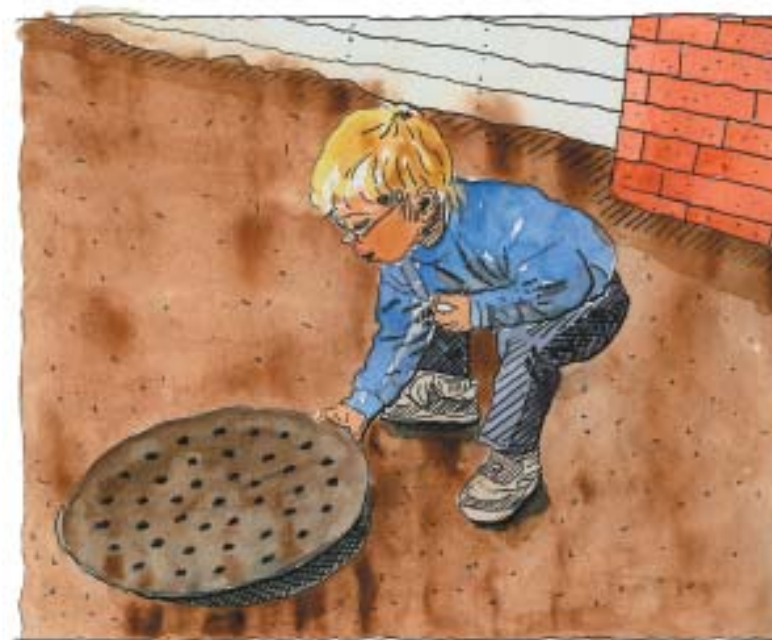


Child-proof appliances for wells and manholes

The objective of this handbook is to give information on hazards that may occur to children in connection with wells and how these hazards can be eliminated. Laws and regulations which deal with these issues are presented. Different types of wells and different safety solutions are discussed, and also how the location and the character of the well affect the safety.

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Child-proof appliances for wells and manholes

TITLE:
EDITOR: Boverket, National Board of Housing, Planning and Building
EDITION: 1:1, November 2001
NUMBER OF COPIES: XX
PRINT: Boverket
ISBN: 91-7147-XXX-X

SUMMARY: The purpose of this handbook is to inform about the risks for children that occur around wells and how these risks can be eliminated. The rules and regulations that concern the field are treated. Different types of wells and different safety solutions are dealt with, and how the location and the character of the well can influence on the safety.

THE PUBLICATION CAN BE ORDERED FROM:
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Phone: 0455-35 30 50 • Telefax: 0455-819 27
E-mail: publikationsservice@boverket.se
Web site: www.boverket.se

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Foreword

The objective of this handbook is to give an account of and to comment on the current rules and regulations which apply to wells and manholes in connection with the safety of children. Besides requirements regarding child safety there are a number of other requirements which can be made, e.g. requirements regarding road safety, aesthetic requirements, requirements regarding accessibility and regarding the working environment. However, these requirements are not dealt with in this handbook. The primary objective with this handbook is above all to save lives by spreading knowledge of the regulations that apply and to illustrate their practical application.

Hopefully, this handbook will facilitate the assessment of the requirements regarding the safety of children irrespective of whether the Public Order Act or the Building Regulations apply in the individual case.

The information is above all intended for manufacturers and for the police and local building committees in their capacity of supervisory authorities but also for clients and property owners who in different ways are responsible for and come into contact with questions regarding the safety of children in connection with wells and manholes. The handbook deals mainly with the relationship between private citizens and authorities, i.e. matters pertaining to public law and does not in detail go into the legal aspects between private citizens.

It is important to be aware of the legal status of the documents, e.g. acts, ordinances, mandatory provisions, general recommendations or handbooks, from which information is collected. Acts are instituted by the Swedish Riksdag and ordinances, which inter alia contain directions for the application of the acts, are decided by the Government. Acts and ordinances may contain directions which give a certain authority, e.g. Boverket, mandate to issue provisions in connection with some of the directions.

Boverket's Building Regulations, BBR (BFS 1993:57 with amendments up to BFS 1998:38), contain mandatory provisions and general recommendations. The mandatory provisions must always be complied with, but the local

Building Committee may in the individual case, under certain circumstances, permit minor deviations from the mandatory provisions. The intention of the mandatory provisions may be exemplified in a general recommendation by indicating one or more alternative ways to meet the requirements. A general recommendation may indicate e.g. the appropriate level of safety.

Helena Persson, Architect, has at the request of Boverket prepared this publication in co-operation with *Aslög Gyberg*, Legal Adviser, *Bengt Lindström*, Civil Engineer, *Sofia Lindén*, Architect, and *Martin Storm*, Civil Engineer.

We would like to thank all persons who, with commitment and expertise, have assisted us with viewpoints.

A publication like this, a handbook, can only be used as an aid and a source of information. The values which are presented in this publication can not be adduced for automatic acceptance.

