Helsinki

21 June 2023

Instructions for the structural sheltering of the population Helsinki 2023 public section

Civil defence management and planning services

Helsinki City Rescue Department 2023-17

Table of contents

1. Introduction

The structural sheltering of the population of Helsinki in its present form began in the 1930s as a result of the development of flight operations and gas weapons. It was deemed that acts of war would no longer take place solely on battlefronts, and there were fears of hostilities extending beyond the frontlines into cities. Above all, there were fears of the civilian population being under threat of the use of gas weapons, due to which civil defence shelters were first built as gas protection chambers. However, it was soon understood that gas weapons were not the only airborne danger, as the home front was also threatened by explosives.

Suomen kaasusuojelujärjestö (Finnish Anti-Gas Defence Organisation) built the first model gas protection chamber in 1933 at Kaisaniemenkatu 13. Parts of the Finnish Red Cross Hospital were also equipped similarly the same year. The City of Helsinki served as a pioneer in also building 'bomb shelters' in the 1930s to protect its employees, without a legal obligation to do so. The City wanted to secure its functions for its residents.

It was not until the Civil Defence Act entered into force in 1940 that the broad-scale construction of civil defence shelters at new properties began. As per the demands of the Allied Control Commission and communists, the construction of civil defence centres was suspended in 1945 for ten years. Since 1955, the construction of civil defence shelters in new buildings has continued until the present day. Civil defence shelters were also built in a few new buildings as per the technical regulations of the Ministry of the Interior in 1951. The owner of the building bears the obligation to build a shelter.

The construction of civil defence shelters alone is not enough, as people who know how to use them are also needed. Accordingly, shelter managers have been trained since the last war, and today, the training of shelter managers is carried out by Helsingin Pelastusliitto together with its member organisations. Helsinki City Rescue Department is in charge of training bedrock shelter managers.

In addition to knowledgeable shelter managers, civil defence shelters need professional service and maintenance. Only regular maintenance will ensure that the civil defence shelter can be put to use in an appropriate condition within the legally prescribed deadline when needed. **The owner of the property is responsible for maintaining the shelter and ensuring that it features the necessary furnishings and tools.** Unfortunately, condition inspections carried out in civil defence shelters have revealed plenty of deficiencies, particularly in old shelters with sand filters, but also in newer S1 class civil defence shelters and bedrock shelters. Accordingly, special attention must be paid to the maintenance and renovation of civil defence shelters in the coming years. Plenty of deficiencies have also been observed in clearing and commissioning plans. The inclusion of the aforementioned procedures in emergency plans must be improved and supervised going forward.

Civil defence and preparing for it are carried out independently in residential buildings, in care and educational institutions and at workplaces, and as public civil defence operations carried out by the authorities. Different authorities are responsible for carrying out and preparing civil defence tasks within their respective administrative sectors in accordance with their own guiding legislation. In 2022, special procedures were started in the planning of the operations of the public civil defence organisation in terms of planning and developing the management of sheltering and warning residents at the right time.

Helsinki also has areas with an insufficient number of civil defence shelters. In these areas, special attention will be paid in the planning of public civil defence operations to charting reserve shelters at the right time and evacuation planning.

The implementation of renovations in bedrock shelters administrated by the City of Helsinki has been started intensively, and the result and the condition of bedrock shelters will be monitored intensively within the review period of 2022–2030.

2. Civil defence strategy

In Finland, the national civil defence strategy has remained practically unchanged since the Civil Defence Act laid down in 1939. The only exception is a short period in 1945–1954, during which few civil defence shelters were built.
Since the 1954 regulation, civil defence shelters have been built continuously to this day. The strategy has been to provide Finnish people with appropriate civil defence shelters that structurally provide sufficient shelter against any enemy attacks. The construction of shelters is connected to new construction, making the costs of the shelter part of normal construction costs, which are the responsibility of the property developer. From 1955 to 1991, the shelter construction obligation only pertained to designated areas, after which it was expanded to cover the entire country. Only agricultural buildings continue to be excluded from the obligation.

Based on experiences from the war, it was first deemed that a sufficient level of protection could be achieved with civil defence shelters that provided protection against pressure waves, shrapnel, light artillery and collapses. In the early stages, ventilation was implemented naturally for cost reasons, and no mechanical ventilation was required. Later, as the potential threat changed, attention was also paid to ventilation and filtering the intake air of the civil defence shelter. Since 1959, civil defence shelters have been required to have a ventilation system with filters.

The latest population sheltering strategy was published in 2007. It states: “The general objective of population sheltering is that people can be protected in disaster and hazard situations under normal conditions so that no human lives are lost due to insufficient sheltering potential. With regard to emergency conditions, the objective is to protect the population as well as is possible within realistically implementable arrangements and costs.

In disaster and hazard situations under normal conditions, the methods of protection are seeking shelter in residential and other indoor facilities, and evacuation. In the vicinity of nuclear power plants or other locations deemed similar based on a risk assessment, the use of civil defence shelters is to be prepared for under normal conditions as well.

In emergency conditions, preparations are to be made to protect the population in existing civil defence shelters, in premises yielding maximum protection or through evacuations in accordance with risk assessments and threat situations.”

The strategy served as the basis for the decision to continue the civil defence shelter construction obligation in all of Finland in the work to reform the Rescue Act in 2011.

However, the legally prescribed obligation to build public civil defence shelters was regrettably abolished.
The Government's 2021 Defence Report continues to highlight the importance of the structural sheltering of the population. Among other things, the Report states the following about civil defence shelters: *"The Ministry of the Interior will examine the condition of civil defence and civil defence shelters and their distribution in Finland, and lead the necessary development actions."*

The 2022 Government report on changes in the security environment also addresses this matter: "When making preparations for military national defence, it must also be possible to protect the population and secure the viability of society. Preparations will be made to protect the population in existing civil defence shelters, in premises yielding maximum protection and, if necessary, through evacuations in accordance with risk assessments and threat situations.

In terms of protecting the population and infrastructure and securing important functions, it is also essential to be able to carry out effective rescue operations and activities that support them. The rescue authorities play a key operational and coordinating role in civil defence. Finland has the most extensive civil defence infrastructure in the EU and has plans for protecting the population. However, the changed security situation requires that civil defence and civil defence shelters be developed and that the need for resources be examined, which will be carried out by means of a national review."

3. Construction of civil defence shelters in Helsinki

3.1. Building shelters and properties' shared building shelters

Since 1954, property-specific so-called building shelters have been built in Helsinki. Such shelters can be found in residential buildings, at workplaces, in industrial buildings and in public buildings alike. Over the years, the equipment of the shelters has increased and developed technically. At first, a shelter could only be made into an airtight space to provide protection against pressure waves and shrapnel. When needed, ventilation was implemented naturally. However, the wall and ceiling structures of the shelter were dimensioned to withstand the potential collapse of the building above it.

From 1959 onwards, shelters were also required to have mechanical ventilation. At first, filters were sand-based, filtering nuclear fallout dust and some chemical weapons. Later, ventilation systems were supplemented with a special filter, improving their filtering capabilities. Since 1971, shelters have only featured a special filter, which filters dust-like and gas-like substances from the intake air.

As a rule, the building shelter is located on the basement floor of the building. It can also be partially or completely above ground, whereby it is subject to stricter construction requirements in terms of aspects such as the thickness of its walls. If there are several buildings on one plot, a shared civil defence shelter for all them may have been built in one of them. This continues to be an option today.

The owner of the property is responsible for the maintenance of the building shelter.

More detailed descriptions of the features of shelters from different eras can be found in APPENDIX 1.

3.2. Area construction in 1960–2020 and shared bedrock shelters

Since the beginning of large-scale area construction in the 1960s, shared bedrock shelters have been built in the suburbs of Helsinki for the entire planned building stock. The capacity of the shared bedrock shelters has varied from roughly one thousand to nearly twelve thousand. A so-called civil defence shelter fee has been collected from properties joining a shared bedrock shelter as a one-off payment to partially cover the construction costs of the bedrock shelter. The City of Helsinki has served as the developer and assumed responsibility for the majority of the costs, rendering the shelters under the City's control. Some of these shelter feature 'extra space.' They may also feature so-called public shelter places for the residents of properties that do not have a civil defence shelter. The City of Helsinki is usually responsible for the maintenance of such shared bedrock shelters and their costs. Property-specific building shelters have later been built in supplemental construction projects in area construction areas.

3.3. Public bedrock shelters

The public civil defence shelters are built by the City, and they are intended for people who live in Helsinki or who are working or staying there, and for people moving about outdoors who cannot otherwise be provided with sufficient shelter. Such shelters have been built in Helsinki since 1940. The latest public civil defence shelters were completed in 2003 as part of the shared bedrock shelter in Merihaka. From the days of the 1939 Civil Defence Act all the way to 2011, the construction of public civil defence shelters was required by law. Public civil defence shelters have also been built at transport stations and harbours, some as bedrock shelters and others as reinforced concrete shelters.

4. Areal distribution of shelters and the distinguishing features of areas

The construction of civil defence shelters has been based on a legally prescribed obligation. The options for fulfilling this obligation have been to build a building-specific civil defence shelter, to build the obligated shelter places for buildings on the same plot in one of the buildings, or to join a local shared civil defence shelter. In the latter case, a so-called civil defence shelter fee has been collected from the developer to cover some of the construction costs of the local shared shelter.

The obligation to build a civil defence shelter has been based on the size and construction materials of the building. In the earliest legislation, the factor bringing about the obligation was the volume of the building. Later, the total floor area of the building became the deciding factor. Due to the aforementioned factors, areas dominated by apartment buildings have enough civil defence shelter places, whereas areas featuring mostly detached houses have an insufficient or non-existent number of shelters.

The greatest permitted distance between the civil defence shelter and a building under the shelter building obligation has varied in the regulations of different times, from 250 metres to the current 500 metres.

