

Sites of Japan's Meiji Industrial Revolution

Conservation, Restoration, Presentation and Public Utilization Plan

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**Component Part No. 6-1 of the “Sites of Japan’s Meiji Industrial Revolution”
Conservation, Restoration, Presentation and Public Utilization Plan
for Kosuge Slip Dock (Area 6 Nagasaki) (Abstract)**

Nagasaki City and the Mitsubishi Heavy Industries Nagasaki Shipyard (MHI Nagasaki Shipyard) drew up a Conservation, Restoration, Presentation and Public Utilization Plan for Kosuge Slip Dock (hereinafter referred to as “Plan”) in FY 2016 and 2017, which became a source of “Conservation Work Programme” pursuant to Recommendation b) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2015. The Plan comprises detailed measures for the conservation, restoration, presentation and public utilization of the component part of the “Sites of Japan’s Meiji Industrial Revolution: Iron and Steel, Shipbuilding and Coal Mining” (hereinafter referred to as “Sites of Japan’s Meiji Industrial Revolution”). This document provides an abstract of the Plan.

1. Vision

When Japan was establishing itself as an industrial power, the Kosuge Slip Dock contributed to this process in the shipbuilding field, merging traditional techniques with Western shipbuilding and repair technology. The buildings and remains characteristic of these accomplishments will be conserved and utilized, while taking considerations for the environment where they are located.

The eight component parts included in Area 6 Nagasaki of the Sites of Japan’s Meiji Industrial Revolution are industrial heritages representative of the shipbuilding and coal industries after the ban on building of large ships was lifted in 1853. They testify to the process of rapid industrialization in heavy industries in Japan. Their special importance is in helping to understand the connections of the two eras in the two industrial fields of shipbuilding and coal mining, namely, the period of directly introducing Western techniques and the period of establishing industrialization.

In the field of shipbuilding and repair, the Kosuge Slip Dock is a set of remains demonstrating how Japan’s traditional techniques came to be merged with Western industrial technology, and in a very short time industrialization in this field progressed to completion. Central to the component part is the modern Western-type slip dock itself, the first in Japan to be driven by a steam engine, as Western technology was being introduced into Japan. It consists of a hauling hut building that is the oldest brick building remaining in Japan, stone masonry bank protections, and other remains characteristic of the Meiji Era when the dock was in operation. They will be passed down to the next generation in as good condition as possible, with a reciprocal cooperation between MHI Nagasaki Shipyard.

(1) Conservation and restoration based on the whole process of changes and developments of the Kosuge Slip Dock, its characteristics, and the present state

Since Kosuge Slip Dock represents the starting point of the shipbuilding industry history, Nagasaki City and MHI Nagasaki Shipyard will faithfully maintain the remains from the initial operation in the Meiji Era, as a component part contributing to the Outstanding Universal Value. At the same time, from the standpoint of the process of historical changes and developments relating to the Kosuge Slip Dock, remains not just from the Meiji Era but those from the Showa Era, during which operation was continued as a boat factory, to the present day, will be conserved based on their individual nature and the history of their transformation.

The first steps will be to determine the current issues and take measures to slow deterioration of each of the remains, for maintaining them in good condition to the extent possible. From the period when the facility was first established to the Meiji operating period, Showa operating period, and the time thereafter, many aspects have not yet been clarified, such as the characteristics in each period and the changes they

underwent. These aspects will therefore be investigated. In parallel with these studies, Nagasaki City and MHI Nagasaki Shipyard will start the work for conservation and restoration in cooperation, giving priority to those parts showing notable deterioration.

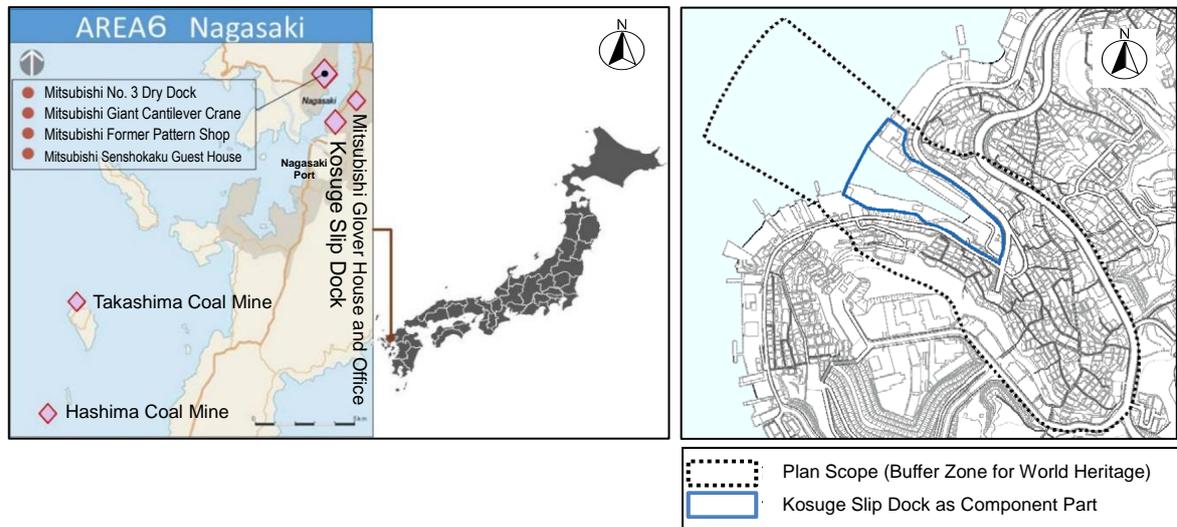


Figure 1: Location of the Component Part and scope of the Plan

(2) Information provision based on the characteristics of Area 6 Nagasaki

At the Kosuge Slip Dock, under the cooperation with MHI Nagasaki Shipyard, Nagasaki City will provide information focusing on the constituent elements contributing to Outstanding Universal Value, including Japan's oldest surviving brick building, created by merging traditional Japanese techniques with industrial technology imported from the West, and the modern Western-style slip dock itself, powered by Japan's first steam engine. The city will also provide information on operation of the facilities continuing into the Showa Era. These aspects will be provided with a close focus on actual objects. Explanations on the Component Part will therefore show the role of the Kosuge Slip Dock in the Outstanding Universal Value, as well as aiming for understanding of the roles played by the hauling hut, the hauling machinery, and the slip dock rails in the hauling process, and the roles of the foundation,¹ stone masonry bank protections, and other remains, while showing the objects themselves.

2. Policy

The policy consisting of following six items have been set toward achieving the Vision.

(1) Conducting investigative studies

To confirm anew the contribution of the component part to Outstanding Universal Value of the World Heritage property, Nagasaki City will carry out excavation surveys and surveys of relevant historical documents to find out more details about the situation during the Meiji operating period and the functions of and changes to each of the elements of the Slip Dock.

In addition, using monitoring charts prepared for the purpose, Nagasaki City and MHI Nagasaki Shipyard will monitor the site and conduct surveys to determine the state of metal deterioration and look for looseness or swelling of the stone masonry. The visitor situation will also be reflected in measures for proper preservation and for presentation, public utilization and promotion.

(2) Preserving, reinforcing, and stabilizing the architectural elements and archaeological remains of the slip dock in terms of materials, substance, and structure

Nagasaki City and MHI Nagasaki Shipyard will maintain and conserve the remains of Kosuge Slip Dock, and improve their environment, with a reciprocal cooperation, to enable harmonious information

¹ The base built under the slip dock for accommodating the rails

provision of the nature of the architectural elements and archaeological remains, focusing on the Meiji operating period from the standpoint of Outstanding Universal Value, but with the attention to changes and developments of the elements and remains including the Showa operating period during which the component part was still in use. The hauling hut, in particular, will be maintained and conserved with due attention paid to its being Japan's oldest surviving brick building, and to the hauling machinery being the first in Japan to be driven by a steam engine, as Japan's first modern Western-style slip dock. From a similar standpoint, the rails and stone masonry remains making up the slip dock from the Meiji operating period will be maintained and conserved. Specific steps will include reinforcement of the bricks, aseismic reinforcement of the brick building, rainwater drainage and groundwater measures, and rustproofing measures. The optimal combination of approaches for these steps will be chosen with due attention to the interworking between methods.

(3) Indicating and explaining industrial systems in the component part

To enable understanding of the hauling mechanism, Nagasaki City and MHI Nagasaki Shipyard will set up tour routes in the component part, and digital images will be employed showing the workings of the boiler and gears and how ships were hauled at the slip dock. The cherry trees, azalea, and other plantings around the hauling hut will be trimmed or removed to avoid adverse impact on the building and stone walls, and to improve the scenery, safety, and comfort.

(4) Arranging and improving the landscape from the standpoint of scenic view

The Kosuge Slip Dock is situated on an inlet going to Nagasaki Port. It was created by altering the river channel while making use of the delta topography impacted on both sides by hilly terrain. This surrounding terrain has been retained to this day as a unified part of the slip dock constituent elements, such as the rails and their foundation, the stone masonry bank protections, and the hauling hut; and because of the significance of making visitors aware of both as an integrated landscape, with a reciprocal cooperation, Nagasaki City and MHI Nagasaki Shipyard will improve elements that obstruct this landscape.

The entire Kosuge Slip Dock, situated on the delta terrain, can be seen from the sea inside Nagasaki Port in the buffer zone and from high vantage points in the background. Accordingly, the foreground landscape will be cleaned up to enable easy visibility from ships bound for tours of the Takashima Coal Mine (Component Part 6-6) and Hashima Coal Mine (Component Part 6-7).

(5) Utilizing as cultural resource and base for information dissemination in the Area

Since the Kosuge Slip Dock is one of the component part owned by the MHI Nagasaki Shipyard, use will be made of the Mitsubishi Nagasaki Shipyard Former Pattern Shop and Former Mitsubishi No. 2 Dock House as a base for information dissemination. The No.2 Dock House was relocated to inside the grounds of the Glover Garden (a tourism facility where the Glover House and Office (Component Part 6-8) is located).

At the Mitsubishi Nagasaki Shipyard Former Pattern Shop, MHI Nagasaki Shipyard² will introduce its role in the Sites of Japan's Meiji Industrial Revolution, and explain the relation of the Kosuge Slip Dock to other component parts, while also provide information about the position and role of the Kosuge Slip Dock in Area 6 Nagasaki.

At the Former Mitsubishi No. 2 Dock House, Nagasaki City will introduce the roles of the eight component parts making up Area 6 Nagasaki of the Sites of Japan's Meiji Industrial Revolution, including the role of the Kosuge Slip Dock as a component part of the shipbuilding industry and the involvement of Thomas Blake Glover.

² Previously known as Nagasaki Seitetsusho (Ironworks), completed in 1861 and sold to the Mitsubishi Company by the Meiji government in 1887. Following a series of organizational changes and changing of the company name, the company made the ironworks the current Mitsubishi Heavy Industries Nagasaki Shipyard.

(6) Implementing projects

The MHI Nagasaki Shipyard as owner of the component part, Nagasaki City, experts, and citizens will jointly establish a system for management and project implementation. Along with conservation and restoration of the building and remains, they will open the site to the public with a focus on the hauling mechanism, and will make use of the component part as a base for disseminating information, including for the related cultural resources in the Area.

3. Methods

(1) Investigative studies

(a) Excavation surveys

Excavation surveys of the Kosuge Slip Dock have not been carried out up to now. Such surveys will be necessary, however, in the case of constituent elements giving evidence that it was the first modern Western-style slip dock driven by a steam engine. These elements include the Lancashire boiler from the beginning of the Meiji operating period, the chimney base, and other underground remains. It will further be necessary to clarify the nature of the slip dock rail (one rail on each side) of Meiji Era, which are currently only partially exposed and the masonry work remains on both banks of the slip dock. The results of the studies will then be used to conserve, restore, and reinforce these elements. These above surveys will be conducted by Nagasaki City under the cooperation with MHI Nagasaki Shipyard.

(b) Historical document surveys

Under the cooperation with MHI Nagasaki Shipyard, Nagasaki City will survey historical documents relevant to the remains to gather basic information necessary for clarifying the nature of each of the remains and methods for conservation, restoration, presentation and public utilization of the component part. The systematic collection of data can hardly be called adequate at this point, as only a few materials including old photographs have been confirmed. Accordingly, along with the existing study results, the collection of data will also cover not-yet-confirmed research results in related fields such as industrial history, architectural history, and industrial machinery.

(c) Detailed surveys of current state

While there are topographical maps of the current state, detailed drawings have not yet been made of the individual constituent elements, namely, the hauling hut, hauling machinery, slip dock, and masonry work remains. Records have therefore not been collected of the current state of deterioration and problem locations. Nagasaki City and MHI Nagasaki Shipyard will implement creating detailed drawings of current state of remains and recording of problems of the individual constituent elements.

(d) Monitoring

Nagasaki City and MHI Nagasaki Shipyard will create monitoring charts for comprehensively and systematically collecting information on constituent elements, and use them to keep track of the state

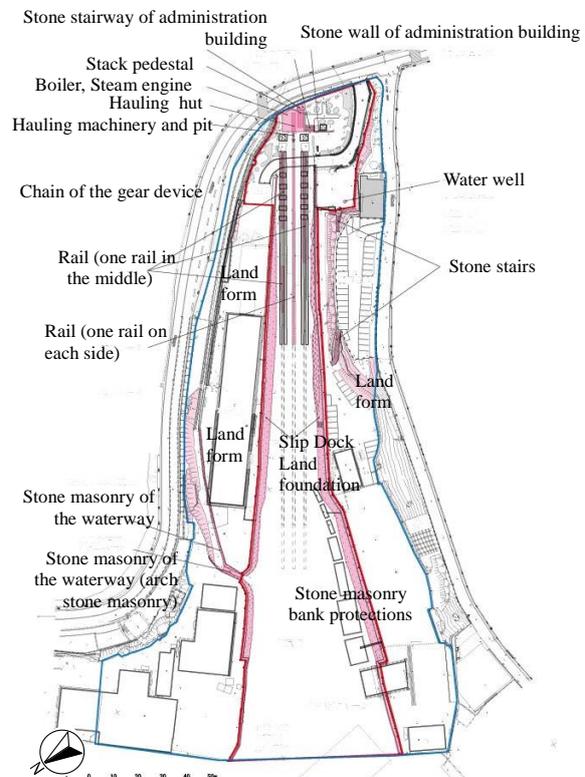


Figure 2: Constituent elements of Kosuge Slip Dock

of and changes to the component part. The results will be analyzed yearly based on monitoring indicators, and annual report will be made to the Nagasaki Conservation Council (for non-working properties) asking for its views. The results will also be reflected in the phased conservation, restoration, presentation and public utilization methods for each constituent element. The monitoring results from monitoring charts will be designed to be useful in particular when renovating the building and remains, with the instruction and advice of experts.

(2) Conservation and restoration

(a) Scope

Under the cooperation with Nagasaki City, MHI Nagasaki Shipyard will implement conservation and restoration (maintenance, repair and renovation) focusing on constituent elements from the Meiji operating period that contribute to the Outstanding Universal Value. Methods for conservation and restoration of constituent elements from the Showa operating period will also be studied in detail based on survey results.

(b) Basic concept and methods

➤ **Hauling hut**

The environmental conditions in the area around the hauling hut, where deterioration of the wall bricks is advanced, will be listed and measures will be taken especially to prevent water permeation and inflow from outside into the bricks and building. Bricks that have deteriorated due to water permeation will be repaired, drainage measures will be taken to collect and drain rainwater and groundwater seeping into the building, and aseismic reinforcement of the building itself will be implemented.

➤ **Hauling machinery**

Machinery in the hauling hut remaining from the Meiji operating period, including the boiler, steam engine, gears, and chains, will be maintained and repaired. Particular attention will be paid to improving the situation whereby rainwater and groundwater collect in the pit and overflow in rainy weather.

➤ **Slip dock**

In determining priorities in repairs, the following factors are to be considered: value classified as belonging to the Meiji or Showa operating periods; environmental conditions classified as belonging to non-inundation or inundation areas; the state of deterioration of steel objects due to rust (surface rusting, surface flaking or layer flaking, overall swelling). Having considered these factors, priority will be given to places belonging to the Meiji operating period, showing surface rust and/or surface flaking, and located in non-inundation areas.

➤ **Stone masonry**

Focusing mainly on the stone masonry bank protections and stone stairs involved in both the Meiji and Showa operating periods, changes up to now will be clarified, and regular monitoring will be conducted to check for changes in the state of stone masonry (looking for swelling, loosening, stone cracks, missing stones, shifting of position, etc.). For cases requiring urgency,

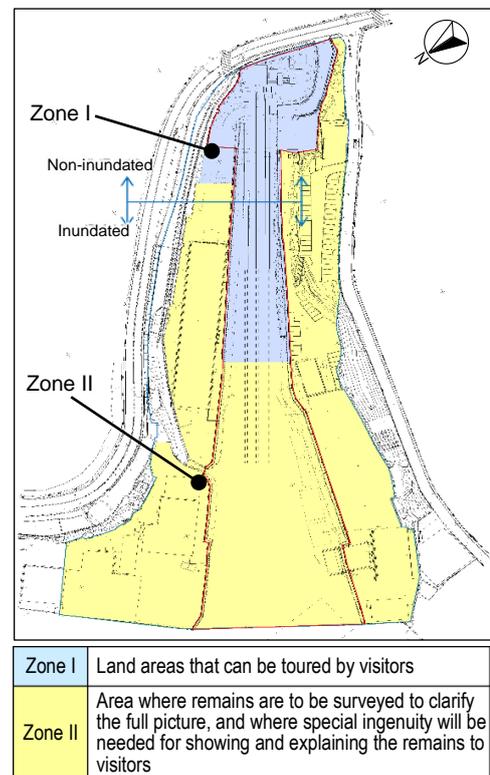


Figure 3: Zoning of component part and surrounding area

a minimum extent will be defined and the stone structure will be restored with dismantling.

(3) Presentation and public utilization of the shipbuilding and repair systems in view

Dividing into the following two zones, under the reciprocal cooperation, MHI Nagasaki Shipyard and Nagasaki City will carry out presentation and public utilization for the purpose of indicating and explaining the Kosuge Slip Dock remains in the shipbuilding and repair systems.

Zone I is defined as the area where remains from the Meiji operating period are still to be found, and consisting of land areas that can be toured by visitors. Zone II is the area where remains are to be surveyed to clarify the full picture, and where special ingenuity will be needed for showing and explaining the remains to visitors.

(i) Flow lines

At this component part, part of a site where corporate activity is taking place will be opened to the public. Since crossing of visitor movement with this corporate activity cannot be avoided, flow lines will be designed that enable corporate actors to readily predict the movement of visitors. These visitor flow lines will be made clear to visitors by means of guidance signs, etc., and visitors will be able to tour, obtain explanations, and view the remains along the prescribed route (see Figure 4).