Contents

1	Introduction	5
1.1	Safety policy regarding children in Sweden	5
1.2	What kind of accidents occur?	5
1.3	Knowledge and the will to use this knowledge are required in order to increase the safety	6
2	What does child safety mean?	7
2.1	Definitions and requirements	7
2.1.1	Young children and older children	7
2.1.2	Damage, supervision and maintenance	7
2.1.3	All safety aspects do not relate to child safety	8
3	Objectives with the safety requirements for children	9
3.1	To protect and prevent	9
3.1.1	Young children are protected	9
3.1.2	Older children are prevented	9
4	Child-proof appliances for wells and manholes	10
4.1	Different types of wells and manholes	10
4.2	Hazards	11
4.3	Safety solutions	11
4.3.1	Weight and design	11
4.3.2	Locks	11
4.3.3	Insets or protection against falling	12
4.3.4	Enclosures and coverings	12
4.3.5	The strength of the manhole cover	12
5	The placing and the characteristics of the well affect the safety requirements	13
5.1	The location and character of the well	13
5.1.1	Location	13
5.1.2	Characteristics	14

6	Responsibility	16
6.1	Responsibility comprises construction, supervision and maintenance	16
6.2	The client, owner and the property user are responsible for the safety	16
6.3	The local Building Committee and the police may intervene ..	17
7	What does the law say?	18
7.1	The safety is regulated in several laws –The Public Order Act and the Planning and Building Act are two of these	18
7.1.1	Mandatory provisions	18
7.1.2	Supervision	18
7.1.3	Differences between PBL, BVL, BVF and OL	18
7.2	Planning and Building Act (1987:10) and Act on Technical Requirements for Construction Works etc (1994:847)	19
7.3	Public Order Act (SFS 1993:1617)	21
7.4	Boverket's Building Regulations, BBR	22
7.4.1	Mandatory provisions and General recommendations	22
8	Type approval and production control	25
	References to sources	26
	Recommended literature	27

Abbreviations used in this publication:

PBL = Planning and Building Act (1987:10), with amendments up to SFS 1998:839.

PBF = Planning and Building Ordinance (1987:383) with amendments up to SFS 1995:1445.

BVL = Act (1994:847) on Technical Requirements for Construction Works etc with amendments up to SFS 1994:1589.

BVF = Ordinance (1994:1215) on Technical Requirements for Construction Works etc with amendments up to SFS 1997:1240.

OL = Public Order Act (1993:1617).

BBR = Boverket's Building Regulations (BFS 1993:57 with amendments up to BFS 1998:38).

1 Introduction

1.1 Safety policy regarding children in Sweden

From an international perspective Sweden is a leading country when it comes to actions for child safety. We have far fewer accidents to children with fatal outcome than many other European countries. This is mainly a result of the long-term preventive work that is carried on within this field in Sweden. The number of children who are killed by accidents has since 1968 decreased with more than two thirds. Statistics from SCB on the cause of death show that 51 children at the age of 0 - 2 died on account of injuries from accidents (a total for traffic, drowning, falling, poisoning, suffocation, fire or other accidents) in Sweden during 1996.

Efforts to reduce the number of fatal accidents to children in the building environment continue. In a society that constantly is changing a continuous evaluation of and information on hazards in the building environment are required. This handbook is thought to be a part of the educational efforts which may help to minimise the risk of accidents to children specifically in connection with wells and manholes.

1.2 What kind of accidents occur?

When it comes to hazards that occur outdoors the youngest children meet with accidents close to their home. They can e.g. drown in a ditch or in a water-filled hole. When children grow up they often seek out places further away from home, places which are not intended for children to play or stay on. Children are often drawn to such places because they feel excitement. Unfortunately, these environments are in many cases also very dangerous and not in the least intended for children.

According to specifications prepared by the children's ombudsman one child is killed each year in accidents in connection with wells in Sweden. During 1997–98 a total of ten accidents in connection with wells were reported to the authorities, however no one was proved fatal. Regarding hazards in

connection with wells and manholes there are no consistent statistics available. It can however be noted that a number of narrow escapes occur every year and that it is often pure chance that these do not have more serious consequences.

1.3 Knowledge and the will to use this knowledge are required in order to increase the safety

The problem with wells and manholes is that they are often situated close to spaces where children are present, e.g. in courtyards, in residential areas, in playgrounds and along pathways and cycling routes, at the same time as these spaces, unless they are designed in a safe way, can be a great hazard for children in particular. Seen from a technical point of view the objective is to prevent children from injuries caused by falling into an opening of a manhole, stepping into or getting caught in it.

