

Conservation work programme and implementation programme for the Shuseikan (Area 2 Kagoshima/ Component Part 2-1)

Kagoshima City drew up a “Conservation Work Programme and Implementation Programme” for Shuseikan in FY 2016 and 2017, pursuant to Recommendation b) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2015. The Programme comprises detailed measures for the conservation and restoration 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”).

1. Approach to conservation

Maintain in good condition the buildings and underground archaeological remains comprising Japan’s first Western-style factory complex Shuseikan, as well as the surrounding environment; enhance the value and attractiveness of these elements; and improve the visitor environment.

Shimadzu Nariakira, feudal lord of the Satsuma Clan, responded to the threat posed by the Western powers by building the Shuseikan factory complex to cast iron cannons and manufacture Western-style warships, textiles, and glass as a means of encouraging new industry and making Japan a strong and wealthy nation. In terms of the Sites of Japan’s Meiji Industrial Revolution, Shuseikan is a component part that illustrates the phase of trial and error experimentation in the iron and steel manufacturing field up to the phase of direct importation of Western technology in the shipbuilding field.

In the Conservation Management Plan (CMP) for Shuseikan, which was prepared for nomination of “Sites of Japan’s Meiji Industrial Revolution” for World Heritage inscription. The list of elements constituting Shuseikan and their value categories are shown as **Table 1**.

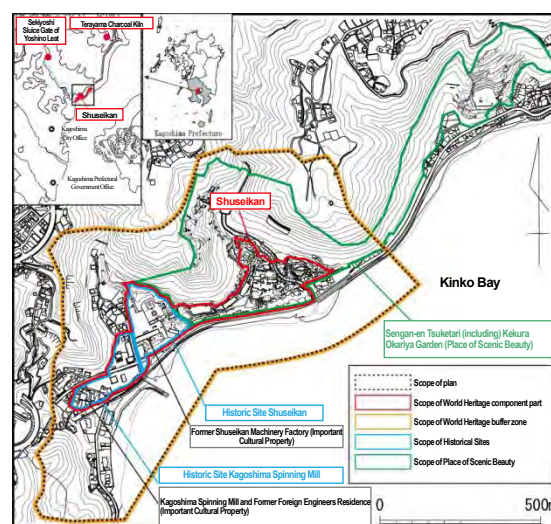


Figure 1: Scope of Programme

Area	Time Period	Element	Value to the actors		
			OUV	Nation	Region
Iso Area	Shuseikan Project Phase I	Site of the reverberatory furnace	○	○	○
		Sites of the blast furnace, No.1 reverberatory furnace (underground remains)	○	○	○
		Leat (Shuseikan side)	○	○	○
		Site of the shrine	○	○	○
		Site of the mint (underground remains)	○	○	○
		Site of the climbing kiln	○	○	○
		Sengan-en	○	○	○
		Crane-shaped Lantern	○	○	○
		Bogakuro Pavilion		○	○
	Shuseikan Project Phase II	Former Shuseikan Machinery Factory	○	○	○
		Shaper (movable property)		○	
		Site of the spinning mill (underground remains)	○	○	○
		Spinning machine (movable property)			○
		Former Kagoshima Foreign Engineer's Residence	○	○	○
		Old structure of the Engineer's Residence (underground remains)	○	○	○
		Facility affiliated with the Engineer's Residence (underground remains)	○	○	○
		Site of the foundry (underground remains)	○	○	○
	Later period	Tsurugane Shrine			○
		Signpost			○
		Monument commemorating the Royal visit of Emperor Meiji			○
		Site of the Hydroelectric Dam			○
		Site of the climbing kiln			○
		Monument commemorating the reverberatory furnace			○
		Monument commemorating the site of the Spinning Mill			○
		Monument commemorating the ship made by Shimadzu Nariakira			○
		Iso Art Gallery			○
		Iso Kohi-kan			○

Table 1: The list of elements constituting Shuseikan and their value categories

Out of these elements in the **Table 1**, which the Conservation Work Programme for Shuseikan will mainly focus on the constituent elements that contribute to the Outstanding Universal Value, due attention will also be given to the elements that represent the value categorized as national and/or regional respectively, and others in view of the process of historical changes and developments of the component part.

Based on the approach for conservation and categorized value of elements mentioned above, Kagoshima City will firmly conduct projects for conservation, restoration and presentation of the component part with a central focus on the following five points.

The owner will maintain the buildings and remains in good condition as elements contributing to the Outstanding Universal Value of the component part, install guidance facilities that convey the appeal of Shuseikan and help visitors to understand industrial systems at each phases, and improve the visitor environment. The site owners will also work to conserve the natural environment and surrounding landscape coexistent with urban facilities, etc.

(1) Undertake conservation and restoration work to maintain in good condition those constituent elements illustrating the fusion of Western technology and traditional Japanese technology

Site of the reverberatory furnace, Former Shuseikan Machinery Factory (hereinafter referred to as “Shuseikan Machinery Factory”), and Former Foreign Engineer’s Residence (hereinafter referred to as “Foreign Engineer’s Residence”)— constituent elements contributing to the Outstanding Universal Value of World Heritage property—are remains demonstrating in a concrete form the fusion of Western technology and traditional Japanese technology.

The owner ¹ of the component part (hereinafter referred to as “the owner”) will maintain the component part in a stable condition and in its original form, and, in the case that deterioration or damage is identified, clarify the cause and undertake the necessary conservation and restoration work accordingly.

