hazards and issues at the concept design stage that may require consideration:

- The general environment surrounding the project site (including other activities, buildings, other structures, other facilities and other persons e.g. the public that might be affected by the construction activities).
- The site itself and any continuing activities on it.
- The positioning of new facilities including any phasing, and the implications for working space and worker welfare accommodation during construction work.
- The choice of structural form and the materials for the major elements.
- On-site construction and off-site fabrication.
- The positioning of design elements such as plant rooms and major service routes.
- Any temporary works that may be required: and any interface implications between them and the permanent works.
- The logistical implications for the flow of materials on and off the site.
- The implications for the selection of major site plant.
- The working methods that are likely to be adopted during construction.
- The management expertise and competence, and the technical knowledge base in the industry (including designers, suppliers and contractors): and, likewise, that of the workers.
- The subsequent intended use of the finished project as a workplace.
- Its continuing upkeep, cleaning, redecoration and other maintenance.
- Any requirements for possible future alteration.
- Its eventual deconstruction.
- Access and emergency exits having regard to traffic management.



#### Example 86:

#### Examples of hazards at the scheme design stage that will require consideration:

- A more detailed consideration of the issues considered at the concept stage now

that the overarching decisions have been taken.

- On-site trade activities and logistics with a particular focus on those generally known to create higher risks to occupational safety and health during the whole-life of the facility.



#### Example 87

##### Examples of hazards at the detailed design stage that will require consideration:

- The assembly and eventual disassembly of the facility's component parts.
- The assembly and eventual disassembly of temporary facilities.
- The ease with which detailed parts of the finished project can be kept in good order and maintained.
- Ditto in relation to occupational safety and health issues during its use (recognising that this will be an issue for the client and user but not one that anyone is required to address under the Construction Sites Directive).



#### Good practices:

Having a brief note of the identified hazards and, subsequently, how they have been addressed.

Passing relevant occupational safety and health information between design teams when designs are passed from one to another to reduce the likelihood of important decisions being reversed by those who may not fully understand the implications.

## I) Taking account of the General Principles of Prevention

### Avoiding risks by eliminating hazards

The first and over-riding principle of the General Principles of Prevention is the avoidance of risk by eliminating hazards. This principle should always be adopted where that is possible. Such an approach is often relatively easy to achieve at the initial (or concept) design stage: and, conversely, is less so as the design develops.

↳ See 1.2 General principles of prevention, p.21.



#### Example 88:

Re-arranging the overall layout may enable a dangerous traffic hazard at the point of entry onto the site to be avoided, both for the construction team and for subsequent users.

More fundamentally, it should be recognised that people suffer injury on construction sites due either to the activities they themselves are doing or due to the general working environment (including the activities of others).

It naturally follows that the likelihood of injuries and ill-health during construction work can be reduced by designs that minimise the numbers of people on the project through:

- Increased off-site fabrication; and

- Selecting processes that minimise the site labour time that will be required (i.e. buildability).

The same is true for subsequent construction work through the remaining 'whole-life' of the project where exposure to hazards can be reduced by specifying finishes that are maintenance free.

Where hazard elimination is apparently achieved by substitution, it is important to check that the means of doing so has not unintentionally introduced other hazards.



#### **Example 89:**

Off-site prefabrication can lead to increased short term risks during the site installation of large prefabricated units if such assembly risks are not fully addressed during design.

↪ See column 5 of Annex 4 - Design Record sheet, p.192.

### **Evaluating risks which cannot be avoided**

Not all hazards can be eliminated and some will inevitably remain.

Designers need to consider the risks that will follow from the design outcomes they individually decide, from those that they decide jointly with others and from those that come about by default because no one thought to address them. (The latter is a particular issue where design coordination is poor or non-existent and where two or more designers might equally address an issue but neither does – e.g. the safety and health implications at the interface of temporary and permanent works design).

Where a structured approach has been taken by designers, they will already have developed lists of issues or activities that may give rise to hazards and which have not been eliminated to date.



#### **Good practices:**

Applying a simple qualitative evaluation and reduction framework specific to the project by reviewing how design decisions can best reduce:

- The likelihood of occupational safety and health injuries occurring;
- The potential severity of injuries that might occur; and
- The frequency and duration of exposure to the risk of injury.

A highly developed quantified risk assessment is not likely to be required unless aspects of the project have the potential for causing a major accident hazard.

Designers should focus on risk reduction using the knowledge and experience that they (and the others that they have consulted) have about the activities that will be required throughout the 'whole-life' of the facility. Where it has been necessary to carry out research and trials (e.g. for new or unfamiliar activities), information about hazards and control measures will add to the body of knowledge.

A focus on significant risks will clearly pay dividends. In a similar vein, sufficient consideration of issues that cause relatively trivial injury should also be considered where they can be reduced, especially where the cost implications are small.



The prevention of ill-health, including from longer term worker exposure, should be given due consideration rather than a narrower consideration of more obvious safety matters. Designers should not simply conclude that risks can be addressed by others during the project execution phase.

Many risk reduction design strategies will be well known through the knowledge and experience accumulated from previous good practice; and these will be easy to adopt. Innovation through new design approaches to long-standing problems should also be on the agenda so that progress can continue to be made in improving the industry's performance.



#### **Good practices:**

Involving other stakeholders in the project team so that occupational safety and health issues can be jointly reviewed at each stage of design process, especially on larger projects.

### **Combating risks at source**

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By combating risks at source, the risk is contained at the point where it arises, often but not always by some form of physical barrier.



#### **Example 90:**

Prefabricated structural elements that provide edge protection for those erecting them.

Noise enclosures around sources that cannot be eliminated.

Guards around dangerous parts of moving machinery.

Barriers to segregate pedestrians and moving vehicles.

A design that includes prefabricated staircases so that the permanent access can be installed early.

### **Adapting work to the individual**

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In adapting work to the abilities of individuals, designers are able to contribute, directly or indirectly to:

- The layout of temporary construction workplaces,
- Choice of work equipment; and
- Choice of working and production methods.

All designers need to have regard to the abilities of people to work safely (e.g. reach, lift and manipulate and of the space that will be required) when they take design decisions about the weight, shape, size and location of component parts of the facility including the services within it.



#### **Example 91:**

The layout of a mechanical/ electrical plant room must take account of the potential difficulties for those who have to construct, install, maintain and replace items within it.



### Adapting to technical progress

Designers need to keep fully informed about technical developments so that the problems of yesterday can be resolved in the designs of today to make for safer tomorrows.

For instance, access solutions for maintaining the external surfaces of facilities have made great advances in recent decades. Designers can make good use of these in their designs provided they fully understand the capabilities and limitations of such solutions.



#### Example 92:

Designing hard standings around buildings to allow the use of mobile elevating work platforms.

Taking advantage of developments in advanced surface coatings and jointing compounds that have extended performance and so require less maintenance.

Selecting mechanical handling systems that provide an integrated approach to materials handling and so reduce the need for manual handling (e.g. static and mobile cranes, goods hoists, rough terrain fork lift trucks, pallet trucks, etc )

### Replacing the dangerous by the non-dangerous or the less dangerous

It is relatively straightforward for designers to comply with this principle provided that they do not seek absolutely to rank design choices where the risks may be broadly similar. The same is true whether a major design is being developed or a decision is only being made about the specification for repainting a room. A common sense approach will generally quickly identify the better design solutions.



#### Example 93:

Avoiding the need for services excavations in potentially contaminated or otherwise difficult ground either by placing the services elsewhere or by aligning services in common service runs and pre-treating the ground in such areas. There is still risk during excavation work but it is less dangerous as the hazards from contaminated ground will have been avoided.



#### Example 94:

Providing access routes to plant rooms that avoid vertical ladders and the need to be exposed to adverse weather. The new route will still have some risks but they will have been substantially reduced.



#### Example 95:

Specifying the use of concrete retarders to create exposed surface finishes as opposed to percussive concrete tooling. Retarders are not risk-free but exposure to noise and dusts when tooling will have been avoided.

**Example 96:**

A precautionary approach to the selection of materials and substances. The use of some substances is obviously banned. Some design practices have developed 'red, amber and green' preference lists for other materials and substances: they routinely take these into account in all their designs. Non-flammable, non-toxic adhesives and surface coatings are typical examples.

### Developing a coherent overall prevention policy

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Design practices will generally have in place procedures for a formalised approach to developing client briefs and subsequent designs so that expectations are met. It is a straightforward step to integrate occupational safety and health into such decision-making and review processes.

Projects will also have procedures, often informal for smaller projects, so that stakeholders are able to work together to achieve their common aims. Occupational safety and health should be included.

**Good practices:**

Providing "shared project risk registers" as a tool for the identification of hazards, for their elimination or reduction, and for the effective management of the remaining risks.

### Giving collective measures priority over individual protective measures

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A design solution that requires workers to make use of personal protective equipment (PPE) has not met the principle of collective protection as PPE only goes some way to protecting the individual user. Collective measures protect everyone who may be at risk.

**Example 97:**

A parapet around a flat roof protects everyone on the roof: an unprotected roof edge puts people at risk of falling. Designers will need to consider if there are any hazards that solely affect those installing collective measures and, if so, take them into account during design development.

### Giving appropriate instructions to workers

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This final principle in the general principles of prevention is perhaps best seen from a designer's perspective, in terms of providing information about risks that are not likely to be obvious to others (including the unusual).

### Recording hazard elimination and risk reduction

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Where designers have decided to make some records at each stage of the design process, it is useful briefly to record what has been achieved and what needs to be addressed in later stages of design.

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**Providing risk information with the design**

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Designers are entitled to take the view that other stakeholders in the project team are competent to carry out the work assigned to them. These stakeholders are equally entitled to expect designers to provide information or 'warning notes' with their designs in certain instances.

Designers should provide warning notes when the remaining occupational safety and health risks are not likely to be obvious to other competent stakeholders. This may be because they are hidden or unusual.

Such risks may emanate from:

- the designs or
- the existing environment in which the work is to be carried out.

Where such project risks emanate from design, it is reasonable to expect designers to take the lead in bringing these to the attention of other stakeholders. This can be done in a number of ways. Information or 'warning notes' should be communicated in plain language, that is, they should be brief, clear and precise. They should be in a form suitable for the users. For most people, this can normally be achieved by using notes on drawings that, where necessary, refer to other supporting documents. The information needs to be passed to others in good time so that they can take it fully into account when developing further designs or preparing for construction work.

If there are hazards from the existing environment (such as asbestos, contaminated land, poorly consolidated ground, lead, PCBs, and existing facilities), designers will have identified the risks during the design process and will therefore be in a position to bring these to the attention of coordinators, contractors and others, including other designers who may rely upon these designs or be required further to develop them. Where projects require coordinators for safety and health matters during the project preparation stage, they can work together with designers in making sure that the risks are drawn to the attention of others. If there is no coordinator, designers should take the lead.

🔗 **See Annex 4 - Design Record sheet, p.192.**

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**Providing information for the Safety and Health File**

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Designers should provide relevant information to coordinators so that they can take it into account as they prepare or update safety and health files.

This information will come from completed designs and should be helpful to others carrying out further design or construction work. There are boundaries that can reasonably be drawn around the information that should be provided. It should be remembered that the information needed for a file is likely to differ from the information needed for initial construction work as the purpose of a file is to ensure that there is a store of information that will be useful for subsequent construction work.

🔗 **See Annex 6 - Safety and health file: suggested contents, p. 202.**

m) Examples on 3 different types of sites



**Example 98:**

Construction of a multi-residential new building of 7 floors above ground, ground floor for commercial use and 2 underground floors for garages.

**Characteristics:** Piling

**Problems:** The designers recognised that piling operations would create problems of noise adversely affecting workers and the public, especially an adjacent school. They were also concerned about noise and hand-arm vibration risks to those using hand-held breakers when cutting the tops of the piles.

**Solutions:**

They sought the advice of the contractor and the contractor brought in a specialist piling subcontractor. Together, they considered the options and found a solution to the problems that met everyone's needs.

Augured insitu concrete piles were preferred over driven piles so as to avoid percussive driving: and hydraulic ring splitters were used to cut the tops of the piles rather than rely on hand-held breakers. This reduced the noise to which those on site and those in the school were exposed. It also removed the exposure of workers to hand-arm vibration.

**Example 99:****Re-equipping the science laboratory of a school.****Characteristics:**

A suite of laboratories in a large school needed modernisation in two stages so as to keep the school in operation. This included replacing all of the benches and the associated services.

**Problems:**

The client wanted the minimum of disruption. The designer and the contractor were also aware of the need to minimise, so far as they could, injuries to workers and to school children: and they also wanted to make the second stage as easy to construct as possible.