It is an important task to spread information about the hazards which may occur and the laws and regulations which apply to wells and manholes in connection with the safety of children. Another important task is to update current rules and regulations so that they cover the latest knowledge within the field. A partial aim is to create better conditions for the current regulations to be observed and to advance the work on finding technical solutions which may prevent similar accidents in the future. *The primary objective is to save lives.*

2 What does child safety mean?

2.1 Definitions and requirements

2.1.1 *Young children and older children*

The mandatory provisions regarding safety measures against accidents to children in BBR refer first of all to children at pre-school age, i.e. children up to the age of six. When it comes to preventive safety measures especially in connection with wells and covers to manholes it is however important to remember also the somewhat older children. Hazards occur also among these children, especially among those who have not yet reached the age of twelve. Within this age group it can be assumed that accidents to a greater extent than for younger children occur at a longer distance from home. If the children then are unattended without adult supervision this may influence the type of activity that the children devote themselves to and may also limit the possibility of calling for help in case of an emergency. Accidents may also occur when older children play and put a safety device out of operation, for example by removing a cover to a manhole. An exciting game may have serious consequences, consequences which a ten-year-old cannot envisage. After the game the older children go somewhere else and maybe leaving the manhole in a state that is dangerous for a younger child who is approaching.

2.1.2 *Damage, supervision and maintenance*

Hazards have occurred when a manhole cover has been moved out of position in connection with e.g. snow-clearing activities. It is easy to imagine that also other types of working vehicles and even private cars can cause such damage on a cover that it does not any longer meet the safety requirements or that it is removed completely. A cover is sometimes moved with the specific intention to cause damage. This is an example of a problem which is very obvious in connection with the accidents that have occurred with manholes. Nevertheless, these accidents constitute a type of problem which cannot be regulated

away by building legislation. In this respect it is above all the supervision procedures undertaken by the person who is responsible for the safety of a particular well or manhole that can be improved. In this publication, child safety means the design and placing of protection in order to prevent accidents to children, and safety procedures.

2.1.3 All safety aspects are not related to child safety

There are a number of other requirements besides the requirement regarding child safety which are relevant in connection with manhole covers. A few examples are requirements regarding accessibility, aesthetic requirements, road safety requirements, requirements regarding the work environment and requirements concerning public health and the management of the physical environment. In the development of new technical solutions all these requirements, and probably a few more, have to be taken into account. This publication is however restricted to dealing with wells and manholes from a child safety perspective.

3 Objectives with the safety requirements for children

3.1 To protect and prevent

3.1.1 Young children are protected

When we speak about the safety of children our main priority is *protection* against injuries caused by accidents to pre-school children. The youngest children are often not aware of the hazards that surround them and they do not have the same ability as adults have when it comes to apprehending and appreciating hazards. Actions to be taken in order to protect this age group against accidents in connection with wells and manholes should be focused on putting the existing regulations into practice.

Younger children are caught in dangerous situations because they have a natural need to examine and investigate their immediate surroundings. The basic idea behind the development of our environment should be that it is planned and developed in such a way that it will not be necessary to restrict young children's inborn curiosity more than necessary.

3.1.2 Older children are prevented

Accidents and narrow escapes also happen to older children and Boverket is therefore of the opinion that in this respect it is also necessary to *prevent* children up to the age of about twelve from unwisely opening covers to manholes or removing other types of protection. In practise this means that the protection should be designed so that it cannot easily be removed with some easily accessible object such as an ordinary house key or a branch of a tree. By extending the length of time needed for one or several twelve-year-olds to remove a cover on a manhole it is possible to gain much in safety. The risk of detection increases as well as the probability that the children give up their attempt before the cover has been moved out of position.

4 Child-proof appliances for wells and manholes

4.1 Different types of wells and manholes

It is probably not very common that the public are familiar with different types of wells and what functions they have. In order to better understand the problems it may be a good idea to know something about the most important types of wells, their use and how they are designed. The following definitions are taken from TNC's publication "Planning and building terms 1994":

- Surface water well** well intended for collecting and draining surface water, e.g. rainwater, melted snow or ice, rinsing water, penetrating subsoil water or other temporary occurring flowing water on the ground or on a construction.
- Sinkhole** well which is mainly intended for the cleaning of connecting pipes with equipment which can be operated from the ground level. Sinkhole was previously denoted inspection manhole or rinse hole.
- Inspection manhole** manhole intended for control, inspection and cleaning of connecting pipes with equipment which can be operated from the ground level.
- Manhole** hole in which a person can climb down, intended mainly for control, inspection and cleaning of connecting pipes.
- Drainage water well** well intended for the collecting and draining of water from drainpipes and in some cases also for the collecting and draining of surface water.

There are also other types of wells than those mentioned above. In rural areas there are wells for drinking water and within the agriculture industry there are manure- and urine containers. For the special requirements that can be made on

wells within the agriculture industry reference is made to the Building Recommendations, JBR, issued by the Swedish Board of Agriculture.