(2) Convey the appeal of the Shuseikan Project and work to build a vibrant community through partnership with other component parts that grew from Kagoshima

The owner will engage in a systematic study of the industrial systems in Phases 1 and 2 of the Shuseikan Project and present the results to promote visitor understanding.

In addition, because Shuseikan is one of the foundation stones of modern Japanese industry, with its technologies spreading throughout Japan, the owner will draw on the results of the above study to reveal in more detail the story of the Sites of Japan’s Meiji Industrial Revolution. That story will be shared with the relevant municipal authorities and disseminated on an ongoing basis through partnership with them with the aim of creating a vibrant community that draws numerous visitors to both Area 2 and other Areas.

(3) Enhance guidance facilities in relation to Shuseikan and its contribution to the Sites of Japan’s Meiji Industrial Revolution

The Shuseikan remains illustrate the two different developmental phases of the Sites of Japan’s Meiji Industrial Revolution, making it difficult to comprehend the respective industrial systems of those two phases. The roles of the Shuseikan Machinery Factory, the annex to this, and the Foreign Engineer’s Residence, which are the current guidance facilities, will therefore be clarified and clearer guidance provided. As part of this, a new guidance facility will be set up to present an overview of the Sites of Japan’s Meiji Industrial Revolution and Shuseikan Project as a whole, choosing a location that will be convenient for visitors but not adversely impact on the Outstanding Universal Value and component part’s landscape, promoting understanding of the Shuseikan as a component part of the World Heritage property.

In presenting guidance information, the owner will bear in mind the process of the historical changes and developments of Shuseikan.

(4) Enhance the environment to assist on-site understanding of the Outstanding Universal Value of the property and the position of the component part within that and industrial systems for visitor

The owner will create an observation route that enables visitors to visualize the industrial systems of the time, from the cannon manufacturing remains from Phase 1 of the Shuseikan Project to the shipbuilding and textile manufacturing remains, etc., from Phase 2, setting up information and guidance boards along the way. Planar markers indicating the locations and scales of the underground archaeological remains will also be installed.

The glassworks in particular is the only functional industrial remaining related to the Shuseikan Project, and visitors can view the glass product manufacturing process. The owner will therefore continue operating and

¹ In this Programme, the owner of the component part refers to Kagoshima City and SHIMADZU LIMITED.

using the glassworks as well as widening the observation path and improving the flow to enhance the environment for visitor.

(5) Conserve the natural environment and the surrounding landscape coexistent with urban facilities, etc.

National Road 10, a part of which traverse the component part and the rail line running parallel to it, did not exist at the time of the Shuseikan Project. However, they currently serve important function as urban facilities, and the owner will work to ensure that these facilities co-exist with the component part without impacting on the remains or the landscape. Due to ongoing urbanization in later periods, the Foreign Engineer's Residence, for example, is now located amongst residential and commercial premises. The city will work to improve the environment in line with the original landscape that appears in old photographs of the time.

The surrounding landscape and natural environment, such as Kinko Bay, Sakurajima, and the sheer and cliff behind Shuseikan, are important elements that influenced the siting of the component part, and the owners of these areas will therefore work with the city and the relevant administrative institutions to preserve these.

2. Policy

The policy consisting of following five items has been set to approach conservation:

(1) Promoting research and study

The owner of the component part will work to elucidate the functions of and relations among the various facilities in Phases 1 and 2 of the Shuseikan Project as depicted in old drawings. Based on the results of long-term surveys continuing through to the present, the owner will undertake additional surveys focused on areas not previously surveyed and areas where such surveys are needed.

Based on progress with the above surveys, measurement and ground surveys will be conducted as necessary. Visitor surveys will be undertaken to confirm the extent of visitor impact on conservation of the component part, and the owner will also create monitoring charts to trace changes to the component part over time.

(2) Conserving and restoring buildings and historical and underground archaeological remains (preserving, reinforcing, and stabilizing materials, substance and structure)

To maintain constituent elements of Shuseikan contributing to the Outstanding Universal Value, the owner will engage in regular monitoring, and if damaged areas, or areas where damage could potentially occur, are discovered, will undertake systematic restoration in order of priority as determined with reference to the views of experts, etc., to stabilize and strengthen those areas. Restoration of exposed structures will be undertaken with due sensitivity to maintaining the structures and materials used at the time. Underground archaeological remains that have so far been detected will be given a protective earth layer of an appropriate thickness and then maintained in a stable condition underground.

(3) Illustrating industrial systems at the component part

The owner will set up information boards to explain to visitors which remains belong to Phase 1 and which to Phase 2 of Shuseikan Project, and how these relate to the component parts of other Areas. The results of further surveys will be actively reflected in the content of explanations and exhibits.

(4) Arranging and improving landscape from a scenic perspective

The owner will conserve trees in the Sengan-en garden which constitute the garden's value. However, trees which have become so large that they might impact on the conservation of remains or on visitor safety will be appropriately maintained with sensitivity to the landscape. As the area around the Foreign Engineer's Residence has changed dramatically due to subsequent urbanization, the city will improve the settings of the area with reference to old photographs of the original landscape.

In the buffer zone, maintenance of the excellent natural environment, which includes the undulating forest belt inland and the Kinko Bay ocean vista to the southeast, will be spearheaded by the city and other relevant administrative institutions. Arranging and improving landscape will be approached with the aim of creating a beautiful town environment in harmony with the natural environment pursuant to the Landscape Act and

other laws and regulations.