**Solutions:**

The designer selected off-site manufactured laboratory benches and liaised with the services designer about the positions of isolation switches and valves.

Manufacture off-site meant that fewer workers were at risk on the site as the installation task was quickly completed. Raw materials needs were also substantially reduced so minimising the numbers of deliveries and the need for storage space on a very confined site. The careful placing of services isolation points meant that the second stage could go forward without having to switch off the services to the first stage.

This made it much easier for the site work in the second stage and it minimised disruption in the school. It also made easier further maintenance operations on the services. Where possible, work was carried out when the school was unoccupied.

**Example 100:****Construction of a new tunnel using an unfamiliar technique.****Characteristics:**

The client and designers were keen to make use of an unfamiliar technique when constructing some large diameter tunnels in an urban area. It had been suggested to them that there were substantial economies to be had.

**Problems:**

The method had not been used in that country before and the project stakeholders were concerned about the possible hazards from a sudden major collapse. The method involved a thin sprayed concrete temporary lining that was later reinforced by a permanent one and a complex system of staged construction so that the ground remained supported.

**Solutions:**

An experienced design team was engaged to design the permanent and temporary works so that there was the fullest safety coordination between them. A robust and cautious approach was taken to design and to the parameters that were set for the performance of the temporary lining. The contractor made sure that their engineers and other workers were fully trained and that sufficient experienced supervision was

also engaged. An independent system of closely monitoring the works was devised and put into effect by the designers so that progress would not be at the expense of safety. A trial length of tunnel was successfully constructed in a safe location.

Lessons were learned and the same stakeholders that were now better equipped to carry out the remainder of the project were engaged to follow the same working methods and engineering supervision and monitoring that had proved successful at the trial. The project works were successfully completed without any major mishaps.

### 4.1.3 Concluding preparations before starting construction work

Clients or project supervisors and project preparation stage coordinators have functions to perform at this point in their projects.

Execution stage coordinators, employers, contractors, subcontractors and the self employed also have functions to fulfil at this time as a part of their preparations for the project execution stage when construction work will be performed.

↳ See 4.1.1 Start of a project, p. 121. This sets out the principal steps that need to be taken during the preparation stages of projects for the purposes of occupational safety and health.

They are replicated below and have been annotated to indicate the functions that are likely to be in hand as the start of construction work draws near. (Practical guidance about preparatory work more closely related to work on site is given thereafter).

#### a) Establishing project teams that have the necessary competences (knowledge, expertise, skills and experience) in occupational safety and health and resources successfully to complete the project

Additional stakeholders, typically lead contractors and subcontractors, will be added to the team. Robust selection criteria should be used.



#### Good Practices:

Integrating occupational safety and health into formalised selection criteria.

In any selection process, cost will properly be an issue to consider along with service, quality and delivery time. Consideration should equally be given to safety and health. It is imprudent to select by lowest price alone.

Making clear from the outset (such as in the safety and health plan) what high risk construction activities are of particular interest to those who were involved in the preparation stages of a project such that they expect to see suitable method statements before work commences.

Setting clear safety and health criteria that will be used in assessing prospective contractors, making these clear to prospective contractors and expecting them to do likewise should work be sublet.

#### **b) Establishing overarching project management arrangements for occupational safety and health so that all stakeholders know the part that they have to play and how they should cooperate and coordinate with others**

Project management arrangements for occupational safety and health should be reviewed to ensure that they satisfactorily encompass contractor functions. Arrangements should ensure that project team members can cooperate with one another and coordinate their actions in order to secure on-site safety and health.



##### **Good Practices:**

Arrangements that enable occupational safety and health to be a topic that is dealt with in an integrated manner alongside other project matters are generally held to be more successful than those that address the topic in isolation.

Ensuring that subcontractors are included in the arrangements when they may be able to make positive contributions.

#### **c) Identifying client needs so that they can be met at the same time as minimising the risks to construction workers**

Final client needs (that are likely to relate to points of detail during construction) should be resolved.



##### **Good practices:**

Clients taking account of the needs of their contractors, often for the space needed for working, for storage and for welfare.

#### **d) Identifying other people whose safety and health may be adversely affected by the project and establishing working arrangements with them or suitable intermediaries**

Liaison should continue where called for and additional team stakeholders (e.g. contractors) should be introduced.

#### **e) Assembling information about current site conditions, its environs and possible technical and design solutions**

Information about a site is likely to have increased and a further stream of information about the intended construction works, in particular from design work, will be available and should be drawn as necessary to the attention of stakeholders (including contractors as they prepare proposals for their clients).



##### **Good practices:**

Coordinators taking the lead on the assembly and distribution of information required by others in contributing to increased safety and health during construction work.



#### **f) As design develops and other decisions fall to be made applying risk assessment to foreseeable occupational safety and health issues and, likewise, applying the general principles of prevention**

Risk assessment and the general principles of prevention should continue with a broadened application as other employers (i.e. contractors and subcontractors) become additional stakeholders in the project team.



##### **Good practices:**

Integrated risk registers where key stakeholders work together to identify hazards and agree the best means for their elimination where possible and the reduction of risk to acceptable levels where elimination is not achievable.

#### **g) Estimating adequate periods of time for completing the work involved**

At the macro level, clients, their advisers and leading contractors should resolve any issues about how much time is required safely to complete a project. At the micro level, the same issues should be resolved, normally between employers (contractors and subcontractors) and, including as appropriate, coordinators.

#### **h) Ensuring that safety and health plans are drawn up**

Safety and health plans should be at an advanced stage of development and should include useful information of the kind mentioned above.

See 2.4.2 Safety and health plan, p. 91.



##### **Good Practices:**

Coordinators who involve others, especially key contractors, in developing and refining safety and health plans.

Contractors who similarly engage with their subcontractors.

Providing plans as a part of the information assembled to assist prospective contractors as they prepare proposals for submission to clients.

Contractor providing plans (or essential extracts from them) to prospective subcontractors as they in turn develop their proposals.

#### **i) Ensuring that the preparation of safety and health files are commenced where required**

Files will have been further developed. Files may contain useful information for the newer stakeholders in a project team. Stakeholders can be informed of the further contributions that they will be expected to make so that files can be completed.

#### **j) Prior notice**

Prior notice should be communicated to the competent authority once key contractors have been selected and before any work starts on site.



↳ See 4.1.1 Start of a project, p. 88.

### k) Preparatory work prior to commencing on site

There are some practical issues that generally require consideration by those dealing with preparatory matters before work commences on site. Those involved can include clients, project supervisors, coordinators where required, employers, (contractors and sub contractors) and the self employed.

Clients and project supervisors should continue to fulfil the functions they have under Article 4.

↳ See 2.3.2 Client, p.50; and 2.3.3 Project Supervisor, p.57.

Project preparation stage coordinators should likewise fulfil their functions.

↳ See 2.3.5 g) What are the functions of coordinators for safety and health matters during the project preparation stage?, p. 65.

Time should be allowed by clients, their project supervisors and by safety and health plans for the preparatory work that will be required before work commences on sites.



#### Good Practices:

**Allowing a realistic period for pre-start preparations.**

Reassessing the period should contractors express views that the time allowed is insufficient.

In the case of term maintenance projects, especially where there are obligations to respond to client emergencies in maintaining their facilities, putting in place as much of the preparatory work as can be done having regard to foreseeable construction work and developing procedures that permit remaining preparatory work to be completed with the minimum of delay without compromising safety. (e.g. a company contracted to respond out of hours to emergencies such as water leaks for a client with a large chain of consumer stores agrees with the client that key information about safety and health risks and how to combat them (e.g. isolating electrical power circuits, safe access routes, etc) will be kept by the access doors to all premises).

Clients, project supervisors, coordinators and contractors should work closely together. A sensible approach that takes account of the nature and scale of the works and the risks should be taken. Practical issues under consideration will include:

- Safety and health plans;
- Safety and health files;
- Management and organisational arrangements (including site rules);
- Advance works;
- Site access;
- Securing boundaries and demarcating any exclusion areas;
- Existing and temporary services;
- Site layout including traffic routes, storage areas;
- Materials handling;
- Temporary offices and welfare facilities;
- Personal protective equipment policies;
- Emergency arrangements;
- Training.

#### Familiarisation with the proposed works and site



Stakeholders new to the project should familiarise themselves with the nature and scope of the proposed works and the site so that they can be aware of the implications for occupational safety and health. This can include reviewing documents and carrying out site visits.



#### Good Practices:

Checking information provided by others at a site inspection, e.g.:

- Is hazardous waste present?
- Are there indications of dangerous substances (e.g. asbestos), contamination or unexploded ordinance?
- Are there overhead power lines, underground services or other masts and are they shown correctly on site plans?
- Is there a water supply for fire fighting?
- Is a power supply available?
- Are there other restrictions such as from surrounding premises, roads or railways?
- What traffic management controls and restrictions are already in place?
- What measures are in place to protect the public?

#### Safety and health plans

Safety and health plans are key documents that will need to be considered by stakeholders newly introduced to project teams so that they are familiar with and fully informed about project-specific occupational safety and health issues.

🔗 See 2.4.2 Safety and health plan, p.91.



#### Good Practices:

Joint reviews of safety and health plans by contractors, safety or workers representatives, coordinators and clients/project supervisors and updating the plans in the light of agreements reached.

#### Safety and health files

Where there are existing safety and health files, these will be further documents that may need to be considered by stakeholders newly introduced to project teams so that they are familiar with and fully informed about existing occupational safety and health issues. Where essential information in such files has been taken fully into account when preparing safety and health plans, the need for review will be reduced.

In cases where the preparation of a new file (or the updating of an existing one) is required, contractors should make themselves familiar with their roles and contributions expected of them.

↳ See 2.4.3 Safety and health file, p. 95.



#### Good Practices:

Stakeholders newly introduced to project teams reviewing existing files and raising issues with others where there is doubt about the significance for safety and health.

Contractors making sure that they and their subcontractors know what is expected of them in contributing to safety and health files.

When establishing a new file, agreeing with clients what contributions to existing files or other records might be helpful.

### Management and organisational arrangements including site rules and plans

Safety and health plans should contain information on this topic. Plans should be reviewed, adjusted and updated as necessary. Steps should be taken to put the arrangements into place, including selecting suitable people, developing necessary procedures and putting them into effect (including any training that may be required for the purposes of safety and health).

Site rules should be prepared and agreed. The means for bringing them to the attention of workers and other people should be decided.

Developing site layout plans showing traffic routes, on-site facilities and arrangements is generally helpful in contributing towards site safety.

↳ See 2.4.2 Safety and health plan, p.91.

Where, according to national legislation, safety and plans are not required, similar issues will still need to be considered by those about to start construction work. For short-term work, verbal agreements, brief notes or simple sketches may be helpful in agreeing such matters with clients.



#### Good Practices:

Extending safety and health plans to include site layout plans showing traffic routes and on-site facilities, etc, where such are not already available.

### Advance (or enabling) works

It is at this stage in a project when any advance or enabling works should be put into effect, if that has not already been done.



#### Examples 101:

For work on rivers and watercourses, risks from intense rainfall and storm surges can require advance safety measures e.g. deviation channels and dykes.



#### Good Practices:

**Completing de-contamination, asbestos removal and dealing with issues of unexploded ordinance before commencing the remainder of the construction works.**

### **Site access points and routes**

Suitable site access points and routes should be determined and established so that construction work can commence on site.

The number and form will depend on the requirements of the work and the requirements of others (e.g. clients, neighbouring properties, highways authorities, etc). On very large sites, advance planning may determine that access points should change during the work.



#### Good Practices:

**Consulting with clients, occupiers of neighbour properties and highways authorities about the best places to put access points and routes and their design.**

**Agreeing the criteria for access/egress points (e.g. minimum visibility lines, etc)**

**Taking account of existing traffic flows and movements so as to reduce risks, especially where work is on a highway.**

**Recognising that pedestrians may be vulnerable to traffic movements at points of access and egress: and planning for those with disabilities.**

**Avoiding crossing public routes where possible, otherwise providing controls such as traffic light signalling equipment.**

**Separating entry and exit points and introducing one-way traffic flows on site.**

**Giving road-users and pedestrians advance warning of site entrances and exits.**

**Marking emergency routes so that they are kept clear.**

**Placing site roads within the operating areas of cranes and other lifting gear.**

**Ensuring sufficient safety distances from excavations, construction plant and natural hazards such as trees, uneven ground and watercourses.**

### **Securing boundaries, demarcating any exclusion areas and excluding the unauthorised**

The general principle should be that construction work is segregated from people not engaged in the work, in particular the public, especially vulnerable people. Moreover, the surroundings and the perimeter of the site must be signposted and laid out so as to be clearly visible and identifiable.