(ii) Terrain modification/environment improvement

No new terrain modification will be carried out, as the existing terrain and pavement will be used. However, paths will be set as visitor flow lines and fences showing deterioration will be removed.

(iii) Arranging and improving landscape and planting vegetation

The main focus of explanations to visitors will be the slip dock rails, stone masonry bank protections, and the hauling hut and hauling machinery itself. To prevent obstruction of the view of the slip dock and hauling hut, not only on the site but from ships in Nagasaki Port, cherry trees impacting the building will be delimbed and azaleas and other plantings will be trimmed back.

(iv) Guidance and explanatory facilities

Nagasaki City will continue to provide the guidance and explanations currently being provided with the cooperation of the local Kosuge community association. Along with installation of explanatory boards using illustrations and photographs, a Wi-Fi environment will be provided and mobile devices will be used to present content enabling visitors to compare the present-day landscape with that back when the dock was in operation.

(v) Administrative and utility facilities

Visitor surveys up to now have pointed to such issues as the relatively short time spent on the tour of the component part, and concerns about getting in the way of corporate activity inside the component part. According to the former issue, rest facilities etc. for visitors will not be provided for the time being.

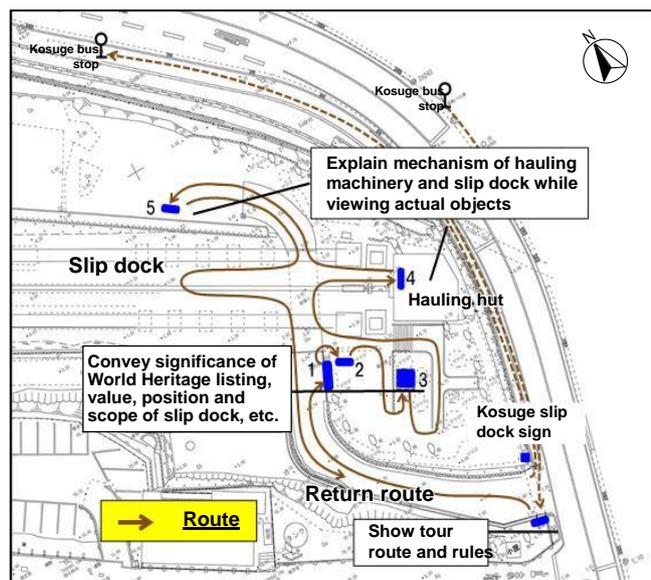


Figure 4: Tour route

(4) Arrangement and improvement for the buffer zone from the standpoint of scenic view

Buffer zone with radius of 500 meters has been set northwest of the component part, to prevent the erection of structures that might obstruct the view of the hauling hut from the sea. The land area of the buffer zone is protected by the Nagasaki City Landscape Plan (general area) formulated based on the Landscape Act, while the harbor area and sea portion are protected by the Ports and Harbor Act, as Nagasaki City and Nagasaki Prefecture are cooperating appropriately in conservation and restoration of the component part. Moreover, since the overall Kosuge Slip Dock terrain and the slip dock as part of the landscape can be visually recognized from the sea, MHI Nagasaki Shipyard will trim or remove trees and other plantings that might obstruct the view from ships headed for tours of Takashima Coal Mine and Hashima Coal Mine.

4. Project implementation

(1) Order of priorities

The projects implementation schedule is as shown in Table 1. Dividing the projects implementation period into a Short Term (first 5 years) and Medium to Long Term (6th to 10th years) periods, conservation, restoration, presentation and public utilization and promotion will take place in phases.

The following items will be given priority in the Short Term period.

· Measures to conserve hauling hut from rainwater and groundwater seepage; brick preservation measures	· Aseismic reinforcement of hauling hut
· Installation of pit drainage facility	· Hauling machinery conservation measures
· Slip dock rail and ship cradle rust-prevention treatment, etc.	· Creating detailed drawings of current state of masonry work remains and making repairs as needed
· Installing guidance and explanatory boards and route markers, and replacing entrance signs	· Trimming/removal of trees

In the Medium to Long Term period, excavation surveys will be carried out to seek possibilities for furthering the value of the heritage.

(2) Review of implementation schedule

After around ten years, the implementation schedule will be reviewed based on project progress to date. If the need arises for new action, revisions will be considered without waiting for ten years to pass.

(3) Other

MHI Nagasaki Shipyard and Nagasaki city has carried out conservation and restoration work, etc. for the Kosuge Slip Dock by securing necessary funds* making use of various subsidy programs available in FY2016 and FY2017, the first two years following inscription of the property on the World Heritage List. To ensure the smooth implementation of the project, it plans to continue such efforts to secure necessary funds in partnership with relevant institutions.

* Approximately 5 million yen was spent in FY2016 (including the amount spent for plan making) and 3 million yen has been budgeted for FY2017, both including the costs incurred or earmarked for the presentation and public utilization of the component part, but excluding the cost for day-to-day maintenance.

Constituent element	Main methods	I (2017-2021)					II (2022-2026)				
Hauling hut	Rainwater and groundwater seepage	■	■	■	■	■					
	Brick conservation	■	■	■	■	■					
	Aseismic reinforcement		■	■	■	■					
	Guidance and explanation facilities		■	■		■					
Hauling machinery	Pit drainage facility	■	■	■	■	■					
	Hauling machinery protection		■	■		■					
Slip dock	Rust-proofing of rails and ship cradle	■	■	■	■	■					
Stone remains	Creating detailed drawings of current state and making repairs as needed		■	■	■	■	■	■	■	■	■
Showing and promotion	Explanatory boards, route markers, entrance sign replacement		■	■		■					
Trees and plantings	Trimming/removal	■									
Left bank	Investigation of stone stairs, survey of related historical documents						■	■	■	■	■
Right bank	Tree trimming/removal						■	■	■	■	■

Table 1: Projects implementation schedule

5. Basic Plan

The basic plans for Kosuge Slip Dock project implementation items is as shown in Figure 5.

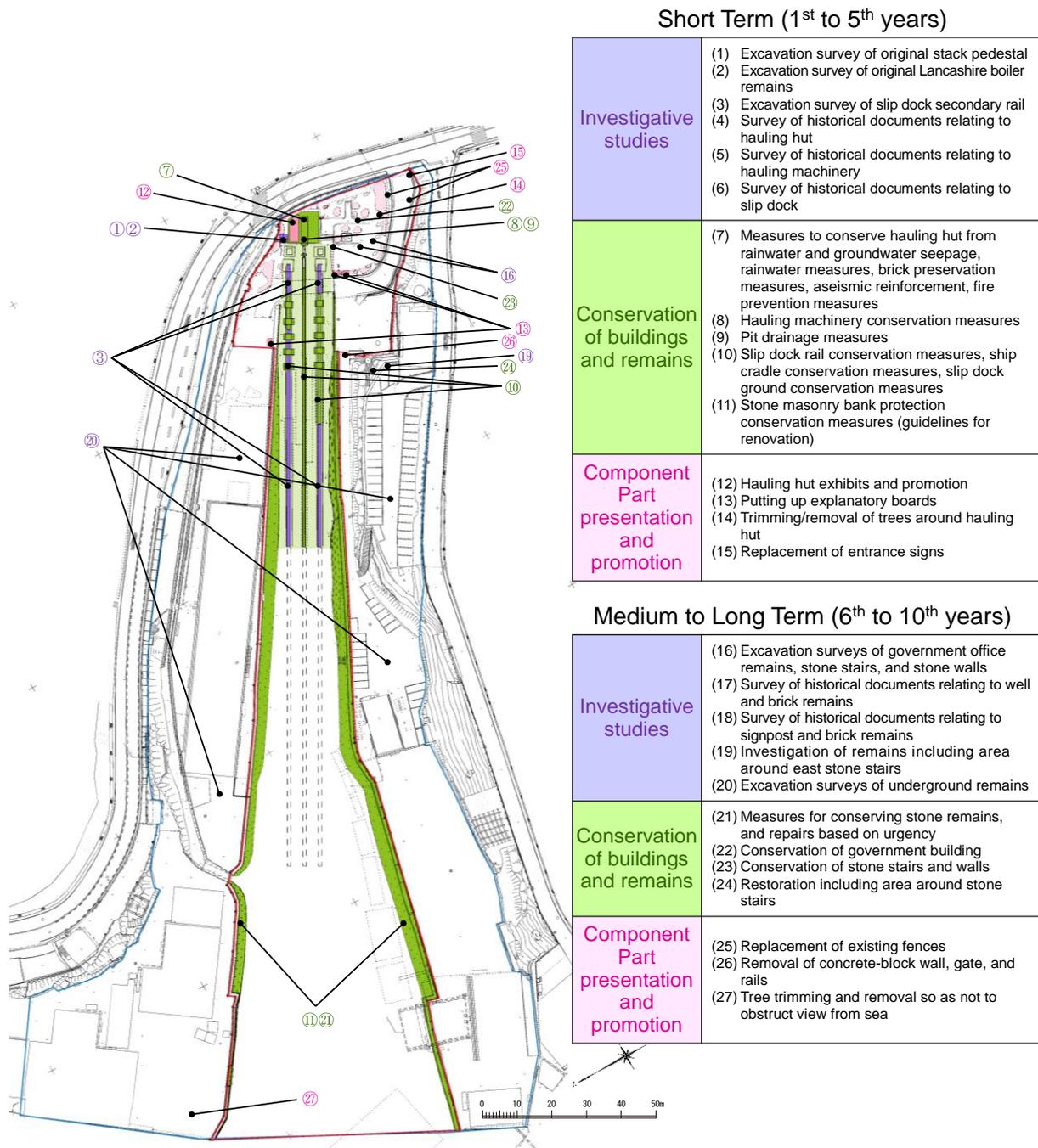


Figure 5: Basic plan (phased conservation, restoration, presentation and public utilization)

Component Part No. 6-6 of “Sites of Japan’s Meiji Industrial Revolution” Conservation, Restoration, Presentation and Public Utilization Plan for Takashima Coal Mine (Area 6 Nagasaki) (Abstract)

Nagasaki City drew up a Conservation, Restoration, Presentation and Public Utilization Plan for Takashima Coal Mine (hereinafter referred to as “Plan”) in FY 2015 and 2017, which became a source of “Conservation Work Programme” pursuant to Recommendation b) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2019. The Plan comprises detailed measures for the conservation, restoration, presentation and public utilization of the component part of the “Sites of Japan’s Meiji Industrial Revolution: Iron and Steel, Shipbuilding and Coal Mining” (hereinafter referred to as “Sites of Japan’s Meiji Industrial Revolution”). This document provides an abstract of the Plan.

1. Vision

By investigating, conserving and restoring the mine shaft and other archaeological remains and arranging and improving the landscape that recall the past when the modern coal industry was born in this place, the component part will be utilized as a resource for learning, for community promotion, and for researching.

The Nagasaki Area where the Takashima Coal Mine is located is home to eight of the 23 component parts. It has a special role that sets it apart from other Areas, in helping to understand the two eras in the three industrial fields of iron and steel, shipbuilding, and coal mining, namely, the period of directly introducing Western techniques and the period of establishing industrialization, as well as the interrelationship of these three fields.

The Takashima Coal Mine is the first mine in Japan to introduce modern coal extraction techniques. Along with the Hashima Coal Mine (Component Part 6-7) where the techniques were carried on, it played an important role in providing fuel for steamships and coking coal for iron and steel making, and as the founding place for the modern coal industry.

In Area 6 Nagasaki, the Takashima Coal Mine and Hashima Coal Mine can be regarded as an integrated site for experiencing the history of coal mining. Conservation, restoration, presentation, public utilization, and provision of information to visitors, will be carried out with consideration to the process of historical changes and developments of the component part in view, from the introduction of Western techniques in the early Meiji era to the period after the mines were closed, and focusing on the functions and links of the remains that enable understanding of the entire coal production system, including coal extraction and transport. The component part will also be used as a unique resource for telling the story of the “island” community that grew up during the period from when coal was being extracted to after the mine was closed.

(1) Conservation based on the characteristics of the remains and the current state

Most of the archaeological remains are buried under ground, and other than the mine shaft, many aspects have not yet been investigated. Excavation surveys will therefore be carried out

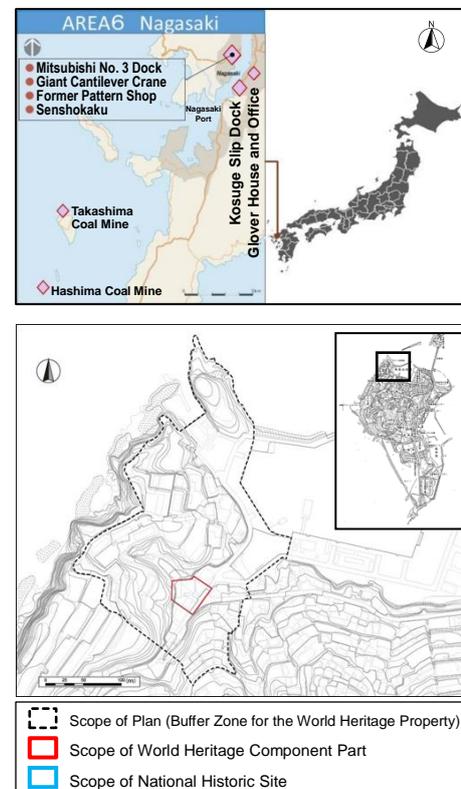


Figure 1: Location of the Site and Scope of Plans

regarding the underground archaeological remains other than the shaft, to the minimum necessary extent.

To avoid adverse impacts on the remains, day-to-day maintenance will be conducted, including small repairs, basically to improve and stabilize the mine shaft and surrounding environment.

Fragile remains that would be difficult to expose above ground for viewing will be kept as they are under ground, and their locations and scales will be presented by flat displays on the ground using other materials.

(2) Public utilization by diverse methods

Given the lack of compelling communication regarding the contribution of the Takashima Coal Mine to the World Heritage Outstanding Universal Value, and of its role as the starting place of the modern coal industry, the component part will be exploited as a resource for learning and community promotion. For this purpose, old photographs showing the state in the past when the mine was operating and explanatory boards will be placed, and facilities will be installed to introduce the results of excavation surveys. Provision will further be made of a view between the Takashima Coal Mine and former coal loading port, and guidance signs and routes will be set up to the second house of Thomas Glover and the former coal loading port, distant from the component part. In such ways, visitors will be able to envision the entire coal production system including coal extracting and transport.

To improve access to the component part on the island, ship and bus schedules will be revised, rental cycles and the like will be made available, and integrated tours of the entirety of Takashima Island and Hashima Island will be made possible, in such ways aiming to increase the number of visitors.

2. Policy

The policy consisting of following six items have been set toward achieving the Vision.

(1) Conducting investigative studies

Nagasaki City will seek to further awareness of the Outstanding Universal Value by continuing with surveys, including (1) field investigations and excavation surveys of the remains, (2) historical document surveys for clarifying the coal production system including extraction and transport, (3) landscape surveys of the World Heritage and surrounding area, and (4) surveys of visitors and their impact on the component part. One purpose for surveys of underground archaeological remains and ongoing historical document surveys is to clarify the individual functions and interrelationship of the Takashima Coal Mine and other mines located on Takashima.

In addition, the City of Nagasaki will conduct regular monitoring, using monitoring charts, to determine the state of the component part and its buffer zone, and will reflect the results in the annual report.

(2) Maintaining, strengthening, and stabilizing the remains in terms of the material, substance and structure

The city will conduct day-to-day maintenance, along with monitoring, mainly to improve the preservation environment so the remains can be kept in stable state. Phased reinforcement, stabilization and other conservation work will also be carried out, assigning priorities, based on an overall assessment of the role and deterioration state of each of the remains. Along with day-to-day maintenance of the mine shaft, future measures will be taken to prevent sand accumulation and to prevent collapse of the west steep slope.

(3) Showing and explaining the coal production system including extraction and transport

It will be necessary to foster understanding of not only the coal industry but also the interrelationship among three industries that are iron-making, steel-making and shipbuilding industries whose advances were made possible by coal. To this end, the city will convey to visitors the nature of the Takashima Coal Mine in the early days of Japan's coal industry development, making integrated use of the site including surrounding facilities. Among the means to be used are (1) posting of explanatory boards, (2) providing flat displays on the surface of the underground archaeological remains, (3) creating diorama models of the mine and surrounding facilities, (4) showing the locations of rail remains for coal loading, and (5) providing views

of the former coal loading port.

(4) Arrangement and improvement of the buffer zone from the standpoint of scenic view

Visitors will need to be able to recognize visually the broad expanse of the land on which the coal mining facilities were located in the past, centering on the mine shaft. To aid visitors in picturing the coal production system at the time, from coal extraction to transport and loading on ships, while comparing the site with old photographs, the city will ensure a view of the area between the Takashima Coal Mine and the former coal loading port north of it. For this purpose, plantings around the remaining mine shaft will be trimmed, and in the future, the wastewater treatment facility serving residents adjacent to the component part will be removed.

In the buffer zone, appropriate guidance will be provided regarding the appearance of dwellings and protective fences, etc. in consideration of the Component Part landscape.

(5) Utilizing the Takashima Coal Mine as cultural resource and for information communication in the Area

The city will create a viewing plaza with explanatory boards in the vicinity of the mine shaft, so that visitors can view the component part in the same direction as old photographs were taken in. Further, while using the existing Takashima Coal Museum on the island as a base for information dissemination, the entire island will be treated as a field museum of the Takashima Coal Mine and used as a resource for learning, community promotion, and research. Information provision will also be made in tie-ups with mine remains throughout Kyushu.

Visitor management rules will be set for those coming to the Takashima Coal Mine, in consideration of local residents, and visitor numbers will be regulated by controlling ship operation.

Along with establishment of mechanisms for supporting volunteers and other groups and the local community, the necessary human resources development will be carried out for training guides and those involved in conservation and surveys, etc., to ensure the component part is preserved into the future.

(6) Implementing projects

The city will draw up a project implementation schedule for ensuring each of the projects is carried out in phases and on time. It will include such matters as project deadlines, methods for implementing the project in phases, items to be carried out in each fiscal year.

At appropriate times, the city will review the schedule, while ensuring communication with the owners and managers of the land involved in the project, and confirming the project progress each year. As the body with overall responsibility for managing and operating projects as a whole, the city will coordinate with parties and organizations concerned, including advertising, holding of events, and working with stakeholders.

3. Methods

Specific methods for conservation, restoration, presentation and public utilization are indicated below. The city has the main responsibility for each of these items.

(1) Investigative studies

(a) Excavation surveys and on-site investigations

Excavation surveys will be continued for coal mining facilities including the underground archaeological remains around the mine shaft and the coal loading rail remains. In the future, all or part of the wastewater treatment facility now in operation for the adjacent community will be removed, and the entire coal production system from extraction to transport and loading will be made clear.