Where monitoring identifies spots that have or might have a negative impact on the landscape, the owner of the spot will improve the landscape to prevent or mitigate that impact based on the views of experts and in conjunction with the city and other relevant administrative institutions.

(5) Implementing projects

The city will set out a clear implementation schedule that delineates short, medium and long-term phases and the various projects to be addressed within those phases to ensure the steady and phased implementation of the Programme.

The owners and managers of the three component parts of Area 2 Kagoshima and their buffer zones will be responsible for managing and operating the each project regarded as necessary during the three phases pursuant to the Programme. In addition to the owners and managers, the Government of Japan and Kagoshima Prefectural Government, local neighborhood associations, NPOs, and other relevant institutions and groups will coordinate at the Shuseikan Conservation Council and the Partnership Council for Modern Industrial Heritage Sites in Kagoshima to ensure steady progress on each of the conservation and restoration.

3. Methods

(1) Research and study

(a) Historical document surveys

The owner will work to elucidate the industrial systems that formed during Phase 1 of the Shuseikan Project, which included the cannon manufacturing depicted in the “Satsushu Mitoriezu collection owned by Takeo city”, and Phase 2, when industries such as spinning were pursued. In particular, a historical document survey will be undertaken to gain a detailed understanding of shipbuilding technologies and compare the Shuseikan Machinery Factory with the Nagasaki Iron Works, which was built by the shogunate prior to Phase 2 of the Shuseikan Project.

(b) Excavation surveys

The owner will spearhead excavation surveys to (i) identify the location and scale of the cannon-boring mill, the cut glass factory, and the blast furnace, (ii) carry out presentation of the leat (Shuseikan side) which was buried in earth and sand due to landslide, and (iii) confirm the remains of a gas lit experiment conducted using Crane-shaped stone lantern in relation to Phase 1; and to (i) confirm the scale of the Spinning Mill, (ii) confirm the location of affiliated facilities, and (iii) confirm remains indicating the location of the original Foreign Engineer’s Residence in relation to Phase 2.

(c) Measurement and ground surveys

The owner will conduct measurement and ground surveys as necessary based on the results of the historical document and excavation surveys. The necessary surveys will also be undertaken for the conservation and restoration of the Bogakuro Pavilion where posts are leaning and the storehouse, where plaster is flaking and stone foundations have weathered.

(d) Visitor surveys

The city will conduct a survey on visitor numbers, as well as observations of visitor behavior and the length of visits, to ascertain visitor impact on the state of the component part as well as the degree of visitor satisfaction.

(e) Monitoring

Every year the owner will engage in monitoring in conjunction with the city to inspect the component part and the buffer zone and ascertain their current states. Individual data for the component part will comprise detailed records of the parts and materials of each constituent element, while individual data for the buffer zone will comprise records of the landscape from multiple points selected within and outside the component part. Monitoring charts aggregating the above information will also be used.

(2) Conservation and restoration**(a) Target**

The owner will conserve (maintain, repair and restore) the constituent elements of the component part contributing to the Outstanding Universal Value. The location of each of these elements is noted in **Figure 2**.

(b) Basic concept and methods**○ Leat (Shuseikan side)**

The owner will engage in conservation and restoration based on the results of excavation survey in order to maintain the remains in stable condition. Because overgrown trees could cause damage to the remains, they will be removed to the extent necessary to prevent such damage. The scope of restoration work will be kept to a minimum pursuant to expert views. A survey will be conducted of the existing drainage canal, determining an appropriate runoff channel so as not to encourage the negative impact of soil runoff by running water on the terrain or the remains.

○ Shuseikan Machinery Factory

The owner has undertaken appropriate conservation and restoration on stone buildings, and will continue with the seismic resistance survey, engaging in structural reinforcement where necessary.

○ Foreign Engineer's Residence

The owner will conserve and repair foundation stones for the pillars around the outside of the building where cracks have appeared. In terms of repair methods, seriously damaged stones will be replaced, but if there is only superficial damage, cracks will be repaired with adhesive, etc., and reinforced by applying chemicals.

Where paint on the outer wall has flaked markedly over time, the existing coat will be removed, the surfaces prepared, and new paint applied.

○ Sengan-en

No areas requiring urgent repair have been found at the sites of climbing kiln (connected kilns on the slope) or on the crane-shaped stone lantern, but the owner will carefully monitor their state and look into undertaking restoration work if deterioration or damage is detected. Conservation and restoration works are also necessary for the following elements and will be undertaken accordingly.