Segregation can normally be provided by physical barriers and by separation in time (e.g. where the work is done 'out of hours') or by distance (e.g. where work is wholly isolated from the presence of other people). The nature of the segregation required will depend on the project and the work in hand as well as the location of the site. What is suitable for a large building site would not necessarily be suitable for the construction of a power transmission line in an isolated location, maintenance

work on existing roadways that remain in use, or some minor works. The possible need to relocate barriers as the work proceeds may also have an influence.

Secure boundaries can serve a double purpose: they can help to protect the public from risks arising during the work and they can also protect workers from external risks such as passing traffic.

Secure boundaries help prevent unauthorised persons from accessing the site. Additional security measures will normally be required at access points.

There may be exclusion areas within a site boundary that need to be established to protect construction workers from existing hazards.



#### **Good Practices:**

Consulting clients, neighbours, local government, highways authorities, etc, when addressing such matters.

Access controls requiring site passes. (The passes may also contain safety and health competencies, training records and essential occupationally related health information).

Using specialist contractors to demarcate working areas where segregation involves high density or fast moving traffic. (Additional crash barriers or robust temporary walls are examples of a means for providing protection and maximising working areas).

Collective measures, such as temporarily closing roads and railway operations, as opposed to visual or acoustic warning methods.

### **Existing and temporary services**

Any requirements for temporary services needed for the purposes of safety and health should be determined and arrangements made for their supply. These can include communication services required for dealing with emergencies.

Existing and temporary services that may pose safety risks should be identified, located and marked. Some member states have published guidance on how this can be achieved in safety.



#### **Good practices:**

Keeping up to date records of where services are located.

Ensuring potable water supplies are available rather than relying on the daily importation of drinking water.

Installing temporary services to high standards and agreeing matters (such as earthing, etc) with supply companies.

Installing temporary electrical installations and distribution services that will provide for safety. (e.g. low voltage and battery operated tools with the provision of adequate charging points).

Placing bulk fuel storage (e.g. gas, fuel oil, etc) in safe locations.

Project requirements for artificial lighting should be determined and provided.



#### **Good practices:**

Planning the lighting of traffic routes, storage, work and welfare areas.

Providing lighting that illuminates all necessary areas and does so without creating glare.

Taking account of the need for public safety and lighting the outside of the boundary, in particular, access and exit points.

#### **Site layout including traffic routes, storage areas**

Other than for the smallest projects, it is good practice to prepare site layout plans showing safety related matters. Plans generally require updating as the work proceeds.



#### **Good Practices:**

Show on site layout plans

- Temporary site accommodation and welfare units;
- Storage facilities - open areas and enclosed stores, waste disposal;
- Access and exit points;
- Parking arrangements;
- Prepared traffic routes for segregating vehicles and pedestrians;
- Work areas;
- External constraints due to activities by others beyond site boundaries;
- Fixed plant and equipment such as silos;
- Cranes and other mechanical handling devices (with their lifting capabilities usefully shown);
- Operating points for mobile plant;
- Permanent and temporary services;
- Areas in which the use of personal protective equipment is mandatory;
- Major Scaffolds;

- The orientation of temporary lights;
- The placing and distribution of utilities like electricity, water, gas, etc..

#### Materials handling

An integrated approach to materials handling that minimises double handling and maximises the use of mechanical handling devices reduces the likelihood of injuries.



##### Good practices:

Develop plans that permit an integrated approach to materials handling e.g.:

- Storage areas and bulk silos, etc, that are directly accessible by delivery vehicles;
- Storage areas that are safely within the operating capabilities of site cranes;

#### Plant and equipment

Plant and equipment requirements should be resolved and arrangements made for their safe operation where there is common usage.



##### Good Practices:

Common on-site training, including refresher training.

Clear understandings on common use, testing and maintenance regimes.

#### Temporary offices and welfare facilities



Permanent facilities often provide the best safety and welfare solutions where they are available. Where they are not, requirements for temporary facilities should be assessed and provided.

Contractor's temporary accommodation units are normally required for welfare facilities (for taking meals, changing, washing and toilet facilities, first-aid), recreation rooms, residential and sleeping accommodation where required, site offices for the project team, tool stores, materials stores fuel storage.



##### Good practices:

Locating site offices so that it is possible to observe safety critical locations.

Taking into account access by those with disabilities.

Enabling safe access routes from boundary access points to offices and welfare so that PPE is not required.

Locating welfare facilities so that they are safely segregated from traffic routes and movements.

Locating welfare facilities close to the work to reduce on-site travel time. On large



## 4. Managing risks during construction projects

### 4.1 The project preparation stage - Concluding preparations before starting construction works

sites, considering making facilities available at a number of locations.

Locating welfare facilities so that they are not at unacceptable risk from the possibilities of structural collapses during the work.

Taking full account of the need to provide for emergency escape.

Agreeing that facilities set up initially for use of one contractor will be used by another as construction work progresses.

Ensuring facilities are regularly cleaned.



Suitable sanitary and washing facilities should be provided from the outset. These will include sanitary conveniences, hot and cold washing facilities (including showers where required), changing rooms, storage facilities for protective clothing and personal clothing not worn at work, messing, rest rooms (including, as required, special provision for pregnant workers) and places to shelter from inclement weather.

Arrangements should be made and put into effect so that they are kept clean and in a suitable condition. Annex IV of the Directive provides further detailed requirements.

### Personal protective equipment policies

Personal protective equipment policies should be developed and made known, perhaps through site rules. 'Hard hat' zones are the most likely components of such a policy having regard to the risk of falling materials: but other equipment may be required or considered beneficial depending on the work that will be undertaken.



#### Good Practices:

Introducing requirements for the mandatory use of necessary personal protective equipment (e.g.: high visibility clothing, protective footwear, eye protection, protective gloves, etc...) where past experience indicates that the likelihood injuries will be reduced by their use.

### Emergency arrangements including first aid

Emergency planning should cover man-made and natural disasters (e.g. inundations, fire, structural collapses, earthquakes, lightning, etc.).

Common emergency plans and arrangements for first-aid provision are advantageous. The 'Framework' Directive requires employers to cooperate and coordinate what they do for occupational safety and health, and this is an example of where such action is beneficial.



## 4. Managing risks during construction projects

### 4.1 The project preparation stage - Concluding preparations before starting construction works



First aid provision and emergency arrangements should take account of hazards from the work, numbers exposed and the likelihood of support and likely response times by emergency services, especially for isolated projects. Liaison with the emergency services can be beneficial when addressing such issues.

Emergency plans should cover the possibility of fires. Issues such as hot processes, the storage of combustible or flammable materials, liquids, gases and waste and increased risks during the night-time occupation of residential accommodation are typical

issues to consider.

Other hazards and possible emergencies (including natural disasters) should be considered having regard to the nature of a project and its location.

The key to emergency planning is first to ensure:

- That effective management action is taken to prevent an emergency occurring;
- That there are systems in place for quickly identifying emergencies and communicating with an emergency response team;
- That all workers are made aware of an emergency and know what actions to take;
- That the emergency response team is properly trained, equipped, instructed and supervised;
- That emergency services are contacted; and
- That others who may be adversely affected are notified.



#### Good practices:

Agreeing comprehensive fire and rescue measures with the appropriate authorities for large construction sites and for projects with high fire loads, or where the rescue of personnel may be particularly difficult.

Planning and implementing emergency procedures and carrying out practices.

Sending route maps to emergency services where it might not be apparent how to access the work.

Placing first-aid facilities close to site exits so they are readily accessible to ambulance staff.

Having fire points with extinguishers at danger points and on circulation routes. Training workers in their use.

### **Training, Information, Consultation and Participation.**

Training needs specific to the project should be considered and action taken. Individuals may require training to fulfil their respective roles on site. The competences (qualifications, skill,

knowledge, and experience) of workers, including project managers, should be reviewed to ensure that they are capable of safely playing their parts.

Induction training for everyone entering the site will be required so that they are aware of the particular hazards and risks, and the appropriate emergency responses.

Action should be taken to ensure that workers will receive necessary information about on-site safety and health.

Special attention should be paid to the training needs of migrant workers and other groups such as young people, temporary workers and new entrants to the construction industry.

Start-up meetings at the initial construction stage can usefully be organised in order to achieve common understandings of site rules. Similar meetings can also be organised when major changes involving new contractors occur.

↳ **See Information for workers, p.77.**

Action should be taken to ensure that workers are consulted on safety and health, and that they actively participate.

↳ **See Consult workers, p.79.**



#### **Good Practices:**

**Developing and putting into effect project training plans.**

**Developing common site induction training.**

**Developing a programme of common 'toolbox' talks.**

**Developing common approaches to information transfer, consultation and participation.**

**Issuing safety passes to all workers who complete a training programme. The trade or profession and the name of their employer can be mentioned on safety passes.**

## **I) Planning and arranging site activities**

This part of the Guide provides information on some typical matters to address when planning and arranging for site activities. The topics covered are indicative of those arising at many projects but they are unlikely to be sufficiently comprehensive for particular tasks.

Account should be taken of Annex IV to the Directive, other worker protection directives and national legislation that may set higher standards.

Clients or their project supervisors continue to have functions to fulfil under Article 4 and project preparation coordinators similarly have functions under Article 5 of the Directive.

↳ **See 2.3.2 Client, p.50; 2.3.3 Project Supervisor, p.57; and 2.3.5 Coordinators for safety and health matters, p.59.**

Employers (contractors and subcontractors) and self-employed persons, once selected, should plan and organise their site activities before they start work so that they do not put people at unnecessary risk.

## Management and Supervision

Suitable management and supervision arrangements should be put in place having regard to the nature and scale of the project and risks involved. The arrangements should be integrated into the management arrangements for the project as a whole.

## Safe working methods

Safe working methods should be developed. Elements of safe working methods, that is safe access, egress, place of work, plant, handling, and working environment, and the provision of training, information and instruction, are addressed by the following part of this Guide.

## Suitable access, egress and working places

Suitable and safe means of access and egress should be provided together with safe places of work. These may either be provided by existing facilities, by completed construction work or by temporary means such as mechanical access plant, scaffolds, temporary stairways and ladders. Choice will be determined by a range of matters including risk assessments.

## Work at heights

A further Directive, 2009/104/EC<sup>1</sup>, on the minimum safety and health requirements for the use of work equipment by workers particularly addresses this issue. You will find comprehensive practical advice in the non binding Guideline on "How to choose the most appropriate work equipment for performing temporary work at a height"<sup>2</sup>.

A risk-based approach should be taken to determine the most appropriate choice of equipment for a particular task.



### Good practices:

Using integrated stairs as a mean of access.

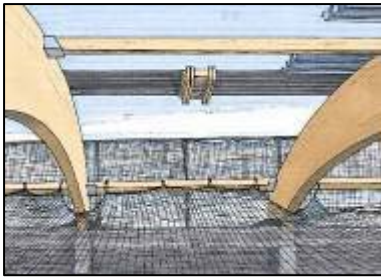
Temporary stairs are preferable to ladders. Stairs reduce the stresses on workers and contribute to faster working processes.

<sup>1</sup> Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ 3.10.2009 L 260

<sup>2</sup> You will find comprehensive practical advice in the Non-binding Guideline on "How to choose the most appropriate work equipment for performing temporary work at a height."

<http://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=140&type=2&furtherPubs=yes>

#### Temporary facilities



Temporary facilities may include scaffolding, guardrails, safety nets, shoring, falsework, and other forms of temporary support. These need to be planned and designed.

They need to be safely constructed and inspected before being brought into use.

They should also be subject to routine monitoring that takes into account modifications, alterations, adverse weather and the conditions of use.

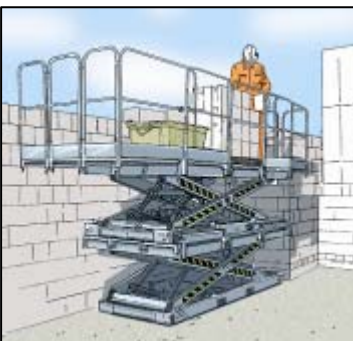
#### Safe handling, storage and transportation etc

Planning should take account of the means for safely handling, storing, transporting and using articles, tools, pre-fabricated assemblies and substances that will be incorporated into the finished works or otherwise used during construction activities. Other directives deal with the safe use of substances.

#### Ergonomics

Ergonomic considerations should be taken into account when planning, especially where there are likely to be repetitive or difficult bodily movements.