(b) Historical document surveys

After the Takashima Coal Mine was closed, many tunnels were developed on the island making use of and advancing the mining technology. The history of Takashima when it was thriving as a coal island will be investigated based on historical documents on the Takashima Coal Mine held by research institutions,

house organs of labor unions, and newspapers from the time. The historical document surveys will provide the role of the Takashima Coal Mine, covering such aspects as the significance of Takashima mines, including the Hashima Coal Mine, for the history of technology, the relation to steelmaking and other industries, and the relation to other coal mines in Japan.

(c) Surveys of visitor numbers and behavior

Surveys will be conducted to verify the effectiveness of the project and determine the impact of visitors on the state of the remains on and under the ground. The results will be reflected in better ways of utilizing the component part of the World Heritage property. Visitor numbers and behavior will be surveyed as part of this effort.

(d) Monitoring

Monitoring charts have been created for comprehensively and systematically collecting information on the constituent elements, and will be used to keep track of the state of the component part and the buffer zone. The results will be reported to the Nagasaki Conservation Council, in accordance with the World Heritage operational framework, asking for its views. If any negative effects are detected and verified, measures will be taken to remove the causes or lessen the impact. The effectiveness of the measures will then be verified by conducting inspections.

(2) Conservation and restoration of buildings and archaeological remains

(a) Scope

Conservation (maintenance, repair and restoration) applies to the constituent elements of the component part contributing to the Outstanding Universal Value (Figure 2).

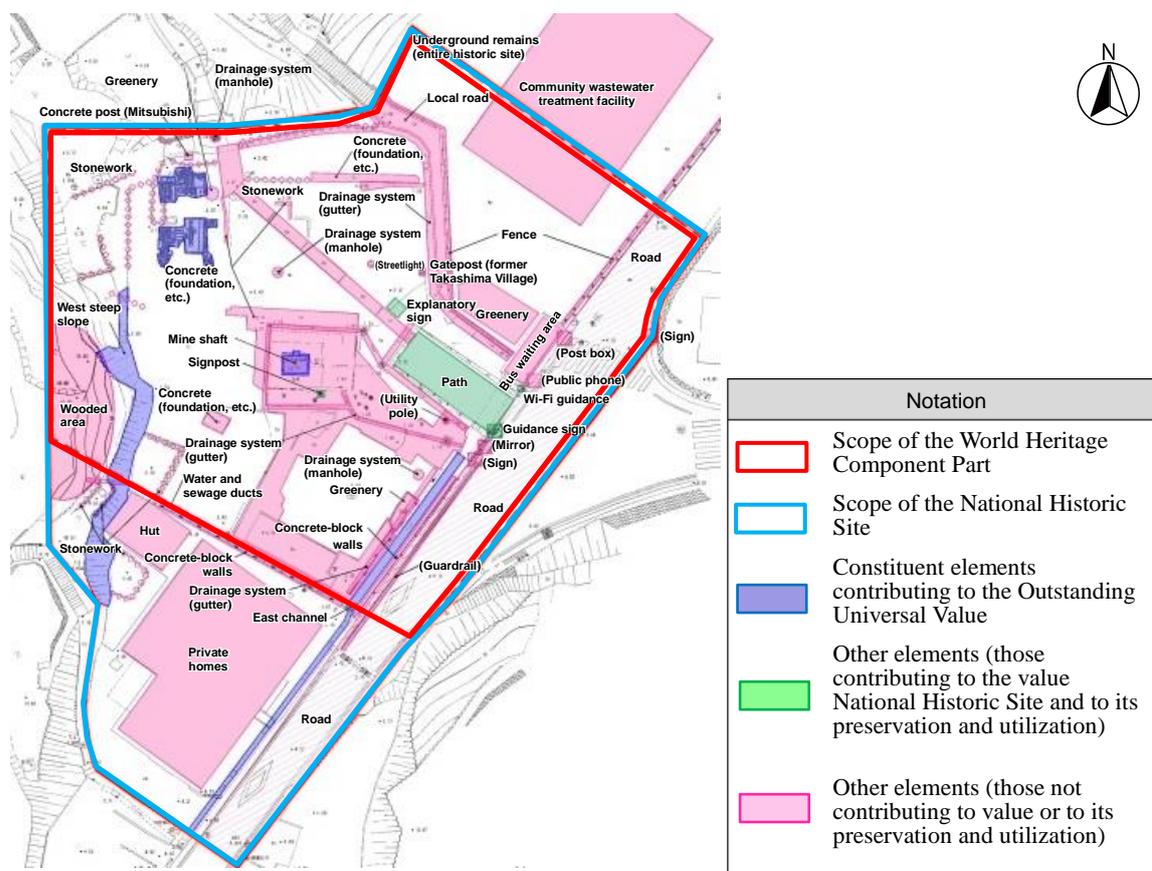


Figure 2: Constituent elements subject to conservation and restoration

(b) Basic concept and methods

➤ **Mine shaft**

For the time being, day-to-day maintenance including minor repairs will be carried out to prevent deterioration and keep the remains in stable condition. After the mine was closed, the mine shaft came to be used as a well and alterations were made to the frame and other parts exposed above ground. Materials that were clearly added later and that diminish the value of the mine shaft remains will be removed. To prevent sand accumulation in the mine shaft, measures will be taken to stop the inflow of rainwater, etc.

➤ **West steep slope**

The situation will be monitored regularly and records will be kept of the results. Day-to-day management of the steep slope will be carried out and trees affecting collapse will be trimmed, to ensure the remains are maintained in stable condition (Figure 5).

➤ **East water channel**

This channel remains as a concrete underground drain. For the time being, records of the current state will be kept and monitoring will be continued. If investigations make clear the original state, restoration will be carried out at that point in time (Figure 5).

➤ **Underground remains (entire area of the component part)**

The remains reburied after excavation surveys, such as the brick structures including chimney, the stone remains, and earthen remains, will be left in their buried state to prevent damage. The remains unearthed in excavation surveys of Takashima Coal Mine to be conducted hereafter will likewise be reburied, covered with protective earth layers of appropriate thickness, and preserved underground.

(3) Presentation of the entire coal production system in view, including extraction and transport

While expanding the scope for public utilization in phases, from Zone I to Zone III, utilization will be made as a resource contributing to school education and education of the public as well as for tourism.

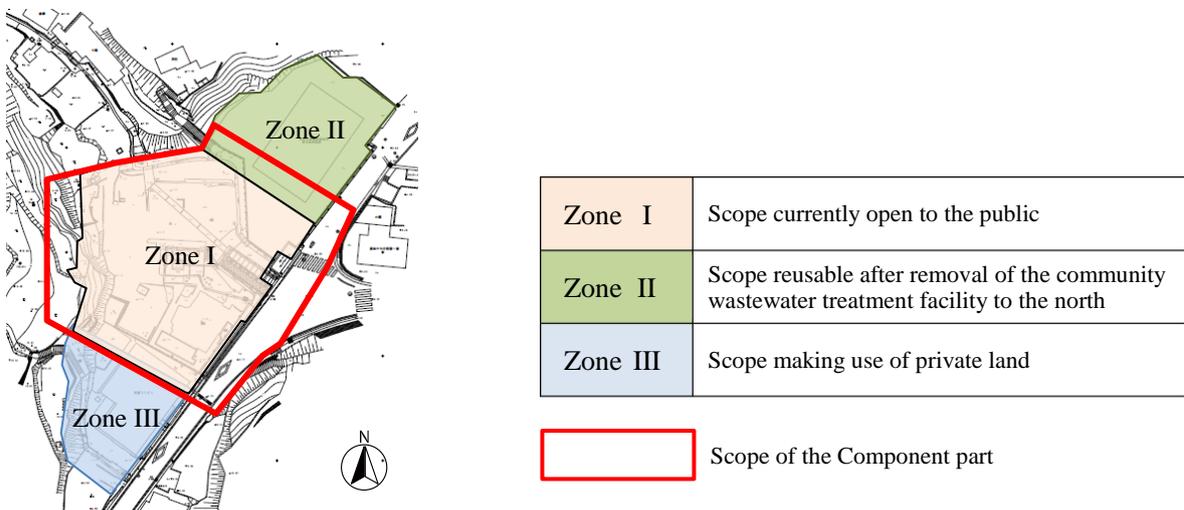


Figure 3: Zoning of the Component Part and surrounding area

(a) Visitors' flow lines

Visitors' flow lines will be set up in the component part linking learning points and other places where remains are displayed, etc., and it will guide visitors in stages to the former coal loading port in the north. Visitors' flow lines will also be set up connecting the Takashima Coal Mine to the former coal loading port and Glover's second house (Figure 6).

(b) Terrain modification/environment improvement

Outdoor paths will be paved with earthen material or other materials appropriate to the landscape.

A slope will be installed at the entrance to the component part.

(c) Arranging the landscape and planting vegetation

Trees near the west steep slope (Figure 5) will be trimmed and the slope will be stabilized. The water supply and drain pipes on the surface of the concrete block walls bordering the private land on the south will be obscured by shrub plants or by board fencing with a design like that seen in old photographs. Trees that threaten the preservation of the remains will be trimmed as needed, and no new trees will be planted.

(d) Guidance and explanatory facilities

Guidance and explanatory boards will be placed inside the component part and in the surrounding areas. The boards will have a uniform design and size befitting the landscape, and will include support for disabled visitors and multiple languages. As the scope of public utilization is expanded in phases from Zone I to Zone III, guidance and explanatory boards and guide markers leading to surrounding facilities will be installed. Guide markers will show the flow lines on the surface of paved walkways.

(e) Administrative and utility facilities

As the scope of public utilization is expanded in stages, an observation space will be installed on the site where the community wastewater treatment facility is currently located, north of the component part. Diorama models, explanatory boards and other facilities with guidance functions will also be set up (Figure 5).

Rest facilities will be installed in the park near Glover's second house, to the north of the Component Part, and visitor parking areas for cars and bicycles will be provided, as well as toilets and benches (Figure 6).

(4) Arrangement and improvement for the buffer zone from the standpoint of scenic view

In the buffer zone, electric wires, utility poles, protective fences, the community wastewater treatment facility, dwellings and other objects detrimental to the landscape will be arranged and improved, and a view will be provided between the Takashima Coal Mine and former coal loading port.

(5) Utilization of the component part as cultural resource and for information communication in the Area

(a) Providing information about the 23 component parts of the Sites of Japan's Meiji Industrial Revolution focused in Area 6 Nagasaki

The Former Mitsubishi No.2 Dock House located inside Glover Garden (a tourism facility where the Glover House and Office (Component Part 6-8) is located) will be used as a base for explaining the interrelationship of the 23 component parts, mainly those in Area 6 Nagasaki, and the historical background.

(b) Utilization of the whole island as a field museum related to Takashima Coal Mine

A guide course will be set linking the Takashima Coal Mine and other mining remains on the island and the Nagasaki-city Takashima Coal Museum and other related facilities, treating the entire island as a field museum related to Takashima Coal Mine.

4. Projects implementation

(1) Order of priorities

The city will draw up a 30-year projects implementation schedule starting from the year 2018. The plan is divided into three phases of ten years each. The priorities and overall plan are subject to revision based on such factors as the results of investigations and monitoring and progress in purchasing up private land on the south side. Urgently needed conservation and restoration work will be carried out whenever necessary.

The city will proceed with conservation and restoration work in the following order: (1) the scope currently open to public utilization (Zone I), (2) the scope that will become reusable after removal of the

community wastewater treatment facility (Zone II), and (3) the scope of the land where the community wastewater treatment facility existed and of usable private land (Zone III). The following items will be given priority in Phase I.

- Removal of unnecessary facilities harming the Outstanding Universal Value
- Trimming of trees on the west steep slope that may lead to collapse of the slope, etc.
- Setting up observation space and explanatory boards that convey value and promote proper understanding

(2) Review of implementation schedule

Around the time Phase I has completed (10 years), the implementation schedule will be reviewed based on project progress to date. If the need arises for new action, revisions will be considered without waiting for ten years to pass.

(3) Other

The city has carried out conservation and restoration work, etc. for the Takashima Coal Mine by securing necessary funds* making use of various subsidy programs available in FY2016 and FY2017, the first two years following inscription of the property on the World Heritage List. To ensure the smooth implementation of the project, it plans to continue such efforts to secure necessary funds in partnership with relevant institutions.

* Approximately 27 million yen was spent in FY2016 and 14 million yen has been budgeted for FY2017, both including the costs incurred or earmarked for the presentation and public utilization of the component part, but excluding the cost for day-to-day maintenance.

Category	Project implementation items	Phase I (1st to 10th year)		Phase II (11th to 20th year)	Phase III (21st to 30th year)
		1st half	2nd half		
Conservation	(1) Ongoing survey of underground remains	←→		←→	←→
	(2) Reburying following excavation surveys	←→		←→	←→
	(3) Removal of facilities diminishing the Outstanding Universal Value	←→		←→	←→
	(4) Measures for maintaining state of west steep slope	←→		←→	←→
	(5) Measures for preventing sand accumulation in the mine shaft			←→	
Presentation and public utilization	(6) Installation of communication facilities	←→			←→
	(7) Placing of guidance signs and route markers leading to former coal loading port, and environment improvement	←→			
	(8) Recording and classification of archaeological remains and relics	←→			←→
	(9) Communication of classification results	←→			←→

Table 1: Project implementation schedule

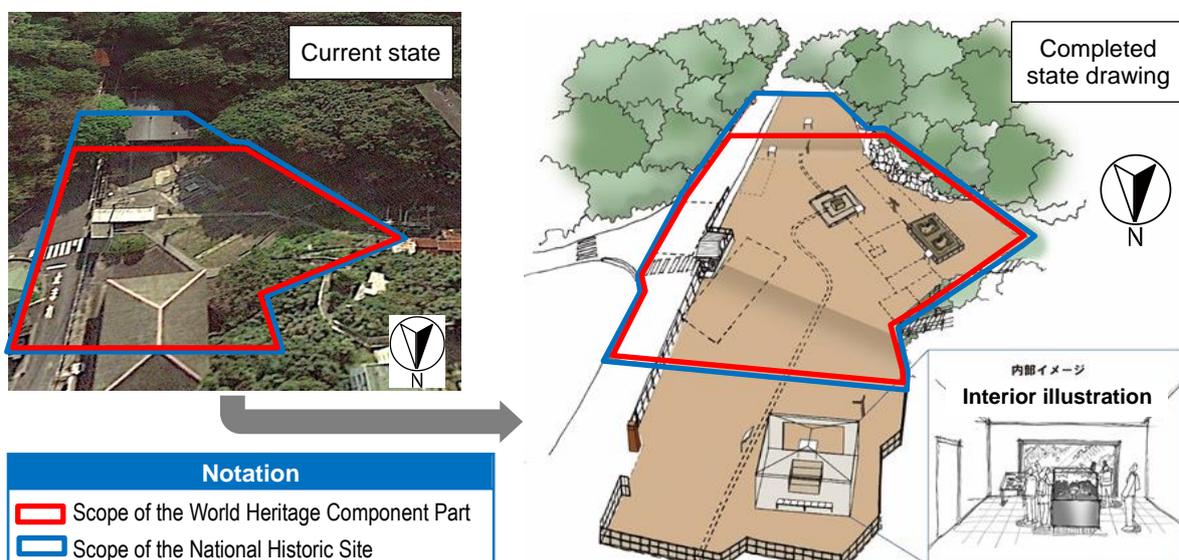


Figure 4: Conceptual drawing of Takashima Coal Mine conservation, restoration, presentation and public utilization

5. Basic Plans

The basic plan showing Takashima Coal Mine projects implementation is given in Figures 5 and 6.

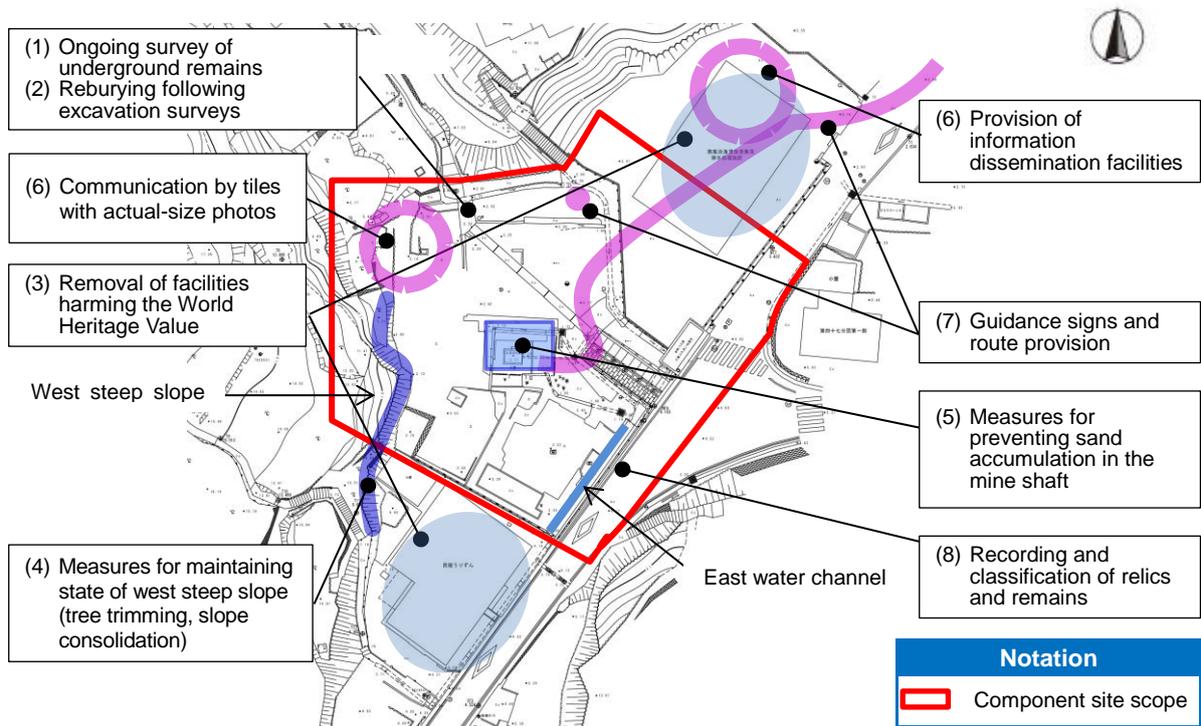


Figure 5: Takashima Coal Mine Plan (numbers correspond to Table 1)