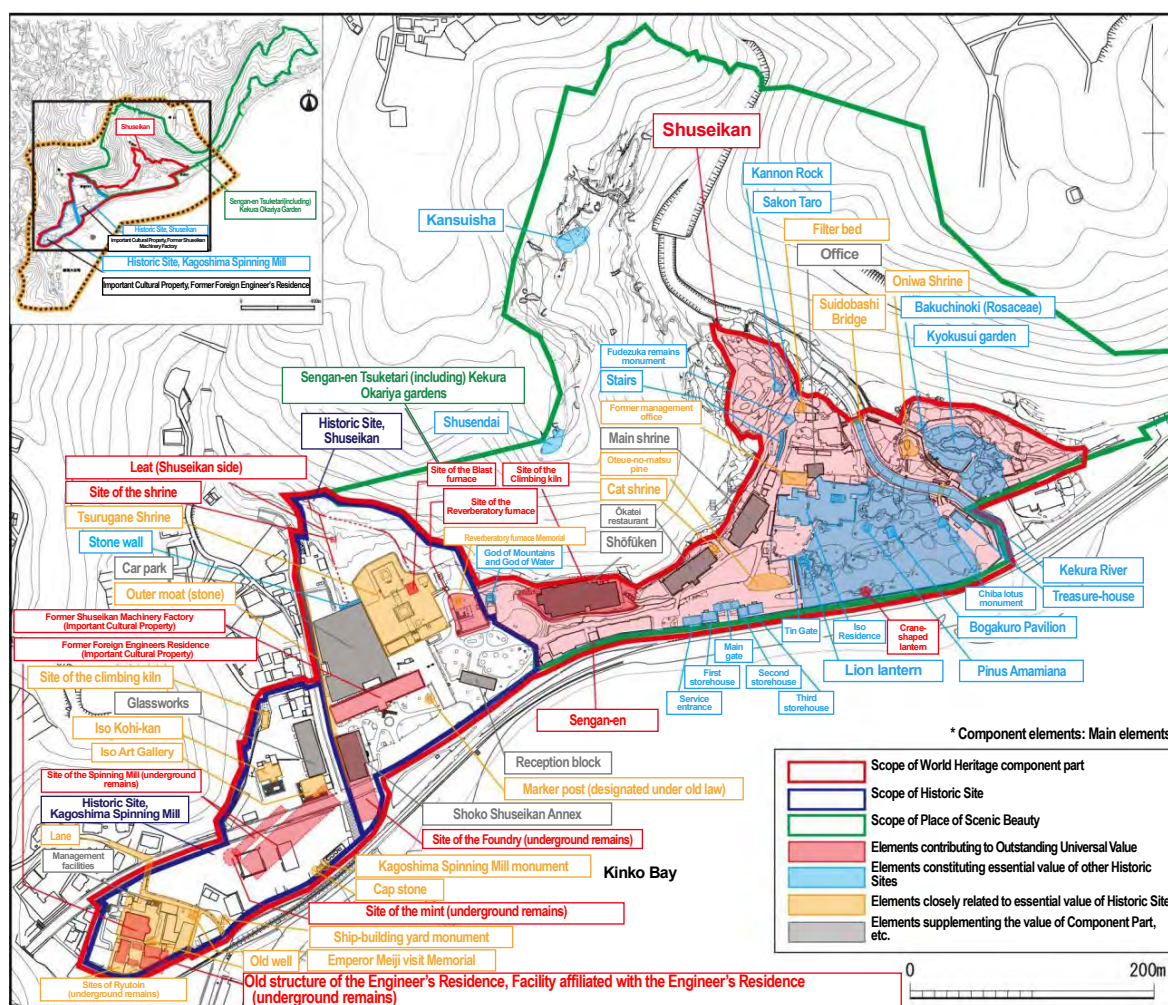


Figure 2: Constituent elements subject to conservation and restoration, etc.

■ Bogakuro Pavilion

Pillars will be replaced or reinforced by putting bolts through the splice area and fixing them on both sides. Angle braces will be attached to crossbeams to reinforce the structure. Heavily weathered flagstones will be replaced. The replacement stones will be made to replicate the existing stones.

■ Treasure house

The second-floor roof trusses will be examined for termite damage, taking termite eradication or prevention measures. Weathered flagstones will be repaired so as to prevent further damage. Weathered areas of the stone steps at the main gate will be replaced with stones of the same material. The structure of the eaves of the high windows will be improved by changing them to wooden backing material, etc.

○ Reverberatory Furnace and Site of Spinning Mill, etc.

No areas requiring urgent repair have been found at this stage, but the owner will carefully monitor the situation and look into undertaking restoration work if deterioration or damage is detected.

(3) Presentation of the component part in light of industrial systems

With the site divided into the Phase 1 Shuseikan Zone, Phase 2 Shuseikan Zone, and Place of Scenic Beauty Sengan-en Zone, the owner will design tour routes that enable visitors to understand the industrial systems of the different periods as well as the connection between the Place of Scenic Beauty Sengan-en Zone and the Shuseikan Project, providing information through display of remains and guidance and information boards. The site will be used not just as a tourism resource but also as a resource contributing to school education, social education, and local revitalization.

(a) Tour routes

The owner will set up a tour route that begins at the Sengan-en reception block and moves from the Phase 1 Shuseikan Zone to the Place of Scenic Beauty Sengan-en Zone and finishes at the Phase 2 Shuseikan Zone. In the Phase 1 zone, the course will follow the order of the cannon-manufacturing process. In the Phase 2 zone, the course will take visitors from the Shuseikan Machinery Factory as a key facility in the Phase 2 Shuseikan Project, and traverse in order the glassworks, Site of the Spinning Mill, and Foreign Engineer's Residence, etc., enabling visitors to understand the positioning of the various facilities and the flow between them. In the Place of Scenic Beauty Sengan-en Zone, the existing path will basically be used on a course that takes visitors to sites deeply implicated in the Shuseikan Project, such as the site of the climbing kiln, the Iso Residence, the crane-shaped lantern, and the Bogakuro Pavilion (**Figure 3**).

