



Northern Periphery and
Arctic Programme
2014–2020



EUROPEAN UNION
Investing in your future
European Regional Development Fund



Approaching Near Zero Energy In Historic Buildings

Deliverable No.: WP1_DT1.1.1

Deliverable Title: Baseline Report on Historic Buildings and Policy Instruments

Delivery: 2022

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Deliverable Type: R

R = Document, report

DEM = Demonstrator, pilot, prototype, plan designs

DEC = Websites, patent filing, press & media actions, videos, etc.

Dissemination Level: PU

PU = Public

CO = Confidential, only for members of the consortium, including the Commission Services

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This project has received funding from the European Union's Northern Periphery and Arctic Programme (2016-2020) under Grant Offer Letter 304_1175_20194.



Ireland

1. Definition of nearly zero energy buildings

Member states have to develop NZEBs definition based on their specific conditions and also have to provide numerical indicator for primary energy use (D'Agostino et al., 2021). Ireland has a definition for NZEB in its building regulations, energy indicators in place and also has a specific obligation for a minimum share of energy demand from renewable energy (D'Agostino et al., 2021). In Ireland, the calculated energy performance coefficient (EPC) of the new dwellings should not be greater than the Maximum Permitted Energy Performance Coefficient (MPEPC) of 0.3 and Maximum permitted carbon performance coefficient (MPCPC) of 0.35 (Department of Housing, Local Government and Heritage, 2021). This is a reduction of 70% from the requirement in 2005. Energy from RES is a requirement for new buildings. A renewable energy ratio (RER)¹ of 0.2 is considered very significant for a building that achieved 0.3 and 0.35 for MPEPC and MPCPC, respectively (Department of Housing, Local Government and Heritage, 2021).

For major renovation the regulation stipulates the energy performance of 125 kWh/m²/yr, if that can achieve cost optimal level or to undertake specific measures mentioned in column 3 in Table 7 of building regulations (refer Department of Housing, Local Government and Heritage, 2021).

2. Historic buildings

National inventory of Architectural heritage (NIAH) <https://www.buildingsofireland.ie> mentions about 65 000 historical buildings in Ireland. Cork city council has listed 1189 protected structures. The list may be amended by adding or deletion. For example, during 2017-2021, in Dublin city 52 and 4 structures were added and deleted, respectively from the list.

3. National administrative organization

Department of Housing, Local Government and Heritage

4. Regulations pertaining to renovation of historical buildings

The Planning and Development Act, 2000, states that the protected structures or parts of structures which are of Architectural, Historical, Archaeological, Artistic, Cultural, Scientific, Social or Technical interest. A structure is defined as “any building, structure excavation, or other thing constructed or made on, in or under any land, or any part of a structure”. For a structure to be classified as protected it must be listed on the planning's authority's record of protected structures (RPS). All future changes in the protected structure is regulated by control process. The owners or occupants of protected structures are legally bound to ensure the structure is not damaged due to neglect. Protecting the architectural heritage of Ireland is an important function of the planning authority. A document on architectural heritage protection

¹ RER is the ratio of primary energy from renewable energy technologies to the total primary energy as defined and calculated in Dwelling Energy Assessment Procedure

(<https://www.buildingsofireland.ie/app/uploads/2019/10/Architectural-Heritage-Protection-Guidelines-for-Planning-Authorities-2011.pdf>) provides information on legal and policy framework for the protected structures.

5. National plans to improve the energy performance of historical buildings

Ireland has several policies that touch upon improving the energy performance of historical buildings. Heritage Ireland 2030 provides framework for the conservation, protection, promotion and management of Ireland's heritage by 2030 and beyond. The policy recognize that historic buildings plays an important role to address climate change and preservation and re-use of historical buildings could reduce carbon dioxide emissions associated with operation, demolition and reconstruction. *Places for People – the National Policy on Architecture* is a new national policy in Ireland aimed to promote and enhance the quality of architecture and the built and natural environment. Sustainability is one of the policy objectives, wherein the policy document states to priorities and sustainable practices with respect to reuse, refurbishment and conservation of buildings (Government of Ireland, 2022).

6. Funding sources aimed at renovation/improve energy performance of historical buildings

Department of Housing, Local Government and Heritage provides financial assistance to conservation and repair of protected structures under the Built Heritage Investment Scheme (BHIS) and the Historic Structures Fund (HSF).

The Built Heritage Investment Scheme (BHIS) scheme is operated by the Department of housing, local government and heritage in association with the local authorities. The funding awarded varies from a minimum €2 500 to a maximum of €15 000. The fund will support 50% of the project cost. The BHIS is mainly aimed for small-scale works such as window and roof repairs, lime pointing and lime rendering. In 2022, 512 projects received funding under the scheme.

The Historic Structures Fund (HSF) provides financial assistance for repairs of protected buildings under different schemes. The stream 1 grant funds from a minimum €15 000 to a maximum of €50 000. It has a minimum 20% match funding requirement. Stream 2 funding is for larger refurbishment projects, wherein the minimum support is €50 000 and the maximum support is €200 000. However, the funding amount must not be higher than 50% of the total project cost. Another stream under this scheme is to support vernacular structures, wherein the minimum amount granted for a project is €5 000 and the maximum support is € 10 000. Similar to stream 1, it requires a match funding of 20%. In 2022, 78 projects received the funding under HSF and the total support from the scheme was 4 million Euros.

Green Low-Carbon Agri-Environment Scheme (GLAS) is a funding scheme dedicated to farmers. The total funding available for this scheme in 2022 is 1.25 million Euros. GLAS provides grant between €4 000 and €25 000 for the conservation of traditional farm buildings, including windows, walls and roof. Typically, the grant will not provide more than 75% of the project cost (The Heritage Council, 2022). In 2022 70-80 projects are likely to receive support from this scheme.

A few opportunities wherein historical building owners/management can apply for funding from Heritage Council, Ireland along with the projects awarded in 2022 under those schemes are listed below:

Community Heritage Grants [Community-Heritage-Grants-2022.pdf \(heritagecouncil.ie\)](#)

Heritage Stewardship Fund [Heritage-Stewardship-Fund.pdf \(heritagecouncil.ie\)](#)

Rural Regeneration development Fund [gov.ie - Rural Regeneration and Development fund \(www.gov.ie\)](#) is commitment of €1 billion investment in rural areas by the government of Ireland for a period of 2019-2027. Under this scheme enhancement of heritage and other community assets can avail support. Further, there are funding schemes initiated at a local level, for example the LEADER programme (2014-2020) in West Cork <https://leaderwestcork.com>, which is co-financed by European agricultural fund for rural development. Another funding opportunity available is “Community Centers Investment Fund” from Department of Rural and Community Development <https://www.gov.ie/en/service/fec91-community-centres-investment-fund/>. This is a capital fund to support improvement and refurbishment of existing community centers. The funding can be available in three categories ranging from €10 000 to €300 000. Renovation of historical buildings may also receive the funding under this scheme if it meets the funding requirements.