4.2 Hazards

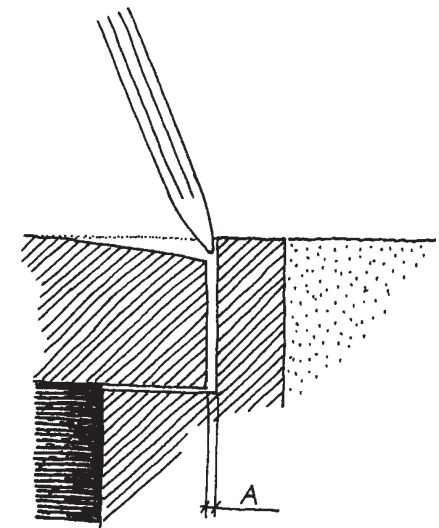
Accidents in connection with wells and manholes sometimes occur because a cover or a grating is missing. Sometimes there is a cover but it has been moved out of position by carelessness or removed on purpose with the intention to cause damage. Other reasons for accidents can be defects in the strength of the cover, that it is poorly fastened or that the cover is broken and that children therefore may hurt themselves on it.

4.3 Safety solutions

BBR does not state how the individual technical solution shall be designed since the mandatory provisions are given as performance requirements. If a well or manhole is equipped with a cover or grating it is regulated that these wells shall be designed so that the risk of accidents to children is limited. In the associated general recommendation it is however stated that manhole covers *should* have a lock. This general recommendation does not exclude the possibility that the requirement regarding child safety may be met also by applying some other protection or construction. Below is a description of the most common safety solutions.

4.3.1 Weight and design

The requirement regarding child safety may be met by making the cover so heavy that a child is unable to move it out of position. It is however important to pay attention not only to the weight of the cover but also to the combined effect of design and weight. A cover which can only be removed by



lifting it upright, for example because it has an inner frame or lock, does not have to be as heavy as a cover which can be pushed aside.

When a cover shall provide protection by its weight it is important that children are unable to move the cover out of position with the aid of levers. Consideration should also be given to the fact that several children may try to move a cover together.

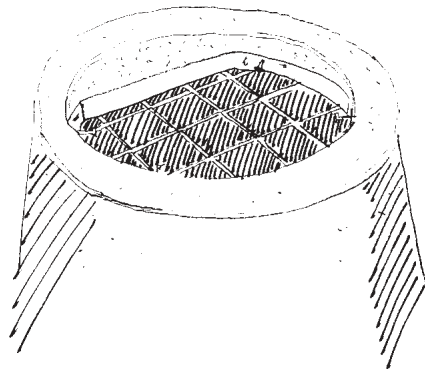
Normally, a protection by the weight of the cover is not quite as safe as e.g. a lock. Protection by weight may therefore be more appropriate where wells or manholes by their geographical location are considered to be far away from children's whereabouts.

4.3.2 Locks

A general recommendation in BBR reads: "Manhole covers should have locks". This general recommendation shall be seen as one example of how the safety requirement can be met. Consequently, the general recommendation does not exclude the possibility that the safety requirement may be met also by other design solutions.

There are a number of different types of locks which can meet the safety requirement. One example of such a solution is a lock which require a key or some other kind of special tool in order to be unlocked. It is also possible that design solutions in the form of locks which lock automatically can be designed in a way that they meet the safety requirements.

A lock should be designed so that it cannot be easily opened with easily accessible objects such as e.g. a common house key, a piece of wood or some similar object.



4.3.3 Insets or protection against falling

A protection against falling is one example of an inset, which can prevent a child from falling into a well or manhole and seriously hurt itself. The size of the opening of the inset should be chosen so that children cannot fall through the opening. In order to function as a good safety device the inset should be assembled with tools and in that way prevent children from removing the protection on their own using simple means.

It has happened that children have fallen into manholes when someone has forgotten to put back the manhole cover properly after sludge suction. In manholes where sludge suction is to be made, the inset may be designed so that suction is possible without removing the protection, e.g. by using a mesh size = 120 mm. (the mean diameter of a one-year-old's head is 125 mm).

4.3.4 Enclosures and coverings

If a well or manhole is situated at a location where neither people are supposed to walk nor vehicles are supposed to drive, the requirement regarding child safety may be met with the help of some kind of enclosure around the well or manhole. The enclosure may consist of e.g. a fence which is designed so that a child is unable to get through, over or under it, and furthermore unable to hurt itself on it.

In some cases, e.g. if a well or a manhole no longer is in service, it may be appropriate to shut the opening of the well or manhole completely. This may be done in different ways, e.g. by covering it permanently or by concrete casting. It is of course also possible to fill up the well again entirely.

4.3.5 The strength of the manhole cover

In order for locks and other safety measures to be meaningful it is required that the manhole cover itself is designed in a way and of such materials that it has sufficient strength. BBR states that manhole covers and gratings on gulleys shall have an adequate strength and that they shall be designed in such a way that the risk of accidents to children is limited.

5 The placing and the characteristics of the well affect the safety requirements

5.1 The location and character of the well

The safety requirements may vary depending on the location and the character of the installation. This means for example that the more densely populated an area is the higher requirements can be made on wells. There are also other factors that influence the decision on what safety level is required for a particular well, for example the depth of the well, whether it is filled with water or not, or if it is located inside or outside buildings where children can be present.