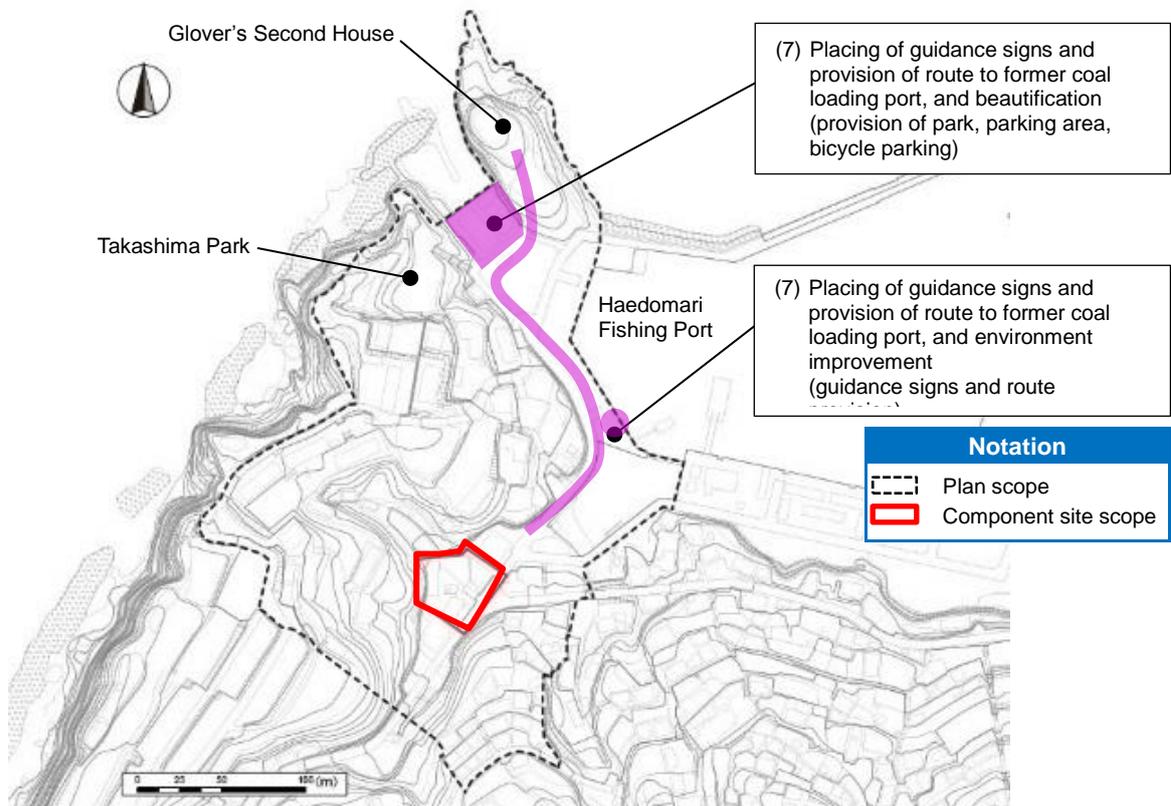


Figure 6: Takashima Coal Mine Periphery Plan (numbers correspond to Table 1)

**Component Part 6-8 of the “Sites of Japan’s Meiji Industrial Revolution”
Conservation, Restoration, Presentation and Public Utilization Plan
for Glover House and Office (Area 6 Nagasaki) (Abstract)**

Nagasaki City drew up a Conservation, Restoration, Presentation and Public Utilization Plan for Glover House and Office (hereinafter referred to as “Plan”) in FY 2016 and 2017, which became a source of “Conservation Work Programme” pursuant to Recommendation b) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2015. The Plan comprises detailed measures for the conservation, restoration, presentation and public utilization of the component part of the “Sites of Japan’s Meiji Industrial Revolution: Iron and Steel, Shipbuilding and Coal Mining” (hereinafter referred to as “Sites of Japan’s Meiji Industrial Revolution”). This document provides an abstract of the Plan.

1. Vision

Restore the deteriorated sections of the house in which Thomas B. Glover resided and did business to inherit them for future generations his role in the industrial revolution of Japan during the Meiji Era and the overall value of Nagasaki's foreign settlement, including this house, as a stage for introducing Western technology to the nation.

Area 6 Nagasaki of the "Sites of Japan’s Meiji Industrial Revolution" constitutes eight of the 23 component parts, including Glover House and Office. The Area is unique for encompassing the stages of the direct importation of Western technology and of the full-blown industrialization of Japan, and is uniquely positioned to provide an understanding of the mutual connections between the iron and steel, shipbuilding, and coal industries.

Thomas B. Glover, a Scottish merchant, brought Western technology to Japan and cultivated human resources by helping Japanese nationals to study abroad. He played a pivotal role in Japan's industrial revolution during a short period of about half a century of from the end of the Edo period through the Meiji Era. Glover House and Office was his residence and a place of commerce, on a top of hill overlooking Nagasaki shipyard within a foreign settlement created when the port opened to Western trade at the end of the Edo period. It is the oldest surviving Western-style wooden house in Japan. The townscape and views of Glover House and Office and the Nagasaki foreign settlement that ushered in Western technology are still intact. Nagasaki City will preserve the district for future generations as an important tourist destination in company with residents.

(1) Conservation and restoration of Glover House and Office based on its characteristics and current state

The house served as a residence and base for the trading and cultural activities of Glover, who shaped the development of Japan's coal and shipbuilding industries. Nagasaki City will improve the present state addressing the causes of deterioration, while the city will restore building to its original design during the Meiji Era. Another goal is to have the masonry, cliff, and other elements of the landscape look as they would have when Glover lived at the house.

(2) Promotion by diverse methods about Glover House and Office

As well as reviewing pamphlets, explanation boards, the website, and other content, the city will endeavor to provide a new information delivery measures through mobile devices so people can compare the contemporary landscape with how it looked in old photos. The city will disseminate information focusing on the architectural historical value of Glover House and Office and the relationship between component parts of the Sites of Japan’s Meiji Industrial Revolution and Glover

himself. In the Glover Garden, as well as this residence, there are national important cultural properties Ringer House and Alt House, and other Meiji Era historic buildings relocated to Glover Garden. The city will update information to clearly present differences in the historical backdrops and value of these buildings.

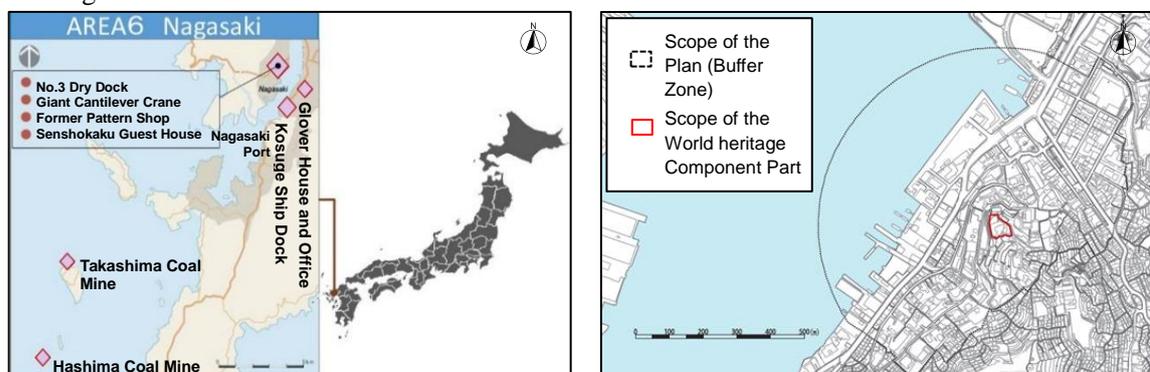


Figure 1. Component part location in Area 6 Nagasaki and scope of the Plan for Glover House and Office

2. Policy

The policy of the conservation, restoration, presentation and public utilization are set based on the six items below.

(1) Conducting investigative studies

Nagasaki City will explore the historical documents to clarify the original usage of Glover House and Office and assess current rainwater drainage channels around the house. It will investigate visitor numbers and behavior to evaluate the current state of visitors and the impact on the component part. The city will also evaluate the conditions of the constituent elements of the component part and the buffer zone by periodically conducting follow-up observations through monitoring charts, reflecting the findings in the annual report.

(2) Preserving, reinforcing, and stabilizing the buildings and remains in terms of material, substance, and structure

Based on the results of aseismic assessment of Glover House and Office in FY 2016, Nagasaki City will undertake restore and earthquake resistance measures in FY 2018. Degradation of the walls, floors, wallpaper, and other parts of the building has progressed since the building became constantly open to the public as a tourism resource. After restoration, the city will endeavor to stabilize the building's stable condition through appropriate cleaning and other ongoing daily maintenance and mitigating the cause of the deterioration by installing air conditioners to enhance the indoor environment. It will also alleviate the impact of visitors' tread pressure on the facility by managing visitor flows in a given direction.

(3) Indicating and explaining contributions of the component part to the industrial revolution

Glover House and Office embodies two eras defined under the concept of the Outstanding Universal Value of the property. The first was that of the direct importation of Western science and technology and the second was that of the full-blown industrialization. To inform visitors properly the fact that Glover has direct ties with the coal and shipbuilding industries, notably through the development of the Takashima Coal Mine and construction of the Kosuge Ship Dock, and that he had great achievement toward Japan's industrialization, Nagasaki City will put up information boards and other installations, train guides, and enhance guide presentations.

(4) Arranging and improving the buffer zone from the standpoint of scenic view

The city aims to reproduce views of Nagasaki Port and the Nagasaki Shipyard of Mitsubishi Heavy Industries on the opposite site reminiscent of the time between the end of the Edo Period and the Meiji Era, when Glover flourished. It will recreate the garden below the northwest of the house at that time based on the results of studies of historical photos. While the construction dates of the barn and stable adjacent

to the house are unknown, the city will repair degraded parts and open the interiors to the public. The city will endeavor to maintain the masonry, cliffs, and other elements of the settlement terrain, logging, removing, and pruning trees, and keeping the views tastefully integrating with buildings in the Glover Garden.

(5) Utilizing the Former Glover House and Office as a cultural resource and base of information dissemination in the Area

The city will display exhibits, including the history of Nagasaki city, inside buildings in Glover Garden through the designated administrator, and utilize the garden as a base for disseminating information about the Sites of Japan's Meiji Industrial Revolution. The city has positioned the Former Mitsubishi No. 2 Dock House in the Glover Garden as a guide facility for the Sites of Japan's Meiji Industrial Revolution, and will explain other component parts in Area 6 Nagasaki and in other Areas.

(6) Implementing projects

The city will ensure a carefully phased implementation of this Plan by formulating a projects implementation schedule that encompasses the project term, staged projects implementation method, and annual project agenda. The city will confirm projects progress every year while communicating with relevant managers and stakeholders to the scope of the Plan, review the projects implementation schedule at the appropriate times. In its supervising role for operating the progress of the projects for the component part, including for public relations, events, and stakeholder coordination, the city will liaise with stakeholders and related organizations.

3. Methods

(1) Investigative studies

(a) Document surveys

Surveys comprise the items as follows: comprehending the process of historical changes and developments of the buildings and the compound of Glover House and Office, the determining the scope of the residential compound owned by Glover and the location of the main gate and approaching route to it at that time, identifying external facilities including the garden at that time based on old photographs, assessing the tree impacts on the masonry and other aspects of the environs for their pruning and cutting, identifying the course of rainwater drainage channels around Glover House and Office and their extents at that time, exploring the history of the furniture currently on display inside the buildings, determining the time when the barn and stable were constructed, and studying the activities in Japan of Glover himself, including in terms of the relationship between him and component parts of the Sites of Japan's Meiji Industrial Revolution.

(b) Surveys of visitor numbers and behavior

As well as assessing the effectiveness of the projects implemented, the city will study visitor numbers and behavior to identify the negative impact made by the visitors on the buildings and compound and reflect the findings in better utilization of this component part of the World Heritage property.

(c) Monitoring

The city will produce monitoring charts that comprehensively and systematically consolidate information on the state of constituent elements within the component part and regularly assess the condition of the component part and the buffer zone. The monitoring results will reflect in an annual report, submitting it to the Nagasaki Conservation Council based on the management structure of this World Heritage property and seek opinions from that body.

(2) Conservation and restoration

(a) Scope

Scope for conservation and restoration work will focus on the constituent elements of the Glover House and Office that contribute to the Outstanding Universal Value of the World Heritage property.

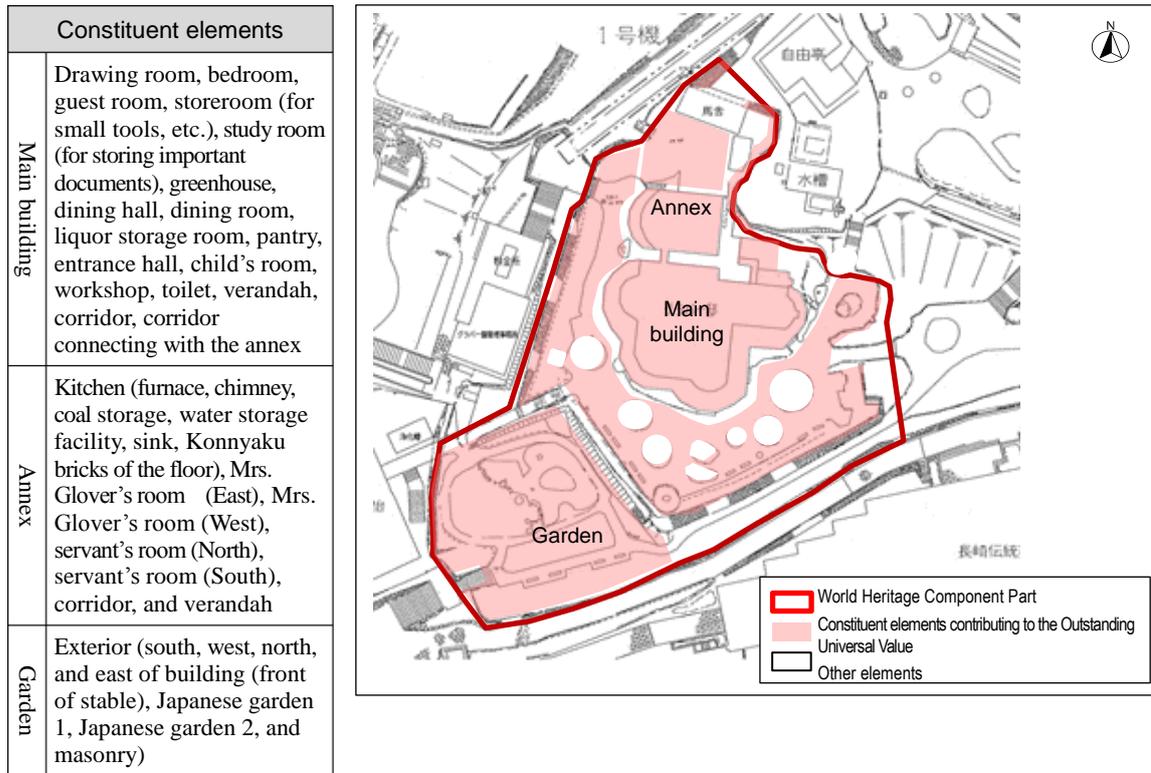


Figure 2. Constituent elements subject to conservation and restoration

(b) Basic concept and methods for conservation and restoration of Glover Garden as a whole

Maintenance and management will entail restoring ceiling paper, exterior wall plaster, and exterior paint, periodically cleaning the gutter and roof, and cutting and pruning trees that are not vital to the landscape. In line with aseismic reinforcement and restoration after FY 2018, the city will review and update the disaster preparedness equipment and revise indoor exhibits. The barn and stable will be opened after restoration. The city will assess and study old photographs of the Japanese garden around Glover House and Office and restore the garden to how it looked in the age set for restoring the main and attached buildings.

(3) Public Utilization

(a) Zoning

The city will properly inform visitors of Glover's great contributions to Japan's industrialization as well as use Glover Garden overall to disseminate information about the Sites of Japan's Meiji Industrial Revolution by dividing Glover Garden into A, B, and C zones (see Figure 3) and improving the environment and arranging the views for each zone.

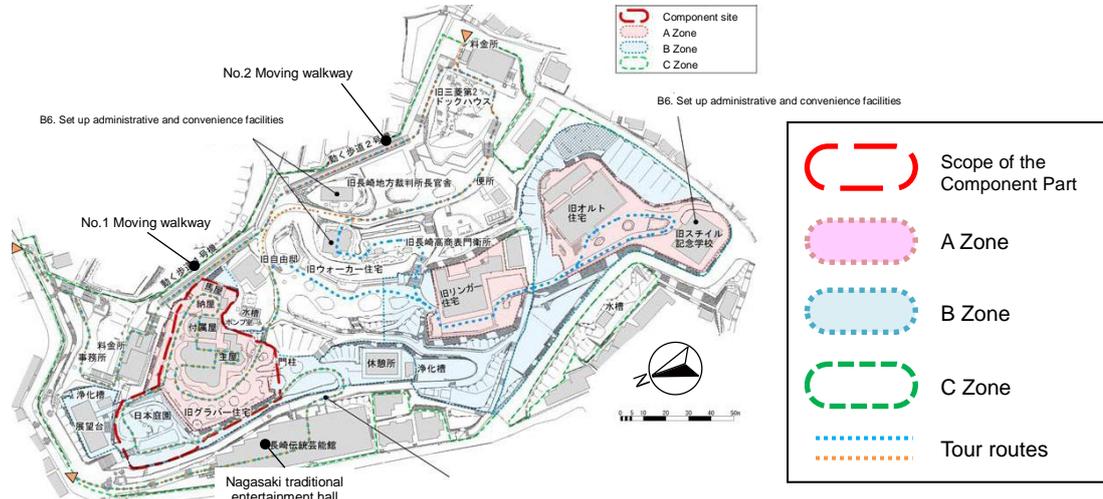


Figure 3: Glover Garden zoning

(b) Tour routes

Once inside Glover Garden, visitors will be guided to the Former Mitsubishi No. 2 Dock House at the top of the park to be informed about the Outstanding Universal Value of the World Heritage property consisting of 23 component parts and the positioning of the Glover House and Office in that. Visitors will thereafter be guided to Glover House and Office through viewpoints overlooking Nagasaki Port and the Nagasaki Shipyard of Mitsubishi Heavy Industries on the opposite side (Figure 3). Inside Glover House and Office, there will be a tour route guiding visitors from the entrance to private areas through the public space (Figure 4).

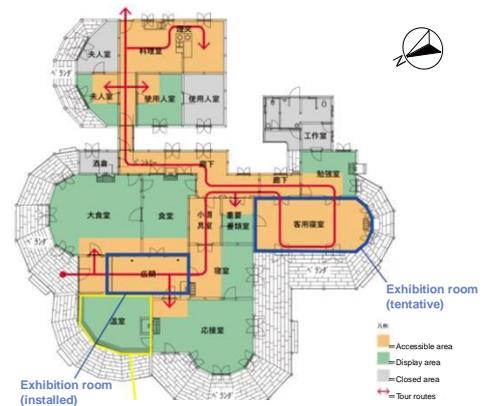


Figure 4: Tour route inside Glover House

Note: Visitor management approach regarding site utilization

Nagasaki city will formulate the following visitor management rules in opening the interior of Glover House and Office to the public while properly preserving structures.

- (i) Entry and exit will be through one location each.
- (ii) It will set up tour courses and post guidance signage indoors (Figure 4).
- (iii) It will install air-conditioning facilities in appropriate locations.
- (iv) It will regularly close the house or certain rooms to the public in some periods for repairs and cleaning.