There are grant support for energy retrofitting and deployment of renewable energy sources for buildings in general such as the Sustainable Energy Authority of Ireland (SEAI) supported grant [Community Grant Overview | SEAI](#). In 2021 SEAI supported 57 community energy projects and 1100 homes and community buildings were upgraded. The total value of the projects was € 60 million. Historic buildings can also avail the funding as long as it fulfills the specific requirements of the SEAI scheme.

The new “housing for all” strategy by the government of Ireland recognize that a large number of old houses can be used to address the housing for all objective. This may also contribute in climate targets as un-used historical buildings could be re-used (Department of Housing, Local Government and Heritage, 2021). The Historic Towns Initiative (HTI) is an initiative to promote and provide support for the heritage-led regeneration of Ireland’s historic towns. Housing for all aims to adjust the HTI to encourage private owners and /or occupiers to use vacant historical buildings.

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Scotland

1. Definition of nearly zero energy buildings

There is no formal definition of nearly zero energy buildings in Scotland although the upgrading of energy efficiency and heating systems in buildings is recognised as a key part of achieving the Government's target of **net zero emissions** by 2045. As part of this, Scotland's *Energy Efficiency Route Map*¹⁶ sets out recommendations for achieving **near zero carbon** in existing buildings (where feasible) by 2050.

It is recognised that there is alignment with the *Energy Performance in Buildings Directive*¹ (EPBD) which defines this as "a very high energy performance, as determined in accordance with Annex 1, the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on site or nearby".

2. Historic buildings

There are 46,792 listed buildings² in Scotland, of which 7.48% are listed at category A, 49.63% at B, and 42.89% at C. It is estimated that listed buildings account for less than 1% of the buildings stock of Scotland and it is likely that a significantly larger number of traditional buildings are protected by being located within conservation areas, of which Scotland has over 600.

Figures are not available for the number of unlisted buildings there are in conservation areas, but the *Scottish House Condition Survey of 2019*³ identified 479,000 buildings of traditional construction, accounting for 19% of the total building stock of Scotland. Historic Environment Scotland uses the date of 1919 as a date which generally indicates the change from predominantly traditional construction to more modern methods using brick and concrete and directs the focus of its work on conservation retrofit.

3. National administrative organization responsible for historical buildings

Historic Environment Scotland⁴ (HES) is the lead heritage body in Scotland. It is a non-departmental body which means that it is not part of the Scottish Government but some of its functions (such as the designation of historic buildings and scheduled monuments) are carried out on behalf of Scottish Ministers.

HES cares for over 350 historic properties, records historic sites and curates an archive of 0.4m records. It also designates parts of the historic environment which are of cultural significance, is a statutory consultee for works affecting them, and the planning authority for works affecting scheduled monuments.

HES has a Technical Research team which researches and produces publications on conservation retrofit. Around 60% of public enquiries received by the team currently relate to retrofit. The team also delivers a Level 3 Award course⁵ in conservation retrofit.

4. Regulations pertaining to renovation of historical buildings

a) Planning Permissions

Permissions to make changes to both listed and unlisted buildings are administered through the planning authorities in each of Scotland's 32 council (local government) areas.

*The Planning (Scotland) Act 2019*⁵ is the principal act under which most planning functions are carried out. The Act controls the way that land is developed and used and represents a radical change of policy in terms of tackling climate change in comparison to previous legislation. The *National Planning Framework* (NPF4)⁶ is a long-term development plan for the whole of Scotland that sets out where development and infrastructure is needed for 2050.

The principal legislation under which Scottish Ministers, HES, and planning authorities operate is the *Planning (Listed Buildings and Conservation Areas) Act (Scotland) 1997*⁷. It governs proposals for development affecting listed buildings and conservation areas. The Act directs planning authorities (in exercising their duties) to pay *special regard* to preserving listed buildings, their setting and any features they possess, and to pay *special attention* to the preservation or enhancement of conservation areas.

The Development Management Procedure Regulations also requires that planning permission is obtained for development affecting category A listed building or their setting or the setting of scheduled monuments.

b) Building Warrant

The Building (Scotland) Act 2003 gave Scottish Ministers the power to make building regulations to:

- secure the health, safety, welfare and convenience of persons in or about buildings and of others who may be affected by buildings or matters connected with buildings
- further the conservation of fuel and power and
- further the achievement of sustainable development.

*The Building (Scotland) Regulations 2004*⁸ are the regulations which apply to all new buildings and to existing buildings where alterations or a change of use is proposed.

The regulations are accompanied by two Technical Handbooks which provide practical guidance on the requirements of the regulations. The Technical Handbooks are also supported by a *Procedural Handbook*⁹ which clarifies the intent of the Building (Scotland) Procedures Regulations 2004.

5. National plans to improve the energy performance of historical buildings

Scotland has an estimated 2.6 million homes and approximately 196,000 non-domestic premises. An estimated 45% of homes currently achieve or exceed EPC Band C.

*The Climate Change (Scotland) Act 2009*¹⁰ created the legal framework for delivering reductions in greenhouse gas emissions in Scotland. In 2019, the Act was amended by the *Climate Change (Emissions Reduction Targets) (Scotland) Act 2019*¹¹ which introduced revised interim targets and a target for net zero emissions by 2045.

In 2010, the Scottish Government published its Energy Efficiency Action Plan¹² (EEAP), followed by its *Climate Change Plan 2018-32* (Third Report RPP3)¹³ which sets out the path to a low carbon economy, including actions to reduce emissions associated with Scotland's building stock. The Government published its *Climate Change Plan Update*¹⁴ in December 2020 which reflects the increased ambition of the new targets set by the 2019 Act.

In 2015, Scottish Ministers designated energy efficiency as a national infrastructure priority through its *Energy Efficient Scotland Programme* (EES)¹⁵ in recognition of the many benefits delivered by improving the energy performance of buildings.

The EES programme represents the delivery of this priority. EES is a 20 year programme with a set of actions aimed at making Scotland's existing buildings near zero carbon (where feasible) by 2050, and in a way that is socially and economically sustainable. By the end of the programme EES aims to transform the energy efficiency and heating of Scotland's buildings, making them more comfortable and easier to heat.

In May 2018, the Scottish Government launched its *Energy Efficient Scotland Route Map*¹⁶ which is a 20-year plan containing a set of actions aimed at achieving near zero carbon (where feasible) in Scotland's existing buildings by improving their energy efficiency and decarbonising their heat supply by 2050.

In September 2019, the Scottish Government published its *Climate Ready Scotland: Scottish Climate Change Adaptation Programme* (SCCAP)¹⁷. Along with the Energy Efficient Scotland Route Map, SCCAP sets out the mandate for Historic Environment Scotland to lead in research and guidance for improving energy efficiency in traditional and historic buildings.