5.1.1 *Location*

The level of safety for wells, manholes and manhole covers is not the same everywhere. In the legislation a difference is made depending on where a well or manhole is situated. The Public Order Act states that wells shall be provided with the necessary safety devices "with regard to the location and the character of the installation". According to the preparatory working documents to the act the intention is that wells within areas where children often are present, sometimes unattended, always shall be equipped with safety devices so that the wells can be said to be child-proof. Some examples of such areas are, according to the preparatory working documents, around playgrounds, day nurseries, nursery schools and ordinary schools, around streets in residential areas with very little traffic and along certain footpaths and bicycle lanes.

Boverket's Building Regulations states that shutters, mesh, gratings and similar shall be designed so that they cannot be lifted by children and so that the risk of injury to persons is limited inside and outside buildings "where children can be present". The expression "where children can be present" refers to such buildings, spaces and places where children at pre-school age, 0 - 6 years, are supposed to be present or may be assumed to be present without permanent supervision by an adult. Manhole covers and gratings on gulleys

shall always have adequate strength regardless of where the manhole or gully is located.

When old covers on wells or manholes are exchanged it is recommended that the new covers are as safe as possible for children, even if the well or manhole is not located within an area where the highest safety level is required by the legislation.

5.1.2 *Characteristics*

The Public Order Act states that the safety device which is required in the individual case is related to the characteristics of the well. Certain types of wells and manholes are more dangerous than others and this should be taken into account when the type of protection is selected. Some of the aspects that should be taken into consideration when deciding what protection shall be chosen for the individual well or manhole are listed below.

Depth

According to the preparatory working documents to the new Public Order Act, higher requirements can be made regarding safety arrangements for wells in order to protect children against accidents the deeper a well is. The depth of the well or manhole is of significance for the vertical drop, and the well or manhole can be considered more dangerous the greater depth it has.

The depth is of significance not only because of the injuries that a fall may cause but also for the possibility that someone successfully will be able to intervene and rescue the child in case of an emergency. It can also be assumed that a state of shock is more frequent in connection with very deep wells partly because of the fact that rescue operations then takes longer time. The possibility for other persons to discover a child who has fallen into a well may also be less the deeper a well is because a cry for help or any other sound may then be more difficult to hear.

Diameter

The shape and dimension of the opening of the well are of significance for the type of accident that may occur. It is important to consider the way a child can fall into a well, e.g. head first or with one leg first etc, and then relate this to the size of a child's body-parts at different ages. A well with such a large

diameter that the child's whole body can pass through, or a well where the head can be caught, e.g. below the surface of the water, are probably the most dangerous types of wells.

Contents

A well that contains water or some other liquid, e.g. urine, is generally a greater hazard than a dry well on account of the potential risk of drowning. Wells filled with liquid are particularly dangerous for the youngest children. Drowning accidents with young children may occur even at very small depths of some decimetres of water. In the winter the surface of the water can freeze to ice and can easily be confused with a dry bottom. Such a misjudgement may easily have tragic consequences.

Height over the ground level

A relatively large number of narrow-escapes that have occurred in connection with wells and manholes have been caused by the fact that the cover or grating for some reason has not been in position. It has occurred that a child during a walk on a footpath suddenly has disappeared into the ground through an unprotected opening of a well or manhole. Sometimes the opening has perhaps been more difficult to discover on account of the fact that it was hidden by a pool of water or by snow. The openings to wells or manholes that are constructed in this way, i.e. are at the same level as the surrounding ground, constitute in this respect a greater hazard than the wells and manholes that rise a bit over the ground level and consequently are easier to spot.

Example

To exemplify how different protection devices can be combined with the following parameters: diameter, depth and location, reference is made to Table 1.

Table 1. Example of choice of safety device for the protection of children in relation to the diameter, depth, contents and location of the well.

Diameter (mm)	Depth	Location *)	Child safety **)
>500	> 2 m	a	l or f
		b	w, l or f
	< 2 m + water	a	l or f
		b	-
	< 2 m	a	w or l
		b	-
>100-500		a	w or l
	b	-	
<100		a, b	-

*) location = a means that the well is situated within an urban area, near a school, sports ground or day nursery, within a residential area; or some other area where children may be present.

location = b indicates that the well is situated near a motorway or on land where people only exceptionally are present.

***) w = protection by sufficient weight of the cover

l = protection by locks (not bolts)

f = protection against falling

- = special protection is not required

6 Responsibility

6.1 Responsibility comprises construction, supervision and maintenance

Sweden has today legislation that states that *all* wells and manholes shall be equipped with the safety devices that are appropriate considering the location and the condition of the individual well or manhole. The fatal and non-fatal accidents that still occur in connection with wells happen mainly because somebody has failed in his responsibility and it can be noted that it is above all knowledge of the practical application of the legislation and the obedience of it that fall short.