4.1. Distribution of civil defence shelters by major district

1. Southern major district (1)

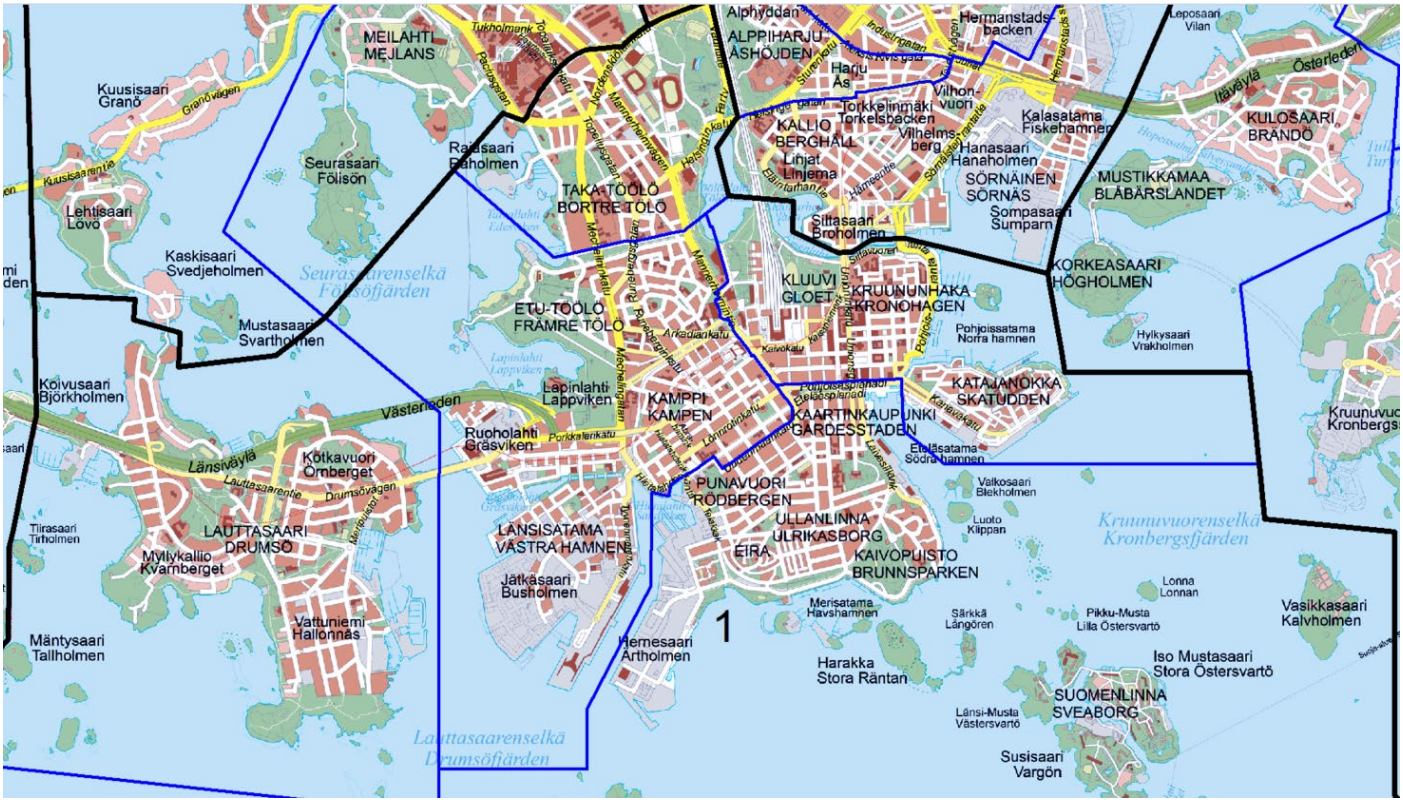

Figure 1. Distribution of civil defence shelters. Southern major district.

The major district consists of a section of the inner city south and west of Töölönlahti and Pitkäsilta Bridge, and Lauttasaari and Suomenlinna. The major district is divided into the districts of Vironniemi, Kampinmalmi, Taka-Töölö, Ullanlinna and Lauttasaari. The area has roughly 120,800 residents. There are 217,900 civil defence shelter places in the area. The area features public bedrock shelters in Siltavuorenranta; at the metro stations of Kaisaniemi, Rautatietori, Kamppi and Ruoholahti; in Katajanokka; in Tähtitorninmäki; in Johanneksen puisto Park; at Erottaja; on Nervanderinkatu at Temppelinaukio; and on Suomenlinna. The area also features the large shared bedrock shelters of Kaisaniemi-Kluuvi, Kamppi-Forum, Finlandia Hall, Jätkäsaari Park and the Salmisaari tunnel.

In terms of transport, the southern major district is very significant for marine routes, road connections and railway traffic alike. The quays of South Harbour are located in Katajanokka and Kaivopuisto, and the quays of West Harbour can be found in Jätkäsaari. The harbours are significant passenger and cargo traffic hubs. In 2022, the harbours had nearly eight million passengers. The area also features a bus station and the main railway station. The Salmisaari power plant area is an important location for energy production in the area.

The area also features significant administrative, commercial, ecclesiastic and educational clusters. Of the areas of Helsinki, the southern major district is a major study and workplace area for non-Helsinki residents in terms of its population. Likewise, the area also has the highest number of foreign visitors in Helsinki.

The civil defence shelters of the area are not distributed evenly. Due to the old building stock, the area has so-called shortage areas where the distance to the closest civil

defence shelter is too great or there are no shelters that meet today's requirements, even though the major district as a whole has more shelter places than residents.

Civil defence authorities are prepared to convert underground facilities in the area into temporary shelters. They are also prepared for putting public buildings in the area into use as public civil defence shelters and allocating unused shelter places at private properties to residents without shelter. The locations of the aforementioned and the arrangements needed for putting them to use are described in the confidential appendices to this document. The public will be informed of the locations when the preparedness level is heightened.

In residential and business buildings without an actual civil defence shelter, the property owner can prepare for converting underground facilities, such as those in the basement, into temporary shelter facilities providing protection against shrapnel if needed. This is done by reinforcing the structures of the building section selected to serve as a shelter to withstand a collapse and protecting the external structures and passageways with means such as sand bags. The civil defence authorities will provide more detailed information if the level of preparedness is heightened due to a change in the threat assessment.

2. Western major district (2)

Figure 2. Distribution of civil defence shelters. Western major district.

The western major district is a major area consisting of the western city districts of Helsinki. It covers five city planning, administration and service production districts: Reijola, Munkkiniemi, Haaga, Pitäjänmäki and Kaarela.

The area has roughly 111,700 residents and features civil defence shelter places for 167,400 people. The area features three public bedrock shelters: on Kuusitie in Meilahti and on Lokkalantie and Rantapolku in Munkkiniemi. There are also shared bedrock shelters in the area in Niemenmäki, Lehtisaari and Munkinpuisto Park. Additionally, the area features a few private bedrock shelters. The shelter places and residents in the major district area are distributed as follows: 16,700 residents and 39,900 shelter places in Reijola; 18,800 residents and 18,620 shelter places in Munkkiniemi; 27,500 residents and 31,000 shelter places in Haaga; 18,200 residents and 45,200 shelter places in Pitäjänmäki; 30,400 residents and 32,600 shelter places in Kaarela.

However, the civil defence shelters of the districts are not distributed evenly. Due to the old building stock and detached house areas, the area has so-called shortage areas where the distance to the closest civil defence shelter is too great or there are no shelters that meet today's requirements, even though the major district as a whole has more shelter places than residents.

The distinguishing features of the western major district include centralised special medical care services in Meilahti and Laakso, an extensive public transport depot area in Ruskeasuo and several significant road traffic hubs. The area features railway connections to the seaside track and the Ring Rail Line to destinations such as the airport. Pitäjänmäki features a significant cluster of industrial operators. The western major district is a significant work area for non-Helsinki residents, particularly the Pitäjänmäki and Reijola districts.

Civil defence authorities are prepared to convert underground facilities in the area into temporary shelters. They are also prepared for putting public buildings in the area into use as public civil defence shelters and allocating unused shelter places at private properties to residents without shelter. The locations of the aforementioned and the arrangements needed for putting them to use are described in the confidential appendices to this document. The public will be informed of the locations when the preparedness level is heightened.

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3. Central major district (3)

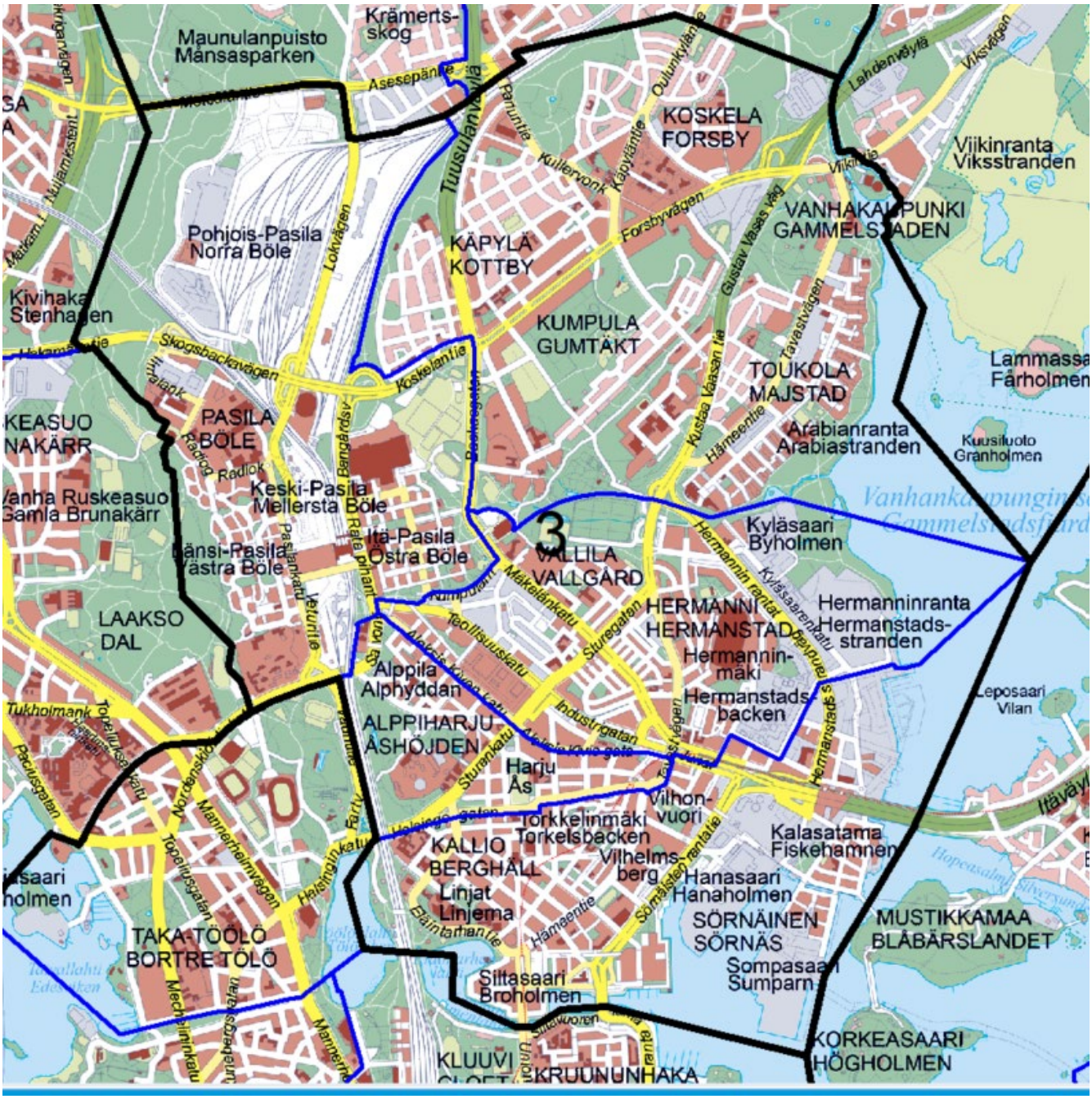

Figure 3. Distribution of civil defence shelters. Central major district.

The central major district is a city planning district formed by the eastern section of the inner city and geographically central city districts of Helsinki. The major district is divided into the districts of Kallio, Alppiharju, Vallila, Pasila and Vanhankaupunki.

The area has roughly 98,500 residents and civil defence shelter places for roughly 182,000 people.

The area features four public bedrock shelters: in Torkkelinmäki, in Katri Vala Park, on Kangasalantie and on Karstulantie. The local metro stations in Hakaniemi and Sörnäinen are public civil defence shelters. The area also features shared bedrock shelters on Eläintarhantie, in Agroksenmäki, in Itä-Pasila, in Toukola and on Miina Sillanpään katu.

Additionally, the two last mentioned feature public shelters. There are a few private bedrock shelters in the area, such as the one in Redi Shopping Centre.
The distinguishing features of the central area include the main railway track going through the area, and the Pasila train yard and depot. Itä-Pasila features significant office buildings for central administration and Messukeskus. There are also significant office buildings in Länsi-Pasila, as well as the operating area of the Finnish Broadcasting Company and the premises of Helsinki Police Department. A significant tall construction centre is growing around Mall of Tripla in Keski-Pasila, posing more challenges to civil defence.