In 2021, the Scottish Government published its *Heat in Buildings Strategy*¹⁸ which sets the targets for reducing carbon emissions to net zero by 2045. The Strategy sets out proposals that will require all buildings to have fabric upgrades and switch to a zero-emissions heating system by this date. The numbers requiring upgrading are estimated to be 1million homes and 50,000 non-domestic buildings and the cost is estimated at £33bn. The Strategy also requires all owner-occupier homes to achieve EPC Band C (where feasible and cost effective) by 2035 and private rented properties to achieve EPC Band C from 2025 (at change of tenancy). However, these have been amended slightly in the light of the Covid pandemic to achieving a good level of energy

efficiency equivalent (at least) to EPC Band C in a large majority of buildings by 2030 and in all homes by 2033.

PAS 2035 (2019) is a document which aims to support standards in the retrofit of domestic buildings. It was produced by the British Standards Institution and covers topics such as accessing buildings for retrofit, identifying improvement opportunities, and designing and specifying energy efficiency measures. Not all of the content of PAS 2035 is relevant to traditionally-constructed buildings and there is an emphasis, therefore, on careful design and application of retrofit measures over and above any requirement in the document. PAS 2038 is a forthcoming document that will cover non-domestic buildings.

EPCs (Energy Performance Certificates) outline how energy efficient a building is. They have been a requirement since 2008 every time a building is sold or rented. In Scotland, places of worship, listed buildings and buildings located in conservation areas must carry out EPC assessments when required. As with the building regulations, it is recognised that EPC assessment methods are flawed in their application to buildings of traditional construction. From July to September 2021 the Scottish Government ran a consultation on reform of Energy Performance Certificates (EPCs)²⁰ in the light of recommendations in the Heat in Buildings Strategy that they should provide recommendations for achieving net zero emissions in line with Government targets for 2045.

6. Funding sources aimed at renovation/improve energy performance of historical buildings

Historic Environment Scotland (HES) and the National Heritage Lottery Fund (NHLF) both provide grant funding for the repair and re-use of historic buildings.

The NHLF²¹ offers heritage grants from between £250,000 to £5m. The priorities identified in its 2019-2024 Strategic Funding Framework are for landscapes and nature, community heritage and heritage at risk.

In both cases, the funding is largely targeted at community-based projects or those with a clear public benefit, rather than private owners or commercial developers/operations. Annually, HES distributes £14.5m in grant funding²² for heritage projects. Although this has traditionally been limited to repair of historic fabric, HES is currently reviewing opportunities for contributing to energy upgrades. To date, the NHLF has generally had a wider remit in what it will fund than HES.

Home Energy Scotland²³ provides advice to owners of domestic buildings including sources of funding. Grants are available from the Scottish Government through the *Warmer Homes Scotland Programme* but are generally for low-income applicants who are having difficulty heating their homes. Funding for most homeowners and for landlords would be through loans. The Smart Export Guarantee (2020) requires certain energy suppliers to offer at least one SEG tariff and make payment to small-scale generators of renewables electricity.

Value Added Tax (VAT) is normally added to building materials and services at a rate of 20%. Historically, VAT relief could be claimed for new building works and works of alteration to existing buildings, but not to their repair and maintenance. Since 01 April

2022, the UK Government has zero-rated VAT for energy efficiency measures including renewables, insulation and draught stripping.

7. Specific challenges for renovation of historical buildings

a) Regulation

As set out above, the *Planning (Listed Buildings and Conservation Areas) Act (Scotland) 1997* directs planning authorities to pay special regard to the preservation of listed buildings, their features and setting, and to pay special attention to the preservation or enhancement of the character and appearance of conservation areas. It should be noted that *preservation* in the context of these duties relates to preservation of the building's architectural or historic interest (character) rather than its absolute preservation. This means that decisions affecting historic assets should be based in an understanding of the cultural significance that led to their original designation.

This means that listed buildings can be adapted to new uses or upgraded to improve their function *providing their special characteristics are maintained*. It should be noted that the majority of new heating systems don't require consent because of the limited effect they normally have on those characteristics, and the same is the case with the majority of conservation retrofit measures. For these reasons, a key aspect of managing change to listed buildings involves changing the perception of owners and others of what *can* be achieved within the regulations (commonly referred to as de-bunking myths).

It is likely that the exteriors of traditional buildings in Scotland will have to be adapted for warmer summers and wetter winters, in particular, the greater prevalence of tropical-type downpours which traditional roof detailing and rainwater goods may not be able to deal with adequately. In meeting forthcoming Government targets for net zero emissions by 2045 however, renewable sources of power generation are likely to have the biggest impact on the character of listed buildings and their setting and therefore provide greater challenges for decision-makers in the next 20 years.

The Building (Scotland) Regulations 2004 are the main regulations that apply to the construction and alteration of buildings to ensure good standards of safety, health, comfort, energy use and sustainability. It is widely recognised by practitioners and regulators that these regulations were essentially designed to apply to the construction of new buildings. This can therefore present significant challenges for practitioners and decision-makers involved in the adaptive re-use of traditional or listed buildings and meeting standards for their insulation and energy use.

In 2007, Historic Scotland produced a document in partnership with practitioners and the Scottish Building Standards Agency called *A Guide for Practitioners 6: The Conversion of Traditional Buildings*²¹. The publication was aimed at helping building standards officers and practitioners to reach agreement on meeting the standard in a way that was sensitive to the character and interest of an historic building. The document was well received by practitioners and HES currently intends to re-write it in the near future with a much greater focus on conservation retrofit and meeting emissions targets.

b) Funding

The heritage sector in the UK has identified a decline in the overall funding available for conservation work, as well as a lack of consistency in the application process from the different funding bodies. The decline in funding is derived from a variety of causes including constraints on public sector spending.

In general, funding in the heritage sector is focussed towards community projects and/or projects with a clear public benefit. It will be necessary for traditional buildings in Scotland to be brought up to a good standard of repair prior to retrofit works being carried out but there is likely to be little or public grant funding to assist private owners or landlords to carry out these repairs.