Responsibility for a certain safety device also includes continuously keeping the device in question in good working order, not only under the construction of e.g. the well. This means e.g. to see to that a cover on a well or manhole whose safety device consists of a lock also *is* locked. It may thus be necessary with some kind of regular supervision in order that the person responsible for the safety shall know whether something needs to be done.

6.2 The client, owner and the property user are responsible for the safety

When it comes to for example whether a well meets the stipulated requirements, it is, according to the Public Order Act, "the owner of the installation or the person who, in consequence of a usufruct agreement or on some other ground is in the owner's place" who is responsible for the installation. This may comprise e.g. property managers, leaseholders, tenants, and similar. The responsibility lies in a continuous duty to see to that repair and maintenance are carried out to the extent necessary in order to uphold the safety. According to the building legislation the person who builds or has somebody to build, the client, is responsible for the construction being as safe as required. Thereafter, the owner shall see to that it continue to be so.

6.3 The local Building Committee and the police may intervene

The local Building Committee is, within the framework of the building legislation, the supervisory authority *inter alia* for the safety of children on sites and in construction works (wells e.g. are regarded as construction works). Owing to its role in the building process the local Building Committee has the necessary insight and the opportunity to intervene so that the safety requirements are met in a satisfactory way. The Committee may order the client and the owner of the installation to fulfil their obligations. The Committee has also the authority to have the problem solved at the expense of the owner.

If an installation constitute a hazard for its surroundings on account of neglect by the owner or usufructuary to undertake prescribed safety measures, the police can order the person in question to take the necessary actions within a certain amount of time. The police may thus "in the case of a particular installation, decide what safety measures shall be taken" with support of Chapter 3 Section 5 of the Public Order Act. The idea is to give the police authority, for example after a reminder from the public, to give instructions on what safety devices should be installed for a particular installation (a well is an example of an installation). In order to be able to propose an appropriate action the police may turn to the local authority and discuss the individual case and together they may come to a conclusion on what measures to be taken. The power of the police to intervene with an injunction should not be utilised until the safety has been considerably set aside or when the person responsible still after previous reminders has not improved the safety. It goes without saying that it shall not be necessary for an accident to happen before the police find a reason for intervening.

7 What does the law say?

7.1 The safety is regulated in several laws – The Public Order Act and the Planning and Building Act are two of these

There are safety regulations regarding wells in the Planning and Building Act (PBL), the Public Order Act (OL), the Act on Technical Requirements for Construction Works (BVL) and the Ordinance on Technical Requirements for Construction Works (BVF). Public safety and the safety of children are thus regulated to some extent in several laws and this is probably a contributing factor to the uncertainty and unawareness of what rules apply *when* and *where*. It is thus important to be aware of the regulations that are applicable in the individual case and what requirements these regulations prescribe.

7.1.1 *Mandatory provisions*

Mandatory provisions in relation to PBL, BVL and BVF are issued by Boverket while the National Police Board is responsible for provisions in relation to OL.

7.1.2 *Supervision*

The supervisory authority for the areas regulated by PBL, BVL and BVF is the local Building Committee or the corresponding municipal committee. The police force is the supervisory authority for those parts which concern OL.

7.1.3 *Differences between PBL, BVL, BVF and OL*

One important difference between the different acts is that OL is retroactive. This means that OL applies to all wells and manholes irrespective of whether they have been constructed before or after the act came into force. PBL, BVL

and BVF however are applicable only to *new* wells and for alterations to these. However, the requirement to maintain existing wells also applies to older wells.

The rules of the Public Order Act regarding wells are applicable to *all wells* (water, urine, gullies etc) irrespective of what type of land they are situated on. The Planning and Building Act covers wells which are situated on sites, public places and areas for other civil engineering works than buildings. BVL with its associated ordinance applies to all construction works (e.g. wells) which are constructed or altered irrespective of where they are situated. It shall also be said that the word "site" in PBL refers to a piece of land which has been set aside for development. A site consists of the land which takes up buildings and such land which lies in direct connection with it and which is used or is needed in order that the building can be used for the intended purpose, e.g. open spaces for playing and out-door activities, circulation spaces for parking, loading and unloading.

The Public Order Act takes account of the location and the character of the well when it comes to the level of safety. In areas where children are present the requirements are higher than usually. For older wells and manholes where the cover is to be exchanged the same requirements regarding safety as for new wells and manholes apply irrespective of where the well or manhole is situated. PBL has rules concerning safety requirements for all sites irrespective of whether these are built upon or not, requirements stating that the risk of accidents shall be limited. The safety requirements in PBL, which are applicable to wells, are of a more general nature than the requirements given in OL. In BVF it is stated that construction works shall not present unacceptable risks of accidents in service or in operation.