The industry and banking cluster of Vallila is located in the middle of the area. Helsinki Prison is located in the Hanasaari power plant area in Hermanni at the eastern edge, as is the Kalasatama area, the tall buildings of which also pose challenges to civil defence.

A significant university campus and the main office of the Finnish Meteorological Institute are located in Kumpula. The important surface water treatment plant of Vanhakaupunki is located right in the north-eastern corner of the area.

The distinguishing features of the Vallila and Vanhakaupunki districts include their old residential areas dominated by wooden buildings: Puu-Vallila, Kumpula and Puu-Käpylä. There is a shortage of civil defence shelter places in the wooden building areas, in addition to which one potential problem is the possibility of a fire breaking out and spreading across the blocks. This must be taken into account in the planning and preparing of extinguishing measures related to independent civil defence in the area, particularly with regard to both extinguishing skills and equipment, and included in the emergency plans for the area.

Of the sections of the area, Vallila and Pasila are significant work areas for non-Helsinki residents.

3. The civil defence shelters of the major district are not distributed evenly. Due to the old building stock and detached house areas, the area has so-called shortage areas where the distance to the closest civil defence shelter is too great or there are no shelters that meet today’s requirements, even though the major district as a whole has more shelter places than residents.

Civil defence authorities are prepared to convert underground facilities in the area into temporary shelters. They are also preparing for putting public buildings in the area into use as public civil defence shelters and assigning unused shelter places at private properties to residents without shelter. The locations of the aforementioned and the arrangements needed for putting them to use are described in the confidential appendices to this document. The public will be informed of the locations when the preparedness level is heightened.

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4. Northern major district

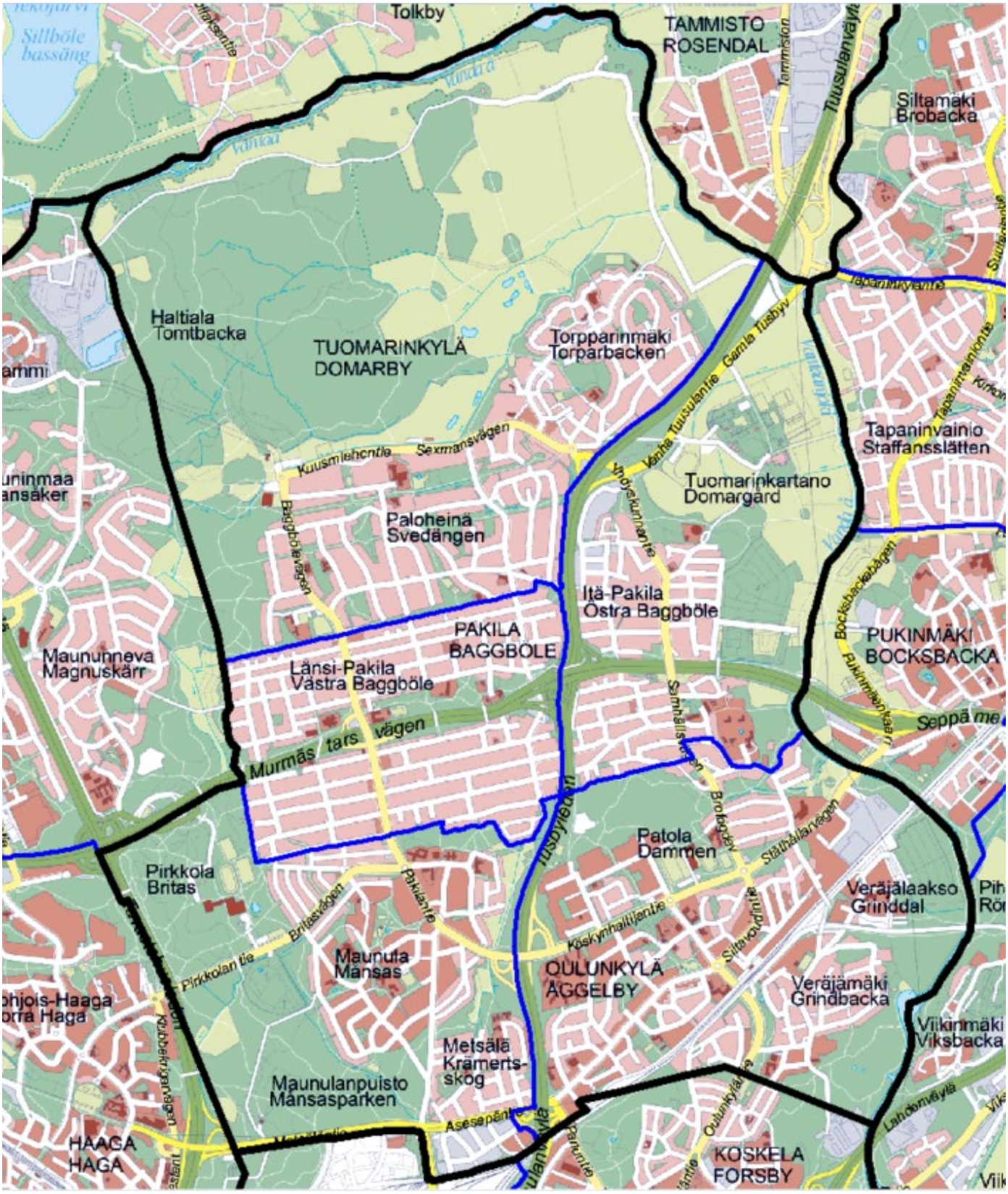

Figure 4. Distribution of civil defence shelters. Northern major district.

The northern major district is one of Helsinki's eight major districts. The northern major district is divided into five districts: Maunula, Länsi-Pakila, Tuomarinkylä, Oulunkylä and Itä-Pakila.

A distinguishing feature of the area is the broad unbuilt forest and field area of Tuomarinkylä. The area also features the significant traffic route Ring Road I, the Tuusulanväylä route from Helsinki to the airport and the main railway track heading northward. There is a small industrial area in Metsälä.

The northern major district has roughly 43,000 residents and a total of 31,400 places in civil defence shelters. Apart from a few exceptions, the area is dominated by detached houses. Because the construction of detached houses has not been subject to the obligation to build civil defence shelters, the majority of the districts are shelter place shortage areas. The number of shelter places only exceeds the number of residents in the Oulunkylä and Maunula districts. Oulunkylä has 14,561 residents and 15,462 shelter places, while Maunula has 9,000 residents and 11,500 shelter places.

Preparations for carrying out evacuations are in place in Pakila, Paloheinä and Torpparinmäki in the event that the risk assessment necessitates such measures in an armed conflict situation.

In residential and business buildings without an actual civil defence shelter, the property owner can prepare for converting underground facilities, such as those in the basement, into temporary shelter facilities providing protection against shrapnel if needed. This is done by reinforcing the structures of the building section selected to serve as a shelter to withstand a collapse and protecting the external structures and passageways with means such as sand bags. The civil defence authorities will provide more detailed information if the level of preparedness is heightened due to a change in the threat assessment.

5. North-eastern major district

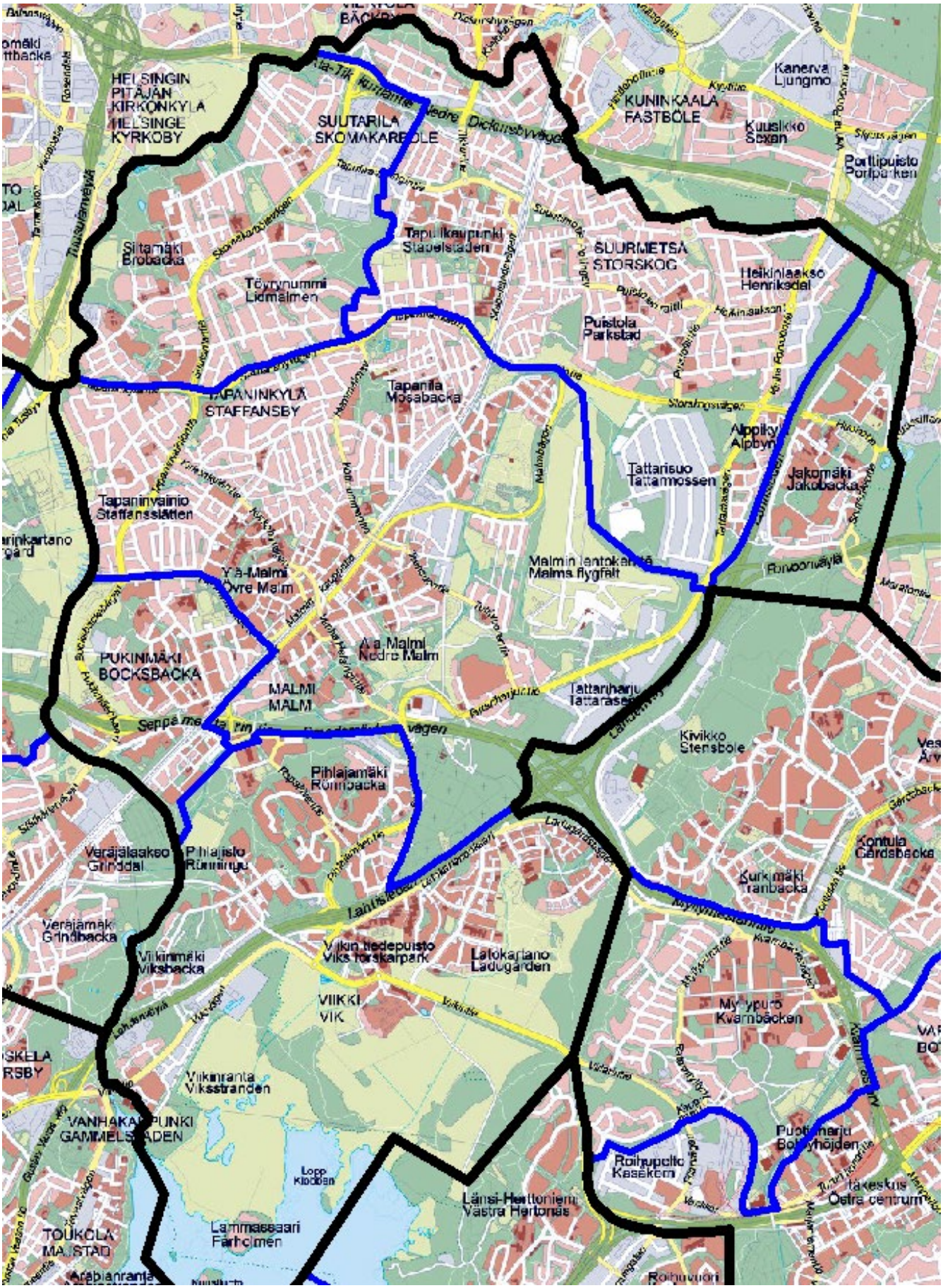

Figure 5. Distribution of civil defence shelters. North-eastern major district.

The north-eastern major district consists of the north-eastern city districts of Helsinki. The major district covers five city planning, administration and service production districts: Latokartano, Pukinmäki, Malmi, Suutarila, Puistola and Jakomäki. Since Helsinki expanded eastward after the Östersundom areas were detached from Sipoo and Vantaa, the major district no longer geographically represents the north-eastern section Helsinki in practice. Instead, it represents the central northern section of the city.

The western border of the major district is the Vantaa River, while the eastern border is the green area from Vanhankaupunginlahti to Kivikko. In the north, the district is demarcated by Vantaa, and a section of the border goes along the Kerava River. The main railway track, as well as Lahdenväylä, Ring Road I and Ring Road III, go through the major district. The current major district area was annexed to the city in the great annexation of Helsinki in 1946. Before that, it used to be part of the rural municipality of Helsinki.