(c) Terrain correction and environmental improvements

It has been confirmed that some of the masonry on the east of Glover House and Office is swollen, and repairs and restoration will be made as determined necessary through ongoing monitoring. No masonry in B or C Zones currently require restoration.

(d) Arranging and improving landscape and planting vegetation

Trees would be cut, replanted, or pruned to return the compound to its condition when Glover resided there where:

- (i) Having negative impact upon building maintenance
- (ii) Being significantly different from those in the garden when Glover was there
- (iii) Detracting from viewing the appearance of Glover House and Office
- (iv) Blocking the view of Nagasaki Port from the front garden of Glover House and Office

(e) Guidance and explanatory facilities

The Glover House and Office hall will be made the exhibition room, with commentary panels and digital imaging equipment showcasing Glover's activities and lifestyle. Based on future surveys and research findings, furniture that is contemporary with when Glover resided on the premises will be installed to transform the room appearance. The interior of the house and front garden will feature panels and replicas of old pictures and photographs and historical documents on the settlement. A consistent design and presentation approach will ensure that explanatory boards and guidance signs will not mar the landscape.

(f) Administrative and convenience facilities

For such structures as the tollgate, toilets, and Nagasaki traditional entertainment hall (Figure 3) in Glover Garden (C zone), and water storage tank, pump rooms, and other facilities, the city will undertake conservation and restoration in forms and colors fitting in the landscape of the former Nagasaki foreign settlement. At the same time, it will maintain and repair No. 1 and 2 moving walkways (Figure 3) in their current setup. As well as continuing to use the Former Mitsubishi No. 2 Dock House to provide information to visitors, the city will also employ other buildings designated as Important Cultural Properties and buildings selected as Historic Buildings in Glover Garden (Figure 3) as information and rest facilities.

(g) Public and utilization facilities

Nagasaki city offers lifelong learning programs. They include providing opportunities at Glover Garden to learn about Glover's accomplishments, producing guidebooks about the origins and history of Nagasaki foreign settlement, and tours of World Heritage component parts in the Area.

(4) Arrangement and improvement of the landscape in the buffer zone

To the extent permitted under existing laws and regulations, the city prunes and cuts trees that detract from the landscape of the buffer zone.

Nagasaki Prefecture's plan for the development, utilization, and preservation of Nagasaki Port (Nagasaki Port Plan) calls for constructing a new quay wall southwest of the existing quay wall of the Matsugae Wharf, located in the northwest of the Glover House and Office, enabling the wharf to accommodate two cruise ships (Figure 5). Due consideration will be given to the view of the port and its vicinity as the plan states as follows: "In order to conserve the historical and cultural value of Nagasaki Port to so that it deserves its designation as a World Heritage Site based on its contribution to the modernization of Japan, consideration shall be given to ensure the appropriate conservation of industrial remains that constitute a component part of the World Heritage Site in developing and utilizing the port." The construction of the new quay wall will enhance the view from the Glover House and Office overlooking the Nagasaki Shipyard of Mitsubishi Heavy Industries, Ltd. by allowing a cruise ship to be berthed at the new quay (Figure 6). The construction of a new passenger terminal or any other facility in the area behind the newly constructed quay, whether on existing or reclaimed land, would also enhance the view, because due consideration would be given to the form and design of any such facility pursuant to the criteria for landscape formation under the Landscape Act. Nagasaki Prefecture will proceed with the planned development of the Matsugae Wharf after ensuring, in consultation with the Nagasaki Conservation Council and other concerned parties, that the plan will not negatively impact

the Glover House and Office.

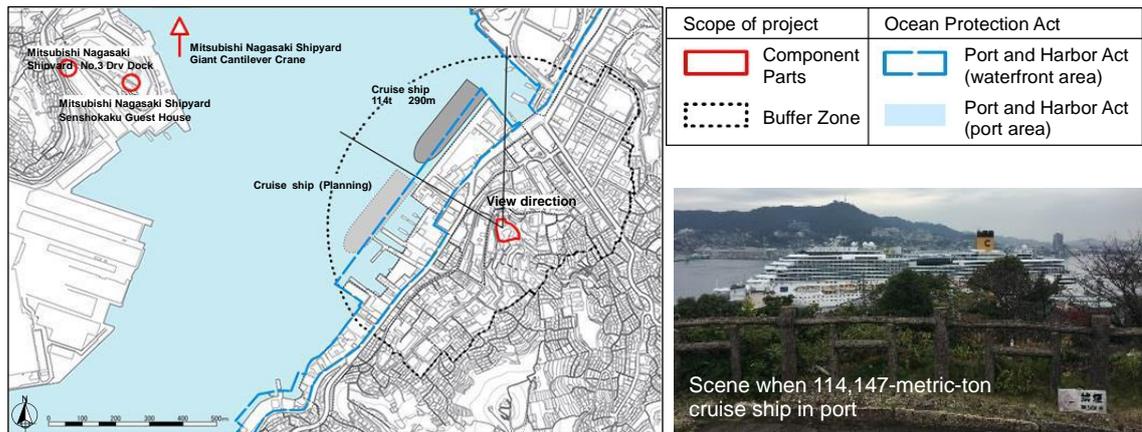


Figure 5: Location of Matsugae Wharf extension



Figure 6: Simulation of view after Matsugae Wharf construction

(5) Utilizing the component part as cultural resource and for information dissemination in the Area

(a) Information dissemination approach by networking traditional buildings

The city will install panels explaining the relationship between certain structures and World Heritage, where are utilizable building out of the 36 traditional buildings in the Nagasaki City Minami-yamate preservation district for groups of historic buildings, including Glover Garden. The city would also use rooms in the buildings for World Heritage training and other activities.

(b) Providing information on 23 component parts of the Sites of Japan's Meiji Industrial Revolution, focusing on Nagasaki Area

The city will use the Former Mitsubishi No. 2 Dock House in Glover Garden to explain the mutual relationships between the 23 component parts, historical backdrop, and other elements, mainly for the component parts in Area 6 Nagasaki.

4. Projects Implementation

(1) Order of priorities

Including for projects that are ongoing, Nagasaki city will determine a projects implementation schedule encompassing three phases over a total of 11 years. Phase I covers FY 2016 to 2020. Phase II will be FY 2021 to 2023, and Phase III will be FY 2024 to 2026 (Table 1). In three years from FY 2018, seismic reinforcement implementation design and reinforcement work will be concurrently conducted. Conservation and restoration of Glover House and Office is scheduled for completion during Phase I. Priority work during that phase would be as follows:

- Undertake conservation and restoration (external and interior finishes and exteriors) and aseismic

reinforcement work for main building and annex

- Survey and elucidate site boundaries (including through marker installations)
- Repair existing drains and construct new drainage channels
- Take chronological measurements of masonry and install explanatory boards
- Prune trees
- Install explanatory boards and digital video equipment and produce guidebook

(2) Revision of implementation schedule

The implementation schedule will be revised in line with projects' progress after 10 years. If new measures are necessary, the city will consider reviews without waiting for that time to elapse.

(3) Others

The city has carried out conservation and restoration work, etc. for the Glover House and Office by securing necessary funds* making use of various subsidy programs available in FY2016 and FY2017, the first two years following inscription of the property on the World Heritage List. To ensure the smooth implementation of the project, it plans to continue such efforts to secure necessary funds in partnership with relevant institutions.

* Approximately 24 million yen was spent in FY2016 and 13 million yen has been budgeted for FY2017, both including costs incurred or earmarked for the presentation and public utilization of the component part, but excluding the cost for day-to-day maintenance.

Project items		Phase I (2016 to 2020)	Phase II (2021 to 2023)	Phase III (2024 to 2026)		
A. Conservation and restoration	Buildings	Constituent elements	A1. Conservation of degradation			
			Design of conservation		=====	
			Repair conservation		=====	
		A2. Seismic reinforcement				
		Seismic assessment and seismic reinforcement estimate plan	=====			
		Seismic reinforcement implementation design		=====		
	Seismic reinforcement work		=====			
	Other	A3. Barn and stable restoration				
		Seismic assessment of natural store in the stable, and barn and stable restoration design		=====		
		Seismic reinforcement of barn and stable, and repairs to damage		=====		
Environment	A4. Clarification of Glover House and Office site					
	Survey and elucidation of site boundaries	Survey =====				
	A5. Rainwater drainage upgrades					
	Repair of existing drains and construction of new drainage channels	Survey =====				
B. Presentation and public utilization	Tour routes	B1. Establish route inside Glover House and Office				
		Establish tour route by considering original entrance		Survey and study =====		
		B2. Establish route in Glover Garden				
		Establish tour route		=====		
	Segment surface finishes of B and C zones			=====		
	Vegetation	B3. Pruning of trees and arranging of Japanese garden				
		Prune trees that detract from assets and landscape	Trees detracting from assets =====	Trees detracting from landscape =====		
		Restoration of a terrace in front of the building and Japanese garden on the lower terrace based on old photos		Survey and study =====		
	Guidance and explanation	B4. Exhibits in conservation area				
		Install explanatory boards, digital imaging equipment, and other items		=====		
		Install furnishings matching to the Meiji era		Survey and study =====		
		Disseminate information utilizing old photos inside and outside exhibition room		Interior Exterior =====		
		Use venue for Glover-related events	=====			
		Reproduce conditions at the time and display cannon models, and other items			=====	
		B5. Install outdoor signs with uniform designs				
	Install information boards and building explanatory boards		=====			
	Facilities	B6. Set up administrative and convenience facilities				
		Exhibit interiors of traditional structures and install furniture			=====	
Public presentation	B7. Maintaining masonry					
	Survey masonry period and install explanatory board	Survey =====				
	B8. Providing lifelong learning program					
	Prepare guidebook and other materials	=====				
Produce lifelong learning program	=====					

Table 1: Projects implementation schedule

**Component Part No. 6-7 of the “Sites of Japan’s Meiji Industrial Revolution”,
Conservation, Restoration, Presentation and Public Utilization Plan
for the Hashima Coal Mine (Area 6 Nagasaki) (Abstract)**

Nagasaki City drew up the Conservation, Restoration, Presentation and Public Utilization Plan for Hashima Coal Mine (hereinafter referred to as “Plan”) during FYs 2015 to 2017, which is a source of the “Conservation Work Programme” pursuant to Recommendation a) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2015. The Plan comprises detailed measures for the conservation, restoration, presentation and public utilization of the component part of the “Sites of Japan’s Meiji Industrial Revolution: Iron and Steel, Shipbuilding and Coal Mining” (hereinafter referred to as “Sites of Japan’s Meiji Industrial Revolution”). This document provides an abstract of the Plan.

1. Vision

The conservation work will be conducted to pass to the future generations the remains of the Hashima Coal Mine and coal mining community. The mine succeeded the mining technology of the Takashima Coal Mine, where Japan’s modern coal mining industry began, and developed as a base for undersea coal mining operations.

Area 6 Nagasaki to which the Hashima Coal Mine belongs encompasses eight of the 23 component parts of the Sites of Japan’s Meiji Industrial Revolution. These component parts relate to the shipbuilding and coal industries after the ban on building of large ships was lifted. All the sites are associated with Mitsubishi, founded by Yataro Iwasaki, who was employed in the Kaiseikan of the Tosa Clan, one of the central major clans in the Meiji Restoration, and with Thomas Glover, a driving force for industrialization from the end of Edo Period to the early Meiji era.

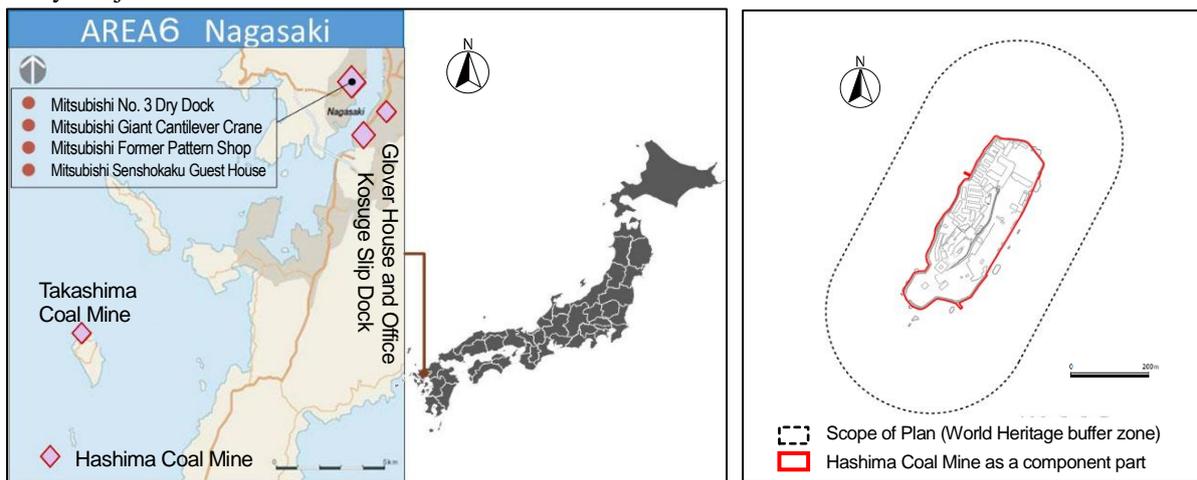


Figure 1: Location of the component part and scope of Plan

Coal supported the rapid industrialization of Meiji Japan, both as fuel for steamships and steam engines, and as coking coal for iron and steel making. The Hashima Island where the Hashima Coal Mine (Component Part 6-7) is located in approximately 3 kilometers southwest of Takashima Island, site of the Takashima Coal Mine. The Hashima Coal Mine belongs to the same mineral deposits as the Takashima Coal Mine (Component Part 6-6),

the first place in Japan to introduce a steam engine. The coal mining techniques of the Takashima Coal Mine were passed on to Hashima. As electrification was introduced, both coal mines came to ship stable supplies of large amounts of coal. Shipment of coal from Hashima began in 1891, and by 1897 it had surpassed Takashima in volume. As the amount of coal extracted grew, the coal wastes generated in the mining process were used to expand the landfill area around the island. The new land thus created around the rock of an island was surrounded by a fortress-like seawall to protect the island from high waves. At its peak, Hashima formed a coal mining community with the highest population density in the world.

The Hashima Coal Mine went into operation during the Meiji era and closed in 1974, and the following remains still stand aboveground and underground: (1) Seawall revetments and retaining walls that are remnants of the expanded and developed part of the island (2) Coal production facilities that were kept updated in keeping with technological progress (3) Reinforced concrete housing facilities built to accommodate the island's growing population. These remains ((1)-(3)) have not been properly maintained for more than 40 years since the closedown of the coal mine in 1974. Therefore, the buildings made of wood, steel, and reinforced concrete have fallen apart or irreversibly decayed. Since further damage and collapse are expected, the city will carefully consider the characteristics of these constructions and prioritize their conservation works.

In Area 6 Nagasaki, the Takashima Coal Mine and Hashima Coal Mine belong to the same mineral deposits, and can be seen as a unified resource enabling the history of the Mitsubishi coal industry to be experienced. From the standpoint of gaining an overall grasp of the Sites of Japan's Meiji Industrial Revolution, the seawall and the production facilities that continued to be renewed with progress in technology, which both contribute to the Outstanding Universal Value of a World Heritage property, will be preserved. In addition, the elements that tell us about the mining community at the time the industry was started up will be preserved as important elements for showing the history of the region, taking into account the course of historical changes and development of the Hashima Coal Mine, even though they do not contribute to the Outstanding Universal Value.

(1) Conservation of the remains based on their characteristics and present conditions

In implementing the conservation work for the Hashima Coal Mine, the following three points are important:

- 1) Ensuring the sustainment and preservation of the Hashima Island with its revetments and retaining walls in order to protect the landscape of the island, which provides the foundation for preserving the remains and remnants on the island.
- 2) Maintaining in a stable condition the remains that represent the intrinsic value of the National Historic Site and contribute to the Outstanding Universal Value as a World Heritage component part.
- 3) Maintaining the relict landscape of the Hashima Island, including its unique silhouette resembling a battleship when looked from afar as well as the close-up view of decayed abandoned buildings and structures



Figure 2: Conservation of the Hashima Coal Mine

The city will holistically look at each of the constituent elements in terms of these three principles and prioritize them to plan and carry out physical improvement measures. It is technically impossible at this moment to keep intact the remains of reinforced concrete production and housing facilities that are increasingly deteriorating and

damaged. However, the city plan to carry out conservation in stages, taking account of technical and financial issues.

The above three points can be rearranged as follows from the perspective of Outstanding Universal Value.

- 1) Conserve and restore constituent elements that contribute to the Outstanding Universal Value (including the Meiji era seawall revetment, and production facility remains) to keep them stable.
- 2) Apart from constituent elements that contribute to the Outstanding Universal Value, repair those elements that represent the intrinsic value of the National Historical Site (including concrete production and residential facility remains) to maintain the unique battleship-like silhouette, showcase the development and decline of the coal industry and preserve evidence of the realities of the community.
- 3) Make comprehensive and diverse evaluations and prioritize from a range of perspectives, including the state of deterioration of constituent elements, the availability or absence of applicable conservation techniques, the degree of contributions to the Outstanding Universal Value, the impact of other elements and visitor safety, and budget requirements, and commence restoration and conservation in phases.
- 4) Some steel reinforced concrete remains at the Hashima Coal Mine could be hard to conserve owing to advanced deterioration and damage. Although structural density will gradually decline of the long term, accord maximum care to maintaining the battleship-like silhouette when viewed from the surrounding sea.

(2) Setting up facilities for different ways of public utilization

It is needed to help visitors understand the process of formulating the island as an undersea coal mine and its closed down, the history of development and decline of the coal industry, and the role of Hashima as a component part of the World Heritage property. To achieve this, by wi-fi network, the city will provide videos that clearly illustrate what the mine in operation looked like, such as aboveground constructions removed when the mine closed, and realities surrounding the coal miners' community at the time.

2. Policy

The policy consisting of following six items has been set toward achieving the Vision.

(1) Promoting research and study

The city plan to launch the following projects in order to reaffirm and enhance the Outstanding Universal Value of the Hashima Coal Mine as a component part of the World Heritage property: studies of the remains (including excavation survey); studies of historical documents that show how the industrial (mining) system worked; studies of landscape of the component part and its surrounding; and studies of visitor number and their impact on the component part.

Furthermore, the city will conduct annual monitoring by using monitoring charts in order to assess the condition of the component part of the World Heritage property and its buffer zone. Then the city will provide the assessment and an annual report to the Nagasaki Conservation Council, and reflect the Council's feedback in the process of conservation, restoration, presentation and public utilization.

(2) Restoring the buildings and remains (preserving, reinforcing, and stabilizing materials, substance and structure)

In restoring and conserving buildings and remains, the city will prioritize work on constituent elements that contribute to the Outstanding Universal Value.