Directive 2002/44/EC<sup>1</sup> gives further indications on the exposure of workers to the risks arising from physical agents (vibration).



#### **Example 102:**

Where heavy block laying cannot be avoided, using a scissor lift is one mean of providing a suitable working platform to lift the heavy block.



#### **Example 103:**

When heavy windows have to be installed, planning so that scaffolds have sufficient working space and sufficient load-carrying capacity so that suitable lifting equipment can be used.

<sup>1</sup> Directive 2002/44/EC of the European Parliament and of the Council of 25 June 2002 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration) (sixteenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ L 177 , 06.07.2002

#### Lifting equipment



The construction industry makes considerable use of temporary site cranes and mobile cranes. Their safe use requires particular attention. Directive 2009/104/EC<sup>1</sup> concerning the minimum safety and health requirements for the use of work equipment by workers at work, addresses this issue.

This includes the suitability of the ground and any temporary foundations, safe erection and dismantling operations, safety during use (including slinging and banks persons, and the training and competence of drivers) and the working environment (e.g. work in hand nearby, overhead power lines, adjacent land uses, clearance around moving/slewing parts etc). Crane lifts should be planned so that operations are safe and within the operating envelope of the machines. Inspection and maintenance regimes need to be planned and followed.

The use of temporary hoists and other lifting equipment, such as rough terrain forklift trucks, requires similar consideration.



#### Good Practices:

**Developing integrated solutions to the lifting of materials.**

**Agreeing and providing safe access routes to the place of use: and preparing the work site so that lifting equipment can be safely installed and used.**

**Coordinating the use of such plant where there are a number of users.**

**Keeping lifting equipment inspected, tested, maintained and fit for its intended use.**

**Clear rules of operation where several cranes are present on a construction project.**

**Physical barriers to demarcate working areas from exclusion areas (e.g. overhead power lines and vulnerable underground services).**

**Clear training procedures. Many national provisions for mandatory training for receiving certificates for lifting equipment.**

#### Other plant and equipment



Other large items of plant and equipment require special consideration including issues concerning its delivery, installation, use and subsequent removal from site.

<sup>1</sup> Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - OJ 3.10.2009 L 260



#### Good practices:

Investigating the access routes to the construction site for large plant such as truck-mounted concrete pumps.

Paying particular attention to the overhead clearance and width and the load-bearing capacity of bridges and access routes.

Having production installations (like concrete mixing plant or places for prefabrication) in close proximity to the construction site.

### **Safe working environment**

Consideration of a safe working environment includes a review of hazards and risks :

- from the work activities in question to those carrying them out and to others,
- from other work activities on the project,
- from other industrial activities at the site,
- and from the general environment in which the project is being undertaken.

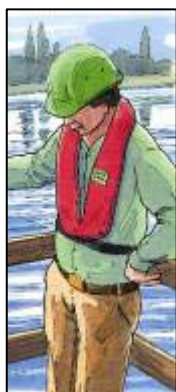
It will be informed by project safety and health plans and files, and by information received from other employers sharing the same workplace. Clients or project supervisors and coordinators have functions to discharge. The self-employed and employers carrying out construction work should consider their own safety and health and that of others who may be adversely affected.

### **Collective protective measures**

Measures that achieve collective protection for workers should be given priority as they reduce risks to all workers.

Contractors should cooperate and coordinate their activities to achieve such outcomes. Clients or project supervisors and coordinators should play their respective parts.

↳ See 1.2.8 Giving collective protective measures priority over individual protective measures, p. 27.



#### Example 104:

Installing barriers when construction work is near to watercourses where there is risk of drowning;

Providing suitable edge protection where there is risk of falling.



### m) Information, consultation, participation, training, instruction and supervision of workers and self-employed workers

Workers and/or their representatives should be:

- Informed about the measures to be taken concerning their safety and health.
- Consulted and encouraged to participate in safety and health matters.
- Trained, instructed and supervised for the work they are required to perform. See the Framework Directive, 89/391/EEC



#### Good Practices:

Self-employed workers and employers who themselves carry out construction work should consider their training needs.

See 4.2.1 Construction stage, p.162; and 2.3.9 Workers and their representatives, p.84.

### n) Examples on 3 different types of sites



#### Example 105:

Construction of a new multi-storey residential building founded on piles and on contaminated ground.

#### Characteristics

New construction work by a private developer who is not a contractor.

#### Problem:

How to construct the piled foundation without exposing workers to unnecessary risks.

#### Solutions:

The client seeks and relies upon the expert designers, architects and engineers that have been appointed. They commission investigations into the level of contamination and possible technical solutions for the piling. Initial solutions are developed involving the on-site treatment of the ground that is heavily contaminated and for the off-site transportation and disposal of piling arisings. A safety and health plan is developed by the coordinator who has been involved from an early stage.

Specialist piling contractors are then invited to express an interest in carrying out the work. One suggests the use of a relatively new augured piling system that creates the minimum of arising and so reduces worker exposure to contaminated soil as well as reducing off-site disposal costs.

The client places the work with this contractor and the safety and health plan is adjusted and accepted by the client before work commences on site.



#### Example 106:

##### Painting operating theatres in a major hospital

###### Characteristics:

Routine maintenance work to achieve high quality wall finishes that can be easily kept clean.

###### Problems:

Such finishes often contain harmful substances, especially when sprayed in internal poorly ventilated rooms.

Risks to patients and other workers (hospital staff) using the same workplace.

The creation of a construction site within an existing workplace.

Some theatres need to be available at all times for emergency cases.

###### Solutions :

Alternative surface coatings were considered and the one creating the least hazards was selected.

Means for sealing the permanent ventilation systems and other possible transmission routes for fumes and dust were devised. Suitable portable mechanical extraction ventilation systems were selected and temporarily installed and tested so that the work areas were under negative pressure and a sufficiency of fresh air was introduced for worker safety. Suitable personal protective equipment was selected to protect the workers and suitable welfare accommodation provided.

Phased working ensured that theatres remained available with segregated access routes for construction workers (created by heavy-duty polythene tunnels).

The client's senior safety and health adviser and the coordinator for the project worked in concert with the architect, the equipment and surface coating suppliers and the contractor. Special arrangements for monitoring the working environment of the contractor and the hospital were devised and formed a part of the safety and health plan. Special site rules were developed with the contractor. Workers employed by the hospital and the contractor (and their representatives) were kept fully briefed and informed.



#### Example 107:

##### Demolition of a tall chimney on a confined site

###### Characteristics:

Demolition of a tall reinforced concrete chimney creates particular dangers for construction workers as well as for people beyond a site's boundary.

###### Problems :





#### 4. Managing risks during construction projects

##### 4.1 The project preparation stage - Concluding preparations before starting construction works

Falling material, tools and equipment during the work.

Damage to other facilities putting people at risk.

In this case, insufficient space to use explosive demolition techniques.

Fall hazards to workers.

Dust from the work.

Solutions:

Expert consultants were engaged by the client. Specialist demolition contractors were invited to demonstrate their competence for carrying out the work by giving presentations about their businesses, their past projects and their proposals for how the proposed work could be safely accomplished (by outlining safe working methods).

Two alternative solutions emerged from two competing contractors: one in which parts would be sawn off by workmen using heavy sawing equipment and thermic lances with pieces lifted off by crane and another in which a specialist demolition machine with a breaker point would be positioned on top of chimney, demolished material would be discharged down the chimney and then removed by a machine with a protected cab. Both involved specialist scaffolding systems inside the chimney that could be hydraulically lowered as the work proceeded.

Both methods were subjected to rigorous hazard and risk assessment by the client's expert consultants, advised by the coordinator, and taking into account the numbers of workers exposed and the hazards to which they were exposed.

The second option was chosen as it involved the mechanisation of the process and so placed fewer workers at risks.

## 4.2 Execution stage of the project

### 4.2.1 Construction stage

During construction, the project enters its execution stage with the involvement of execution stage safety and health coordinators, employers, contractors and subcontractors. They have particular functions to perform.

↳ See 2.3 The stakeholders, p. 47.

Workers and their representatives are also involved as others have obligations to inform, consult and seek their participation.

↳ See 2.3.9 Workers and their representatives, p. 84.

Safety and health plans and files where these are required should inform people about the execution of the construction works.

↳ See 2.4.2 Safety and health plan, p. 91, and 2.4.3 Safety and health file, p. 95.



#### Good Practices:

Where plans and files are not required, it is normally a good idea to have agreements between the stakeholders involved to cover similar issues where enhanced safety will result.

Project execution stage coordinators should:

- Coordinate implementation of:
  - o The general principles of prevention;
  - o The principles in Article 8 by employers and the self-employed;
  - o Safety and health plans by employers and the self-employed;
- Organise cooperation between employers including the self employed;
- Coordinate arrangements to check that working procedures are being correctly implemented;
- Update safety and health plans and files; and
- Take steps to ensure that only authorised persons are allowed onto construction sites.

↳ See h) What are the functions of coordinators for safety and health matters during the project execution stage?, p.68.



#### Good Practices:

Where coordinators are not required, it is normally a good idea to have agreements between clients and the single contractors engaged to cover similar issues where cooperation and coordination between clients and their contractor will enhance safety.

Whether or not there are coordinators, employers should:

- Implement Article 6 of Directive 89/391/EEC;
- Take measures that are in line with the minimum measures set out in Annex IV of Directive 92/57/EEC;
- Provide comprehensible information to workers and/or their representatives;

- Ensure consultation and participation of workers and their representatives;
- Fulfil responsibilities that they have under the 'Framework' Directive, 89/391/EEC;
- Take account of directions from coordinators where they are appointed; and
- Those employers personally engaged in construction work should comply with the issues identified in Article 10.1.

➤ See 2.3.8 Self-employed person, p. 82; Contractors and subcontractors should refer to part 2.3.7 Contractors and subcontractors, p.82; Suppliers and others should refer to Parts 2.3.10 Suppliers, p. 85, and 2.3.11 Others, p. 86,

The actions that will be necessary to fulfil these functions will depend on the nature and scale of the project, the hazards and risks that will be created, and what will be required to ensure that the risks are effectively controlled. Actions taken should avoid unnecessary bureaucracy: rather, they should add value to the project by reducing occupational safety and health risks to which people might otherwise be exposed.

The implementation of effective management arrangements is the key irrespective of the nature, scale and duration of the construction works. Safety and health plans, where required, should inform people of the management arrangements. The positive involvement of workers so that they can make effective contributions to on-site safety is also essential.

Clients committed to having a project that achieves exemplary standards can play a useful part by demonstrating their commitment during the construction stage of a project.



#### **Good practices:**

Appointment by the client of an "ambassador", a person who can make clear the clients commitment to good working conditions and who acts as a channel for maintaining contact with site workers.

### **a) Managing projects for safety and health**



Effective organisation and coordination of construction work is essential to its safe completion. The Directive requires execution stage coordinators to take the lead on these functions and requires employers (contractors and subcontractors) and the self-employed to take into account directions they are given by coordinators. These functions are best carried out so that the management organisation, arrangements and actions on occupational safety and health matters are integrated into the mainstream activities of managing projects. This requires coordinators to work closely with those stakeholders carrying out such broader management functions.



#### **Good Practices:**

All project stakeholders working in close cooperation having agreed a common objective of a 'zero tolerance' towards poor safety performance by any member of the team.

### **Coordination**

It is essential to note that the coordinators' functions are to coordinate implementation of the general principles of prevention and the detailed issues raised by Article 8, and safety and

health plans. Their functions are not directly to manage work activities by employers and others to achieve such ends. Coordination involves a broad consideration of the work activities and the safety and health issues that will arise. This should be done in advance of the work commencing.

Coordinators will be informed by their knowledge of the work to be done, by risk assessments carried out by employers (contractors and subcontractors) and from the working methods that employers and the self-employed are proposing to adopt. Coordinators should work with them with a view to ensuring that work activities will secure safety, including in particular that the work of one stakeholder will not put others at risk and that facilities to be used in common will be provided, maintained and used as intended by project plans.

Employers and the self-employed should cooperate with coordinators and take full account of the directions that they give so that they can satisfactorily carry them out. They should also recognise the positive benefits to them from the work of coordinators and their obligations to coordinate with one another under the Framework Directive.