The area features shared bedrock shelters in the Viikki area and Jakomäki, and two shelters in Pihlajamäki.

The transport-related distinguishing features of the area include Ring Road I going across the southern section and the northern main railway track across the area from south to north, and the Malmi airport area yet to be built. The south-eastern corner of the area also features the significant Ring Road I and Lahdenväylä junction, as well as the Lahdentie and Porvoonväylä junction.

The south-western section of the area features the Viikki wastewater treatment plant, an important part of the city infrastructure. Finland's largest cemetery, Malmi Cemetery, is located east of Pihlajamäki. Viikki Science Park and Viikki Research Farm of the University of Helsinki are located in Latokartano.

The area has roughly 99,200 residents and roughly 105,500 civil defence shelter places. The distribution of shelter places within the major district varies based on the building stock of each area: the Latokartano area has roughly 24,500 residents and 36,900 shelter places; Pukinmäki has roughly 8,700 residents and 10,900 shelter places; Malmi has roughly 29,150 residents and 32,500 shelter places; Puistola has roughly 20,100 residents and 12,000 shelter places; Jakomäki has roughly 5,450 residents and 7,800 shelter places; Suutarila has roughly 11,300 residents and only 5,400 shelter places.

Preparations for carrying out evacuations are in place in Puistola and Suutarila (Tapanila, Tapaninkylä, Tapaninvainio, Töyrynummi, Siltamäki), as well as the Malmi and Pukinmäki detached house areas, in the event that the risk assessment necessitates such measures in an armed conflict situation. This is because it is not possible to sufficiently rely on the unoccupied shelter facilities of the local public buildings by means of internal transfers, nor are there public civil defence shelters in the area.

In residential and business buildings without an actual civil defence shelter, the property owner can prepare for converting underground facilities, such as those in the basement, into temporary shelter facilities providing protection against shrapnel if needed. This is done by reinforcing the structures of the building section selected to serve as a shelter to withstand a collapse and protecting the external structures and passageways with means such as sand bags. The civil defence authorities will provide more detailed information if the level of preparedness is heightened due to a change in the threat assessment.

6. South-eastern major district

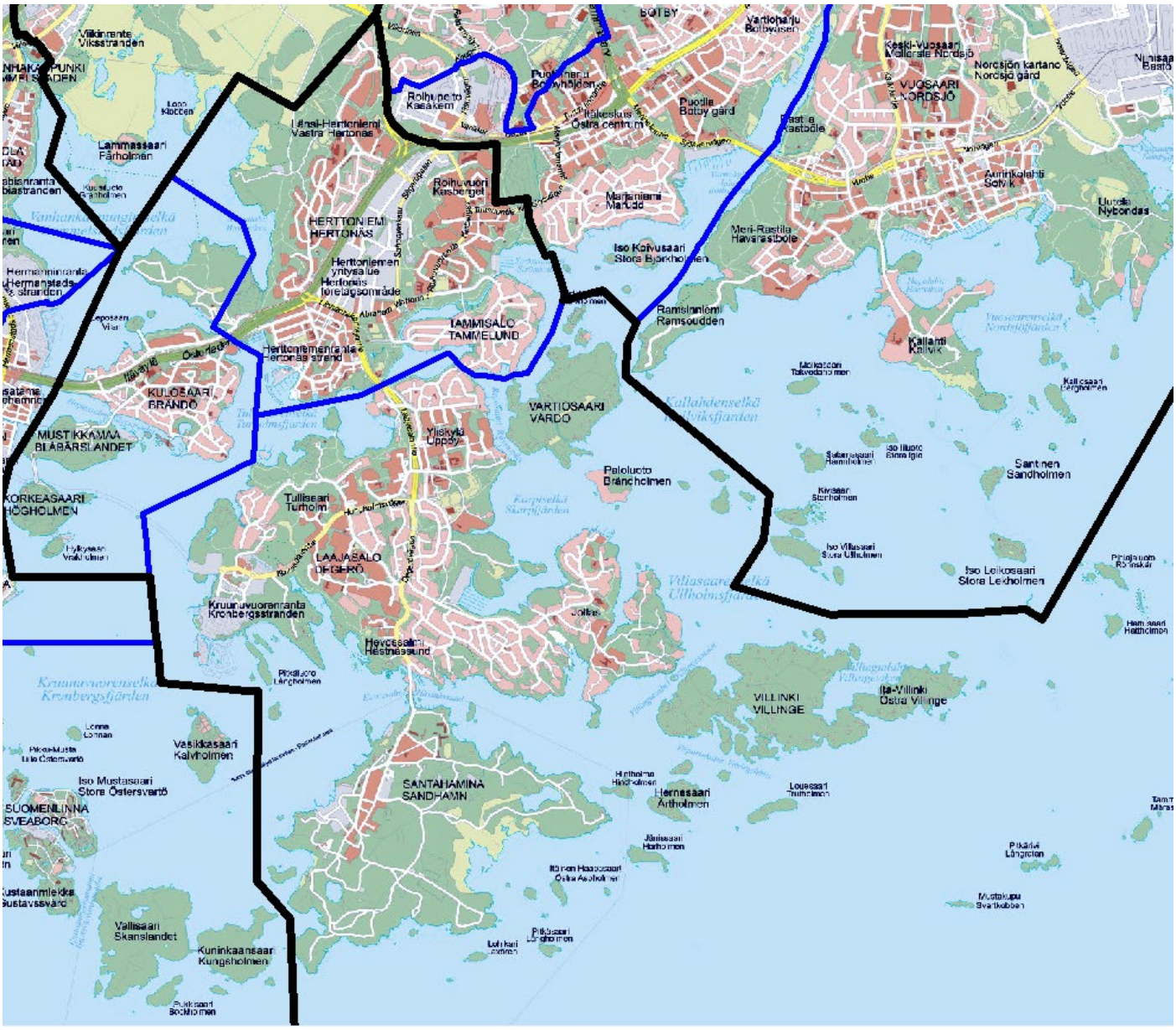

Figure 6. Distribution of civil defence shelters. South-eastern major district.

The most densely populated area of the major district is Herttoniemenranta, located south of Herttoniemi Metro Station. Since the 1990s, the area has been built as a residential area to replace the former harbour area. Länsi-Herttoniemi and Roihuvuori located on the mainland are also primarily apartment building areas.

Of the islands belonging to the major district, Kulosaari, Tammisalo and Laajasalo are also mainly residential areas. They feature both apartment building and detached house areas. The western section of Laajasalo features a former oil harbour area, Kruunuvuorenranta, which is being built into a new apartment building area. Kaitalahti in Laajasalo, the northern section of Yliskylä, Sarvasto, Jollas and Hevossalmi are detached house or low-rise apartment building areas. Of the other islands, Mustikkamaa is a green area, Korkeasaari features a zoo, and Vartiosaari and Villinki primarily feature old villas. Santahamina, as well as Isosaari located by the open sea, are in military use. In Kulosaari and Laajasalo in particular, the possibility of transport connections being damaged in an

armed conflict situation must be taken into account in both independent preparations and the organisation of public civil defence.

The area features three shared shelters in Kulosaari, Herttoniemenranta and Porolahti, of which the Porolahti shared shelter is not a bedrock shelter but a class S1 shelter.

The distinguishing features of the area include Korkeasaari Zoo, Kulosaari Bridge as a compiler of eastern traffic, Itäväylä and a metro line going through the area, the Herttoniemi industrial area and conversion station, the Roihuvuori water tower, Laajasalo Bridge connecting the southern section of the area to the mainland, and the Santahamina garrison area located behind it, at the southern edge of the area. A bridge for tram and non-motorised traffic is currently being built at the western edge of the area, from Kruunuvuorenranta to Korkeasaari and from Sompasaari to Hakaniemi.

The area has roughly 56,532 residents and 66,800 civil defence shelter places. The distribution of shelter places within the major district varies based on the building stock of each area: the Kulosaari area has roughly 4,050 residents and 5,550 shelter places; Laajasalo has roughly 22,050 residents and 20,500 shelter places; and Herttoniemi has roughly 30,500 residents and 40,800 shelter places.

Preparations for evacuating the residents of shelterless properties are in place in the detached house area of western Herttoniemi, as well as the Tammisalo and Laajasalo detached house areas, in the event that the risk assessment necessitates such measures in an armed conflict situation. This is because it is not possible to sufficiently rely on the unoccupied shelter facilities of the local public buildings by means of internal transfers, nor are there public civil defence shelters in the area.

In residential and business buildings without an actual civil defence shelter, the property owner can prepare for converting underground facilities, such as those in the basement, into temporary shelter facilities providing protection against shrapnel if needed. This is done by reinforcing the structures of the building section selected to serve as a shelter to withstand a collapse and protecting the external structures and passageways with means such as sand bags. The civil defence authorities will provide more detailed information if the level of preparedness is heightened due to a change in the threat assessment.

7. Eastern major district

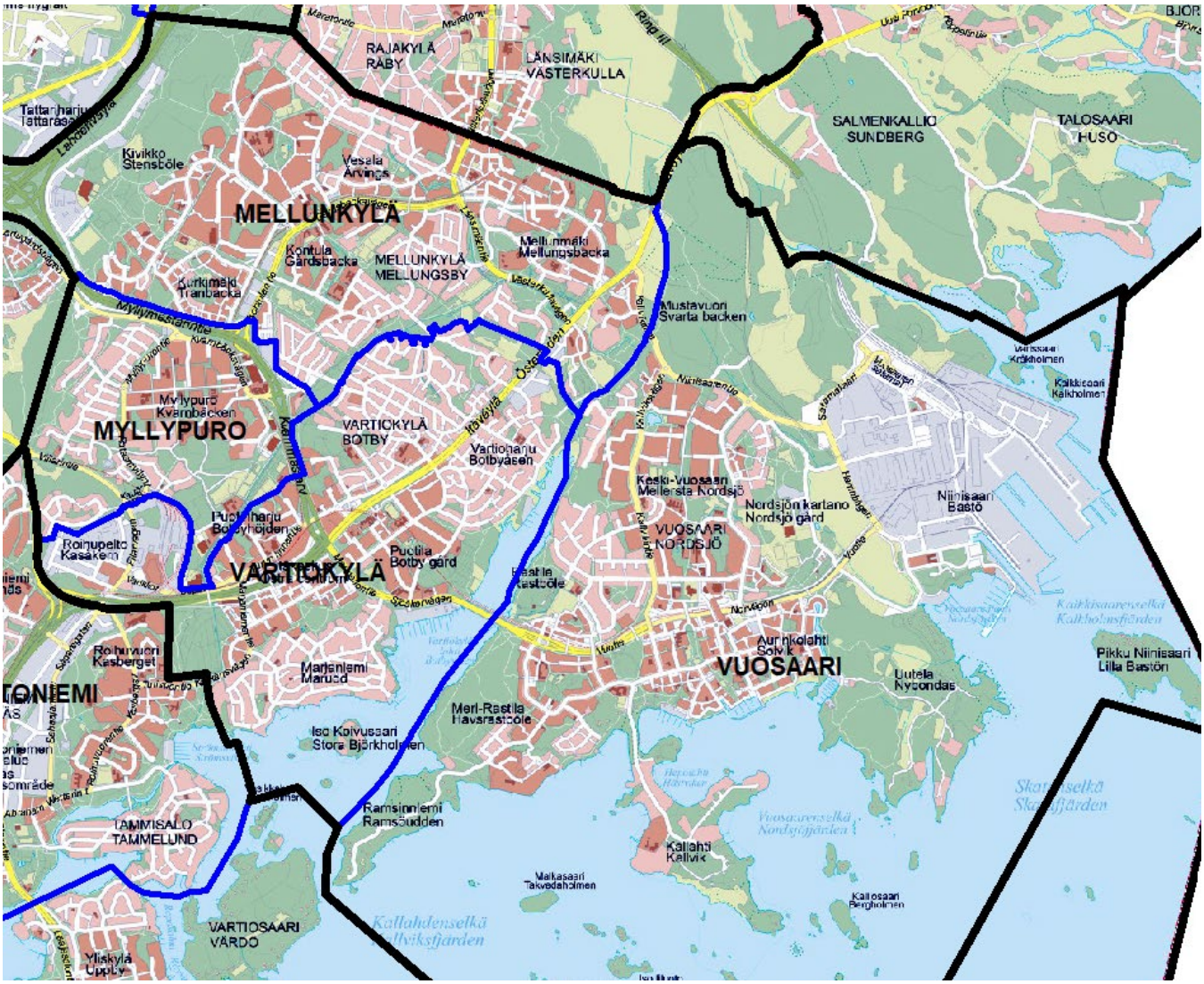

Figure 7. Distribution of civil defence shelters. Eastern major district.