The Plan is primarily to make improvements on conservation efforts to ensure that the remains will continue to exist in stable condition, providing day-to-day maintenance work and conducting monitoring. Then the city will holistically assess the roles of the remains and degradation levels to prioritize the needs and provide conservation work such as reinforcement or stabilization, etc., in stages. Particularly, on the remains of seawall revetments of the coastline, coal production facilities and housing facilities areas, the city will continue

monitoring for any changes in the condition and take action if necessary to keep these remains. As for the remains of the coal production and housing facilities, the city will continue research for conservation, and restore the constructions according to the priorities to control degradation. The following are the policies on conservation work for the constituent elements:

- Seawall revetment remains in the coastline

The seawall revetment remains in the coastline play a critical role in protecting the whole of Hashima from ocean waves. Therefore, the city should give the highest priority to actions for keeping them from collapsing. The city will take measures to prevent collapse attributable to the degradation of the current state, thereby keeping these revetments soundly functioning. The view of the island that looks like a battleship at sea (i.e., the exterior and silhouette) will be considered to remain.

- Retaining wall remains in the coal production and housing facilities areas

A tableland was made to create enough space on the small island for mining facilities and residents' day-to-day living. Land was reclaimed by the ocean for expansion of the island five times during the Meiji era. It is inferred that these expansion projects pushed land and revetments by the water's edge inland. The retaining wall remains found across the island today are the traces of the expansion efforts. Since these constituent elements contribute to the Outstanding Universal Value, the city must prevent the collapse of these remains and keep them functioning. At the moment, the city have not found any spot in the remains that may lead to collapse and thus requires urgent conservation work.

- Production and housing facility remains

The city will repair and strengthen the reinforced concrete constructions to keep their structures and thereby retain the current shape. Since the characteristics and corrosion of the structures make it technically impossible to retain the shape permanently, the city will keep watch for advances in conservation technology to select the best possible means to preserve the remains.

The reinforced concrete structures of the housing facility remains suffer irreversible damage and degradation, and may collapse at any time. These buildings may be removed as an exception in order to ensure the preservation and safety of the other elements on the component part of the World Heritage property.

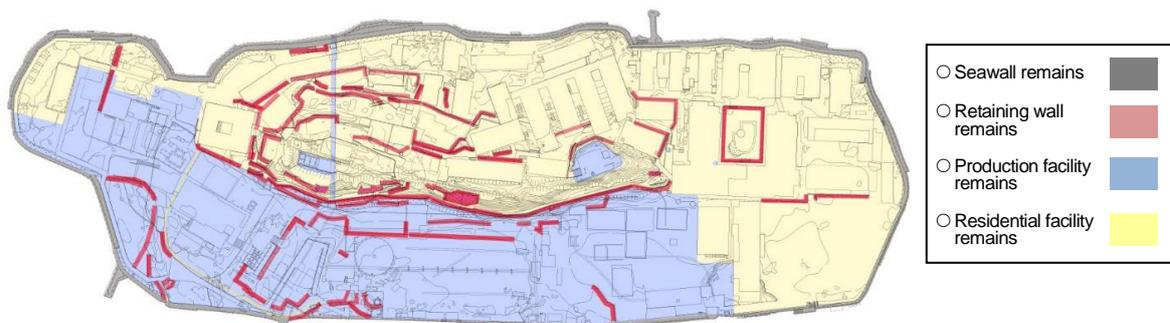


Figure 3: Constituent elements of Hashima Coal Mine

(3) Presentation of the mining system

The Hashima Coal Mine is related to the two phases of industrialization, the phase of direct importation of Western technology and the phase of full-blown industrialization. It is also closely involved in the interrelationship of three industrial fields, not only the coal industry itself but the iron and steel making and shipbuilding industries that developed thanks to coal. The Sites of Japan's Meiji Industrial Revolution, in addition to the Takashima Coal Mine and Hashima Coal Mine belonging to Mitsubishi and sharing the same mineral deposits, also include the Miike Coal Mine. The Mitsubishi mines have a particularly deep technological connection to the development of the Nagasaki Shipyard in the Mitsubishi Goshi Kaisha period. With the electrification of coal mining operations, the coal production infrastructure system was rapidly

developed, and large volumes of coal were shipped. The coal wastes generated as a result were then used to expand the landfill area around the island. The new land created around the rock of an island was surrounded by a fortress-like seawall to protect the island from high waves.

By the time the industry reached its peak, Hashima had formed a Mitsubishi coal mining community that was the most densely populated in the world. The mine housing built on the landfill-expanded island to support the work of the coal industry testifies to the Mitsubishi corporate culture behind the rapid industrialization of the time. New viewing plazas will be installed within the minimum scope needed for clearly conveying the nature of the facilities on the island at the time the mine was in operation, so that visitors can understand them. These facilities are not only those for mining (vertical mine shafts), transporting, and preparation of coal, and for stockpiling and loading coal, but also the entire coal production system such as for drainage, electrification, and powering the operations. The viewing plazas will be equipped with small wireless transmitters for communicating information to mobile devices. Visitor understanding will be further enhanced by tying in with existing facilities, such as the Takashima Coal Museum on the Takashima Island, and the Nagasaki City Gunkanjima Museum located in Nomozaki.

(4) Retaining better views (exteriors) of the island

The city aims to pass down how the coal mining started and developed from the Meiji era and to conserve the distinctive views (exteriors) of the island as an undersea coal mine, namely: (i) Current views of the coal production facility remains that represent the island's industrial structures (ii) Unique battleship-like views (exteriors) that consists of seawall revetments, coal production and housing facilities. (iii) Relict landscape of the ruins with degradation and damage further in progress.

As a rule, the city will maintain the upright bulkheads that constitute a significant part of long-distance views of the Hashima Coal Mine. Primarily for the sake of short-distance views, conservation work on any part of the structures visible from passages must be done in such a way that retains the colors, shapes, and textures of the current views as much as possible. Any equipment needed for reinforcement will be installed inside the structure if possible.

(5) Presentation and public utilization as a cultural resource and base for information dissemination

To make visitors understand the process of formulating the island as an undersea coal mine and its close, and the position of Hashima Coal Mine in the history of development and decline of the coal industry, the city will organize and compile records of remains and artifacts unearthed during research on underground archaeological remains. These records will be displayed at the Takashima Coal Museum located on Takashima Island and the Gunkanjima Museum.

The city also plan to offer technical and financial support for volunteer bodies and other action groups as well as local communities to provide training for tour guides, and research and conservation staff.

(6) Implementing projects

Nagasaki City will develop an Action Plan that covers project deadlines, implementation techniques for phased work, what to do during each of the fiscal years, etc.

To make sure that the conservation and utilization of the World Heritage component part will be properly managed and the projects for conservation, restoration, presentation and public utilization will methodically proceed, the city will check the progress of the project annually and share the information with people involved in the project. Moreover, since the city is the managing organization responsible for the operation of the overall component part that entails coordination between public relations, events, and stakeholders, the city will act as a liaison between people and organizations involved in the projects.

3. Methods

(1) Research and study

(a) Archaeological excavation and field study

Aboveground structures of the coal production facilities were demolished to be replaced by new facilities. This means that the coal production facilities continued to be upgraded. The housing facilities were also rebuilt anew after suffering a disaster or when their features needed upgrading. The masonry revetment remains were also rebuilt when a typhoon devastated them. Given these historical facts, it is unlikely that any of the original aboveground structures still remain, while it is likely that underground structures from that time still do.

For part that are likely to be the remains of production facilities from Meiji era, such as mine mouths and shaft winding areas, survey of underground remnants as much as possible during structural repair, etc.

(b) Study of historical documents

With the aim to clarify the production system at each period and grasp detailed information about production facilities, the way of operation and technology, the city will study documents archived at research institutes, labor unions' publications, newspaper articles at the time, and old videos and photographs to ensure that the city have accurate knowledge of the history of Hashima as a thriving island of a coal mine. The city will also work with citizen groups to interview former miners and their families to learn about the realities of their labor and day-to-day lives in Hashima at the time.

(c) Research on structural materials

The city will analyze the materials of the reinforced concrete, masonry, and brick structures and test their strength to scientifically assess the structures' degradation levels. The city also plan to research how to conserve regular and reinforced concrete structures as well as specific ways of conservation in the current environment where no essential utilities are available. Before any conservation work on structures, the city will survey the facilities and research their structures, and the ground upon which they are built in order to ensure the safety of on-site research and conservation work and to assess the safety performance of the structures. Comparative study with similar cluster housing facilities will also be undertaken.

(d) Research on the number and movement of visitors

The city will research the number and movement of visitors to assess the impact of intense tourism on the remains and reflect the results in better utilization of Hashima.

(e) Monitoring

The city will prepare monitoring charts that systematically collect complete information about the constituent elements of Hashima in order to regularly assess the current condition of the component part and buffer zone. The city will also compile the results of monitoring into an annual report to provide it to the Nagasaki Conservation Council for feedback in accordance with the operation system for the "Sites of Japan's Meiji Industrial Revolution". If any negative impact on Hashima and/or its buffer zone is found, the city will take action to eliminate the cause or to reduce the impact, conduct a follow-up inspection, and examine the effects of the measures the city have taken.

The city have surveyed the whole of the island with a 3-D laser (**Figure 4**), and will install four stationary cameras to record and monitor the current state. The city plans to identify individual spots on the remains of seawall revetments, coal production and housing facilities that are likely to need monitoring in order to measure any slant and widths of cracks every six months.



Figure 4:
3-D Model of Hashima
Coal Mine made from
3-D laser survey

(2) Conservation

(a) Approaches for phased conservation of the remains

The relationship between the constituent elements of the Hashima Coal Mine (remains of the seawall revetment, retaining wall, and production and residential facilities) and the three points relating to conservation of the mine that are indicated in the Vision (Figure 2), is as follows (Table 1).

Constituent elements of Hashima Coal Mine	Contributions to conserving Hashima Coal Mine remains		
	(1) Conserving the island	(2) Securely preserving the remains	(3) Maintaining the views (exterior)
Seawall Revetment	○	○	○
Retaining walls	○	○	○
Production facilities		○	○
Residential facilities			○

Table 1: Relationship between conservation and constituent elements of Hashima Coal Mine

In light of the three conservation points, Nagasaki city is prioritizing and implementing material improvements over three phases over 30 years for the seawall revetment, retaining walls, and production and residential facilities, constituent elements of Hashima Coal Mine.

The city will take measures to preserve the seawall revetment remains in the coastline starting from Phase I to “maintain their function well” because they are critical elements covered by all the principles of conservation. The retaining walls are covered by all the principles just as the seawall revetments in the coastline, and their “forms will be maintained as seawall revetments.” Since these retaining walls have relatively few deteriorating spots, the city will take measures to preserve them starting from Phase II, taking into account the progress of conservation work across Hashima. Coal production facility remains are elements covered by two of the principles “Securely preserve the remains” and “Maintain the views (exteriors).” Since these remains are critical to understanding the coal production system, the city will take measures to preserve them starting from Phase I to “maintain the current shape.” The housing facility remains are covered by “Maintain the views (exteriors).” The city will take measures starting from the later part of Phase I to “maintain the current shape,” taking into account the progress of conservation work across Hashima.

As part of the restoration process, the city will monitor and continue recording all the remains and conducting repairs in 10-year phases. In Phase I, places that require urgent work and for which established methods are available will receive conservation. The city will also conduct research into conservation methods during this phase. From Phase II, the city will apply the research results to repairs. The city will also review the Plan every 10 years, taking account of the progress, finances, and preservation and other study results.

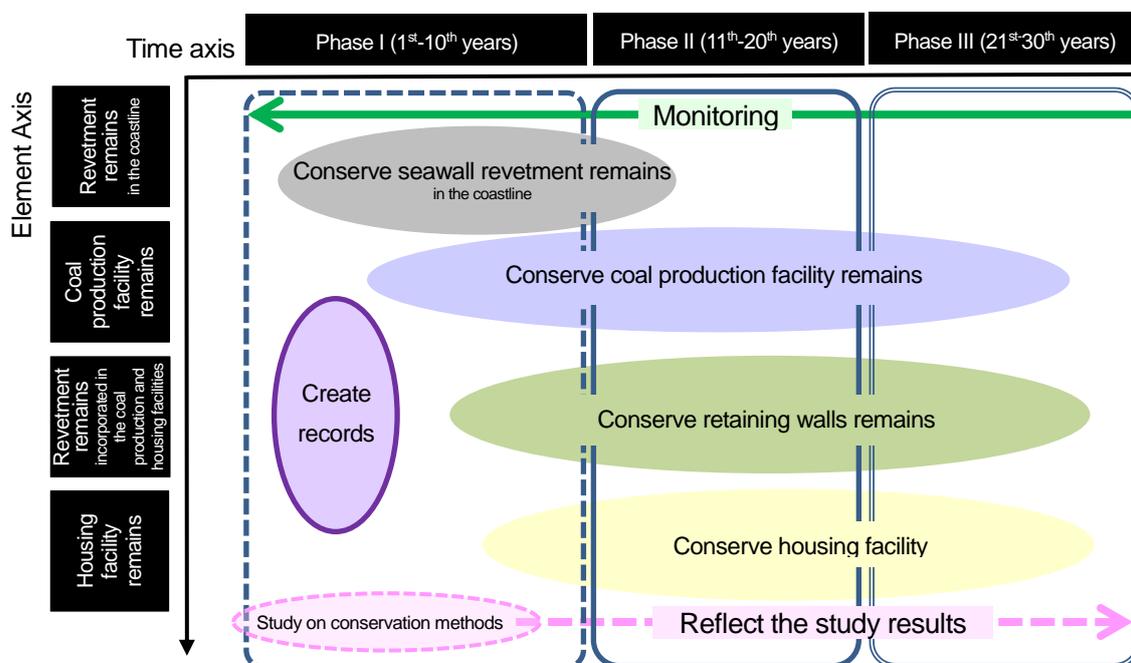


Figure 5: Approaches for phased conservation measures

(b) Approaches for prioritizing conservation measures for each constituent element

Conservation measures are prioritized for each constituent element of the remains from all angles, rather than from a single point of view. They include the extent of deterioration, applicable conservation and restoration techniques, the extent of contributions to the Outstanding Universal Value, the safety of other buildings and visitors, and the cost requirements.

In the process of conservation work for the seawall revetment remains in the coastline, the city will give priority to maintaining the World Heritage constituent elements. Therefore, places with damage that may significantly alter the shape of the remains of the seawall revetment in the coastline and impair their functions will be repaired first. Then the surrounding remains will be reinforced in order to maintain the seawall revetments' functions.

The remains of retaining walls are not damaged much at this moment, and thus the city will take maintenance measures if any, taking into account the progress of conservation work across Hashima. In the process of maintaining these remains, the city will give priority to conserving the World Heritage constituent elements. Therefore, parts of the remains with high levels of degradation will be repaired first.

In the process of conserving the coal production facility remains, the city will give priority to conserving the World Heritage constituent elements. Therefore, remains with high levels of degradation will be repaired first. Then a series of remains that show the workflow of the coal production system will be repaired.

In the process of conserving the housing facility remains, buildings that significantly contribute to the unique view (exteriors) of the island and show high levels of urgency and feasibility will be repaired first.

Element	Viewpoint for prioritization			Approach for prioritization by element		
Seawall revetment remains in the coastline	World Heritage constituent element	>	Factor for altering shapes	>	Degradation level (high to low)	Give the highest priority to conserving the World Heritage constituent elements. First repair places with damage that may significantly alter the shape of the remains in stages. Then reinforce the surrounding revetments.
Retaining walls remains	World Heritage constituent element	>	Degradation level (high to low)			Give the highest priority to conserving the World Heritage constituent elements. The retaining walls remains are essential to preserve the topography of the island. Repair them in stages, taking into consideration their degradation levels and the progress of conservation work across Hashima.
Coal production facility remains	World Heritage constituent element	>	Degradation level (high to low)	>	Contributions to coal production system (high to low)	Give the highest priority to conserving the World Heritage constituent elements. First repair severely degraded remains. Then repair a series of the remains that show the production system.
Housing facility remains	Elements related to maintaining the views (exteriors)	>	Feasibility of preservation (high to low)			First repair buildings that contribute significantly to the views (exteriors) of Hashima, where restoration and conservation techniques are well established and preservation is highly feasible.

Table 2 Relationship between conservation and elements of Hashima Coal Mine

(c) Conservation method

Hashima is perpetually exposed to the elements, suffering salt, wind and flood damage. Hence, many of the reinforced concrete structures are irreversibly damaged and degraded. At this moment, there is no established technology to preserve structures in this state. The following are conservation methods the city could turn to today. Attention should be given to the fact that the examples of these methods are current as of this moment, and that the city will continue to research and explore other methods and revisit these examples in the future.

● Seawall Revetment remains in the coastline

In the process of conserving the seawall revetment remains in the coastline, give priority to maintaining the World Heritage constituent elements. Therefore, first repair places with damage that may significantly alter the shape of the remains and impair the functions of the seawall revetments, where restoration and conservation techniques are sufficiently established for easy and instant repairs.

The method of restoration of the revetment remains described below was the subject of discussion at Nagasaki City Takashima Coal Mine Conservation and Utilization Committee established by Nagasaki City. However, in order to restore the revetment remains in a harsh environment, further consideration is required, from the technical point of view of the seawall strength aspect. Discussion will be continued in a working group composed of technical and specialized framework.

Fundamental policies

- Make drainage and outlets to drain seawater that wash over the seawalls into the island.
- Ensure that the shapes of the upright bulkheads of the seawalls are visible. Do not install any protective structures (e.g., tetrapods) in front of the revetments.
- Install any facilities for reinforcement on land unless doing so is physically impossible.
- Install any structures needed to reinforce the masonry revetments of the seawalls located in areas visible to visitors. Ensure that the original masonry revetments are partially visible.

Examples of conservation methods

- Fill cracks with mortar (A & B)
- Fill damaged parts underwater (e.g., cavities in the revetments) with concrete (C-F)
- Coat existing revetments with concrete (G-N)
- As for the exposed masonry built using the *Amakawa* (traditional bonding agent of lime mixed with red soil), reinforce the back of the seawall revetments with concrete (G-N)
- Coat the exposed *Amakawa* masonry with a surface coating material to protect it from damage. Note that we will need to further research and explore technical methods that use coating materials. (G-N).