The decline of town centres has been recognised as a significant issue for Scotland, leading to the adoption of the *Town Centre First Principle*²⁵ in 2014. This led to a significant policy shift to encourage planning and investment decision to give priority to town centres. The Scottish Government is providing local authorities with very substantial funding through its City Region Deals and a number of these include the repair and re-use of prominent historic buildings.

c) Buildings in Multiple Occupation

Scotland has a prevalence of traditionally-constructed apartment buildings (known as tenements) in its towns and cities, accounting for around 24% of its housing stock. A problem which commonly affects these buildings is a lack of agreement between the different owners to carry out repairs and other works to their building. The Scottish Government recognises the importance of bringing tenements up to a good standard of repair prior to retrofit works as a result of the findings of a 2018 Parliamentary Working Group²⁶ set up to consider their maintenance across Scotland. A Short Life Working Group was subsequently set up (2022) to examine the challenges for upgrading insulation and heating in tenements. Bringing them up to a state of good repair was again identified as being a key barrier to a widespread programme of retrofit. The Scottish Law Commission is currently considering new legislation that will require owners to agree a scheme of repairs in advance of conservation retrofit.

d) Availability of Skills and Knowledge

In recent years, the advice provided by energy assessors and funders has guided owners to use non-traditional materials and methods although we are seeing a move to recognising the value in approaches more appropriate to traditional buildings. HES published its *Guide to the Conservation Retrofit of Traditional Buildings*²⁷ in November 2021 which is the first guide to cover the subject in a general but comprehensive manner. The Guide incorporates the findings of many research projects by HES exploring options for upgrades to buildings using traditional methods and sustainable materials in a manner which respects the character and fabric of buildings.

As stated previously, approximately 60% of enquiries received by Historic Environment Scotland's Technical Research team relate to conservation retrofit. However, a significant proportion of the enquirers are looking for contractors who understand traditional materials and methods and can execute works to a good standard. There is a significant deficit in traditional skills in Scotland, particularly in its more rural areas. This is a significant impediment to many owners who wish to bring

their buildings into a good state of repair or wish to repair and upgrade existing features (such as windows) rather than replacing them.

There is currently a significant shortage of contractors that would be capable of carrying out retrofit works to buildings to meet the forthcoming government targets. Whilst this point relates mainly to the number of contractors required to meet upgrade targets, there are currently very few contractors that have a knowledge of sustainable insulation materials and methods, and how to install these in a building without creating a risk of altering the way the structure handles air and moisture. Along with other organisations, HES delivers a Level 3²⁸ qualification in conservation retrofit to improve skills availability for retrofit to traditional buildings using sustainable materials. HES also supports training in other traditional skills.

e) Availability of Sustainable Retrofit Materials

Whilst materials are freely available for the energy retrofit of buildings, these have mainly been of the type commonly used in new-build construction. Typically, this means they may have structure that is impermeable to moisture, be made from non-sustainable/recyclable materials, or have a high carbon footprint associated with their manufacture and transport.

HES's Guide to Conservation Retrofit aims to provide solutions to upgrading of traditional buildings using materials with more sustainable credentials that will also maintain a building's fabric in sound, dry condition. HES intends to engage with economic development partners in the near future to assess the potential of the manufacture of insulation products produced locally and from sustainable materials or from by-products of existing industry or agriculture. Obtaining warranties (guarantees) for products or contractors' work using sustainable materials is reported to be one of the challenges/barriers to retrofit works.

g) Scotland's Churches

Church buildings are likely to represent one of the biggest challenges to heritage management in the coming years due to the decline in congregations that use and fund them. Scotland has a very large number of churches, many of which have small congregations. A significant proportion of them are large 19th century structures that represent a significant maintenance responsibility. They also represent one of the most significant challenges to heating due to the fact they will generally have one or two large spaces which may be heated very infrequently. The result of this is that the buildings are not comfortable when they are occupied and the fabric may be adversely affected by a lack of heating and high humidity. In the last 20 years there has been a noticeable move toward creating more of a community centre function in churches, and more recently schemes are showing the introduction of smaller spaces with innovative heating systems and some installation of renewables. Some church bodies may well be considering significant numbers of closures in the medium term. We have observed that their conversion to warm and efficient homes often results in significant interventions to the original character and historic fabric of the church.

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Sweden

1. Definition of nearly zero energy buildings

Sweden has a definition for NZEB in place, however, the share of renewable energy is not specified (D'Agostino et al., 2021). During the last decade, Sweden has made modifications a few times in its building code. The building code from 2019 has a primary energy use requirement of $\leq 90 \text{ KWh/m}^2 \text{ year}$ and $\leq 85 \text{ KWh/m}^2 \text{ year}$ for single-family buildings and multifamily buildings, respectively (Boverket, 2019). In Swedish building code (2019), the renewable energy such as energy from sun, ground and air extracted at the building site is not counted for calculating buildings' primary energy use. From 1st January 2022 onwards, the climate impact of new buildings in Sweden should be reported in the climate declaration.

2. Historic buildings

As of 2015, Swedish National Heritage Board has a total of 2459 "architectural monuments" (byggnadsminnen) registered in Sweden (Myndigheten för Kulturanalys, 2016). Of those 265 facilities are government facilities. The above number does not represent the number of buildings as the byggnadsminnen can consist of several buildings. 1530 buildings are protected as state buildings monuments according to the regulation on state buildings monuments (2013:558), and 8144 buildings are protected as buildings monuments according to Chapter 3 of the Cultural Environment Act. (1988:950), (Söderholm, 2016). The County Administrative Board (Länsstyrelsen) decides on byggnadsminnen (Myndigheten för Kulturanalys, 2016). Further, according to the law, church buildings and church grounds older than 1940 may not be changed in any significant way without the permission of the county administrative board. Churches that requires such permission in Sweden is 2960, of these 116 have been erected after 1939 (Myndigheten för Kulturanalys, 2016). In addition to this there is a partial list from north, south and west Sweden (11 counties) of 30011 of q-märkta (listed) buildings (Myndigheten för Kulturanalys, 2016).

3. National administrative organization

Swedish National Heritage Board (Riksantikvarieämbetet) <https://www.raa.se>

4. Regulations pertaining to renovation of historical buildings

Important laws that in various ways affect culturally valuable buildings are the Cultural Environment Act (1988:950), the Environmental Act (1998:808), and the Planning and Building Act (2010:900). They are introduced in more detail below. Other important laws and regulations that deal with the handling of cultural heritage in different ways are the regulation on state building monuments Act (2013:558) and Boverket's building regulations, BBR, The Swedish National Board of Housing, Building and Planning.

The Cultural Environment Act (1988:950), handles various cultural-historical values, such as ancient monuments, building monuments, church cultural monuments, and cultural objects. It describes what a building monument is, how a building receives this classification and how a building with this classification must be handled." A building

that has an especially high cultural-historical value or that is part of an area with an especially high cultural-historical value can be declared a building monument". It is the regional county administrative board that decides whether a building may be declared a building monument according to the Act. Individuals as well as the county administrative board can apply for a building to be declared a building monument.

The Environmental Act (1998:808), deals with different types of natural and cultural areas and describes, among other things, how natural values should be preserved in the best way. It may consist of national interest areas, which to some extent may include buildings of cultural and historical value. National interest area consist of natural and cultural values but also values for outdoor life.