#### **Good Practices:**

**The development of shared risk assessments for particular stages of a project (e.g. structural erection) involving all of the parties involved in the work or able to influence positive safety outcomes.**

### **Cooperation**

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The Directive requires coordinators to organise cooperation between employers (including the self-employed) for the purposes of safety and health. Employers and others have obligations under the Framework Directive to cooperate one with another when implementing their actions on occupational safety and health. Cooperation requires employers to address what they can do to work together in dealing with the issues that they face, both in their individual work and where they share working areas and facilities. The cooperation that is required and the means for achieving it will depend on the particular hazards and risks. Employers and the self-employed should take full account of the directions that they are given by coordinators in seeking cooperation between stakeholders.



#### **Good Practices:**

**An agreed project-wide approach coordination and arrangements that will provide a means of coordinating hazard elimination and risk reduction that includes designers and contractors.**

### **Working effectively**

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Exchanges of information, exploring and reaching agreement on matters of common interest and implementing those agreements are at the core of effective coordination and cooperation. Effective communications between stakeholders also play an important part. Safety and health plans provide a means for setting out in advance how these functions will be carried out and for reflecting changes that are made as the construction work proceeds.



#### **Good Practices:**

**Team building events that help to demonstrate how 'win-win' solutions can come from working effectively together.**

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**Checking performance**

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Coordinators have also to implement arrangements to check that working procedures are being correctly implemented. They may do so themselves or they may require others (in particular, employers and the self-employed) to play a part in doing so. In practice, a combination of the two is likely to be the most effective way forward so that employers can monitor their own activities as well as the interfaces between them and others, and inform coordinators of the outcomes whilst coordinators can independently review project performance by taking a more holistic viewpoint and by particular attention to the effectiveness of the management arrangements that are in place for occupational safety and health.

**Good Practices:**

Setting success criteria before construction work commences and measuring performance against them.

**Example 108:**

A client required a bonus program for improving occupational safety and health. The contract included a sum to cover the bonus payments to the contractors and the workers. Payments depended on achieving good scores on key performance indicators for safety and health (e.g. keeping the site tidy, participating in on-site training courses, reporting near-misses, participation in safety-meetings).

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**Subcontractors**

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Employers when addressing cooperation, coordination and monitoring of their work activities should take account of any activities that they have subcontracted to others. They should include subcontractors in the arrangements that have been made. Employers should ensure that their subcontractors are fully aware of, are able to influence and are kept up to date on any changes in safety and health plans.

**Good Practices:**

Informing coordinators about all subcontractors working on site.

Ensuring that subcontractors play a full part in addressing safety and health, especially those engaged in high risk or safety-critical activities.

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**Others**

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Coordinators for project execution stages will also need to seek the cooperation of and secure the coordination of clients or their project supervisors, project preparation stage coordinators and others such as designers and suppliers in achieving satisfactory project outcomes.

**Good Practices:**

Others who might otherwise be on the periphery of a project are encouraged to become actively involved.

### Site meetings

Depending on the project, site meetings provide one communication means for securing the effective transfer of information, cooperation and coordination, and the review of occupational safety and health performance.

Occupational safety and health is generally best addressed by integrating issues into discussions on how projects are managed such that they are given full consideration when dealing with technical reviews, the distribution of information, discussions on progress, work scheduling, logistics and the like. However, separate consideration should always be given to performance reviews and corrective actions to achieve the required standards of occupational safety and health.



#### **Example 109:**

When working on a live railway, the coordinator ensured that representatives of the railway company were present at specific project meetings so that the hazards identified in the preparatory stages were successfully managed throughout the project, and regular reviews of the hazards register undertaken. This ensured the safe completion of the project and the safe operation of the railway system.

### Controlling access to site

Coordinators have functions for ensuring that steps have been taken to exclude unauthorised people from entering construction sites.

Authorized persons are likely to include those who have been inducted and then permitted to enter a construction site such as:

- Those carrying out and supervising the construction work;
- Clients, project supervisors and others they have appointed such as designers; and
- Persons authorised by legislation (e.g. building control officers, competent authorities for occupational safety and health, police and fire services) etc.

The effectiveness of the measures in place should be considered by coordinators when carrying out reviews of project performance: corrective action should be taken where needed. Future developments in the construction work that might adversely affect security should be considered so that arrangements can be put into effect to maintain security.



#### **Good practices:**

Access control by means of personal badges for each worker issued and checked by competent security personnel.



Electronic access control systems for all authorized persons. Systems might include information about worker safety and health training and other work related matters.

Appointing one contractor to be in charge of site security.

Maintaining a list of authorised contractors and workpeople and whether they have successfully completed their induction training.

Maintaining a register of which contractors and workers are on site for use in the event of emergencies.

## Emergencies



In addition to addressing planned site work, stakeholders should jointly devote sufficient time and resources to planning for and dealing with emergency responses, whether for first-aid, fire fighting, rescue and evacuation. Safety and health plans should address such matters. Where there is no requirement for a plan, emergency arrangements should be considered by clients and their single contractor.



### Example 110:

The emergency plan for a project involving widening of an existing major road took into account the need for access by the emergency services attending incidents both on the project and on the public traffic route. This involved close cooperation between the client, the coordinator, the designer, the contractor and the emergency services.

☞ See 2.4.2 Safety and health plan, p.91.

## Information, consultation and participation - Workers and/or their representatives

The provision of common information can sometimes best be achieved by using a common approach on a project. Coordinators can have a role to play in putting arrangements in place. Likewise, consultation and participation can also be the subject of common approaches on a project.

☞ See 2.3.9 Workers and their representatives p.84.



### Good practices:

Using a range of means:

- Briefing and consultation meetings;
- Leaflets, videos, etc;
- Site notice boards;
- Posters campaigns;
- Choosing subjects for toolbox talks that are relevant to the work (e.g. personal protective equipment, major risks such as falls, electrocution, etc);

- Paying special attention to “near misses” as they may highlight problem areas.

Workers whose native language is not that of the construction site can be at risk and special account should be taken.



#### Good practices:

Having at least one supervisor on site who can communicate with workers whose native tongue is not that of the site.

Translating safety rules, induction, training and instruction materials.

Using illustrations, pictograms and international safety signs so that instructions are more readily understood.

Informing coordinators about all subcontractors working on site.



#### Example 111:

Giving access to relevant publications or/and the Internet to all site workers so that they can access safety and health information.

### **b) Article 8 and Annex IV of Directive 92/57/EEC and Article 6 of the Framework Directive, 89/391/EEC**

Article 8 requires the general implementation of the principles in Article 6 of the Framework Directive, those being the general principles of prevention, (See Part 1.2 of this Guide)

Annex IV sets minimum safety and health requirements for construction sites. Part A sets general minimum requirements for on-site workplaces. Part B sets specific requirements for on-site workstations. Part B is divided into two sections. Section 1 sets minimum standards for on-site indoor workstations. Section 2 sets standards for on-site outdoor workstations.

Leading stakeholders during project execution stages have particular functions to perform on these. Thus:

- Coordinators have to coordinate implementation of the principles in Article 8 by employers and the self-employed,
- Employers have to:
  - o Implement Article 6 of Directive 89/391/EEC;
  - o Take measures that are in line with the minimum measures set out in Annex IV; and
  - o Fulfil responsibilities that they have under the 'Framework' Directive, 89/391/EEC,
- Self-employed workers have to comply with Article 8 and Annex IV.

➤ See 2.3 The stakeholders, p.47.

Article 8 itemises 10 instances when the principles should be particularly applied. They are with regard to:

(a) Keeping the construction site in good order and in a satisfactory state of cleanliness;

(b) Choosing the location of workstations bearing in mind how access to these workplaces is obtained, and determining routes or areas for the passage and movement and equipment;



- (c) The conditions under which various materials are handled;
- (d) Technical maintenance, pre-commissioning checks and regular checks on installations and equipment with a view to correcting any faults which might affect the safety and health of workers;
- (e) The demarcation and laying-out of areas for the storage of various materials, in particular where dangerous materials or substances are concerned;
- (f) The conditions under which the dangerous materials used are removed;
- (g) The storage and disposal or removal of waste and debris;
- (h) The adaptation, based on progress made with the site, of the actual period to be allocated for the various types of work or work stages;
- (i) Cooperation between employers and self-employed persons; and
- (j) Interaction with industrial activities at the place within which or in the vicinity of which the construction site is located.

### **c) Some other issues**

#### **Selection of plants/ tools/materials and working methods**

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Choices should be made having regard to the general principles of prevention and ergonomic principles.

↳ **See 1.2 General principles of prevention, p.21.**

Work stations should be designed having assessed the risks and by taking ergonomic factors into account.

Work platforms should be stable and arranged so as to prevent falls. Safe access should be provided.

Construction machinery, lifting apparatus and other machines should be appropriate for the work in hand, checked, tested and maintained. Workers should be suitably trained.

#### **Air quality, noise, vibration, dust, lighting, cleanliness**

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Working environments should be provided and maintained so that they comply with the appropriate European directives (e.g. noise, chemicals, etc).

↳ **See Annex 7 - European Union legislation - Other safety and health Directives, p. 206.**

#### **Conformity of work equipment**

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Work equipment should be appropriate, checked, tested and maintained. Workers should be suitably trained in its use.

Contractors can usefully review similar matters with their subcontractors.

**Good practices:**

Having a policy in the company that includes safety and health criteria in their purchasing and rental procedures.

Using equipment that conforms to European standards and has statements of conformity. The CE Marking should be visible on the work equipment.

Having work equipment with a high level of performance regarding the prevention of risks related to its use (e.g. vibration, dust emissions, etc.).

Coordinators promoting the use of work equipment with emission capture at source and, similarly, equipment that has the lowest vibration levels.

**d) Updating Safety and Health Plans**

The Directive gives to coordinators functions for updating safety and health plans. Plans should be regularly reviewed and changes agreed and made after consultations with relevant stakeholders. Management arrangements for securing occupational safety and health should be regularly reviewed to ensure that they remain 'fit for purpose.'

↳ See 2.4.2 Safety and health plan, p. 91.

**e) Updating Safety and Health Files**

The Directive requires coordinators to update files. Additional information is likely to come from those continuing to develop designs and from those carrying out construction work.

↳ See 2.4.3 Safety and health file, p. 95.

**f) Examples on 3 different types of sites****Example 112:**

**Construction of a multi-residential new building of 7 floors above ground, ground floor for commercial use and 2 underground floors for garages (see Example 1 of 2.6 above)**

**Characteristics :**

**Client:** Private developer who is not a contractor.

**A 7-floor building of reinforced concrete frame with in situ slabs with brick cladding/masonry.**

**Pile foundations.**

**Flat roof with parapet.**

**Projecting balconies.**

**Ground floor for shops and 2 underground floors.**

**Built on a contaminated site.**

**Next to a school and a busy road.**



Also adjacent to another construction site.

#### Problems :

During a safety and health audit at the site, it is found that the bricklaying subcontractor is working from the structure rather than an external scaffold and that workers are at risk of falling from unprotected edges.

According to the safety and health plan, an external scaffold should have been erected for the use of a number of trades including the bricklayers.

#### Solutions:

Work is stopped until a suitable scaffold is erected.

The site safety committee is informed.

Toolbox talks are arranged for all trades about safe working at height.



#### Example 113:

##### Changing underground sewer under a public road.

#### Characteristics:

The client, a city council that has an engineering department, is replacing part of a foul water sewer under an existing roadway involving more than one contractor.

#### Problems:

Close proximity to the public and residential properties.

Presence of underground and overhead services and utilities. Risk of collapse of the excavations.

#### Solutions:

Appoint a coordinator.

Prepare a safety and health plan because of the specific risk of burial under earthfalls irrespective of the need for prior notice.

The coordinator takes an active part in site meetings and reviews with others the accuracy and interpretation of the plans of existing services. Agreement is reached for a suitable form of fencing around the works. The coordinator and contractors

#### 4. Managing risks during construction projects

##### 4.2 Execution stage of the project – Construction stage

jointly review working methods including the safe use of plant and equipment, especially for excavating near live services and for lifting.

“Toolbox talks” on the key risks (e.g. overhead and underground services, collapses of excavations, excavators used as cranes) are carried out before work starts.

**Example 114:****Renovating a suspension bridge.****Characteristics**

Renovation of a suspension bridge.

Nature and objectives of the works:

- Paint stripping and repainting of parapets;
- Corrosion protection treatment of cables;
- Renovation of the wearing course;
- Replacement of movement joints.

Total duration approximately 4 months.

**Problems**

Traffic restrictions;

Night working when replacing the wearing course;

Risks related to incompatibility between trades working at the same time (shot blasting, cable treatment, wearing course);

Risks related to work at a height.

**Solutions**

Specially designed platforms for work at a height (cables, parapet);

Jointly assessing the risks of one trade adversely affecting another. Initial worker induction and information about working in the vicinity of live traffic;

Worker training about night working;

Particular attention to the methodologies for high risk work such as work at height;

On-site monitoring during shot blasting to assess the risks related to dust and noise.