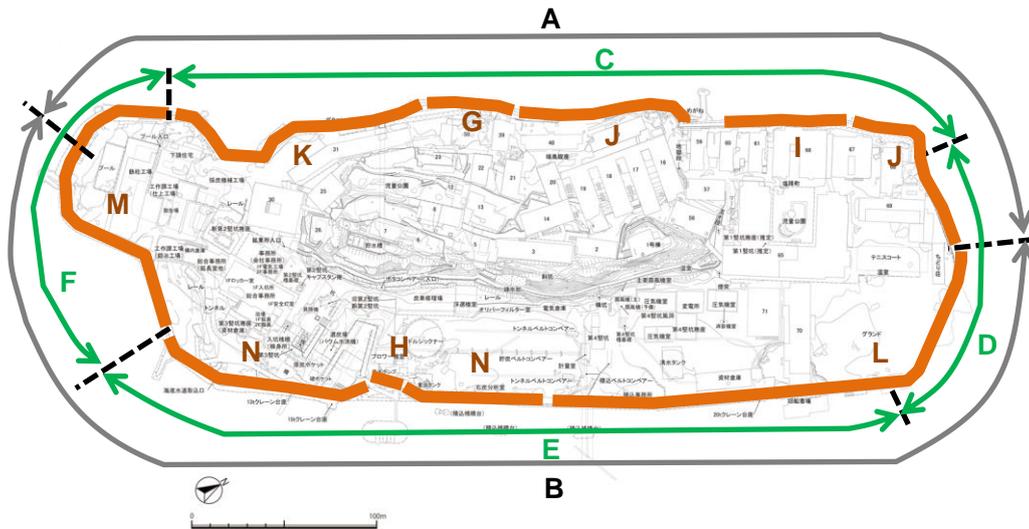


Figure 6: Map indicating the location of seawall revetment remains in the coastline to conserve with high priority (see the below table for details of the conservation methods etc.)

Zone	Conservation work with high priority	Reason for high priority
A	Repairing cracks (west side)	These cracks may significantly alter the shape of the remains and impair the functions of the seawall revetments. Those for which conservation and restoration techniques are established for instant repairs will be worked on.
B	Repairing cracks (east side)	
C	Filling underwater cavities (west side)	These cavities may significantly alter the shape of the remains and impair the functions of the seawall revetments. Those in the underwater revetments must be filled.
D	Filling underwater cavities (north side)	
E	Filling underwater cavities (east side)	
F	Filling underwater cavities (south side)	
G	Reinforcing the seawall revetments (west of Building 50)	These seawall revetments may significantly alter the shape of the remains and impair the functions of the seawalls. Structures for reinforcement need to be installed for the parts of the seawall revetments for which there are no established conservation and restoration techniques. The reinforcement method most suitable for this purpose will be selected from the three options below (Options 1 to 3).
H	Reinforcing the seawall revetments (south side adjacent to the pier)	
I	Reinforcing the seawall revetments (northwest side)	
J	Reinforcing the seawall revetments (north side)	
K	Reinforcing the seawall revetments (west side)	
L	Reinforcing the seawall revetments (east side)	
M	Reinforcing the seawall revetments (south side)	
N	Reinforcing the seawall revetments (southeast side)	

Table 3: Prioritized conservation work on the seawall revetment remains in the coastline

To reinforce Zones G to N (see above Table 3), the city will examine following three options:

- Option 1** Coat the top sides of the seawall revetments and part of the sides facing land with concrete. Avoid coating the *Amakawa* masonry revetments built during the Meiji era wherever possible.
- Option 2** Coat the top sides of the seawall revetments and the whole surface of the sides facing land with concrete.
- Option 3** Coat the top sides of the seawall revetments and the sides facing the ocean with concrete.

The method for Option 1 is to keep the *Amakawa* masonry revetments exposed wherever possible. It is to work mainly on places near tour spaces for visitors (**Figure 7**). The method for Option 2 is to reinforce the seawall revetments facing land. The method for Option 3 would be selected only when no space is available for construction on land.



Figure 7: Images of seawall revetments conserved by Option 1 (left: before conservation; right: after conservation)

- Retaining walls remains

Give priority to conserving the constituent elements that contribute to the Outstanding Universal Value of the World Heritage property. Therefore, start repairs from considerably degraded retaining remains. Note that the field study results concluded these remains currently have no spots that require urgent repairs.

Fundamental policies

- Maintain the current shape.

Conservation methods

- Coat the exposed *Amakawa* masonry with a surface coating material to protect it from damage. Note that we will need to further research and explore conservation methods that use coating materials.
- Fill the parts that fell off with sandstone (a material of the same quality) if they are structurally essential.
- Restore collapsed parts using materials of the same quality as the original wherever possible (i.e., cobblestones and ashlar for masonry walls; concrete and reinforced concrete for concrete walls).

- Coal production facility remains

The coal production facility remains are vital to understanding the industrial (mining) system at the time in that they are direct representations of the realities of the coal mining industry. Give priority to conserving the elements that contribute to the Outstanding Universal Value of the World Heritage property, and start conservation work from the series of the severely degraded remains that show the workflow of the coal production system. The fundamental policies and conservation methods for these remains are as follows:

Fundamental policies

- Maintain the current shape. Changes made to the exteriors must be minimum and only for the purpose of maintaining the structures.
- Any facilities needed to reinforce ferroconcrete structures should be installed in places invisible to visitors wherever possible (e.g., inside the constructions) so that they will not affect the exterior views.
- Conduct examinations before using rust inhibitors and impregnating and other agents to ensure that they do not harm the remains.

Conservation methods

(1) Reinforced concrete structures

- Reinforce beams and pillars mainly by placing steel frames inside or outside of them.
- Apply corrosion inhibitors to exposed steel frames.
- Apply impregnants of corrosion inhibitors to the exterior walls.
- Inject corrosion inhibitors into cracks in the building frames (pillars and beams).

(2) Brick structures

- Add new bricks to areas where bricks are missing to prevent further falling-off. Do not repair cracks (e.g., by applying mortar) in order to ensure reversibility.
- The addition of new bricks as stated above must be limited to the part of the arch crown and to the extent necessary to retain the structure (Figure 8).
- Ensure that the colors and shapes of newly added bricks are close to those of the existing ones on the severely degraded and damaged structures. Also ensure that these new bricks bear the mark “Repaired in 20XX” on the four sides (front, back, left and right) to distinguish them from original ones.
- Use lime mortar (with the ratio of lime to sand is 1:3) as a joint filler in order to prevent any impact on the surrounding original bricks and to ensure reversibility, since lime mortar’s bond strength is lower than that of cement mortar.
- Fix newly added bricks with anchor pins ($\phi 3 \text{ mm} \times 60 \text{ mm}$) to prevent them from falling off.

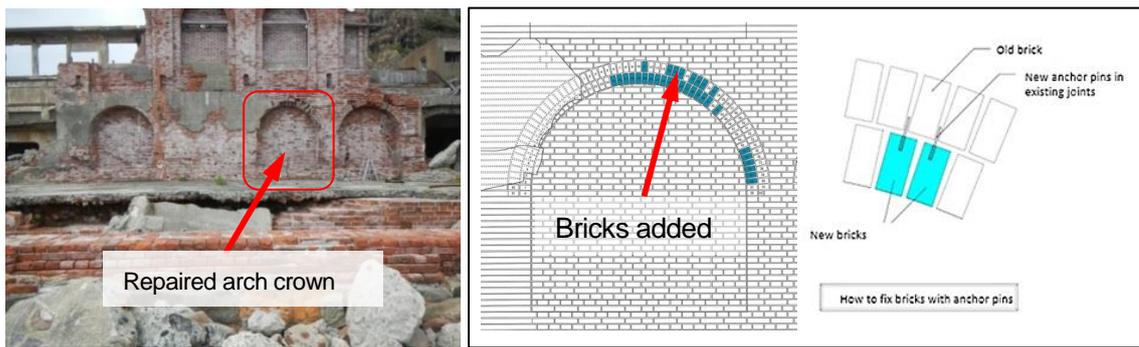


Figure8: Repairs to a brick structure

- Housing facility remains

The dilapidated housing facility remains soaring in clusters overwhelm visitors. These remains form the major part of the unique battleship-like views (exteriors) of the island. Begin repairs from housing facilities remains that contribute significantly to the views (exteriors) unique to Hashima Coal Mine and for which conservation and restoration techniques are established.

Fundamental policies

- As a rule, make no major changes to the exterior views.
- Repair and/or reinforce the interior of the buildings only to maintain the structures and any other work must be limited to the removal of obstacles to such repairs and reinforcement. Conserve the current condition wherever possible.
- As a rule, install any facilities for reinforcement in places invisible from the tourist routes, the sea, and thoroughfares in the area of the housing facilities.
- Research construction methods for degradation control and reinforcement of materials and structures and makes sure the methods work before applying them.
- Some of these remains may be removed as an exception in order to ensure the preservation of the other buildings or the safety of visitors.

Conservation methods

- Inject corrosion inhibitors into cracks in the building frames (pillars and beams).
- Apply impregnants of corrosion inhibitors to the exterior walls.
- Apply corrosion inhibitors and then mortar for coating to exposed reinforcing steel in pillars and beams visible from the tourist route.
- Wrap steel plates or carbon fiber sheets around exposed reinforcing steel in pillars and beams invisible from the tourist route, and then apply extra reinforced concrete.
- Place facilities for reinforcement inside the pillars and beams for further strength. (Reinforcement is mainly to prevent collapse under the pillars' or beams' own weight.)
- Waterproof the roofs with asphalt or an urethane coating.

Location	Facilities with high priority	Reason for high priority	Photo
A	<ul style="list-style-type: none"> ➤ Former 3rd shaft winding area ➤ Entrance to the dock 	These are production facility remains in the Meiji era where visitors can imagine how miners entered and exited the mine.	 Former 3 rd shaft winding area  Entrance to the dock
B	<ul style="list-style-type: none"> ➤ Dorr thickener ➤ Conveyor belt for coal storage ➤ Conveyor belt for loading 	These remains help visitors understand the workflow of coal transport that consists of coal cleaning, storage, and loading.	 Dorr thickener
C	<ul style="list-style-type: none"> ➤ 4th shaft ➤ Foundations of the derrick ➤ Former 4th shaft winding area ➤ Substation ➤ Pneumatic machine rooms (large and small) ➤ Main electric fan room ➤ 4th shaft wind tunnel 	These remains help visitors understand the aboveground coal mining system.	 Substation (right foreground) and others
D	<ul style="list-style-type: none"> ➤ Building No. 1 	Workers prayed for work safety in labor-management cooperation in this building. These remains also form a part of the industrial landscape.	 Building No. 1

Table 4: Conservation of production facility remains: Priority (the letters under “Location” correspond to those in Figure 9)

Location	Facilities with high priority	Reason for high priority	Photo
E	<ul style="list-style-type: none"> ➤ Building No. 3 	The building forms a part of the battleship-like views of the island. It is also typical remains of the housing facilities.	 Building No. 3

Table 5: Conservation of housing facility remains: Priority (the letters under “Location” correspond to those in Figure 9)

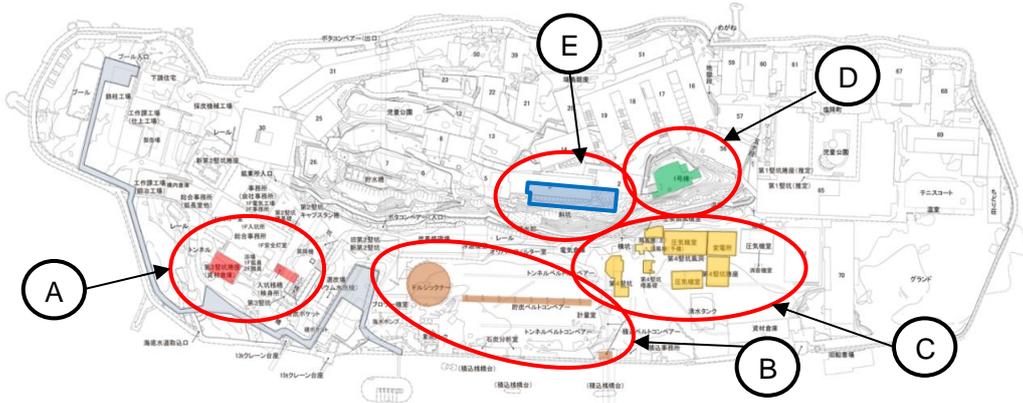
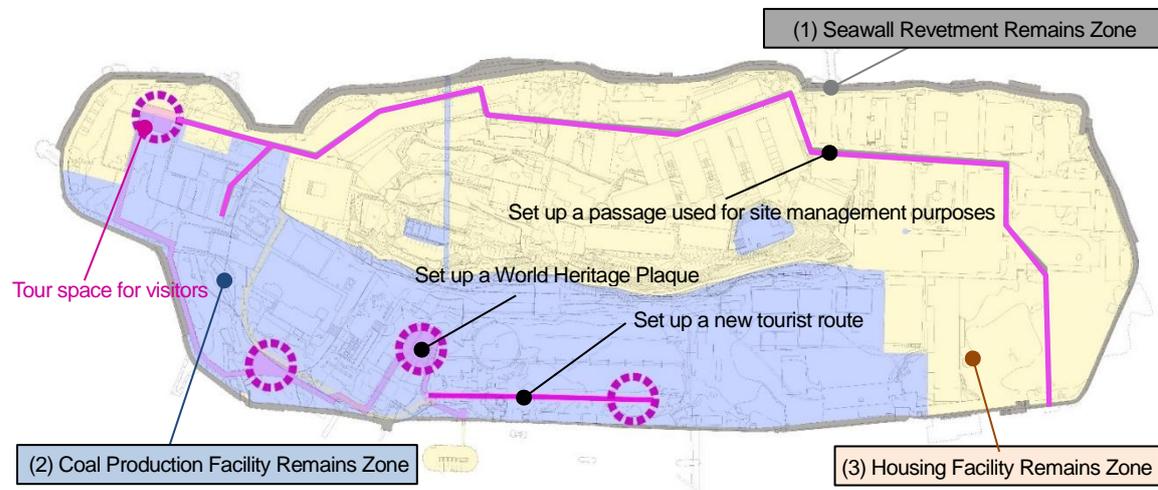


Figure 9: Locations of the facilities to conserve with high priority (coal production and housing facilities)

(3) Presentation of the mining system

The facilities for use will be set up in three different zones: (1) Seawall Revetment Remains, (2) Coal Production Facility Remains, and (3) Housing Facility Remains Zones.



Zone	Methods
(1) Seawall Revetment Remains Zone	This zone is for the seawall revetment remains surrounding the island. Conservation will be primarily for preservation. No facilities for use will be set up.
(2) Coal Production Facility Remains Zone	This zone is for the coal production facility remains. It will be open only to visitors on the tourist route. Minimum facilities needed for research and study as well as for visitors will be set up. <ul style="list-style-type: none"> ➤ Set up a new tourist route in a minimum size ➤ Set up a commemorative plate to mark the inscription on the World Heritage List in the tour space for visitors and devices for information dissemination
(3) Housing Facility Remains Zone	This zone is for facilities connected to day-to-day living of miners and other workers. Minimum facilities needed for research and study will be set up. <ul style="list-style-type: none"> ➤ Set up a passage used for site management purposes

Figure 10: Zoning and locations of main facilities to set up

(a) Paths

Set up a new tourist route in the Coal Production Facility Remains Zone, and a passage needed for studies of and academic research on the remains, and conservation work in the Housing Facility Remains Zone.

Keep the height of the new tourist route as low as possible to make it easy for visitors to imagine what the facilities in operation were like. Pave the route with concrete slabs to preserve the remains and ensure the route will blend in with the surrounding buildings. Consider concrete that is less bright to match the look of the ruins. In addition, the possibility of setting up the light and simple path using grating so as to see the road direct under the path will be examined.

As for the passage used for site management purposes, make its width minimum to ensure it will not affect the surrounding remains.

* Notes on the maintenance of the passage used for site management purpose

- a. Move fragments of certain size to the edges of the passage if pieces of rubble are scattered over the floor.
- b. As a rule, sweep soil and stone to the sides of the passage, or move them someplace else on the island if they cannot be swept to the sides.
- c. If heavy loads may be carried on the passage, cover the original concrete surface that must be protected with a sheet or an iron sheet, or pave it with concrete for protection.



Figure 11: Current site management passage

(b) Trees and plants

Branches and roots of trees may affect the buildings, and trees may fall at any time. Hence, fell trees that may affect the preservation of the remains on the island as necessary, and ensure that no more trees will be planted.

(c) Facilities for on-site interpretation for visitors

No more new explanatory boards will be installed in an effort to maintain the views of the ruins on Hashima. Guides will show visitors around the facilities. Set up a pole that indicates the island is designated as a National Historic Site as well as a World Heritage Plaque in one of the tour spaces for visitors.

In all the tour spaces, the city will set up small scale Wi-Fi repeater so that such technologies as 3D and virtual reality will be utilized to offer visitors visual experience of what the coal mine in operation was like via mobile devices.

(d) Facilities for site management and convenience for visitors

Set up refuge facilities needed for academic research (used as an evacuation place when weather is inclement and for storing monitoring and survey equipment, etc.) in locations invisible from the tour spaces for visitors (see **Figure 15**). Keep these facilities for site management and convenience minimum. No rest facilities, toilets, benches, and lighting for visitors will be set up (visitors will use the toilets on the ship that carries them to the island)

(4) Arrangements and improvements for the buffer zone

The city currently have no plan to set up any new structures in the adjacent seas that serves as the buffer zone. The city will continue to protect the zone in accordance with the Coast Act, the Port and Harbor Act, and the Nagasaki Prefecture Sea Control Ordinance.

(5) Public utilization as a cultural resource and base for information dissemination

(a) Providing information about the 23 component parts of the Sites of Japan's Meiji Industrial Revolution focused in Area 6 Nagasaki

The Former Mitsubishi No.2 Dock House located inside Glover Garden (a tourism facility where the Glover House and Office (Component Part 6-8) is located) will be used as a base for explaining the interrelationship of the 23 component parts, mainly those in Area 6 Nagasaki, and the historical background.

(b) Public utilization at Takashima Coal Museum and Nagasaki City Gunkanjima Museum

Positioning the Takashima Coal Museum as the base for information dissemination on coal industry, and with a viewpoint of Takashima Coal Mine remains' museum, the whole Takashima Island will be utilized as resources for studies, regional promotions and researches. Nagasaki City Gunkanjima Museum will be utilized as the information dissemination base in case people are not able to land on Hashima because of the weather conditions. Moreover, information will be disseminate in corporation with domestic coal mine remains.

4. Implementation of the projects (Schedule)

(1) Review of implementation schedule

Nagasaki City will prepare a project schedule for the 30 years that starts at 2018.

This Schedule will cover projects taken in stages during each of the decades, and will be reviewed every ten years from a perspective gained after examining the progress, finances, and results of research on technical methods for conservation.