(b) Display of underground archaeological remains and environmental improvement

The owner will create garden paths and drains to promote public utilization of the Leat (Shuseikan side). Planar markers will be installed for the sites of blast furnace, cannon-boring mill, and glassworks to provide information on the locations, scales, and structures of the underground archaeological remains based on excavation survey results. The area around the Foreign Engineer's Residence will be arranged so that it can be used together with the land recently purchased by the city, with planar markers installed for related archaeological remains such as the stable, the foundation facilities of which are buried underground. If, once the planned National Road 10 bypass goes in beneath part of the verge of the buffer zone, traffic on the existing National Road 10 dwindles and commercial facilities move elsewhere as a result, the underground archaeological remains of the foundation portion of the Spinning Mill will be indicated on-site with planar markers to the extent possible.

(c) Arranging landscape and planting vegetation

The city will arrange landscape around the Foreign Engineer's Residence by replanting the original evergreens and putting soil-based paths through the grounds with reference to old photographs, etc., while ensuring that the building can be seen from National Road 10, which runs along the northwestern side, and the municipal road which runs along the southwestern side.

In Sengan-en, Shimadzu, Ltd. will preserve and nurture the trees constituting the garden, as well as felling and replacing overgrown trees that might impact on the safety of visitors and the conservation of underground archaeological remains such as the reception block and Tsurugane Shrine approach.

(d) Guidance and information boards

The city will set up a World Heritage Plaque as one of the Sites of Japan's Meiji Industrial Revolution in the vicinity of the Shuseikan Machinery Factory, highlighting the Outstanding Universal Value of the property and how Shuseikan is contributing to the OUV as one of the 23 component parts. Together with progress on excavation surveys and marking out the remains, guidance boards will be set up to explain the role of the each remains in the industrial system and their relationship to other remains, while information boards indicating the new courses will be installed along the routes. Guidance and information boards set up within Sengan-en will be of a design, form, and quantity and in locations that do not detract from the value of the garden as a Place of Scenic Beauty.