The eastern major district is formed by the eastern city districts of Helsinki and divided into the districts of Vartiokylä, Myllypuro, Mellunkylä and Vuosaari.

The most important hub of the area is Itäkeskus, which is part of Vartiokylä and features services such as the Itis and Easton Helsinki shopping centres. Other important hubs in the area are Vuosaari and Kontula.

The area features six shared bedrock shelters, in Roihupelto, Myllypuro, Etelä-Kontula, Pohjois-Kontula, Vesala and Mellunmäki.

The building stock of the area is primarily dominated by apartment buildings, but there are also detached house areas such as Marjaniemi, Vartioharju and parts of Rastila and Myllypuro, as well as the area within Ring Road I – Kontulantie – Länsimäentie – Itäväylä, apart from a few exceptions.

In terms of transport, significant features in the area are Itäväylä and Ring Road I and their junction, as well as the metro line going across the area to Mellunmäki and Vuosaari, above ground for the most part. Other distinguishing features of the area include the Roihupelto industrial area and the bus depot area and metro depot adjacent to it on the

eastern side. The city infrastructure of the area includes the Myllypuro water tower, the Kivikko waste station and the Vuosaari power plant. Another significant distinguishing feature is the Vuosaari harbour area and its functions.

The area has roughly 113,000 residents and civil defence shelter places for roughly 141,000 people. The shelter places are divided by district: Vuosaari has roughly 38,600 residents and 48,200 shelter places (excluding the harbour area) and Vartiokylä has roughly 21,600 residents and 27,300 shelter places, but these figures do not reflect the actual shelter situation of the Vartiokylä area, as the district is very broad. As the map image indicates, the area features an industrial area and apartment building areas in which there are more shelter places than residents. On the other hand, the area also features broad detached house areas in which there are clearly fewer shelter places than residents. Myllypuro has roughly 13,000 residents and 14,900 shelter places, while Mellunkylä has roughly 40,000 residents and 45,400 shelter places.

Preparations for evacuating the residents of shelterless properties are in place in the detached house areas of Vartiokylä, Marjaniemi and Vartioharju in the event that the risk assessment necessitates such measures in an armed conflict situation. This is because it is not possible to sufficiently rely on the unoccupied shelter facilities of the local public buildings by means of internal transfers, nor are there public civil defence shelters in the area.

In residential and business buildings without an actual civil defence shelter, the property owner can prepare for converting underground facilities, such as those in the basement, into temporary shelter facilities providing protection against shrapnel if needed. This is done by reinforcing the structures of the building section selected to serve as a shelter to withstand a collapse and protecting the external structures and passageways with means such as sand bags. The civil defence authorities will provide more detailed information if the level of preparedness is heightened due to a change in the threat assessment.

8. Östersundom major district

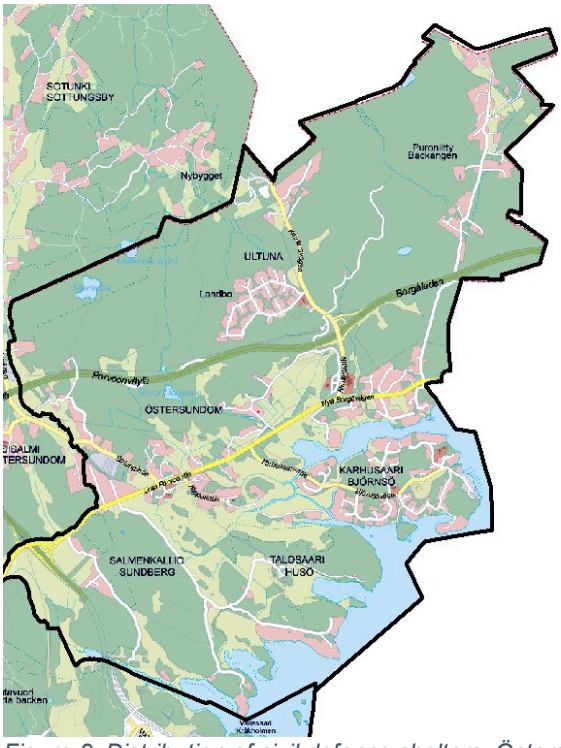

Figure 8. Distribution of civil defence shelters. Östersundom major district.

The Östersundom major district is a city planning major district in Helsinki. It is also the Östersundom district. The Östersundom major district consists of the Östersundom, Salmenkallio, Talosaari, Karhusaari and Ultuna city districts. The major district was formed in early 2009, consisting of the areas of Vantaa and Lounais-Sipoo annexed to Helsinki. The area has a roughly 1,800 residents.

The building stock of Östersundom consists primarily of detached house areas, which were not subject to the obligation to build a civil defence shelter at the time of their construction. Because of this, there is only one civil defence shelter in the area, at Sakarinmäki Comprehensive School.

In the local residential and business buildings without an actual civil defence shelter, the property owner can prepare for converting underground facilities, such as those in the basement, into temporary shelter facilities providing protection against shrapnel if needed. This is done by reinforcing the structures of the building section selected to serve as a shelter to withstand a collapse and protecting the external structures and passageways with means such as sand bags. The civil defence authorities will provide more detailed information if the level of preparedness is heightened due to a change in the threat assessment.

A distinguishing feature of the area is the new eastward main route Uusi Porvoontie going across it.

4.2. Temporary shelters

‘Temporary shelter’ can refer to a shelter construct that has been decreed in prior legislation to be built as part of a repair construction project, is equipped less comprehensively than a proper civil defence shelter, is put to use under emergency conditions and may be subject to an obligation to carry out pre-determined structural supplementation (e.g. Act on Amending the Civil Defence Act 304/1990).

The term can also refer to partially protective structures built in buildings without a civil defence shelter or their immediate vicinity when the level of preparedness is heightened in accordance with the threat assessment. Such a structure can be an underground cellar that is sufficiently supported to withstand a collapse and the passageways of which are protected against the shrapnel of explosives. Another example of such a structure is a protected shrapnel shelter dug into the ground. If necessary, the civil defence authorities will provide instructions for building such shelters if the level of preparedness is heightened in Finland based on the threat assessment.

4.3. Other protection against shrapnel

Residential and industrial properties may feature operationally significant facilities or equipment the damaging of which by shrapnel could seriously disable operations. At residential properties, examples of the aforementioned include windowed heating distribution rooms or transformer substations. At industrial properties, such examples include fuel and chemical tanks, gas bottles and large key entrances. Preparations must be in place in accordance with the threat assessment for protecting the aforementioned with means such as boards and sand bags.

5. Civil defence training and preparedness planning

5.1. Communities providing training

In Helsinki, civil defence training is provided by Helsingin Pelastusliitto (Helpe) in cooperation with its member organisations. The civil defence shelter manager course involves training related to the shelter manager's duties and readying the shelter for use. The course on the safety of a residential property is nine hours long. It involves going through the basics of safety in housing and everyday life, learning to identify and prevent the most common hazards and delving into the creation of an emergency plan. The training provided also focuses on the safety team's duties under normal and emergency conditions and features a course and an exercise on fire extinguishing.

The individual's responsibility with regard to preparedness is highlighted in disruption situations in normal conditions, and in emergency conditions. Informing residents of this is one the safety team's most important duties. The so-called 72-hour concept, in which residents reserve three days' worth of food, water, hygiene products, any personal medications and first aid equipment, must be known to all, and information related to the concept must be actively provided at residential properties.

5.2. Who should be trained to be shelter managers and safety staff

The people selected to be civil defence shelter managers and safety staff members should always be people who are actually able to carry out their duties in emergency conditions brought about by an armed conflict. For example, people working in rescue services, health care, law enforcement or defence administration must not be appointed as shelter managers, as they are bound to their respective duties in all safety situations.
Readying a civil defence shelter for use requires some ability to use physical force and a normal level of mobility, which must be taken into account when selecting people for the duty. If there are persons with technical skills among the residents or workers of the property, utilising their know-how is recommended.
Shelter managers trained under normal conditions are to inspect the shelter and its materials on a regular basis. The recommended interval for testing the sealing of the shelter with its ventilation system is five years at the most. Any deficiencies or repair needs observed are to be reported to the housing manager, owner or board of the property. Any deficiencies and faults detected are to be remedied without delay.

5.3. The basics of taking shelter

When properly maintained and used, a civil defence shelter will protect the people within against military attacks and building collapses, as well as ionising radiation and toxic substances. Both the shelter manager and the entire safety team of the residential property must know how taking shelter is to be carried out in different identified threat situations and which features of the shelter support protection in which situations.

The shelter must be ready for use within 72 hours of the issuance of the authorities' order to prepare it.

The civil defence shelter can be used in four ways: normal use, lockdown, filtering use and bypass use. Under normal conditions, the shelter features a ventilation system connected to other technology at the property, heating and possibly a water supply and

a sewer system. When the shelter is put to use under emergency conditions, the ventilation system used under normal conditions is disconnected and the ventilation system for emergency conditions is put to use. The system is equipped with features such as a pressure valve that prevents the pressure waves of potential explosions outside from entering the shelter.

The ventilation of the shelter can be implemented in three ways.

- In the lockdown state, all valves are closed and no air is taken in from outside or released from the shelter.
- In the filtering state, air is taken in from outside through a filter, facilitating the supply of oxygen, removal of carbon dioxide and maintaining an overpressure in the shelter. Additionally, the filter connected to the ventilation system for emergency conditions can be used to filter out any harmful substances from the air taken into the shelter.
- In the bypass state, air is taken in from outside without filtering. If the supply of external electricity is disrupted, the ventilation system for emergency conditions can be operated manually, or with backup power in larger shelters.

The water supply and sewer system of the shelter can also be closed if necessary, which will ensure an overpressure is maintained in the shelter and prevent the impacts of pipe damage occurring elsewhere from affecting the level of shelter.

5.4. The intended purpose and operation of the equipment of the shelter

Depending on their time of construction, civil defence shelters feature slightly different equipment, switches, backup water systems and air and water shutters made by different manufacturers. The civil defence shelter manager must familiarise themselves in advance with the features of the technical equipment and how the different features of the equipment can be used to support protection before, during and after taking shelter. They must also delve into measures related to the maintenance of the equipment and keeping it ready for operation. Instruction manuals for the equipment of the shelter should be available in the shelter. If necessary, instruction manuals can be requested from the device manufacturer or the after-sales service provider.

5.5. Creation of a clearing plan

The intended purposes of shelters under normal conditions vary. They are often used as storage facilities, social facilities and club rooms. Putting a civil defence shelter to use at the right time is only possible through advance planning. Clearing the facilities of items under normal conditions may require special arrangements, the opening of lockouts and the commissioning of substitute facilities for storage purposes, etc. In particular, the aforementioned course on the safety of a residential property delves into the required planning work. The clearing plan for the civil defence shelter must be included in the emergency plan of the building.