	Details of Conservation Work	Preparation Period (2014-2017)	Phase I (1-10 years)		Phase II (11-20 years)	Phase III (21-30 years)
			(1-5 years)	(6-10 years)		
Conservation and Restoration	(1) Repairing and reinforcing the revetment remains					
	a) Repair the revetments (west of Buildings No. 31 and 51)	↔				
	b) Repair cracks in the revetment remains		↔			
	c) Fill underwater cavities		↔	↔		
	d) Reinforce the revetments		↔	↔		
	e) Protect the surfaces of the masonry retaining wall remains				↔	↔
	f) Survey of the current state of underwater seawall revetment and its height		↔	↔	↔	↔
	(2) Protecting the retaining wall remains					
	a) Protect the surfaces of the masonry retaining wall remains				↔	↔
	(3) Repairing and reinforcing the coal production facility remains					
	a) Provide temporary reinforcement of the former 3rd shaft winding area	↔				
	b) Provide temporary reinforcement of the entrance to the dock	↔				
	c) Repair and reinforce the former 3 rd shaft winding area		↔			
	d) Repair and reinforce the entrance to the pier		↔			
	e) Repair and reinforce the coal storage yard belt conveyor		↔			
	f) Repair and reinforce Dorr thickener		↔			
	g) Repair and reinforce the 4th shaft winding area		↔			
	h) Repair and reinforce the 4th shaft		↔			
	i) Repair and reinforce the Foundation of the derrick (4th shaft)		↔			
	j) Repair and reinforce Building No. 1			↔		
	k) Repair and reinforce the Loading belt conveyor			↔		
	l) Repair and reinforce the Substation			↔		
	m) Repair and reinforce the Compressor room (large)			↔		
	n) Repair and reinforce the Compressor room (small)			↔		
	o) Repair and reinforce the Main fan room			↔		
	p) Repair and reinforce the Pit No.4 wind tunnel			↔		
	q) Provide regular repair work for the production facility remains that have already been repaired and reinforced				↔	
	(4) Controlling the degradation of the housing facility remains					
	a) Backfill the scoured part of the foundation of the housing facility remains (Building No. 70)	↔	↔			
	b) Research construction methods for preservation of the housing facility remains (Building No. 16)		↔	↔		
	c) Take measures to control the degradation of the housing facility remains (Building No. 3)			↔	↔	
	d) Provide regular repair work for the production facility remains that have already been repaired and reinforced (Building No. 3)				↔	↔
	(5) Continuing studies of the remains					

Presentation and Public Utilization	a) Study the masonry revetment remains			←	→		
	b) organize the records of the remains and relics			←	→		
	(6) Setting up facilities needed for studies of the remains etc.						
	a) Set up passages			←	→		
	b) Set up private facilities				↔		
	(7) Safety measures etc.						
	a) Fell trees as necessary, remove rubble in high places, take measures to prevent exterior walls from collapsing, etc.			↔			
	b) Remove rubble in high places (e.g., roofs of buildings), taking measures to prevent exterior walls from collapsing, etc.			←	→		
	(8) Setting up facilities for information dissemination						
	a) Set up facilities for information dissemination designed to enable visitors to feel what the coal mine in operation was like via mobile devices in the three existing tour spaces for visitors			↔		↔	
	(9) Setting up a new tourist route						
	a) Set up a new tourist route from existing visitor's space No.1 to the related remains of No.4 shaft					↔	
	(10) Setting up facilities needed for academic research etc.						
	a) Set up passages			←	→		
	b) Set up private facilities				↔		
(11) Organize the records of the remains and relics							
a) Organize the records of the remains and relics			←	→			
(12) Information dissemination of results of excavation							
a) Information dissemination of the results of excavation			←	→			

Table 6: Project Schedule * changing will be expected

(2) Project cost estimate and financial resources

Nagasaki City estimates that the costs of the current action plan over 30 years (including costs relating to promotion) will amount to approximately 10.8 billion yen. Nagasaki City will make effective use of the Hashima (Gunkanjima) Provision Fund set up in 2015, etc.

(3) Order of priorities

The targets are “seawall revetment,” “retaining walls,” “production facilities,” and “housing facilities.”

In Phase I, the city will work on places that require urgent conservation. The city will also conduct research on technical methods for conservation during this phase (**Figures 13 and 14**).

In Phase II, the city will continue repairs that reflect findings from the research on technical methods for conservation (**Figure 15**).

The time before the start of Phase I (FY2018) is defined as a preparation period. During this period, the city will take actions urgently needed for conservation, and then carry out the following items that are preparations for conservation work: (i) a “survey of the current condition” of structures to conserve (ii) “taking safety measures” in areas where visitors are warned to watch their heads, e.g., removing rubble and working on the exterior walls to prevent them from collapsing (iii) “taking measures to maintain structures” assessed as structurally unstable, e.g., providing temporary reinforcement.

(a) Urgent actions during the preparation period

Any urgent actions will be taken as the need arises (**Figure 12**).

The facility remains listed below are not only severely degraded but also at high risk of collapsing, which poses a threat to the preservation of the surrounding remains. Hence, the city gave priority to these facilities and started works to conserve their structures as urgent actions from 2014. These actions were completed by the end of FY2018 before the projects based on this Plan begin.

A: Seawall revetment reinforcement (west of Building No. 31) - Complete in September 2015

B: Seawall revetment reinforcement (west of Building No. 51) - Complete in September 2015

C: Repairs to and temporary reinforcement of the coal production facility remains' brick walls (former 3rd shaft winding area) - Complete in March 2017

D: Temporary reinforcement of the coal production facility remains (entrance to the pier) - Complete in March 2017

E: Design of the process of backfilling the scoured areas in the foundations of the housing facility remains (Underneath the Building No.70)- 2018~

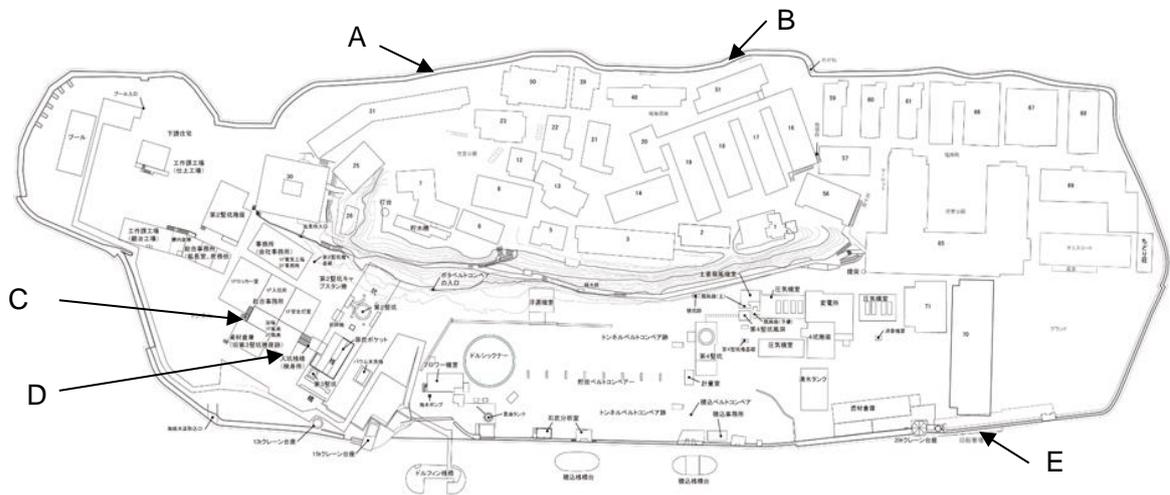


Figure 12: Locations of urgent actions A-E during the preparation period

Location	Before action	Progress state
A	<ul style="list-style-type: none"> ➤ The back of the seawall revetment was scoured and caved in 	<ul style="list-style-type: none"> ➤ The cavity facing the sea is closed with concrete. ➤ The caved-in part is filled with concrete. 
B	<ul style="list-style-type: none"> ➤ The back of the seawall revetment was scoured by typhoons and caved in. 	<ul style="list-style-type: none"> ➤ The cavities facing the sea is closed with concrete. ➤ The caved-in part is filled with concrete. 
C	<ul style="list-style-type: none"> ➤ One wall stands alone, which is structurally unstable. There are cracks all over it. Bricks in the arch crown are missing. 	<ul style="list-style-type: none"> ➤ Bricks have been added to the parts of the arch crown where bricks were missing. ➤ Temporary facilities for reinforcement of the revetments have been set up. 
D	<ul style="list-style-type: none"> ➤ The truss-like steel frames that once supported the stepped passage corroded and crumbled, leaving only the concrete structure. The whole shape became bowed, and the supporting point of the steel is degraded. 	<ul style="list-style-type: none"> ➤ Temporary facilities for reinforcement have been set up. 
E	<ul style="list-style-type: none"> ➤ The typhoon in 1991 scoured the building to expose the foundations of concrete piles, and some of the piles were lost. 	<ul style="list-style-type: none"> ➤ The construction work for backfilling the scoured part has been designed. ➤ This construction will be carried out after FY 2017.

Table7: Urgent actions during the preparation period (FY2014-FY2017) (See Figure 12 for the locations of A-E)

5. Maps of Phased Plans

Each of the projects and its location that will be implemented in Phase I-III is as shown in Figures 13-16.

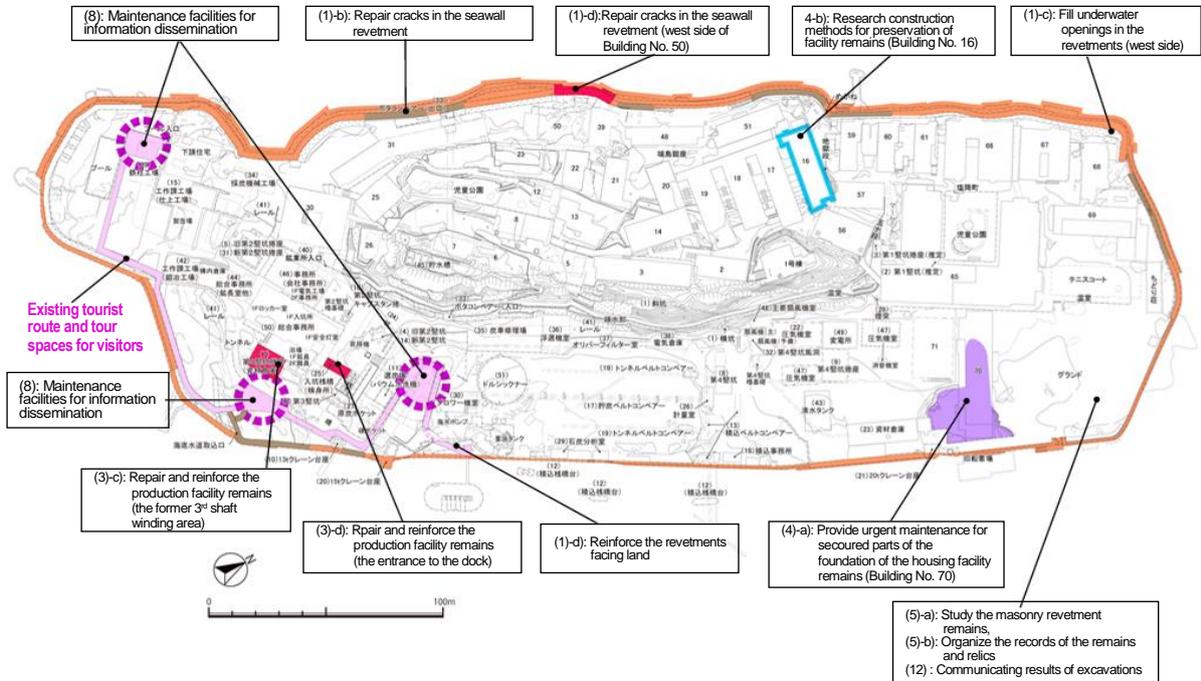


Figure 13: Phase I---1st Half (1-5 years)

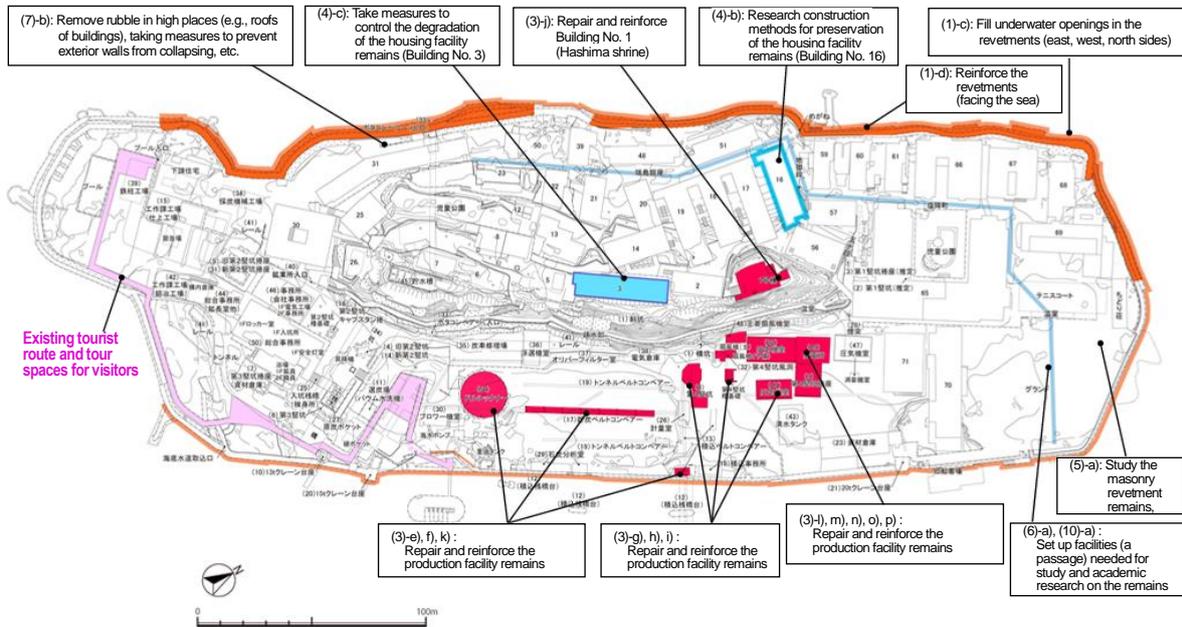


Figure 14: Phase I---2nd Half (6-10 years)

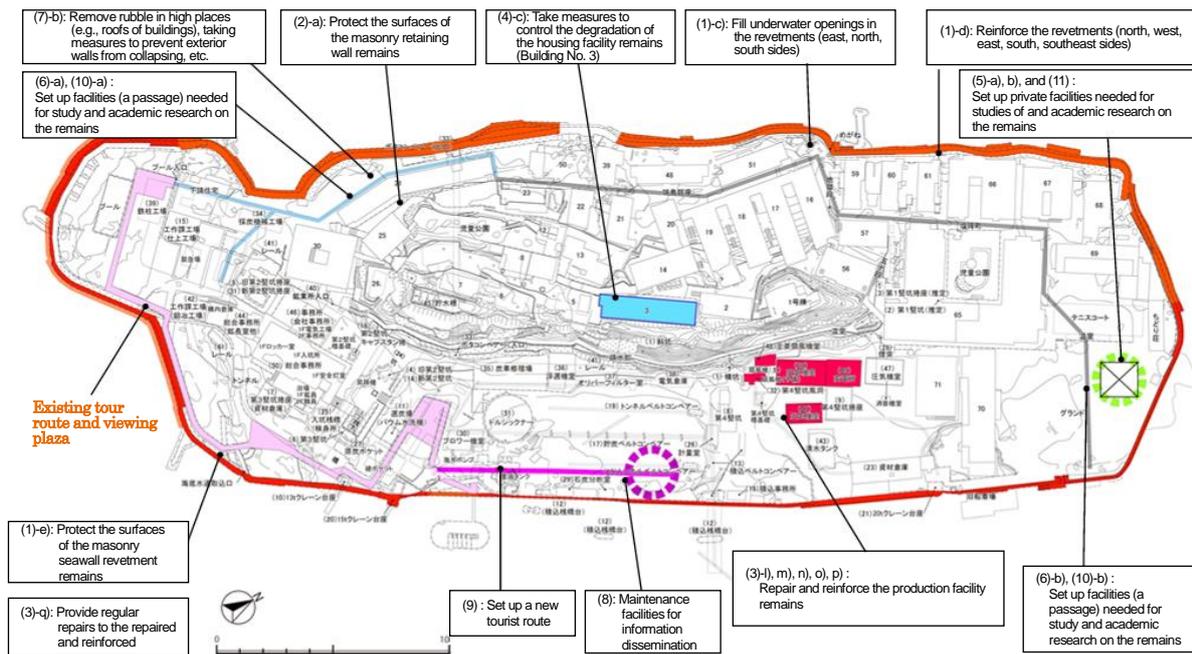


Figure 15: Phase II (11-20 years)

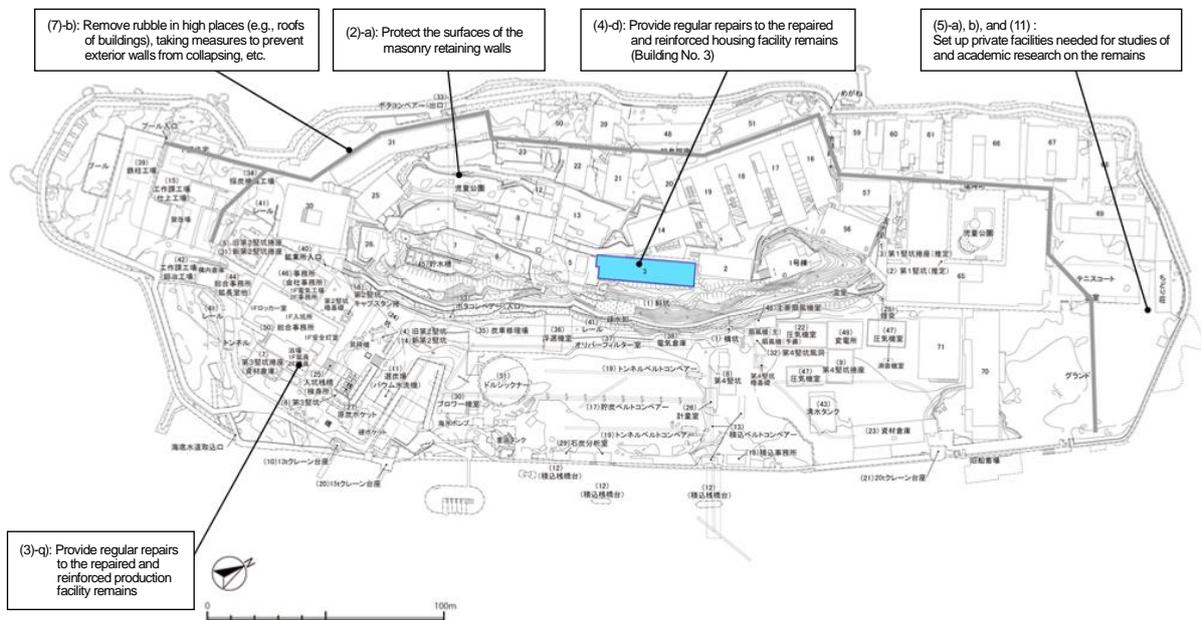


Figure 16: Phase III (21-30 years)