7.2 Planning and Building Act (1987:10) and Act on Technical Requirements for Construction Works etc . (1994:847)

PBL contains safety requirements regarding sites. The requirements apply only to those areas for which PBL is applicable, i.e. mainly to sites and within areas which constitute public spaces or are intended for other civil engineering works than buildings.

All sites, irrespective of whether they have been set aside for development or not, shall be kept tidy. This means inter alia that they shall be managed so that the risk of accidents is limited.

Furthermore, construction works and other civil engineering works shall be maintained and safety devices shall be kept in repair.

These issues are regulated in Part 3 Sections 15, 16, 17 and 18 of PBL, in Sections 2 and 13 of BVL and in Section 6 of BVF.

" Sites for development shall be used in a way that is suitable with regard to the natural landscape or townscape as well as to the natural and historical value of such sites. In addition, efforts shall be made to ensure that:

- - -
3. the risk of accidents is limited and that serious disturbances to traffic do not occur,
- - -"

PBL Part 3 Section 15

" On developed sites, the regulations in Section 15, first paragraph, item 6 as well as the second and third paragraphs shall apply within reasonable limits.
For alterations to a building for which a building permit is required, the site shall be arranged so that it meets the requirements of Section 15 to the extent and within the limits regarding work costs and the site's particular qualities."

PBL Part 3 Section 16

" Sites shall, irrespective of whether they are used for development or not, be kept tidy. They shall be maintained so that no disturbances are created to the surroundings or to traffic and so that the risk of accidents is reduced.

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PBL Part 3 Section 17

" With regard to public spaces and areas for installations other than buildings, the regulations in Section 17, second paragraph shall always apply as well as those in Section 15 and 16 , and the first, third and fourth paragraphs of Section 17 § shall apply within reasonable limits."

PBL Part 3

Section 18

" Construction works which are constructed or altered shall, on the assumption of normal maintenance, during an economically reasonable service life comply with essential technical requirements concerning:

- - -
4. safety in use
- - -

Construction works shall be maintained so that their properties in those respects which are set out in Paragraph 1 are substantially preserved. Devices which are intended to meet the requirements in items 2 - 4, 6 and 8 of the first paragraph shall be kept in repair."

BVL Section 2

" Construction works must be designed and built in such a way that it does not present unacceptable risks of accidents in service or in operation, such as slipping, falling, collision, burns, electrocution or injury due to explosions."

BVF Section 6

The requirements in PBL stating that all sites shall be kept tidy and that the risk of accidents shall be limited apply above all to wells on the site. A well without a cover, grating or some other protection is a great hazard to both adults and children. Nor does it meet the requirements given in BVL, BVF and BBR. A well with a cover which is placed carelessly, is decayed or easy for a child to move out of position is naturally not appropriate from a safety point of view.

It is thus not only at the time of construction of the well that the safety shall be sufficient. The person who is responsible for the well shall see to that it is inspected and maintained in such a way that the original safety level is upheld. The local Building Committee may intervene if the safety is not sufficient.

7.3 Public Order Act (SFS 1993:1617)

The previous General Act on Public Order, AO, was replaced by inter alia a new Public Order Act (SFS 1993:1617) on 1 April 1994. This new act contains inter alia regulations for protection against accidents in connection with wells.

The provisions of the Public Order Act regarding wells and manholes constitute a sharpening of the rules in relation to what was stated in AO inter alia because *the hazards that may occur to children in connection with wells shall be taken into account* when deciding what safety devices are necessary in the individual case. The regulations of the Public Order Act are applicable to all wells irrespective of what kind of land they are situated on and irrespective of whether they were constructed before or after the Public Order Act came into force.

Chapter 3 Section 5 of the Public Order Act deals with several aspects regarding wells and safety. It states inter alia that preventive measures in order to avoid accidents to children shall be given special consideration. Government bill 1992/93:210 contains a longer discussion of the ideas behind Section 5. The owner of the well, or the person who replaces the owner, is responsible for meeting the safety requirements concerning the well. The safety requirements are in their turn dependent on where the well is situated and its characteristics. Higher safety requirements can be made for a well which is situated in a densely populated area and in such areas where children often are present or usually are present without supervision. Examples of such places are schools and playgrounds. In the same way higher requirements can be made regarding safety devices to a well which is particularly dangerous, e.g. because it is very deep and perhaps even filled with water. The police have the authority to intervene by deciding what actions need to be taken in order that a certain well shall meet the safety requirements.

"Wells, pools and similar installations shall be provided with the necessary safety devices with regard to the location and character of the installation. The necessity for safety devices to give sufficient protection against accidents to children shall in particular be taken into account. The owner of the installation or the person who, in consequence of a usufruct agreement or on some other ground is in the owner's place, is responsible for ensuring that the installation is provided with the necessary safety devices. The police may, in the case of a particular installation, decide what safety measures shall be taken."