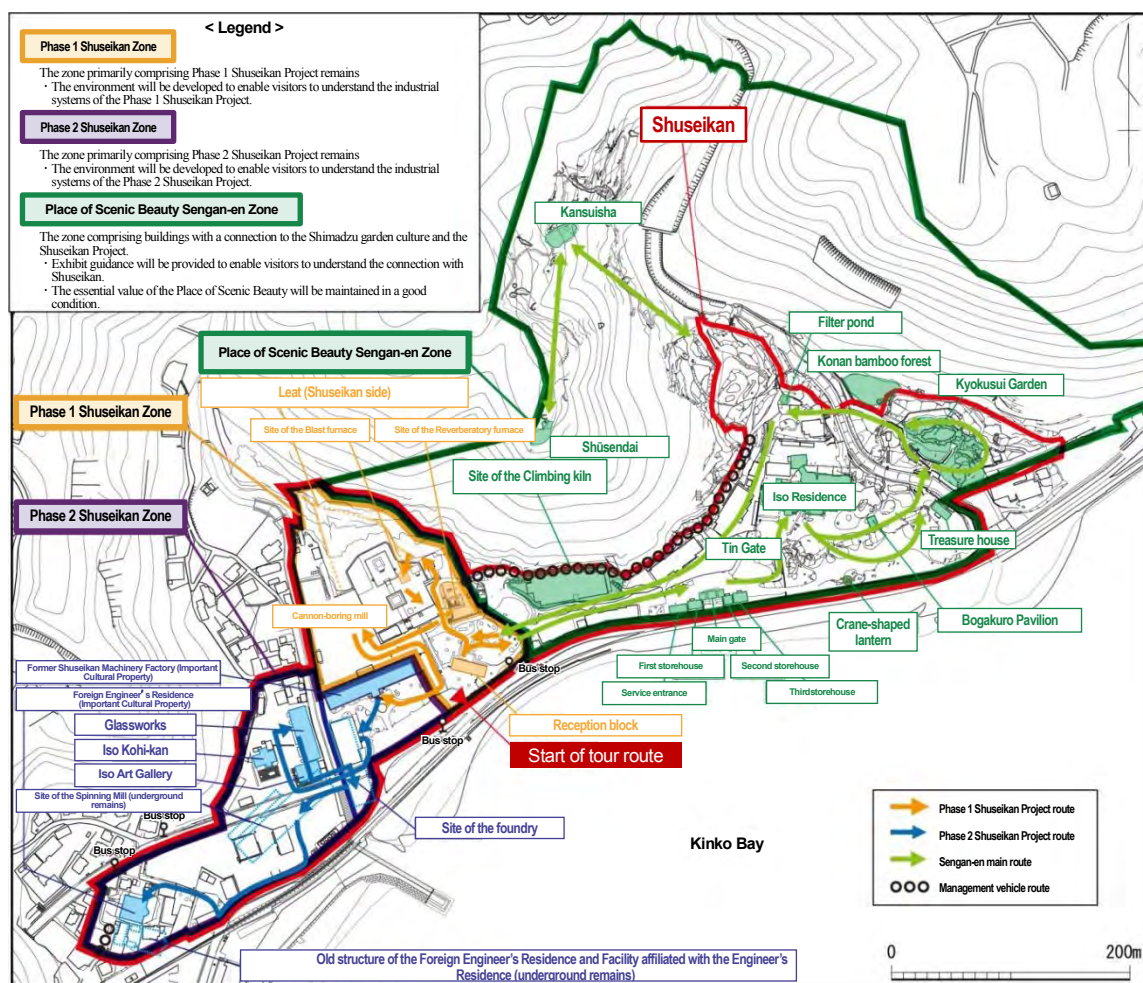


Figure 3: Zoning of component part elements and surrounding area

(e) Administrative and utility facilities

The owner will set up a new guidance facility near the Sengan-en reception block, providing clear guidance in the collaboration with Shoko Shuseikan (Shuseikan Machinery Factory), the annex to this, and the Foreign Engineer's Residence. The new facility will present exhibits and provide explanations that enable visitors to understand the Outstanding Universal Value and contribution of Shuseikan, the content of the Shuseikan Project in Phases 1 and 2, the relationships between Shuseikan and other component parts in other Areas, and the connection with nearby historic sites, maintaining an appropriate division of roles with other explanation and exhibition facilities.

The administration block, information station, and toilets, etc., scattered around the Foreign Engineer's Residence grounds will be merged into one new facility built with sensitivity to the landscape. All toilets within the component part will be made barrier-free.

The glassworks where visitors can observe the glassmaking process will continue to be opened to the public, as will the Iso Residence, etc. The three storehouses will also be opened to the public after restoration are completed (Storehouses 1, 2, and 3 in Figure 3).

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

The city and the relevant administrative institutions will conserve the settings and landscape in good condition through regulations pursuant to the Landscape Act, the Natural Parks Act, and the City Planning Act. In the area behind the component part, slopes will be stabilized and mōsō bamboo and dead trees will be

felled. Particularly when restoring slips, etc., on slopes, materials and methods will be applied with sensitivity to the landscape.

In addition, there is a plan to run a National Road 10 bypass tunnel through the west hilly area. At present, this is not expected to adversely impact on the buffer zone. Based on progress with the construction plan, the Cabinet Secretariat will coordinate with the Ministry of Land, Infrastructure, Transport, and Tourism, Kagoshima Prefectural Government, and Kagoshima City to gather the necessary information to create a Heritage Impact Assessment Report, and the city will work through the Shuseikan Conservation Council to build consensus on the content of that report.²

4. Projects implementation

(1) Order of priorities

The schedule for implementation of those projects which should be undertaken on a priority basis in each zone will be as in **Table 2**. Projects which will be given particular priority in the short term phase are as follows:

- Establishment of guidance facilities
- Seismic resistance analysis and structural reinforcement of the Shuseikan Machinery Factory
- Establishment of a World Heritage Plaque
- Conservation and restoration of other constituent elements (buildings and historical and archaeological remains and objects) contributing to the Outstanding Universal Value.

(2) Review of implementation schedule

The schedule will be reviewed after the medium-term phase (15 years) based on the state of project progress. Where new measures need to be taken, a review will be considered prior to that time.

(3) Other

The owner has carried out conservation and restoration work, etc. for the Shuseikan 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 168 million yen was spent in FY2016 (including the amount spent for excavation survey of Former Foreign Engineer's Residence and its vicinity) and 627 million yen has been budgeted for FY2017 (including the amount earmarked for seismic resistance analysis), 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.

² The National Road 10 Bypass Construction Plan was submitted to the UNESCO World Heritage Center on November 30, 2015, pursuant to Recommendation h) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2015. In addition, the ICOMOS Technical Report on "Sites of Japan's Meiji Industrial Revolution: Iron and Steel, Shipbuilding and Coal Mining" was sent to the Government of Japan on June 1, 2017 via the World Heritage Center conducted a Heritage Impact Assessment (HIA) in relation to the above plan and recommended that a report be submitted to the World Heritage Center for the purpose of an ICOMOS assessment.