## 4.2.2 End of the construction stage

Once construction work is completed, a project is nearly concluded. There is the need to complete work on safety and health files and the opportunity to take stock on the lessons that can be learned for implementing on subsequent projects.

### a) Update of the Safety and Health File

Safety and health files should be updated to take account of any further information. They should then be handed to clients and explanations given about its purposes and what it contains.

↳ See 2.4.3 Safety and health file, p. 95.

### b) Safety and Health Performance evaluation of the construction project



**Good practices:**

Providing a "Safety and Health Project Closeout Report".

Doing a performance evaluation of each construction project at its completion, based on proactive and reactive monitoring at the end of the project. (This approach may also be used during a project and is the norm in many construction projects so that immediate corrective action can be taken when needed).

Comparing the actions performed against those planned at the start of the project (i.e. proactive monitoring).

Measuring failure by monitoring the occurrence of occupational injuries and ill-health (i.e. reactive monitoring).

Developing ways (meetings etc) to gather information and experiences from this project to improve safety and health performance on the next project.



**c) Examples on 3 different types of sites**



**Example 115:**

**Construction of a multi-residential new building**

**Characteristics**

At the end of the execution stage of the building, the coordinator for safety and health matters during the execution stage has received from the contractor all the information related to the building to update and complete the safety and health file of this project.

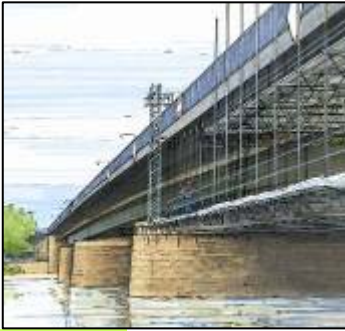
**Problems**

During the maintenance stage there will be a need to use scaffolding for the future maintenance of the façade (painting, repairs, etc.). How should the scaffolding be fixed to the structure?

**Solutions**

Install some anchorage points in the structure during the execution stage to allow scaffolds to be anchored to it and explicitly mentioning this in the safety and health file.

The coordinator for safety and health matters for the execution stage passes the completed safety and health file to the client or the person nominated by the client (e.g. the building manager appointed by the owners of each apartment). It is a good policy to keep the original of this file in a safe place and use copies.



The building manager can cooperate by keeping the file updated and making it available to any of the apartment owners whenever needed (e.g. for authorised alterations inside each apartment). When the building manager changes, the file is passed to the new manager.

Any work to common parts of the building or its equipment is a new project and requires people to consult the file.



#### Example 116:

##### Changing expansion joints on a viaduct/bridge.

#### Characteristics

Expansion joints are used in viaducts and bridges and also in many other facilities (buildings, pipelines, railways, etc.).

They are designed to “work” permanently and to deal with movements (e.g. expansion and/or contraction). They can also deal with movement in use. (e.g. that caused by moving traffic).

#### Problems

The life of these elements is usually less than the life of the structure in which the joint was installed. Therefore such joints wear out and juxtaposed surfaces suffer movements. This can cause disturbance to passing vehicles.

#### Solutions

When this happens, it is time to change the joints. Special measures are normally required to divert vehicles to allow the work to be carried out in a safe manner. These measures can include traffic management plans and safety and health plans.

Once the joints have been replaced, the organisation responsible for the maintenance of the structure should ensure that the safety and health file is updated with information that will be helpful to others when carrying out further construction work. In such cases, it is unlikely that there is the need for a new file.

**Example 117:****Renovating the running surface of a major highway.****Characteristics**

The running surface of a major highway needs to be renovated due to the replacement criteria that have been set. It was originally constructed after the Directive came into effect.

**Problems**

The renovation work is a new project. There may be one or more files from previous construction projects involving highway maintenance. The current position is unclear.

**Solutions**

The organisation responsible for the maintenance of the highway decides that a single file will be created and updated for all maintenance work irrespective of whether this is required by the Directive. Information that is known about the highway from other sources is included so as to create a more useful record.

### 4.2.3 Post- construction stage

The post-construction stage is when the buildings (or other facilities from completed projects) are ready for or are in permanent use after completion. Often safety and health aspects during this stage are underestimated, especially when carrying out maintenance and similar works.

Particular note should be paid to ensuring that:

- Risks to the safety and health of workers involved in subsequent work on the facility are eliminated or reduced to acceptable levels; and that
- Safety and health files are kept up to date.

#### a) Keeping the safety and health files updated

Files are intended to provide those who perform subsequent work on the facility with information that will enable them to plan and perform further work safely and with due regard to health.

The file should be updated if changes are made that have implications for the safety and health of workers during foreseeable further construction work.

Files should normally be kept by clients.

Clients normally give copies of files to users and hand files over to new owners when ownership changes.

↪ See 2.4.3 Safety and health file p. 95.



## b) Examples on 3 different types of sites

**Example 118:****Construction of a multi-residential new building of seven floors above ground, ground floor for commercial use and two underground floors for garages****Characteristics**

Client: Private, a developer.

The safety and health file drafted before the construction work commenced does not take account of changes made and working methods used during construction. Before completing the project, the contractor provides information to update the partially completed file. Other companies who carried out work, such as subcontractors, also comply with the obligation to provide relevant information for the file and pass this to the contractor so that it can be passed on to the coordinator.

**Problems**

Updating files to take account of changes during construction.

**Solutions**

Companies who carried out the work comply with the obligation to provide relevant information for the file.

Modifications to piping diagrams etc. can be documented with relative ease since the plans and construction management are carried out by one firm: but the question must first be asked: What, if any, of this information is essential for safety and health during subsequent construction work?

Anchorage points have been included in the specification for use by those tasked with window cleaning activities. Information about their inspection, maintenance and use should be put in the file.

Periods for maintenance work on heating and air-conditioning equipment and equipment requiring testing etc. have been determined in conjunction with the manufacturers: but the question must be asked: What, if any, of this information is essential for safety and health during subsequent construction work?

The file will be of use when new services including, for example, new building management technology and solar technology, are added

**Example 119:****Replacing some roof tiles on a barn at a farm****Characteristics**

Replacing roofing tiles on a pitched roof of a small farm building can be hazardous.

**Problems**

Pitched roof: Risk of falling from the edge of the roof or through it.

Accessibility, since there are broken tiles on various parts of the roof.

**Solutions**

The farmer hires a mobile elevating work platform (MEWP) of sufficient size to

provide suitable edge protection and replaces the broken roofing tiles in the autumn when the barn is totally filled with straw. (Harnesses (personal protective equipment) are attached to the MEWP). Hazards and risks are reduced.

No further action is necessary once the work is complete.



#### Example 120:

##### Maintenance/Cleaning works of ventilation system in an airport terminal

##### Characteristics

Ventilation ducts within the building require regular cleaning. The facility operators and designers agreed suitable intervals for this work. Every year, a contract is put out to tender for the cleaning work.

##### Problems

Cleaning while the airport is operating, i.e. this activity must not disturb or harm passengers.

Risk of falling, since ventilation ducts are usually attached to high ceilings.

##### Solutions

The same company has been engaged to carry out the work for a number of years as it is familiar with the site, understands the client's needs, employs personnel exclusively for this special task and has an excellent safety record.

Cleaning plans for the ventilation system were prepared as a part of the designer's contribution to the safety and health file. Walk-in ventilation ducting is designed to be cleaned by personnel.

Smaller ducting is cleaned using robots and suction apparatus.

Cleaning is documented.

Mobile scaffolding is used for access, work affecting passengers is carried out when the airport is less busy and segregation of work areas is achieved by barrier systems of a type used elsewhere in the airport to control passengers.

## 5. GENERAL TABLE OF DUTIES OF EACH STAKEHOLDER DURING THE CONSTRUCTION PROJECT

1	2	3
Stakeholders	Duties where there will be only one contractor during the execution stage	Additional duties, where there will be more than one contractor during the execution stage.  Note: all duties in column 2 also apply.
<b>Clients</b>	May appoint a project supervisor to act on their behalf, if they so choose.	
<b>Clients or project supervisors</b> (Note that project supervisor means person(s) responsible for design and/or execution and /or supervision of the execution of a project , acting on behalf of the client)	<p>Communicate prior notice to the competent authority where required.</p> <p>Take steps to ensure that it is clearly displayed at the construction site and that it is updated as necessary (Art. 3.3)</p> <p>Take account of the general principles of prevention during the various stages of designing and preparing the project. (Art. 4)</p> <p>Ensures that a site safety and health plan is drawn up before work starts on site. (Art. 3.2) (Note that there may be national derogations in certain limited instances).</p>	<p>Appoint coordinators for the project preparation stage and the project execution stage (Art. 3.1)</p> <p>Note that clients and project supervisors have continuing responsibilities under Arts. 5 and 6 even though they have appointed coordinators. (Art. 7.1)</p>
<b>Coordinators for safety and health matters at the project preparation stage</b>	There is no duty to appoint a coordinator.	<p>Coordinate implementation of Art. 4 (Art. 5a)</p> <p>Ensure that a safety and health plan is prepared. (Art. 5b)</p> <p>Prepare a safety and health file. (Art. 5c)</p>
<b>Coordinators for safety and health matters at the project execution</b>	There is no duty to appoint a coordinator.	Coordinate implementation of the general principles of prevention and safety. (Art. 6a)

## 5. General Table of duties of each stakeholder during the construction project

<b>stage</b>		<p>Coordinate implementation of the principles in Art. 8 by employers and the self-employed. (Art. 6b)</p> <p>Coordinate implementation of the safety and health plan by employers and the self-employed. (Art. 6b)</p> <p>Update the safety and health plan and the safety and health file. (Art 6c)</p> <p>Organise cooperation between employers including the self-employed. (Art. 6d)</p> <p>Coordinate arrangements to check that working procedures are being correctly implemented. (Art. 6e)</p> <p>Take steps to ensure that only authorised persons are allowed onto the construction site. (Art. 6f)</p>
<b>Employers</b>	<p>Implement Art. 6 of Directive 89/391/EEC. (Art. 8 a to j)</p> <p>Take measures that are in line with the minimum measures set out in Annex IV. (Art. 9)</p> <p>Provide comprehensible information to workers and/or their representatives about their safety and health (Art.11)</p> <p>Ensure consultation and participation of workers and/or their representatives. (Art.12)</p> <p>Note that employers have continuing responsibilities under the Framework Directive 89/391/EEC. (Art.7.2)</p>	<p>Take into account directions from coordinators. (Art. 9)</p>
<b>Self employed persons</b>	<p>Comply with the requirements identified in Art. 10.1 (Art. 10.1)</p>	
<b>Employers personally engaged in the work</b>	<p>Comply with the requirements identified in Art. 10.2 (Art.10.2)</p>	
<b>Workers and their representatives</b>	<p>Information to workers and consultation and participation of</p>	

## 5. General Table of duties of each stakeholder during the construction project

	workers and/or their representatives should take place in accordance with Construction Sites Directive. (Art.11 and 12)	
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## Annex 1 - Glossary

Term	Definition
Client	Any natural or legal person for whom a project is carried out.
Coordinator for safety and health matters at the project execution stage	Any natural or legal person entrusted by the client and/or project supervisor, during execution of the project, with performing the duties referred to in Article 6 of the 92/57/EEC Directive.
Coordinator for safety and health matters at the project preparation stage	Any natural or legal person entrusted by the client and/or project supervisor, during the project preparation stage, with performing the duties referred to in Article 5 of the 92/57/EEC Directive.
"Construction Sites" Directive 92/57/EEC (See Annex 7, p. 205-218)	Directive 92/57/EEC of the European Parliament and the Council on the implementation of minimum safety and health requirements at temporary or mobile construction sites. It is the eighth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work.
Employer	Any natural or legal person who has an employment relationship with a worker and has responsibility for the undertaking and/or establishment.
"Framework Directive" 89/391/EEC (See Annex 7, p.194-201)	Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work
Prevention	All the steps or measures taken or planned at all stages of work in an undertaking to prevent or reduce occupational risks.
Prior Notice	A schedule of information about a project that, in certain instances, has to be sent to the competent authority before work commences on a construction site.
Project execution stage	That stage of a project when construction work is carried out on a construction site.
Project preparation stage	That stage of a project when it is designed and pre-construction preparations are made.
Project supervisor	Any natural or legal person responsible for the design and/or execution and/or supervision of the execution of a project, acting on behalf of the client.
Safety and health file	A document appropriate to the characteristics of the project, that contains relevant safety and health information that should be taken into account during subsequent construction works.
Safety and health plan	A document, required by Directive, 92/57/EEC, that sets out the rules applicable to a construction site and addressing particular

	matters mentioned in Article 5. Member States may allow derogations to it in certain circumstances – check the national legislation.
Self-employed person	Any person other than those referred to in Article 3 (a) and (b) of Directive 89/391/EEC whose professional activity contributes to the completion of a project.
Temporary or mobile construction sites	Any construction site at which building or civil engineering works are carried out; a non-exhaustive list of such works is given in Annex I of the 92/57/EEC Directive.
Worker	Any person employed by an employer, including trainees and apprentices but excluding domestic servants.
Workers' representative with specific responsibility for the safety and health of workers	Any person elected, chosen or designated in accordance with national laws and/or practices to represent workers where problems arise relating to the safety and health protection of workers at work.