Chapter 3 Section 5 Public Order Act

7.4 Boverket's Building Regulations, BBR

7.4.1 *Mandatory provisions and General recommendations*

Boverket's Building Regulations, BBR, contain mandatory provisions and general recommendations in relation to a number of acts and ordinances, inter alia PBL and BVL, and to the ordinances associated with these acts, PBF and BVF respectively.

The mandatory provisions of BBR are applicable when a building is constructed, in principle to additions when a building is added to, to earthworks and demolition works and to sites which are used for building development. Holiday houses and similar are excluded from some of the provisions but not from the mandatory provisions regarding safety.

In Section 8 of BBR, Safety in use, safety in connection with wells is dealt with partly in Subsection 8:2, Protection against falls, and partly in Subsection 8:6, Protection against drowning. The safety aspects are consequently of different kinds and each aspect must be considered at the same time as a comprehensive view is important. According to BBR 8:233 openings in surfaces which are intended to be walked on shall be covered by appropriate safety devices or be bounded by a guard rail or similar. Openings in footpaths, playgrounds, parks, etc are examples of such places. Safety devices to wells or manholes can be e.g. covers, shutters or gratings. Regarding the protection specifically for children BBR states that inside and outside buildings *where children may be present* without permanent supervision these protection devices shall be designed so that they cannot be lifted by children and so that the risk of injuries to persons is limited. Examples of spaces where children at pre-school age may be present are dwellings, after-school centres, nursery schools and libraries.

"Openings in surfaces which are intended to be walked on shall unless they are bounded by a guard rail or similar be covered by shutters, mesh, grating or some other appropriate safety devices. Inside and outside buildings where children can be present, such shutters, mesh, grating and similar shall be designed so that they cannot be lifted by children and so that the risk of injury to persons is limited."

BBR 8:233 "Openings"

Regarding the protection against drowning in connection with wells child safety is emphasised in particular. Subsection 8:6, Protection against drowning, starts with a general recommendation which refers to Chapter 3 Section 5 of the Public Order Act. Wells and manholes should be equipped with some kind of cover or grating with a lock which protects children against accidents, but other technical solutions may also be excellent. Naturally, the design of the cover is also of significance for the safety and strength of the cover. A cover shall have sufficient strength and shall be designed so that people do not hurt themselves on it e.g. because it has sharp edges, protruding parts or similar.

8 Type approval and production control

The regulations contained in the building legislation and in Boverket's Building Regulations are often expressed as performance requirements, i.e. they state what shall be attained but not how. Many manufacturers are having their products type approved, e.g. manhole covers, in order to easily show that a certain product meets the requirements in the legislation applicable for the intended use.

General recommendation:

" It is stated in Chapter 3 Section 5 of the Public Order Act (1993:1617) that wells, pools and similar installations shall be provided with the required safety devices and that protection against accidents to children shall be given special consideration. (BFS 1995:17)"

BBR 8:6 " Protection against drowning"

" Pools, containers and similar which are not enclosed and in which water or some other liquid is stored shall be designed to have satisfactory protection which limits the risk of injury to persons due to falls into the water or liquid."

General recommendation:

" During design special attention should be given to the risk of accidents to children."

BBR 8:62 " Other pools, containers, manholes etc"

" Covers on manholes and gratings on gulleys shall have adequate strength. They shall be designed so that the risk of accidents to children is limited."

General recommendation:

" Manhole covers should have locks."

BBR 8:621 " Manholes etc"

" Applications can be considered for approval of the use of certain kinds of materials, constructions or installations in construction works (voluntary type approval).

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It may be decreed in conjunction with the issue of a type approval that continual control (production control) shall be exercised. Even when type approval is not involved, it may after application be decreed that production control shall be performed."

BVL Section 18

" Type approved or production controlled materials, constructions and installations shall be deemed to comply with the requirements in accordance with Section 2 in those respects to which the type approval or control refers."

BVL Section 19

References to sources

Planning and Building Act (1987:10), (PBL).
Planning and Building Ordinance (1987:383), (PBF).
Act (1994:847) on Technical Requirements for Construction Works etc, (BVL).
Ordinance (1994:1215) on Technical Requirements for Construction Works etc, (BVF).
Public Order Act (1993:1617), (OL).
Boverket's Building Regulations (BFS 1993:57, with amendments up to BFS 1998:38), (BBR).
Central Product Directive, (CPD).
Accidents to children in connection with wells and ponds 1997-1998, Barnombudsmannen 1999¹.
Statistics regarding accidents in connection with wells, 1995-1998, *kolla*, Barnombudsmannen¹.

Recommended literature

Child safety in buildings, handbook, Boverket¹.
And then I think -, report from children's ombudsman, Barnombudsmannen 1999¹.
Demands for safe wells are now finding a ready audience, article in *Kommunikativt* 1978 no. 32 p. 3¹.
Crimes to children are neglected, article in *Dagens Nyheter*, DN-Debatt 1999-03-29¹.

(Footnotes)

¹ Only available in Swedish.

¹ Only available in Swedish.