5.6. Creation of a commissioning plan

In addition to clearing the facilities, commissioning a civil defence shelter can also involve other structural preparations, the planning of which is a prerequisite for correctly timed sheltering. For example, soil may have to be removed from above the emergency exit leading out of the collapse area. The ventilation system used under normal conditions must be shut down and the ventilation system used during sheltering must be readied for use. In order for the work to go smoothly when needed, the locations of any facilities

requiring alteration work must be included in the plan. The shelter manager must be able to carry out the duties listed in the plan.

Equipping the shelter so that everyday routines, lounging, eating and resting in the shelter are possible also requires advance planning. The shelter is equipped during its commissioning. If the club or meeting facilities of a residential property feature shared equipment for cooking, making coffee, etc., these items can be brought to the shelter. Likewise, dressing room benches and other items can be brought from shared sauna facilities. The commissioning plan for the shelter and all measures related to the commissioning are to be included in the emergency plan of the property, and another copy of the document is to be kept with the materials of the civil defence shelter.

5.7. Arrangements for activities during sheltering

Activities during sheltering must also be planned in advance and included in the emergency plan. The shelter involves several tasks, the appropriate and correctly timed performance of which is a prerequisite for successful sheltering.

People may have to be leave the shelter to carry out reconnaissance or maintenance duties. These duties also require advance planning in order to guarantee successful sheltering and mental resilience during sheltering. People must know how to correctly use personal protective equipment if needed.

5.8. Maintaining skills, e.g. regular inspections and testing of the shelter equipment, sealing tests, taking stock of materials and restocking

Another prerequisite for successful protection is ensuring that the civil defence shelter is always technically operational and features appropriate devices for commissioning its equipment and using it during sheltering, maintaining the shelter and evacuating the shelter if necessary. The shelter manager course involves learning which features and items must be inspected and tested in the shelter and which protection materials must be available in the shelter.

5.9. Serving as bedrock shelter staff in a public civil defence organisation

In certain city districts, taking shelter is based on local bedrock shelters instead of building shelters. The bedrock shelter can be a so-called shared shelter, which is primarily intended for the residents, students and workers of certain local buildings. Instead of these buildings featuring civil defence shelters, the obligation to build a civil defence shelter is fulfilled by joining a shared shelter and paying a civil defence fee for shelter places.

In densely populated old parts of the inner city in which the building stock was completed in a time in which the obligation to build a civil defence shelter had not yet been set, the City has had so-called public bedrock civil defence shelters built at its own expense for local residents and people working or otherwise moving about in the area. The metro stations from Sörnäinen to Koivusaari also feature civil defence shelters for people present in the area.

If a building or other buildings on the same plot do not have a civil defence shelter, it must be established whether the building in question has joined a local shared shelter when

creating the emergency plan. At old properties built before 1954, it must be established whether there is a public civil defence shelter nearby (within roughly 500 metres).

The aim is to train, designate and reserve a core staff for bedrock shelters under normal conditions. The objective is to train people living in the vicinity of the shelter to serve as the core staff. These duties require plenty of volunteers. Some of the staff required during the operation of the shelter are appointed from among the people taking shelter.

The Rescue Department collaborates with the National Defence Training Association (MPK) and the Civil Defence Association of Helsinki (HVSSY) to provide free-of-charge bedrock shelter staff training courses. People can sign up for these courses via the training calendar found on the MPK website (mpk.fi). The course consists of an online course and practical exercises.

HVSSY also provides advanced familiarisation events related to the operation of bedrock civil defence shelters for bedrock shelter staff.

There are also many other volunteer organisations holding training events that provide participants with the know-how needed when taking shelter in large bedrock civil defence shelters. Of course, the same skills also support resilience in other disruption situations occurring under normal conditions. Examples of such skills include first aid skills, mental maintenance skills, supporting children in crisis situations and fire extinguishing skills. Information about these training courses and events can be found on the websites of Helsingin Pelastusliitto, the Finnish Red Cross, Save the Children Finland, the Martha Association, reservist organisations and volunteer fire departments.

HELPE
www.helpe.fi

https://www.helpe.fi/

1941 HELSINGIN VÄESTÖNSUOJELUYHDISTYS RY

https://www.hvssy.fi/association/

MPK
MAANPUOLUSTUSKOULUTUS
FÖRSVARSUTBILDNING

https://mpk.fi/en/

Punainen Risti

https://oma.punainenristi.fi/publicevents

Pelastakaa Lapset

https://www.pelastakaalapset.fi/en/tapahtumat/

https://www.martat.fi/in-english/

VOLUNTEER FIRE DEPARTMENTS (in random order):

Helsingin VPK

https://helsinginvpk.fi/
https://www.laajasalonvpk.fi/
https://www.haaganvpk.com/
https://tammisalonvpk.fi/
https://puistolanvpk.fi/
https://vkvpkwpweb.azurewebsites.net/ (Vanhan Käpylän VPK)
https://www.malminvpk.fi/
https://www.tapanilanvpk.fi/
https://lvpk.org/ (Lauttasaaren VPK)
https://www.vuosaarenvpk.fi/
http://www.marjaniemenvpk.fi/
https://www.pukinmaenvpk.fi/
http://www.pitajanmaenvpk.fi/yhteystiedot.html
http://pakinkylanvpk.net/
https://www.oulunkylanvpk.fi/

6. Shelter maintenance in the shelters of properties

6.1. Key inspection and maintenance objects in shelters

6.1.1. Communication connections

Today's regulations require civil defence shelters to feature a technical system or phone station to facilitate the use of a mobile communication device. The system must be connected to the phone network either as its own connection or with a parallel phone connection in the building. It must be ensured during normal conditions that a mobile phone works when the doors to the shelter are closed.

The 1963–2011 regulation that required shelters to have an antenna connection for receiving radio and TV transmissions has been omitted from today's legislation. However, Helsinki City Rescue Department strongly recommends that shelter operators aim to have a cable connection facilitating the reception ULA transmissions via FM radio in shelters built in accordance with the current regulations as well. The shelter's ability to receive radio transmissions via a mobile phone connection or a radio cable must be ensured when the shelter is inspected.

6.1.2. Collapse resistance

In order to ensure that the civil defence shelter is always ready for commissioning, it must be inspected and maintained on a regular basis. All civil defence shelters built during

different time periods protect people against the building collapsing. This means that the shelter's structural ceilings and walls are dimensioned to withstand the load of the building above it even if the building collapses due to an attack. Because of this, the shelter must not be altered in any way that would undermine its damage resistance.

6.1.3. Gas tightness – lockdown state – doors and valves

Even back in the days of Finland's last wars, the regulation was that shelters ordered to be built in new buildings had to be built so that they could be sealed from gases while also preventing pressure waves from entering the shelter. The doors, as well as the intake and exhaust valves of the shelter, had to conform to the regulations in place and be gas-tight. Additionally, the volume of the shelter had to be planned so that it had a sufficient amount of air even when closed. This facilitated protection against chemical weapons for a few hours.

The tightness requirement remains to this day. The sealing of the shelter is an important feature for three different reasons:

- First and foremost, it is important that any hot and harmful combustion gases from fires around the shelter can be prevented from ending up in the air supply of the shelter during sheltering.
- Secondly, it is important that any airborne irradiated dust occurring during a radiation situation can be prevented from entering the shelter, as radiation in the air supply forms the greatest threat in a civil defence shelter that is otherwise well protected with thick wall structures.
- Thirdly, should an attacker decide to use chemical weapons in breach of international agreements, tightness is essential in order for harmful substances to be prevented from entering the indoor air of the shelter.

If the exit door of the shelter is to be equipped with a barrier tent, it must be ensured that the tent and its fastenings are undamaged.

Due to the aforementioned reasons, inspecting the sealing of the civil defence shelter on a regular basis is particularly important. Attention must be paid to the condition of all of the valve and door seals during the inspection. If any retroactively implemented inappropriate lead-through openings that could undermine the tightness of the shelter are detected, the inspecting party must contact an expert service company to remedy these issues.

6.1.4. Ventilation system, filters and ducts

The purpose of a ventilation system in a civil defence shelter is to facilitate the intake of filtered air and the maintenance of an overpressure in the shelter during sheltering, particularly in situations in which the shelter may not be completely airtight. This allows for the protection time to be extended considerably if needed. Without a ventilation system, the concentration of carbon dioxide from people's expiratory air will become dangerously high after 3–8 hours, depending on the size and occupation rate of the shelter. Furthermore, the ventilation system for emergency conditions can be used between sheltering situations to efficiently air out the shelter and remove heat and moisture generated during sheltering from the shelter, even if no external power is available.

The regulations in place during the war required larger shelters to feature a ventilation system equipped with a carbon filter. Smaller shelters conforming to the 1954 regulations were not required to have a ventilation system, as natural ventilation was allowed. However, the requirement was that the shelter could be closed off completely with valves. Even larger shelters were not required to have a ventilation system in the regulations of the time, but the requirement was that the strategic plans facilitated the installation of such a system in the shelter if needed. In other words, there had to be spaces reserved for a ventilation unit and its ducts.
Since 1959, all civil defence shelters have been required to feature a ventilation system. Back then, a sand filter was used for filtering the air. The sand filter was relatively effective in filtering out irradiated dust but limited in its ability to filter out gas-like substances. Since 1963, shelters have been required to be equipped with a ventilation system featuring a special filter. The filtering capacity of such systems is sufficient for today's potential threats.

The equipment must be maintained in accordance with the manufacturer's instructions. Test runs of the equipment must also be carried out in accordance with the manufacturer's instructions, with particular attention paid to the measures to be carried out before testing the electric motor. If the equipment has been unused for a long time, any water accumulated in the system is to be discharged by opening the drainage screw; the lubrication system must be inspected and the system must first be operated manually so as to avoid damaging the bearings.

When inspecting sand filters, the condition of the sand is inspected. If necessary, the old sand is removed and new sand is reserved for future use, stored in a protective container in the shelter and used when necessary. Special filters are inspected when necessary by checking the sealing and weighing the filter. An intact filter must not be opened, as it was closed and made airtight in the manufacturing process.

In addition to the aforementioned, the existence and condition of the intake and distribution ducts of the ventilation system must be inspected. In many cases, the intake ducts in particular have not been installed under normal conditions. Instead, they are stored by the ventilation system and only installed when the shelter is readied for use. The existence of the necessary ducts must be ascertained, and the condition of any duct sections outside the collapse area must be inspected.

Shelters equipped with a ventilation system must be able to maintain an overpressure. Such shelters feature overpressure gauges for achieving the correct level of overpressure. The operation of the overpressure gauges is inspected and manometer fluid is added if necessary. When the sealing of the shelter is tested, the overpressure gauge is used to determine whether the shelter is sufficiently sealed. The sufficiency of the level of tightness (S1) can be measured by overpressurising the shelter with a pre-determined volume of airflow (150 m^3/h) and checking that the target level of overpressure (100 Pa) is achieved. The sufficiency of the tightness can also be tested by overpressurising the shelter with the ventilation system in accordance with the device manufacturer's instructions, turning the system off and monitoring how quickly the level of overpressure decreases from 200 to 50 Pa. If this takes longer than 20 seconds, the shelter is sufficiently airtight.