The Planning and Building Act (2010:900), deals with regulations regarding land and water planning and construction. A building that possesses one or more cultural-historical values is specified according to the Planning and Building Act with protection or precautionary provisions, which states: "A building that is particularly valuable from a historical, cultural-historical, environmental or artistic point of view must not be tampered with". Protection regulations are the strongest protection according to the Act, which means that the building possesses such values that must not be tampered with, and that the building as a whole or specific building part must be preserved and maintained in its original condition. The precautionary regulations state that refurbishment of a building or moving a building must be carried out carefully so that the building's character traits are taken into account and the building's technical, historical, cultural-historical, environmental, and artistic values are taken into account."

5. National plans to improve the energy performance of historical buildings

The Swedish national research programme for energy efficiency in historic buildings was initiated in 2006 by the Swedish Energy Agency. The research programme in historic buildings is unique in an international context (Claesson, M., Broström, T., 2017). The Swedish Energy Agency initiated, the research program called "Spara och bevara" (Save and Preserve), <https://sparaochbevara.se> to increase the knowledge on energy efficiency in buildings of cultural and historical value. The program aims to develop technology solutions that contribute to energy efficiency in such buildings without destroying or distorting their values. The programme is currently in its fourth phase and it is coordinated by Swedish Energy Agency and Uppsala university.. Over time, the scope of the programme and the projects have developed from mainly dealing with indoor climate control in monumental buildings towards addressing more general issues in the much larger stock of non-listed buildings (Claesson, M., Broström, T., 2017). The results from the programme are presented in several scientific journal publications, conference papers, books and PhD theses. The projects have also contributed to CEN standards. An long-term effect of the programme is that it increased the research competence in historical buildings in Sweden: From practically none in 2007 to 18 senior researchers and twelve PhD students from ten universities within seven years (Claesson, M., Broström, T., 2017) and the number of researchers has increased further.

6. Funding sources aimed at renovation/improve energy performance of historical buildings

Financial support for research and development for renovation/improving the energy performance of historical buildings is distributed from several different funders, such as The Swedish National Heritage Board and The Swedish Energy Agency,

The Swedish National Heritage Board primarily distributes funding to the regional county administrative boards and they in turn distribute these to various prioritized projects. However, The Swedish National Heritage Board also supports research and development activities in the field of culture. The goal of that contribution is that it should achieve the greatest possible effect and benefit for the cultural environment and contribute to fulfilling the national goals for cultural environment work. The cultural environment conservation support is a state funding aimed to support cultural environment conservation efforts. It is normally the regional county administrative board that makes decisions on the distribution of these funds. Approximately 270 million Swedish kronor is allocated annually for cultural environmental conservation efforts across the country. The Church of Sweden receives compensation from the state for the corresponding costs for the care and maintenance of the church's cultural monuments.

The Swedish National Heritage board primarily conducts research and development through externally funded projects, but sometimes also in internal projects and through direct assignments that can be either internal or external. Funds are primarily allocated to projects within cultural heritage and the cultural environment as well as to central museums, but projects within calls that are co-financed by other research financiers may also occur. The Swedish national Board has a catalogue of all projects that received RD grant from 2001 till today <https://fou-anslag.raa.se/raa/>. In 2022, 19 projects received RD funding.

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Energy Pathfinder

Protection of historical buildings in Finland.

Pictures and text Kai Tolonen 2022.

Picture. Vantaan Pitäjän kirkko.





Obligation to preserve the cultural environment and building protection

In Finland, there is a legal obligation to preserve the cultural environment and protect buildings, which must be followed

Inventories

The result of the inventory project is a structured and descriptive research report about the inventoried area, its history and the characteristics and features from different times found in it at the time of the inventory. Based on the area, site and building information, the cultural-historical significance of their characteristic features is assessed.

Previous inventories and surveys must always be taken into account when determining the goals of the repair project.

An inventory or other survey tells about the current state of a regionally defined environment and analyzes the historical development that led to it.



Starting points, explanations and impact assessments

The inventories are based on international agreements, which Finland also complies with.

We transfer these goals to national goals and strategies.

In all of these, it is emphasized that the Corrections must be based on sufficient studies and reports, as well as impact assessments.

International agreements;

UNESCO (World Heritage Convention 1972)

(Hague Convention 1954)

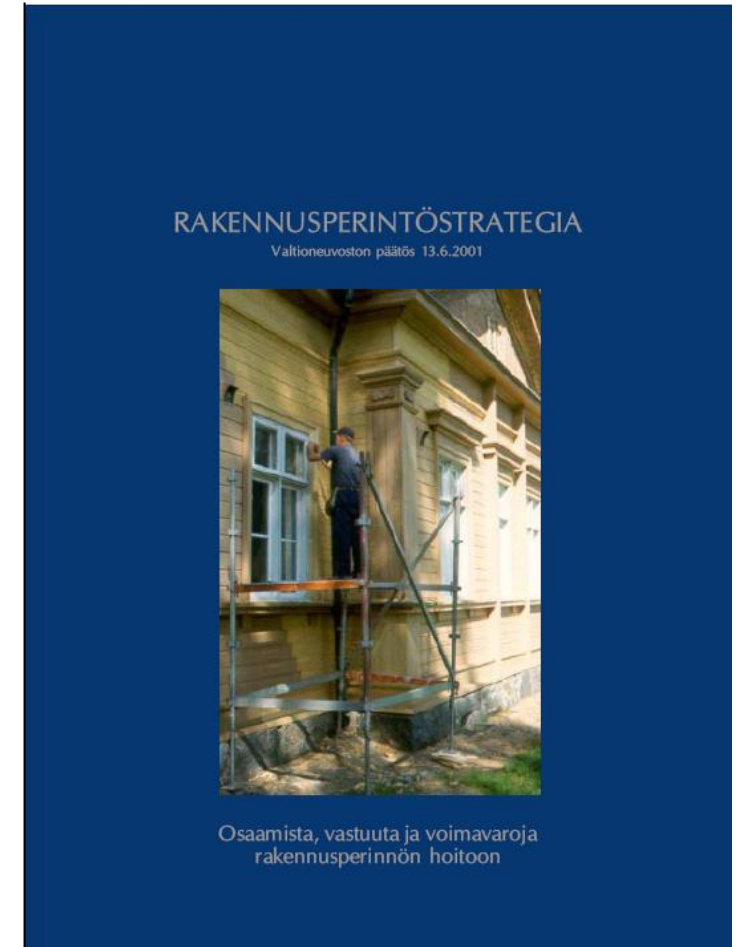
The European Council

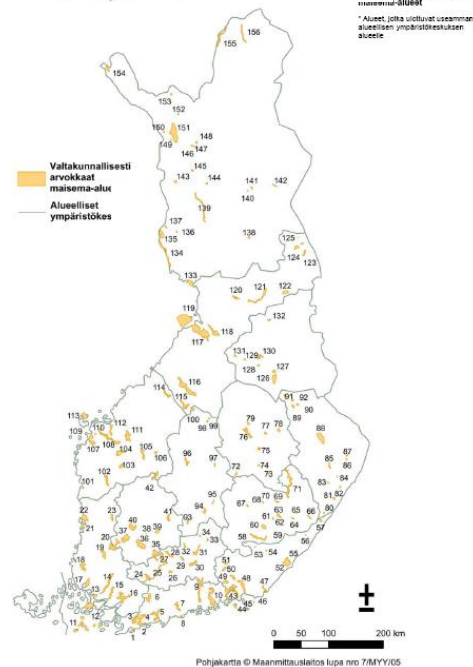
(Granada 1985)(Valletta 1992)(Florence 2000) etc.