Figure 4: Conceptual drawing after projects completed in the component part

Zone	Category	Project	Short term					Medium term	Long term
			2017	2018	2019	2020	2021	2022-31	2032 onward
A. Phase 1 Shuseikan zone	(1) Research and study	(a) Excavation surveys for cannon-boring mill, glassworks, and blast furnace							
		(b) Excavation survey on the portion of the leat (Shuseikan side) buried in earth and sand							
	(2) Conservation and restoration of buildings and historical and archaeological remains and objects	(c) Restoration of drainage canal leat (Shuseikan side)							
		(d) Conservation and restoration of sites of reverberatory furnace and Spinning Mill							
	(3) Presentation and Public utilization in light of industrial systems	(e) Arrangement and improvement of landscape with felling and replacing large and dead trees							
		(f) Establishment of guidance facility							
		(g) Display information on tour routes							
		(h) Installation of barrier-free toilets in Sengan-en carpark							
		(i) Improve leat (Shuseikan side) and open to public							
		(j) Installation of signage on underground archaeological remains of cannon-boring mill, glassworks, and blast furnace							
B. Phase 2 Shuseikan zone	(1) Research and study	(a) Excavation survey of Spinning Mill							
		(b) Excavation survey of original location of Foreign Engineer's Residence							
	(2) Conservation and restoration of buildings and historical and archaeological remains and objects	(c) Conservation and restoration of Foreign Engineer's Residence							
		(d) Conservation and restoration of reverberatory furnace and Spinning Mill (relisted)							
		(e) Seismic resistance analysis and structural reinforcement of Shuseikan Machinery Factory							
	(3) Presentation and Public utilization in light of industrial systems	(f) Establishment of a World Heritage Plaque							
		(g) Combined public utilization of glassworks and Iso Art Gallery							
		(h) Installation of barrier-free toilets in Iso Art Gallery							
		(i) Updating of guidance boards based on the results of excavation survey							
		(j) Installation of planar markers on site of Spinning Mill							
		(k) Improvement of settings of Foreign Engineer's Residence for public utilization with the land owned by city							
		(l) Establishment of management and toilet facilities to merge the administration block and information station, etc., into one place							
		(m) Installation of barrier-free toilets in the Foreign Engineer's Residence							
		(n) Arrangement and improvement of landscape reminiscent of the historical background							
C. Place of Scenic Beauty Sengan-en Zone	(1) Research and study	(a) Excavation survey around crane-shaped stone lantern							
		(b) Measurement of amount of lean in Bogakuro Pavilion, etc., and ground survey							
	(2) Conservation and restoration of buildings and historical and archaeological remains and objects	(c) Conservation and restoration of sites of climbing kiln and crane-shaped stone lantern							
		(d) Conservation and restoration of treasure house							
		(e) Conservation and restoration of Bogakuro Pavilion							
	(3) Presentation and Public utilization in light of industrial systems	(f) Conservation and nurturing the trees forming the garden							
		(g) Continued use of the Iso Residence							
		(h) Opening of the storehouses to the public							
D. Buffer zone	Presentation and Public utilization in light of industrial systems	(i) Stabilization of slopes							
		(j) Felling of mōsō bamboo							
		(k) Felling of dead trees, planting of replacements							
		(l) Legal protection sensitive to the natural terrain and landscape							

Table 2: Project implementation schedule

5. Basic plan

The master plan showing those project to be implemented at Shuseikan is as in **Figure 5** below.

6. Others

The Conservation, Restoration, Presentation and Public Utilization Plan for Shuseikan, which became a source of “Conservation Work Programme and Implementation Programme” is available on Kagoshima City’s web site. <<http://www.city.kagoshima.lg.jp/kanko/sekaiisan/bunkazai-sekaiisan/syuufuku-koukaikatsuyoukeikaku2.html>>