## Annex 2 – Table of examples

<b>Small</b>	Yellow indicates small size projects examples
<b>Medium</b>	Green indicates medium size projects examples
<b>Large</b>	Orange indicates large size projects examples.

N°Ex	Page	Type of works										Type of risks																		
		Alteration - Conversion	Construction	Dismantling - Demolition	Excavations - earth works	Renovation - Repair	Upkeep - Maintenance	Prefabricated components	Fitting out	Refurbishment	Access	Collapse	Contaminated ground	Confined spaces	Dust	Electricity	Ergonomics	Explosion	Falls from heights	Falling material	Fire	Gas	Manual handling	Noise	Public Safety	Slips	Traffic	Toxic substances	Vibration	Weather conditions
Ex 1	21														x		x	x	x	x					x					
Ex 2	21													x								x					x	x	x	
Ex 3	22												x																	
Ex 4	22	x	x											x									x						x	
Ex 5	23	x	x													x						x								
Ex 6	23	x	x													x						x								
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Ex 10	25															x						x								
Ex 11	25																	x												
Ex 12	26												x				x				x						x			
Ex 13	26		x		x		x																				x			
Ex 14	27																													
Ex 15	27		x			x	x									x		x	x											
Ex 16	28						x											x	x											

N°Ex	Page	Type of risks										Type of works																	
		Weather conditions	Vibration	Toxic substances	Traffic	Slips	Public Safety	Noise	Manual handling	Gas	Fire	Falling material	Falls from heights	Explosion	Ergonomics	Electricity	Dust	Confined spaces	Contaminated ground	Collapse	Access	Refurbishment	Fitting out	Prefabricated components	Upkeep - Maintenance	Renovation - Repair	Excavations - earth works	Dismantling - Demolition	Construction
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Ex 18	28																												
Ex 19	36							X						X										X					
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		Weather conditions	Vibration	Toxic substances	Traffic	Slips	Public Safety	Noise	Manual handling	Gas	Fire	Falling material	Falls from heights	Explosion	Ergonomics	Electricity	Dust	Confined spaces	Contaminated ground	Collapse	Access	Refurbishment	Fitting out	Prefabricated components	Upkeep - Maintenance	Renovation - Repair	Excavations - earth works	Dismantling - Demolition	Construction
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		Prefabricated components								Toxic substances							
		Upkeep - Maintenance								Traffic		x		x	x		
		Renovation - Repair								Slips							
		Excavations - earth works	x							Public Safety	x						x
		Dismantling - Demolition								Noise		x					
		Construction								Manual handling							
		Alteration - Conversion								Gas	x						
Ex 113	171									Fire							
Ex 114	173									Falling material		x	x				
Ex 115	174									Falls from heights	x	x	x				
Ex 116	175									Explosion							
Ex 117	176									Ergonomics							
Ex 118	177									Electricity							
Ex 119	177									Dust		x					
Ex 120	178									Confined spaces							
										Contaminated ground							
										Collapse	x						
										Access	x	x		x			

## Annex 3 – Risk Assessment Record Sheet

Note: this record sheet is a suggestion, but not an obligation under the Construction Sites Directive. (a risk assessment is always due under the Framework Directive).

PROJECT .....

ACTIVITY .....

ASSESSOR .....

Date.....

	STEP 1. Identifying hazards and those at risk			STEP 2. Evaluate and Prioritise			STEP 3. Deciding preventative action on	STEP 4. Taking action	STEP 5. Monitoring
Col 1 Ref. No.	Col 2	Col 3	Col 4 People at Risk	Col 5. How			Col 6. Preventative actions: to eliminate hazards; or to reduce the risks.	Col 7. Action by Whom and When.	Col 8. Monitoring Arrangements.
				Likely?	Serious?	Often? Many?			
Example	Multiple crane work	Interference of operating range	Workers, people nearby	Med	Med	Med	Optimize site layout, electronic delimitation of operating range	Coordinator for the execution stage	Test delim- itation after installation
		Toppling over	Workers, people nearby	Low	High	High	Crane foundations to be approved by engineer	Contractor during site preparation	Measure vert- icality monthly by foreman
Example	Roof work	Falls from height	Workers on the roof	High	High	High	Edge protection including guardrails	Contractor before work starts	Daily by site foremen
		Falling objects	Others on the ground	High	High	High	Protective fans and safety netting	Contractor before work starts	Daily by site foremen

Approved by .....

STEP 5 Next review. Review date .....

## Annex 4 – Design Record sheet

Note: this record sheet is a suggestion and not an obligation under the Construction Sites Directive.  
By completing such a proforma at each design phase, a record of the decisions taken as the design developed will have been created.

PROJECT ..... COORDINATOR.....  
DESIGNER ..... DESIGN PHASE .....

(1) Ref No.	(Col 2) Issue/ Activity/ Element of construction	(Col 3) Identified Potential Hazards during 'Whole-Life' and to users.	(Col 4) People at Risk	(Col 5) Actions taken during design: to eliminate hazards; or to reduce the risks.	(Col 6) Remaining risks not likely to be obvious to others? YES / NO	(Col 7) If YES, Action Taken. (e.g. Note on drawing)
Example	Battery room for stand-by power supply	Gases from defective battery	Maintenance crew of user	Provide room ventilation and alarm sensor for gas detector	Chemical hazards are less familiar	Provide information for the safety and health file on hazards when maintaining the system.
Example	Pre-stressed ground anchors	Anchor "explodes" when ruptured	Workers during subsequent excavations	Specify de-tensioning of ground anchors after the permanent facility is complete	Temporary measures not in the as-built drawings.	Note on drawings, specify in tendering, check before backfilling.



## Annex 5 – Safety and health plan : suggested contents

### Introduction

A comprehensive plan for a large complex project might include the sorts of issues set out in this non-exhaustive appendix remembering always that a plan should cover the particular issues applicable to the hazards and risks in a project. The contents, format and style of a plan should have regard to the hazards and risks on the project.

It should also be noted that the contents will have to evolve over the life of a project as some of what is suggested will not be available at the project preparation stage, but will be gathered as the project progresses.

Annex 5 may also serve as checklist for smaller projects provided a sensible approach is taken in determining a plan's content. A safety and health plan for a smaller project should only cover the issues applicable to the project.

Plans can be arranged under the following major headings:

#### **1. General information about the project**

---

#### **2. Project specific information and information sources.**

---

#### **3. Information on how the project should be managed**

---

#### **4. Arrangements for contributing information for the safety and health file**

---

# 1. General information about the project

## Description of the project

This should be sufficient to give a full overview of what is involved in the project including any preparatory works, any phased hand-over of the site, any phased hand-over of the completed work and any joint occupation that may be required.

The focus should be on those issues relevant to the occupational safety and health of workers and any other people who might be adversely affected.

## Names of the stakeholders

The plan should make clear the names of:

- All Clients and the name of the lead client if there is more than one and it has been decided that one will take the lead.
- Project supervisors
- Coordinators
- All designers (no matter who has or will appoint them)
- All employers (no matter who has or will appoint them)
- All contractors (no matter who has or will appoint them)
- Any social partners requiring particular mention.
- Any other local parties who are stakeholders in the project (e.g. representatives of local communities, elected officials, their officers and other community groups).
- Any other parties who can be considered as stakeholders (e.g. suppliers of plant and equipment for incorporation in or for use when constructing the works, etc).
- Safety supervisors of parallel industrial operations.

This information may best be set out in tabular form so that the parties and their respective contributions can readily be identified. It is probable that the list grow as a project develops.

## Client expectations on how the project will be carried out and the safety and health success criteria that will be applied

This provides clients with an opportunity to make clear their policy objectives and commitment towards the respect for the safety and health of all those who may be exposed to risk.

Client success criteria can be expressed in a number of ways. Performance criteria based on incidence rates for injuries and ill health are often used but these are essentially measures of failure and the data is simply historical.

More positive performance measures are to be preferred. These may measure activity levels (e.g. numbers of preventive audits, site safety inductions, occupational health assessments, site safety meetings, etc) and they can also usefully measure positive achievements in the safe performance of the work such as may be indicated by safety and health audit scores (for both on-site activities and for other stakeholder performance in applying preventative strategies. e.g. designers and coordinators).

## 2. Project specific information and information sources.

Project drawings and specifications might be considered as key information sources. However, such documents normally address many matters other than occupational safety and health. While certain parts might be useful reference points, more needs to be done to flag up the key safety and health reference sources.

### Identifying project hazards

A register of hazards can usefully be compiled listing the source documents where further information can be found.

On-site hazards may include (but will not be limited to) issues such as:

- Existing facilities and plant above and below ground: and any structural weaknesses, instabilities, fragile roofs, etc.
- Live and potentially live services in or serving the site, whether permanent or temporary.
- The presence of any hazardous materials (especially asbestos) and substances in or on the site, facilities or plant, or in storage or transit.
- Adverse geological conditions.
- Contaminated ground.
- Water courses and flooding risks.
- Underground and overhead services.
- Continuing work activities by the client during the construction work and the process hazards and risks.
- Ditto by others.
- Work in or close to moving traffic, whether road, rail, water or air.
- Work in or close to public areas, especially where vulnerable people such as children, those with disabilities and the elderly are present.
- Obligations to maintain access routes, services, working space, etc, to or for others during the work.
- Other construction work that will be in hand during the project.
- Any other project risks emanating from the existing environment that require special attention.

### Identifying off-site hazards that will need to be taken into account

A similar schedule can usefully be compiled. Off-site hazards may include (but will not be limited to) issues such as:

- Those noted above but in relation to nearby land uses and the following:
- The use to which nearby land is put where there are safety and health implications (e.g. vulnerable people e.g. the young, the infirm and the elderly: and vulnerable work activities e.g. high hazard industrial worksites, high speed transport systems, etc)
- Access roads and any restrictions on their use that may cause difficulties.
- Limitations placed on construction activities by local planning or other similar controls (e.g. flooding, over-flying aircraft, work adjacent to high-speed rail routes, etc).
- Any other project risks emanating from the existing environment that require special attention.

### Identifying risks from the design that are not likely to be obvious to others (including the unusual)

Designers following the suggested structured approach to design in this guidance will have considered whether their designs create any project risks that are not likely to be obvious to

others (including the unusual). Such risks should be mentioned under this heading of the plan together with reference to where additional information can be found.

### **Identifying work involving particular risks according to Annex II**

Annex II to the Directive lists 10 work activities that are believed to create particular risks. The list is not exhaustive and those preparing and contributing to safety and health plans may identify further work activities in particular cases. Work activities involving one or more of these particular risks should be mentioned under this heading and, once more, there should be reference to where additional information can be found.

### **Identifying other sources of information relevant to safety and health**

Project stakeholders may have identified further information sources that can usefully be mentioned in the plan. These may be project specific (e.g. client standards) or more generally (e.g. national and international standards).

### 3. Information on how the project should be managed

Where the management organisation and arrangements for occupational safety and health are different in the preparatory and construction stages, information about both should be given.

Information should be given on how it is intended to manage the project as a whole involving all of the stakeholders and not simply for those at the construction site although this will clearly be one essential part.

A structured approach to managing occupational safety and health should be agreed between the stakeholders and details should be included in the safety and health plan.

It is important that the organisation and arrangements are appropriate to the nature and scale of the project and the hazards and risks so that sensible outcomes result. The emphasis should be on the effective management of risk.

Project preparation stage coordinators will need to liaise closely with others in developing the plan, in particular, with:

- The project execution stage coordinator;
- Those employers and contractors who will be taking the lead on site; and
- Those who will be involved in high risk activities.

Typical issues that might need to be specifically addressed include the following. (N.B: The list of issues is not exhaustive.)