National goals:

National land use goals

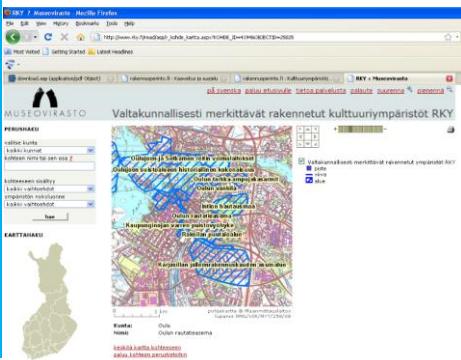
Government approval Building heritage strategies





Construction and repairs are indirectly affected by various national inventories like
 Landscape areas of national value (YM 66/1992)
 National Landscape publication (YM 1993)
 Nationally significant prehistoric protected areas (SM 3/1983)

The meaning of these is guiding.
 The authority has the opportunity to intervene in clear excesses in construction.



Inventories of built cultural environments directly guide construction and especially repair. The effect is significant if the objects are listed in these inventories.

This "listing" does not directly mean the protection of the building.

Nationally significant sites are listed:

Valtakunnallisesti merkittävät rakennetut kulttuuriympäristöt 2009.

http://www.rky.fi/read/asp/r_default.aspx.

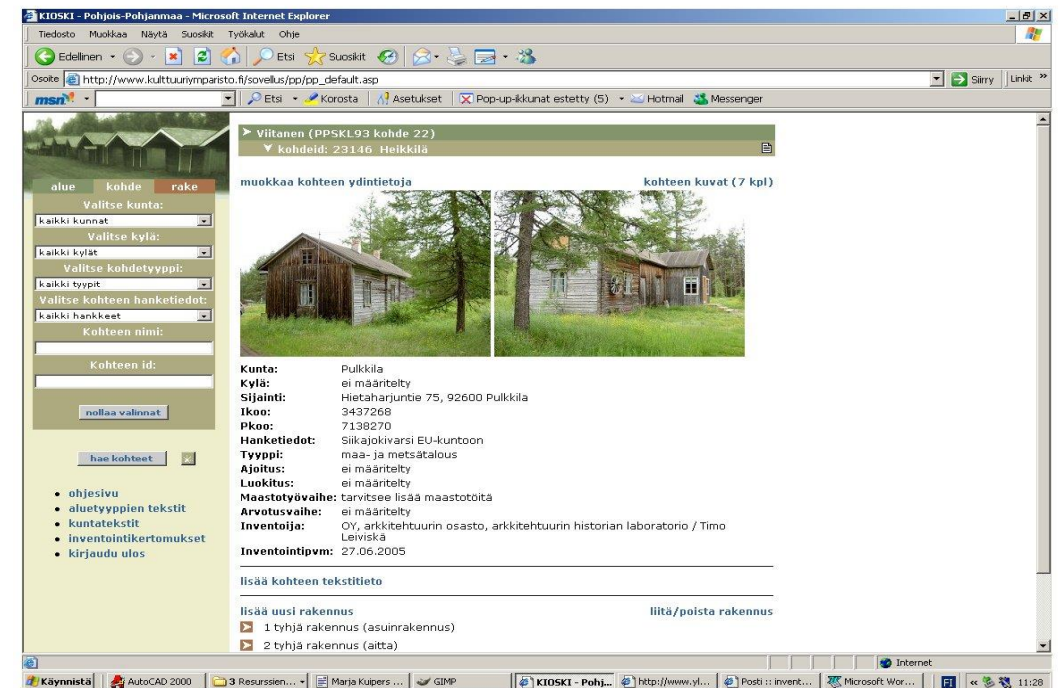
The red brick building stock of the Forssa spinning area is mainly from the end of the 19th century. Soile Tirilä, MV/RHO.

The terraced village structure of Lavinno village has been preserved exceptionally well. Johanna Forsius, MV/RHO.

Turku's western student village represents the structuralist planning of the 1960s. Timo-Pekka Heima, MV/RHO.

The so-called in the central area of Oulu rky objects.

The kiosk application is a very similar commercial card-based interface used by many municipalities (pictured).





Provincial inventories, The Provincial plan,
Local inventories in connection with general planning
and Cultural Environment Programs
they do not directly mean protection, although quite a
few of these listed buildings are protected!

Provincial plan and further The information compiled
from these should be compiled into a fitness
assessment

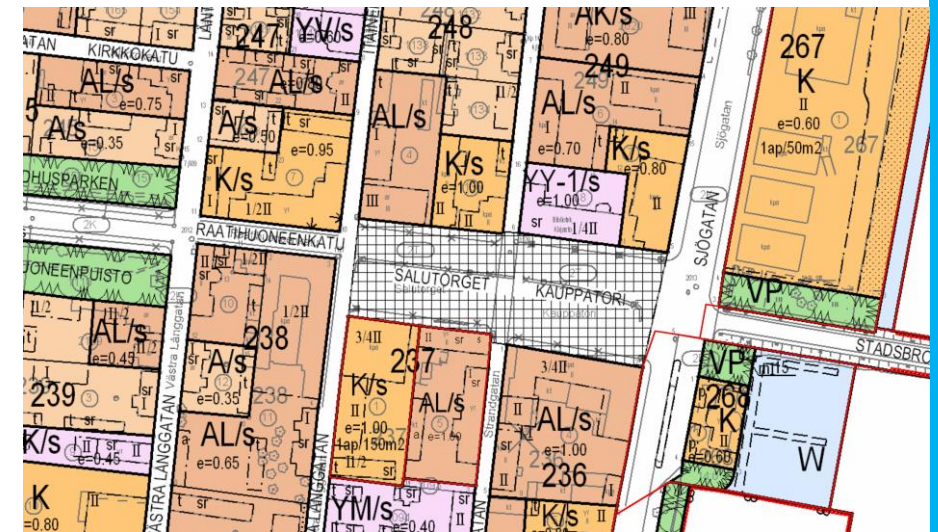
- to support decision-making
- key information about the investigated options

The general plan are a guide when preparing the site
plan!