6.1.5. Fixed water points, sewerage and backflow traps

Depending on its year of construction, the shelter may be equipped with a water point, backup water reservoirs or both. If the shelter features a water point, it must also feature a drain or a sump pit, either separate from the building or connected to its sewer system. The water supply to the shelter features a shut-off valve, the condition of which must be inspected. If the shelter features a drain, the pipeline located on the wall inside the shelter features a shut-off valve, the condition of which must be inspected. This shut-off valve has often been found to be the one component of the shelter equipment that has rusted, even to the point where it is no longer usable, due to a lack of use and maintenance. If the shut-off valve of the drain cannot be closed, the shelter may be unable to maintain an overpressure.

If the floor of the shelter is below the average level of groundwater, the shelter must also feature a manually operated pump that can be used to pump out any water entering the shelter. In such cases, building the shelter required building a well with a minimum volume of 50 litres.

6.1.6. Water reservoirs, waste containers and dry toilets

Shelters may have different kinds of water reservoirs, depending on their year of construction. B and C class shelters built in 1959–1971 often feature sizeable zinc reservoirs, as do earlier S1 class shelters built after 1971. Since then, the practice has been to equip shelters with assemblable water reservoirs. The cleanliness of the water reservoirs must always be inspected when maintenance is carried out. It must be ascertained that there is a sufficient number of assemblable water reservoirs and that they are stored appropriately. The required amount of water to be reserved has varied from 5 litres per person (1941) to the current 40 litres per square metre of floor area in the shelter (≈30 litres per person). The current amount is recommended.

Regulations regarding waste containers have changed over the years. In the early years of shelter construction, no such regulations were issued. The 2011 regulation states the following with regard to the waste containers of civil defence shelters:

“The waste container of the civil defence shelter (JS-3) must feature handles and a lid. The maximum weight of the waste container when filled with water is 110 kg, and the container must fit through a 900 x 2,000 mm doorway. The waste containers must be nestable when empty.

The waste container must be able to withstand the stress caused by dropping the container filled with water upright from a height of 200 mm onto a hard surface after the container has been kept full of water for 14 days at +20 °C and 95% relative humidity.

When filled with water, the waste container must be able to withstand the stress caused by a 75 mm long and 10 mm thick steel rod, the end of which has been rounded to a 5 mm radius, being pressed horizontally against the outer wall near the bottom of the container with a force of 200 N.”
It can be inferred from the aforementioned that shelters must be equipped with sufficiently durable waste containers. However, the regulation does not provide for the number of containers required – so using common sense is allowed.

The number of dry toilets and cubicles for them has also varied in the regulations. The 1939 instructions required the shelter to have one dry toilet and cubicle per 25 people, while the current regulation states that there must be a furnished dry toilet cubicle per every 20 square meters, rounded upwards (≈1/26 persons). It must also be ensured that the shelter features enough bags for the dry toilets, as well as supplies needed for closing them. There are no regulations regarding dry toilet litter, but having litter available in the shelter can make the environment more pleasant.

6.1.7. Tools and protection materials of the shelter

There are no regulations regarding the tools and protection materials of the shelter. However, the needs of the shelter and the quality of tools should be taken into account when selecting tools. For example, if the underground emergency exit of the shelter needs to be cleared and opened during commissioning, adequate tools must be reserved for this purpose. All other tools needed for commissioning the shelter must also be available. The shelter should also have tools for digging out of the shelter in the event that the doors or hatches cannot be opened, e.g. due to a collapse. Indicative tool lists are available at courses and from sources such as the websites of rescue departments and the Finnish National Rescue Association (www.spek.fi).

When assessing protection material needs, it must be taken into account that people may have to leave the shelter in radiation hazard situations due to reasons such as duties related to maintaining the shelter, and the shelter must feature the necessary protective equipment and clothing. High-visibility vests or outfits can be acquired for making it easier to distinguish protection staff. When reserving protection materials, it must also be ensured that the shelter has adequate equipment for extinguishing fires and providing first aid.

The tools and protection materials of the shelter are to be stored so that their preservation is ensured but they are available for use without delay.

6.1.8. Other materials needed when taking shelter

Other materials needed for taking shelter, battery-powered radios and cooking equipment, such as coffee makers and microwave ovens, can be brought to the shelter from shared facilities, people’s apartments or the social facilities of workplaces. As mentioned before, the same procedure can be applied to furnishings needed in the shelter as well. The first aid supplies of the shelter can be supplemented with supplies reserved for normal use at homes and workplaces if necessary.

The shelter must have water preservative for preserving the backup water, reserved in accordance with the volume of the backup water reservoirs. Iodine tablets are part of home emergency supply kits at residential properties, and residents are to reserve a sufficient number of them for their own household, taking into account the number of persons and the new instructions issued by the Radiation and Nuclear Safety Authority (STUK). Employers are to reserve a sufficient number of iodine tablets at workplaces, taking the instructions of STUK into account. If necessary, the same tablets are to be used when taking shelter in a civil defence shelter. The iodine tablet is to be taken only when urged by the authorities to ensure that the timing is correct. The authorities will issue their instructions via radio and TV. The tablet dosage must follow the instructions provided on the package.

6.1.9. Potential backup power and a fuel storage and acquisition plan

In larger shelters featuring backup power equipment and related fuel tanks in case of disruptions in the distribution of electricity under emergency conditions, fuel must be reserved and a plan for restocking the fuel reserve must be created in advance.

6.1.10. Training

In Helsinki, the civil defence shelter managers of properties are trained by Helsingin Pelastusliitto (Helpe) in cooperation with its member organisations. People can sign up for these training courses via the Helpe website at www.helpe.fi

7. Activities during sheltering

7.1. The beginning of sheltering and the organisation of civil defence

Civil defence is implemented as public civil defence led by the authorities, and as self-preparedness implemented in public buildings, at workplaces and in residential buildings by workers and residents.

Preparations for taking shelter are initiated when the authorities issue an order to ready civil defence shelters for use. The civil defence operations of the property must be organised at this point at the latest, involving appointing a defence director and a shelter manager, as well as a sufficient number of assistants for them, depending on the size of the property and so that protection duties can be carried out 24/7 if needed.

Once the civil defence operations of the property have been organised, the shelter is cleared of items where needed and readied for use in accordance with the instructions included in the emergency plan, taking into account what is stated above about inspecting the shelter.

Particular attention must be paid to timing the operations correctly. For example, the shelter must be cleaned immediately after clearing in the early stages of commissioning in order to avoid any dust generated from the cleaning from ending up on the furnishings used during sheltering.

The filling of the water reservoirs is also to be timed so that the other measures involved in the commissioning process do not cause a risk of the reservoirs being damaged. The possibility of freezing must be taken into account in winter. Local residents and workers are informed of the location of the shelter at this point at the latest and, if necessary, signposts leading to the shelter are installed.

The current regulations do not require the shelter to be equipped with beds. However, in practice,
when people take shelter in the shelter overnight without an actual order from the authorities, it is recommended that the shelter facilitate resting in a lying position. For this purpose, the shelter can be equipped with assemblable bunk beds under normal conditions. Commercial operators provide triple bunk beds that conform to the regulations and can be stored in a small space and assembled when needed. If necessary, other

available materials can also be used to build bunk beds when the shelter is being readied for use.

7.1.1. Operators' duties

The duties of the defence director and their alternates are: managing and directing the civil defence operations of the property; training supplemental staff in their own property; information gathering and conveyance; the defence director serving as the head of the shelter when in it; submitting help requests if needed to the local self-preparedness management or contact point set by the public civil defence organisation; and coordinating evacuation arrangements at the property if needed. If the civil defence authorities deem it necessary for ensuring civil safety to set a round-the-clock on-duty obligation for properties, the defence director is to ensure that the on-duty service is arranged as ordered together with the residents or workers.

If the civil defence authorities deem it necessary for facilitating local sheltering, they may order the defence directors of properties to check in with the self-preparedness management point in situations involving the threat of a military attack or an actual attack. This can be the case in various situations, e.g. when there is a need to chart the number of vacant civil defence shelter places in the area or establish the local situation in terms of damage caused by attacks. The obligation to check in will be announced via radio and other mass media channels.

The contact details of management and contact points will be announced if the level of preparedness is heightened in accordance with the threat assessment. The management of self-preparedness is described in the chapter 'City-level management of protection.'

The duties of the shelter manager and their alternates are: to ready the shelter for use together with residents or workers in the preparation phase, and to train door and ventilation system staff among the people taking shelter if needed.

7.1.2. Heightening the level of preparedness – the civil defence shelter on standby

When the level of preparedness is heightened in accordance with the threat assessment, the authorities will issue an order to ready civil defence shelters for use. The level of preparedness is heightened in a front-loaded manner. Because of this, the time between readying civil defence shelters for use and the first actual sheltering situation can range from a few days to several weeks. During this time, the shelter is kept on standby for immediate commissioning, but there is no need to arrange continuous preparedness or on-call services there. The continuous on-call service is maintained for the purpose of starting protection in the event that the situation escalates. Water and sewerage shutters are kept open during the state of preparedness and not closed until sheltering operations begin.

During sheltering, the temperature of the shelter is naturally increased by people's body heat. The structures of the shelter store heat even when the majority of heat is removed by the ventilation system. Being in the shelter can be made more comfortable by keeping the shelter and its structures as cool as possible during the state of preparedness and between sheltering operations. If the temperature of the shelter is ordinary room temperature or higher under normal conditions, the shelter must always be thoroughly aired out when the state of preparedness begins and between sheltering operations. The

radiators of the shelter are shut off with the shut-off valves near the surrounding wall and the exhaust air and overpressure valves are kept open, as are all the doors and the emergency exit. If necessary, the ventilation unit of the shelter can also be used (without filtering). If the temperature of the shelter is low, this will quickly be remedied during sheltering. However, sub-zero temperatures should be avoided due to health reasons and the risk of freezing. In winter, it must be ensured that the pipelines or radiators do not freeze.

7.1.3. Matters to consider when taking shelter

As a rule, no food is stored in the civil defence shelter. Each person must bring their own food and beverages, as well as any personal medications and hygiene products. Of course, there is nothing to prevent people from socking food and hygiene products in the shelter if the residents or the supervisors of workplaces so decide. The food should preferably be consumable as it is, as cold storage is not possible in the shelter and heating food in the shelter would further increase the need to ventilate the heat load caused in the shelter by taking shelter.

Once the level of preparedness has been heightened, it is recommended that people pack a protection bag at home, containing all necessary medications for three days, a large water bottle for each member of the household, hygiene products and energy bars, nuts and other foods that can be consumed without cooking, a flashlight, a multitool, earplugs, a sleeping mat, ‘small change and playing cards’ or other pastimes. People should also carry a less comprehensive survival pack consisting of the same items for the purpose of taking shelter if needed whenever moving about outside home.

When taking shelter, the doors and windows of the apartment are to be closed and all electric devices turned off, with the exception of refrigeration equipment.

If the property is connected to the town gas distribution network and features gas-powered equipment, the location of the main shut-off valve for the gas must be established in advance. In a sheltering situation, the main gas shut-off valve is closed. After the sheltering situation, the gas valve is not opened until any damage has been surveyed.

7.1.4. Pets

There are no regulations that stipulate whether people are allowed to bring pets to the civil defence shelter. The owner of the property decides on how the facilities are used. Several laws provide for guide dogs’ right to accompany their handler, and they have the right to take shelter in a civil defence shelter with their handler. If necessary, arrangements will be made in the shelter to facilitate this.

The City of Helsinki has decided that no pets are allowed in any bedrock civil defence shelters administered by the City. The City has several reasons for this decision. The same reasons apply to recommending that no pets be brought to any civil defence shelters:

- The dimensioning of the civil defence shelter is based solely on the amount of space needed by people. Depending on the type and time of construction of the shelter, the

amount of space reserved is 0.6–0.75 m² per person and slightly more in bedrock shelters.