#### Management arrangements

The project management arrangements for occupational safety and health should be clearly set out so that all stakeholders know what is expected of them. This can involve:

- Agreeing and setting project safety and health objectives;
- Project safety and health management organisation, arrangements and procedures;
- Means for coordination and cooperation between all stakeholders including with designers (i.e. not only between contractors);
- The development and sharing of risk assessments and method statements;
  - o The sequencing and timing of activities, and the allocation of work areas so as to secure safety and health (project construction plans will need to take full account of such safety and health issues);
  - o Worker consultation procedures;
- Special initiatives, publicity, etc, for promoting improved occupational safety and health; and
- Monitoring implementation of safety and health plan as well as performances and investigating adverse events including near misses.

#### Arrangements for welfare

The arrangements should cover what is the necessary provision for both sexes for:

- Changing;
- The safe storage of Personal Protective Equipment, protective clothing, personal belongings and clothing;
- The drying of clothing;
- Washing facilities including the provision of showers having regard to risk and personal hygiene;
- Sheltering from extremes of weather;

- Providing drinking water;
- Preparing and consuming food and drink;
- Taking rest breaks;
- Protecting non-smokers from tobacco smoke;
- For pregnant women, nursing mothers, and those with disabilities; and
- Accommodation for living, sleeping and recreation where the work requires.

Account should be taken of the nature of the work and the risks to safety and health.

### **Site rules (taking account as necessary of other industrial activities at the site)**

Site rules should be drafted in plain and simple language so that they can be readily understood. They should be kept to the minimum necessary to achieve the intended objectives. They should be brought to the attention of all employers, contractors and workers when they are inducted to the project and they should be clearly displayed on the project.

While generic site rules are often used, it may be that rules particular to an individual project will be required because of the hazards and risks.

### **Arrangements made to deal with common issues**

These will depend on the nature of the project and the work to be done. They could include the following and how they are to be managed and coordinated:

- A common approach to matters mentioned elsewhere in this Guide about the safety and health plan;
- A common approach to particular on-site and off-site hazards identified earlier in the plan;
- Access and egress for people, plant and for logistics deliveries and removals;
- On-site pedestrian and vehicular routes, and traffic management;
- Off-site and on-site material storage;
- The provision, use and maintenance of shared :
  - o access routes and access systems;
  - o site plant, tools and equipment;
  - o mechanical handling devices;
  - o temporary services and energy sources;
- The protection and marking of all services and energy sources that may pose a hazard;
- Protection from falls and falling materials;
- The safety of the public and others (especially vulnerable groups) who may be adversely affected;
- Fire precautions (general and process risks):
- Securing the site boundary;
- Risks to site workers from the activities of others on or near the site;
- Keeping the site and its facilities clean, tidy and in good order;
- Waste management;
- Consultation between the social partners on occupational safety and health matters;
- Safety meetings,
- Safety inspections and audits,
- Worker and visitor induction,
- Initial and refresher training ('tool-box talks' and the like).

Occupational health can usefully receive special mention:

- Initiatives to raise awareness;
- Attention to the common occupational health issues as well as those that are activity specific including;
- Hazardous materials and substances;

- Contaminated ground and plant;
- Manual handling;
- Noise;
- Vibration;
- Dust;
- Ionising and non-ionising radiation;
- Exposure to the sun; and
- Biological hazards.
- Special attention to the planning and organisation of those work activities that may have adverse implications for occupational health.

### **Arrangements made to deal with project risks that are not likely to be obvious to others (including the unusual)**

This guidance explains how designers can identify and provide information about such project risks. Coordinators may also add their expertise in a similar way. The plan can usefully be a table where further information can be found.

### **Arrangements made to take account of work involving particular risks**

The Directive requires that such work activities noted in Annex II to the Directive must be addressed in safety and health plans. The plan should identify such risks and must include the specific measures for dealing with the risks.

### **Arrangements made to take account of other activities at the site including industrial ones**

The Directive requires that these must be addressed. The plan should identify such risks and how they will be addressed.

### **Arrangements for safety and health during any joint occupation with the client and eventual hand-over to them**

During construction stages, clients may continue or commence activities that are non-industrial at or near the site of the construction works. Joint occupation can have implications for the occupational safety and health of workers and others such as members of the public. Where this is the case, the arrangements that will need to be put in place to deal them should be set out. An explanation of the hazards and risks would also be helpful.

Activities during the hand-over of a project to its eventual user can create unnecessary risk unless management attention is given by all parties to coordination and control. The arrangements for doing so should be set down in the plan.

### **Arrangements in the event of injuries and emergencies**

The arrangements should take full account of the hazards and risks from the construction work and from the working environment, including from other industrial and non-industrial activities and the like.

These can include:

- The training of first-aid teams, the on-site provision of equipment and facilities;
- The means for the rescue and evacuation;

- Fire prevention, response in the event of fire and evacuation including the provision of instruction, training and equipment;
- Emergency response and evacuation procedures for other foreseeable events;
- Liaison with other employers and the emergency services; and
- Arrangements for practice exercises,

Regard should be had to special risks such as dealing with adverse events in difficult locations e.g. up tower cranes, on suspended access, in tunnels, in compressed air and confined spaces, etc.



## **4. Arrangements for contributing information for the safety and health file.**

It is helpful for project stakeholders to know how and when they are expected to contribute to the safety and health file. It is similarly helpful to know what those contributions are expected to cover, whether particularised or expressed in more general terms. Such matters can usefully be included in the plan.

It is also helpful in clarifying how coordinators for the project preparation stage and the project execution stage will cooperate in preparing the safety and health file.

## Annex 6 - Safety and health file: suggested contents

### Introduction

A file can be arranged under the following major headings:

- General information about the project.
- Project specific information and information sources.
- Information on how designers took account of hazards that might arise during future construction work.
- Identifying other sources of information relevant to safety and health.

The contents, form and format will necessarily vary depending on the project, the client and the foreseeable hazards and risks. At all times, have regard to the need for a file to contain information that is likely to be useful during further design and construction work with a clear focus on the occupational safety and health of workers and any other people who might be adversely affected. Particular regard should be given to occupational health risks as these are often missed.

It is not the purpose of a file to provide a full record of what was done during previous construction work nor to be a repository for a complete set of 'as built' drawings unless such are essential: that is only likely to be the case in exceptional instances.

### 1. General information about the project

#### Description of the project

This should be sufficient to give a clear overview of what the file covers so that persons later reading it can understand whether it covers all of a facility that then exists or only a part of it. There should be a means for recording when a file is updated and what the scope and limitations of the update might be. Where copies are made, a controlled copy system will be required.

#### Names of past stakeholders

Details of those stakeholders who might hold information that may be relevant to occupational safety and health and which is not included in the file should be included (for instance, designers of highly complex facilities may retain large amounts of design information that cannot reasonably be held in a file).

### 2. Project specific information and information sources

Project drawings and specifications can be considered for inclusion where they help to explain information in the file and where they provide a useful means for conveying information that will be relevant to occupational health during subsequent construction work.

### Identifying hazards

A schedule of hazards that are not likely to be obvious to others can usefully be compiled listing their location, how they have been dealt with to date and any source documents where further information can be found (e.g. surveys of contaminated land, asbestos, location of underground services and other services that might not be visible or immediately apparent, potentially defective facilities, etc).

### Identifying hazards from the design

Designers following the suggested structured approach to design in this guidance will have considered whether their designs create any hazards that are not likely to be obvious to others (including the unusual). Such matters should normally be included in the schedule of hazards unless they are unlikely to arise once the initial construction work has been completed.

Hazards that might foreseeably arise during further construction work such as hazards from unusual structural solutions (e.g. pre and post tensioning, potential instabilities), the inclusion of hazardous materials and substances, limitations on floor loadings, etc, should also normally be included.

### Identifying high risk hazards (Annex II)

Where it can reasonably be expected that further construction work may create particular risks (See Annex II to the Directive), it may be prudent to mention it in the schedule of hazards.

## 3. Information on how designers took account of hazards that might arise during future construction work

### Routine maintenance

During developments of designs, designers should have taken into account how routine maintenance of the facility can be safely performed. Information should be included in the file so that it is clear how such work can be done (e.g. window cleaning, replacement of those building elements and plant with relatively short life-spans compared to that of the facility of which they form a part, maintenance of building services, etc) with a clear emphasis on likely hazards. Access at height, work in confined spaces, means for moving heavy plant and equipment, means for isolating, maintaining, repairing and replacing hazardous plant and equipment, etc, and the isolation of live plant are typical issues that should be covered.

### More major work

Likewise, designers should have taken into account how other more major construction work that can reasonably be foreseen throughout the 'whole-life' of the completed works (including dismantling or demolition) can be carried out. Information should again be considered for inclusion so that the file provides a useful source of information.

## 4. Identifying other sources of information relevant to safety and health

There may be further information sources that can usefully be mentioned in the file.

## Annex 7 - European Union legislation

Framework directive 89/391/EEC

**“Construction Sites” Directive 92/57/EEC**

**Corrigenda to 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 individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC) (OJ No L 245 of 26. 8. 1992)**

**OJ L 15, 23.1.1993**

**OJ L 33, 9.2.1993**

## Other Safety and health Directives

It is advisable to check the Eur-lex website (<http://eur-lex.europa.eu>) to ensure that you are referring to current European legislation.

### Directive 89/654/EEC

Council Directive 89/654/EEC of 30 November 1989 concerning the minimum safety and health requirements for the workplace - OJ L 393 30.12.1989

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31989L0654:EN:HTML>

### Directive 89/656/EEC

Council Directive 89/656/EEC of 30 November 1989 on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace – OJ L 393 30.12.1989

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### Directive 90/269/EEC

Council Directive 90/269/EEC of 29 May 1990 on the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers – OJ L 156 21.06.1990

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Council Directive 90/270/EEC of 29 May 1990 on the minimum safety and health requirements for work with display screen equipment (fifth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC) – OJ L 156 21.06.1990

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### Directive 92/58/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 - OJ L 245 26.8.1992

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### Directive 92/85/EEC

Council Directive 92/85/EEC of 19 October 1992 concerning the implementation of measures to encourage improvements in the safety and health of pregnant workers, workers who have recently given birth and women who are breastfeeding – OJ L 348 28.11.1992

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**Directive 98/24/EC**

Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work – OJ L 131 5.5.98

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**Directive 1999/92/EC**

Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres – OJ L 023 28.01.2000

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**Directive 2000/54/EC**

Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work – OJ L 262 17.10.2000

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**Directive 2002/44/EC**

Directive 2002/44/EC of the European Parliament and of the Council of 25 June 2002 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration) – OJ L 177 06.07.2002

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Directive 2006/25/EC of the European Parliament and of the Council of 5 April 2006 on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation) – OJ L 114 27.04.2006

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#### **Directive 2009/104/EC**

Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) – OJ L 260 03.10.2009

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009L0104:EN:HTML>

#### **Directive 2009/148/EC**

Directive 2009/148/EC of the European Parliament and of the Council of 30 November 2009 on the protection of workers from the risks related to exposure to asbestos at work.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009L00148:EN:HTML>



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## Information providers

### European Union

European Commission  
DG Employment, Social Affairs and Equal Opportunities  
B-1049 Brussels  
Publications are available at the following address:  
<http://ec.europa.eu/social/home.jsp?langId=en>

European Agency for Safety and Health at Work  
Gran Via 33  
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Fax: +34944794383  
E-mail: [information@osha.europa.eu](mailto:information@osha.europa.eu)  
Publications are available at the following address: <http://osha.europa.eu>

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Federal Public Service Employment, Labour and Social Dialogue  
Federale Overheidsdienst Werkgelegenheid, Arbeid en Sociaal Overleg  
Ernest Blerotstraat 1  
B-1070 Brussel  
Publications are available at the following address: [www.meta.fgov.be](http://www.meta.fgov.be)

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Publications are available at the following address: <http://www.prevent.be>

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Publications are available at the following address: <http://www.mlsp.government.bg>

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Publications are available at the following address: <http://www.szu.cz/chpnp/>

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State Labour Inspectorate of the Republic of Latvia

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<http://www.szmm.gov.hu/main.php?folderID=13318andlangchanged=eng>

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Munkavedelmi Kutatási Kozalapítvány (MKK)

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<http://www.pip.gov.pl/html/en/html/index.htm>

Centralny Instytut Ochrony Pracy (CIOP)

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Institutul National de Cercetare Dezvoltare pentru Protectia Muncii (INCDPM)

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<http://www.employment.gov.sk/index.php?SMC=1>

Narodny Inspectorat Prace  
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Publications are available at the following address: <http://www.safework.gov.sk/>

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