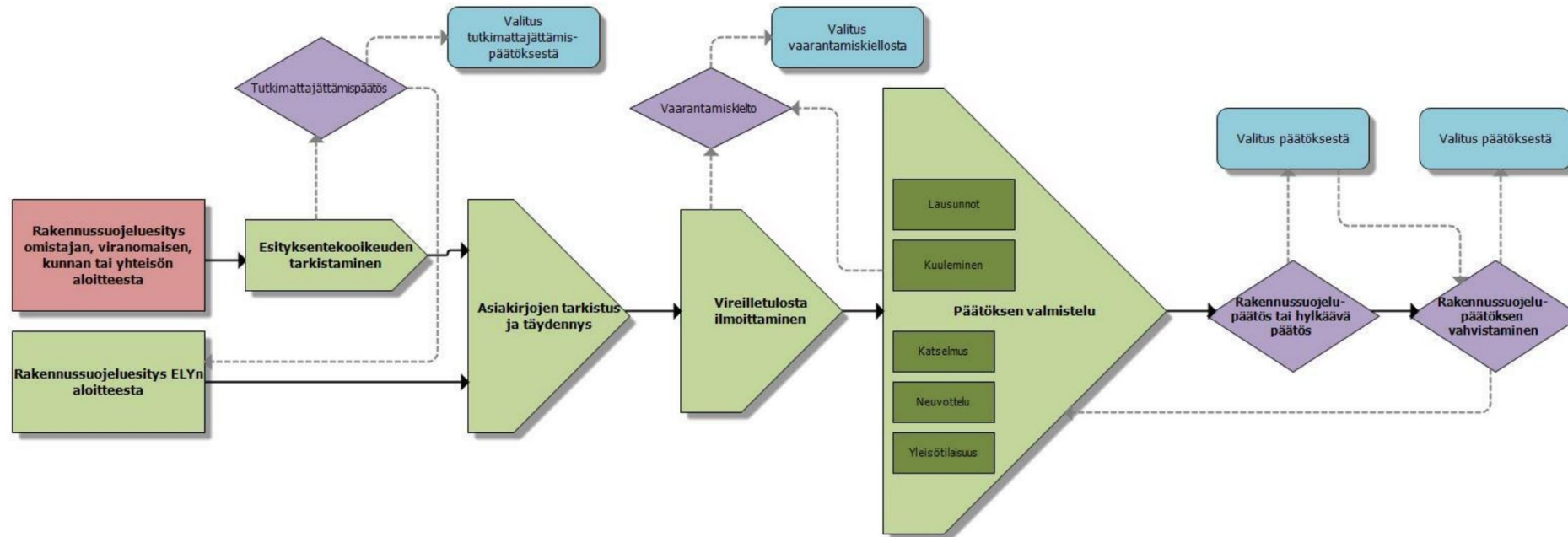


Protection is implemented under different laws

- According to the Land Use and Construction Act (MRL), buildings in Finland are protected by site plan markings and regulations.
- There is no exact information on the number, because protection is a matter for each municipality and there is no common register of sites. The estimate is around 30,000 – 80,000 buildings.
- Pursuant to the Act on the Protection of Built Heritage (485/2010) outside the site plan areas. (approx. 340 areas, i.e. approx. 3000 buildings)
- A decree has been issued on the protection of state-owned buildings (480/1985) (approx. 800 buildings)
- The so-called railway agreement (approx. 850 buildings)
- The buildings protected by the Church Act (1054/1993) are those built before 1917 (approx. 500)
- There are only 12 buildings protected under the law on the Orthodox Church.
- Newer churches are protected by a decision of the church board.
- There are approximately 100 buildings protected by the Antiquities Act.



Law on the Protection of Built Heritage (498/2010) – LaRS



The law is used as a means of protection mainly outside the site plan areas and when, in addition to the exterior of the building, valuable interior spaces are protected.

The local ELY makes a protection decision.

Old laws from 1985, 1964 in the background.

Attached is a diagram of how protection progresses in accordance with this law.

Obligation to preserve and protect the cultural environment

The owner or holder of a protected site can apply to the ELY Center for permission to deviate from the protection decision. A permit can be granted if there is a particularly compelling reason to promote the use or care of the built heritage. For example, if part of the building is damaged or the use of the building requires improvements to accessibility or rescue safety. The deviation from the protection decision must be planned so that the central cultural-historical values of the building are preserved, because the building remains protected even after the deviation.

Chapter 6 of the Criminal Code 48 describes what a building protection crime is.

Compliance with the Building Heritage Act is monitored by ELY centers and the Finnish Museum Agency.



The Site Plan

In Finland, according to the Land Use and Construction Act, buildings must be protected by a site plan.

The goals of preserving the built cultural environment may conflict with other goals of land use, for example with strong additional construction.

Tasks of the Site plan

The site plan creates the conditions for use and supports and guides the complementary expansion of the area and the renovation and repair of buildings

Protection is best achieved by continuing current use

If this is not possible, new natural usage possibilities will be explored.

With the plan, different land use options and their effects have been studied and interests have been reconciled. It's a deal by nature!

The planning process offers the possibility of cooperation to promote e.g. protection of buildings.



The reasonableness of the conservation provisions of the site plan for landowners

The owner of the building has the right to use building in an appropriate manner

However, provisions necessary to protect a building or other object have also been included in the site plan, even if they must be considered unreasonable (MRL 57.3).

Protection can lead to liability for compensation.

The compensation obligation is examined when the site plan is drawn up.



Compensation obligation

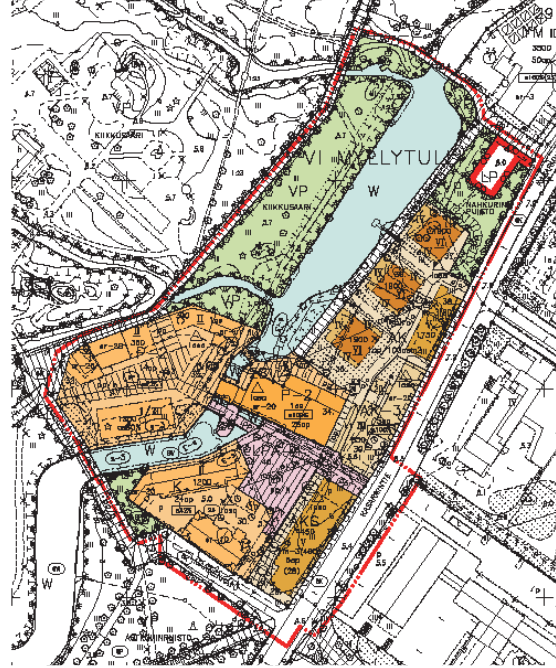
The assessment of reasonableness must be reflected in the formula description (e.g. MRL 57.2). The municipality is responsible for compensation for the sites protected in the formula. According to the Law on the Protection of Building Heritage (formerly the Law on Protection of Buildings), the state is, however, liable for compensation. That's why this is rarely used!

It is possible to reduce the building right according to the previous site plan in the plan, if there are justified reasons based on the content requirements of the plan.