- When protection is taken in a lockdown situation in which no fresh air can be supplied to the shelter, the temperature of the shelter will relatively quickly rise above the hot weather limit.

- The people taking shelter may have severe allergic reactions, particularly in a lockdown situation in which there is no ventilation.

- The shelters only have dry toilets for people.

- There is no certainty as to how animals will react to the lack of space, the heat, the noise and other animals.

The recommendation is that all pets be left in a safe environment at home, preferably in a windowless space, with water and food. If the building features cellars or other underground facilities, potential safe spaces for pets can be charted in advance.

The Act on Limited Liability Companies stipulates that the use of shared facilities is decided on at a board meeting unless otherwise stipulated in the articles of association. Likewise, the use of company-owned facilities is decided on at a board meeting unless otherwise stipulated in the articles of association. The decision-making process concerning the use of shared facilities in rental buildings is governed by the Act on Joint Management of Rental Buildings. The Act stipulates that decisions on the use of shared facilities are made at resident meetings or by the resident committee if one has been appointed.

Bedrock civil defence shelters administrated by the City are public places and thus subject to the Public Order Act.

7.2. Description of activities when taking shelter

7.2.1. The order to take shelter

When the authorities issue a general order to take shelter under normal conditions, this is done by taking shelter indoors. If civil defence shelters have been ordered to be readied for use, the order to take shelter always means going to the nearest civil defence shelter. If no shelter is available, people are to take shelter in indoor facilities that provide as much protection as possible.

The order to take shelter can be issued via the public alarm system, radio or TV, or by means of an emergency bulletin sent to people’s smartphones (the 112 app). When citizens are ordered to take shelter under emergency conditions, the first step is to ensure that all people living or working in the building are alerted and told to immediately go to the local civil defence shelter, as planned in advance.

At this stage, the shut-off valves for water and sewerage, as well as heat in winter, are closed if previously open. If the building is connected to the gas distribution network, the main shut-off valve is closed as described above.

Once all people have arrived in the shelter, the doors are closed and sheltering begins in a lockdown state unless otherwise ordered. On-duty monitoring of radio transmissions begins for any bulletins issued by the authorities.

It is recommended that a situation journal be kept in the shelter and the names of all people taking shelter be collected at the beginning of sheltering.

7.2.2. Leadership in the shelter

The defence director appointed in advance will immediately begin leading the protection measures upon their arrival in the shelter. If they are not present, the shelter manager will assume leadership.

7.2.3. Organisation during sheltering

Unless otherwise agreed, the person in charge of operations appoints persons from among the people taking shelter at the given time to assist the shelter manager in taking care of the doors and passageways of the shelter, ventilation-related tasks, on-duty radio monitoring, etc.

7.2.4. Usage situations during sheltering

There are three states in which shelter can be taken: the lockdown state, the filtering state and the bypass state.

In the lockdown state, no air is taken into or ventilated out of the shelter. In the filtering state, filtered air is taken in with the ventilation system used under emergency conditions and removed from the shelter via overpressure valves, however doing so in a way that ensures a constant overpressure is maintained in the shelter. In the bypass state, air is taken in with the equipment for emergency conditions without filtering. This facilitates airing out the shelter, but thanks to the pressure valves, the people taking shelter are protected against the pressure waves of any explosions.

Unless otherwise ordered, sheltering begins in the lockdown state and the radio is monitored for any instructions issued by the authorities. If the defence director so decides, the shelter can switch to the bypass state once the situation has been established and outdoor air is not assessed to be hazardous. The shelter can switch between the three states in accordance with the situation. For example, if the smell of smoke or gas is detected in the intake air, the shelter is to immediately switch to the lockdown state. If necessary, a scout wearing protective clothing and equipment can be sent out of the shelter to survey the situation outside.

In the lockdown state, the aim is to avoid unnecessary heat generation and oxygen consumption. Cooking food in a manner that produces extra heat and moving about unnecessarily are to be avoided if possible. However, when possible, the shelter will quickly switch to the filtering or bypass state, as in the lockdown state the temperature inside the shelter tends to rise quickly due to people’s body heat. The amount of carbon dioxide will also increase while the amount of oxygen decreases. In the filtering state, the amount of airflow is substantially lower due to the resistance caused by the filters. Because of this, the shelter will switch to the bypass state as soon as the situation allows in order to improve ventilation.

During sheltering, the aim will be to follow an ordinary circadian rhythm. If the sheltering time is prolonged, the people taking shelter are divided into three groups with the aim of operating in three shifts so that one group at a time sleeps while the other two are awake. People are only allowed to exit the shelter with the defence director's permission.

7.2.5. Activities after sheltering

Once the authorities have announced that the danger has passed or informed citizens via the media that the need to take shelter has ended, or the defence director has decided to cease sheltering, maintenance measures are to be initiated immediately in the shelter.

Any waste accumulated in the shelter is taken out and the shelter is cleaned and aired out for future use. The water reservoirs of the shelter are filled, and lubricant and fuel levels are replenished in accordance with their consumption in shelters with backup power equipment. If any of the shelter's protection materials have been used, they are restocked.

All people taking shelter are required to take part in the aforementioned tasks.

7.3. Taking shelter in a bedrock shelter

7.3.1. Cessation of normal use

Almost all bedrock civil defence shelters are used for some purposes under normal conditions. They serve as facilities for storage, parking, hobby activities, exercise or combinations thereof.

Once the authorities have issued an order to ready civil defence shelters for use, they are cleared of items and cleaned. This is done by the people who use the shelter under normal conditions. Shelter users are required to create a clearing plan even under normal conditions. If one shelter has several users under normal conditions, these users will create the clearing plan together. The plan details who will clear the shelter, where the items in the shelter are to be transported to and how, how the required cleaning is to be organised, etc.

Once the shelter has been cleared and cleaned, the core staff appointed for bedrock shelters will take care of readying the technical equipment of the shelter for sheltering use and tasks such as assembling the dry toilets and shelter beds and dividing the shelter into sections. First aid stations are also to be prepared in the shelters. Another task is to install signposts outside the shelter in pre-determined locations. Volunteers can be called upon by means of official bulletins to help.

Metropolitan Area Transport Ltd is responsible for arrangements to put the metro stations of the city centre area serving as bedrock shelters into civil defence shelter use.

7.3.2. Description of operations: shared shelter – public shelter

As stated in the previous chapters ‘Area construction in 1960–2020 and shared bedrock shelters’ and ‘Public bedrock shelters’, a proportion of people living or working in Helsinki or visiting the city are to take shelter in the nearest bedrock shelter if the situation so requires.

In sheltering situations, the aforementioned core staff will be operating in the bedrock shelters. The core staff have been trained and appointed in advance. When the level of preparedness is heightened due to a situation involving the threat of a military attack as detailed in the Emergency Powers Act, the core staff will be assigned to civil defence duties and hired by the City of Helsinki.

The core staff will take care of opening the doors at entrances, cleaning if necessary, assisting the people taking shelter and closing the doors.

A technical group will be responsible for using the ventilation and backup power equipment of bedrock shelters.

First aid groups appointed in advance will be responsible for the provision of first aid.

If necessary, the aforementioned groups will be supplemented by appointing persons from among the people taking shelter.

7.3.3. Taking shelter in a bedrock shelter

If a building without its own civil defence shelter is located in an area with a shared bedrock shelter or in the vicinity of a public bedrock shelter, this matter is entered into the emergency plan and communicated to the users of the building. As a rule, bedrock shelters have several entrances. The nearest entrance and the quickest route there must be established at the latest when the level of preparedness is heightened and shelters are ordered to be readied for use. Preparations are to be in place for bringing protection materials acquired for the building (detailed in section 6.1.7) to the shelter. This equipment can be used for taking part in shared work in the shelter, such as transporting waste away from the shelter, and going to people’s homes to feed their pets.

When an alarm is sounded, people moving about in the city may seek shelter in the nearest bedrock shelter.

The aim will be to divide the halls of large bedrock shelter, excluding metro stations, into sections. The sections will be filled in the order of arrival, starting from the back. A first aid section and a sleeping section will also be established in bedrock shelters. People arriving at the shelter are required to strictly follow the guiding staff’s instructions.

Dry toilets may have to be put to use in bedrock shelters. People taking shelter are required to bring their own hygiene products.

If the protection period is prolonged, the aim will be to divide the people taking shelter into three groups with one group resting at a time.

People are not allowed to exit the shelter until the management of the shelter give their permission to open the shelter doors. The purpose of this is to ensure the safety of everyone taking shelter.

7.4. Leadership, duties and organisation in a bedrock shelter

In public and shared bedrock shelters administrated by the City of Helsinki, operations are led by an officeholder appointed by the City. In addition to the core staff of the shelter, the officeholder or their assistants will appoint a sufficient number of other staff from among the people taking shelter, such as shelter section supervisors, security guards, shelter maintenance staff, etc. The volunteer staff appointed by the defence director, as well as the core staff, can be identified by their high-visibility vests, the markings of which indicate the person's assignment.

Bedrock shelters are equipped with central public address systems, which can be used if needed to instruct the people taking shelter or request people with special skills to check in with the management of the shelter.

7.4.1. City-level management of taking shelter

7.4.2. Description of the management system of the public civil defence organisation

Civil defence in Helsinki is managed and coordinated by the Helsinki Command Centre (HelJoKe). Public civil defence is implemented with all of Helsinki City Group's resources. In addition to this, civil defence duties are carried out by several other authorities in accordance with their obligations and many commercial operators in accordance with the legislation of their respective sectors. The key cooperation partners appoint their own representatives for HelJoKe. Each operator's management under normal conditions is responsible for managing their own operations by sector.

In rescue operations in which professionals of other sectors are needed to help the rescue staff in the operation area of an accident, the operations are led by the director of rescue operations.

Self-preparedness at properties is managed by local civil defence management points operating under HelJoKe. This management work is carried out in cooperation with the rescue authority in charge of rescue operations in the area.

7.4.3. Levels

In order to organise self-preparedness among the population, Helsinki is divided into four rescue operation areas, which are further divided into smaller areas called protection blocks (SluL) by district in accordance with the district division system of Helsinki.

Under normal conditions, questions related to structural protection are answered by the fire inspectors of the Rescue Department, the Rescue Department's Structural Planning Advisory group and the planning officers of the Civil Defence Unit. The Rescue Department's telephone exchange number is +358 9 310 1651.

Under emergency conditions, questions are answered and any support needs responded to by the local management or contact points of the public civil defence organisation. Their contact details will be provided on the Rescue Department's website and via press bulletins when the level of preparedness is heightened.

7.4.4. Management of public civil defence

The Helsinki Command Centre (HelJoKe) is in charge of overall civil defence operations in Helsinki. The command centre has its own facilities reserved under normal conditions. The command centre is activated if needed in accordance with the threat assessment when the preparedness level for civil defence is heightened. All key representatives of the City of Helsinki and the necessary representatives of other parties related to civil defence take part in the command centre's operations. HelJoKe:

- coordinates the use of Helsinki City Group's resources
- coordinates the use of Helsinki City Group's civil defence resources
- directs the operations of the local management points of the civil defence organisation
- is responsible for warning the public
- determines the level of protection to be implemented in civil defence shelters based on the information gathered
- is responsible for analysing the situational information gathered
- is responsible for city-level information provision regarding civil defence
- supports the operations and information provision of other authorities as separately agreed
- is responsible for other public civil defence duties assigned to it.

Decisions on heightening the level of preparedness for civil defence are made in accordance with the management hierarchy determined in the City of Helsinki's administrative regulations. The City Manager decides on the organisation and implementation of preparedness and continuity management.

Sources and appendices

Appendix 1:

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