Decreasing the right to build does not cause the municipality an obligation to compensate.

You cannot get compensation for the loss of the intended use of the property!





Protection can be compensated

Usually Money is not used. Protection can be replaced by e.g. With the benefit received by the landowner elsewhere, such as e.g. by exchanging land.

Or Replace with building rights. - This requires a formula change.

The general method is that when the current/formula comes into force, it is allowed to use the attic spaces of the existing building as living rooms, for example in addition to the building right indicated in the plan.

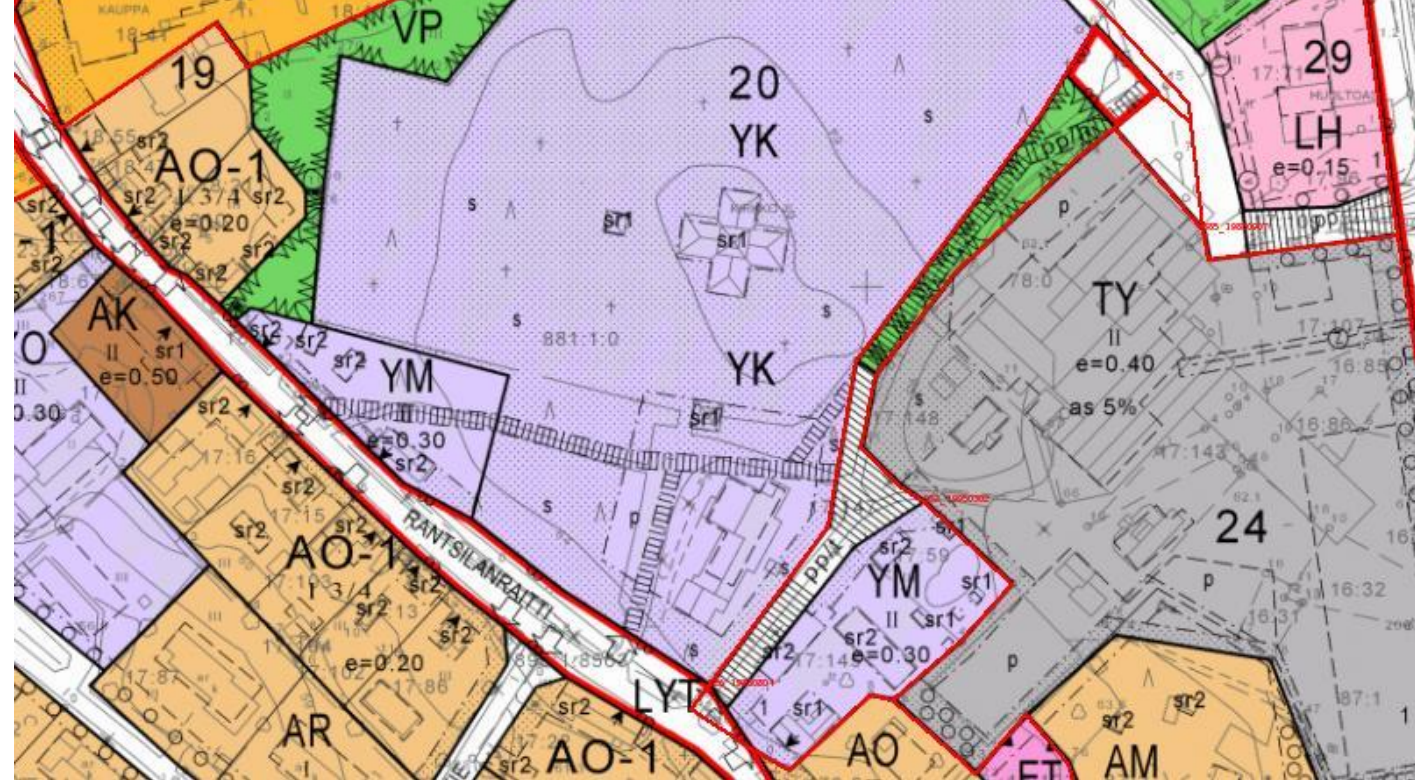


Protection of state-owned buildings

About 800 buildings and 200 areas. (Not Eg. Senaatti nor Kapiteeli Oy)!
The list is kept by the Finnish Museum Ag.



The order usually contains a reference to a separate protection decision, what can be done to the site.



Building demolition ban and conservation valuesprohibition of impairment in repair and alteration works

sr

sr-1

In some municipalities, the notations sr-1, sr-2, etc. have been used to describe the level of protection of valuable buildings, so that sr-1 represents a regulation completely prohibiting modification work, and other numerical indices (sr-2, sr-3, etc.) represent gradually easing regulations.

The problem is that the level descriptions differ in different cities. In any case, it is necessary to go through the specification carefully each time together with the building control, what the specification means.

Obligation to restore and restore in connection with alteration works

The background of the protection label is research and expertise. The plan statement and possible construction method instructions usually describe the cultural-historical values of the buildings to be protected and give examples of good ways to repair them. These guide the building control authority's permit consideration for repair and alteration works (MRL 117, 125 and 135).

sr

Listed building. In connection with repair or alteration work, the building's cultural-historical values must be preserved and the appearance/facades and water ceiling and stairwells must be returned to the situation in the xxxx century.

sr-1

In connection with repair or alteration works, the building must be repaired in a way that preserves its cultural-historical values and restores its historical characteristics.





Interiors of buildings

The interiors of buildings are usually not covered by site plan protection.

Only used in special cases in position formulas.

For example, when it comes to preserving the building's stairwells and room division The procedure according to the Building Protection Act is often necessary when you also want to protect the fixed interior of the building.



Church law

Evangelical Lutheran church building built before 1917

- Churches and belfries, blessing and burial chapels, and comparable buildings in the cemetery.
- Also the churchyard and its and the cemetery's fence and gate are protected by law.

Other denominations are protected by the site plan

Built after 1917, it is protected by the decision of the church board

Protection of parsonages or parish houses LaRS



Can also be used in site plan areas when protection measures are needed that cannot be prescribed under the Land Use and Construction Act.

E.g. fixed interior of buildings

A building protected under the Act on the Protection of Built Heritage

srs

A building protected under the Building Protection Act.

The regulations regarding its repair or modification work are given in the conservation decision.

srs-1

Substantial changes must be negotiated with the Finnish Museum Agency.



Act on the Protection of Built Heritage

It is written in the Act on the Protection of Built Heritage that the significance of a building is assessed on the following criteria:

1. rarity or uniqueness
2. historical typicality of the area
3. typical features that describe an area or a certain time (representativeness)
4. the manifestation and continuation of the original or similar use, construction method, architecture or style (originality)
5. meaning as proof of a historical event or phenomenon or as an example that tells about it and increases information (historical authenticity)
6. or visible structures, materials and stylistic features from different eras that embody the history and continuity of construction, care and use (historical layering)