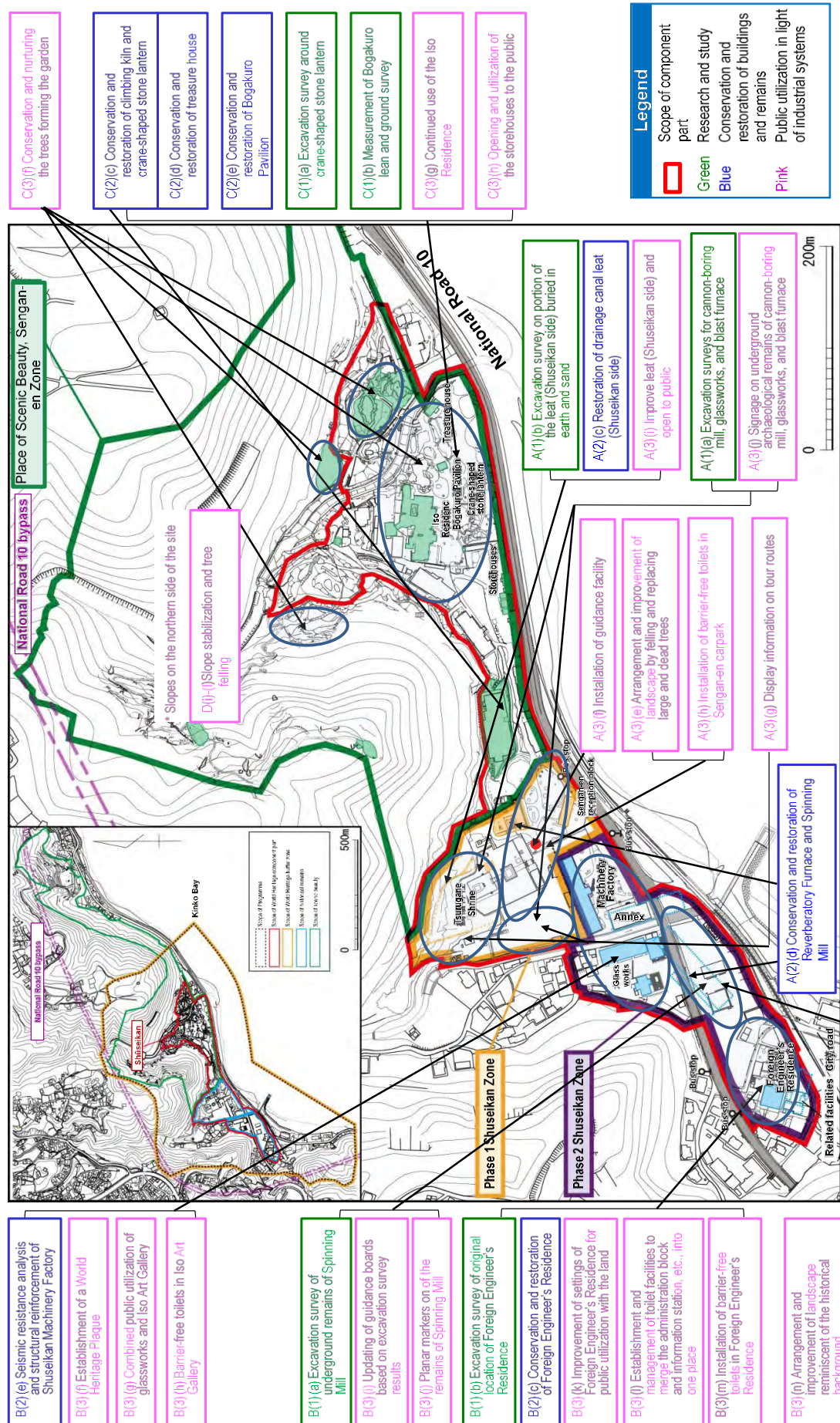


Figure 5: Shuseikan Basic Plan

Conservation work programme and implementation programme for Terayama Charcoal Kiln (Area 2 Kagoshima/ Component Part 2-2)

Kagoshima City drew up a “Conservation Work Programme and Implementation Programme” for Terayama Charcoal Kiln in FY 2016 and 2017, pursuant to Recommendation b) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2015. The Programme comprises detailed measures for the conservation and restoration 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”).

1. Approach to conservation

Maintain in good condition those remains and its settings embodying the production system for hard charcoal, which served as the fuel for the Shuseikan Project; enhance the value and attractiveness of these, and the visitor environment.

The Terayama Charcoal Kiln was a large kiln built for the mass production of powerful-firing hard charcoal to supply the fuel needed for the Shuseikan Project. In addition to representing the hard charcoal production system, the site also forms part of the whole Shuseikan industrial system which illustrates the phase of trial and error experimentation in the iron and steel manufacturing field that took place at the Sites of Japan’s Meiji Industrial Revolution.

In the Conservation Management Plan (CMP) for Terayama Charcoal Kiln, which was prepared for nomination of “Sites of Japan’s Meiji Industrial Revolution” for World Heritage inscription. The list of elements constituting Terayama Charcoal Kiln and their value categories are shown as **Table 1**.

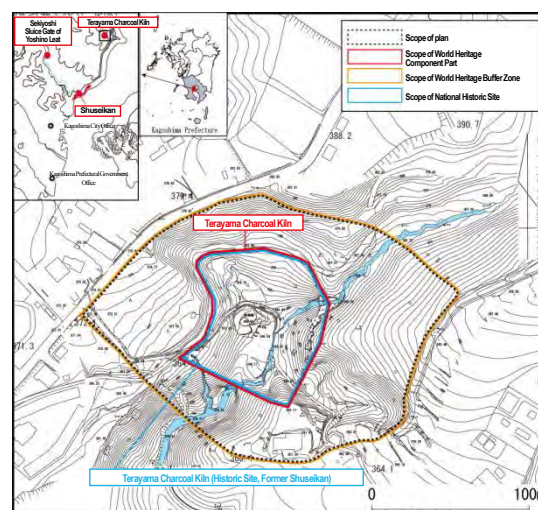


Figure 1: Scope of programme

Area	Time Period	Element	Value to the actors		
			OUV	Nation	Region
Terayama Area	Shuseikan Project Phase I	Site of the Charcoal Kiln	○	○	○
		Monument to the Charcoal Kiln	○	○	○

Table 1: The list of elements constituting Terayama Charcoal Kiln and their value categories

Out of these elements in the **Table 1**, which the Conservation Work Programme for Terayama Charcoal Kiln will mainly focus on the constituent elements that contribute to the Outstanding Universal Value, due attention will also be given to the elements that represent the value categorized as national and/or regional respectively, and others in view of the process of historical changes and developments of the component part.

Based on the approach for conservation and categorized value of elements mentioned above, Kagoshima City will firmly conduct projects for conservation, restoration and presentation of the component part with a central focus on the following three points.

The city will serve as the main agent in not only maintaining the kiln itself as remains contributing to the Outstanding Universal Value of the World Heritage property, but also undertake surveys of surrounding remains

that embody the whole charcoal production system, and conserve the settings, such as the forests that provided the raw materials and the streams that supplied the cooling water after firing.

The city will enhance explanation functions so that visitors can understand the hard charcoal production system as well as the role which the site played in supplying fuel to the Shuseikan Project and ensure a safe observing environment.

(1) Conduct surveys of and conserve (maintain, repair and restore) the charcoal kiln and related remains

The city will conduct a displacement measurement survey of the kiln's masonry, which remains above ground in the same condition as when it was built, engaging in conservation and restoration where necessary under the direction of experts, and maintaining the masonry in a stable condition. If any underground archaeological remains related to hard charcoal production are discovered through excavation surveys, appropriate measures will be taken to conserve them underground.

(2) Conserve (maintain, repair and arrange) the settings, which is closely related to kiln operation, and arrange and improve later installations appropriately for landscape

The *Castanopsis sieboldii*, tan oak, and other evergreen broad-leaved trees around the kiln which supplied the raw materials for the kiln, as well as the stream running down the eastern side of the kiln which was necessary to secure the charcoal cooling water for the production process, are both essential elements in understanding the hard charcoal production system. Therefore, the city will appropriately manage and maintain elements and undertake conservation and restoration, arrange and improve landscape where necessary. The significance of trees and concrete installations from later times that hamper understanding of the original hard charcoal production system will be carefully judged, and, where necessary, these will be felled, removed, or arranged, improved.

(3) Provide clear explanations of the original kiln operation

Considering the process of historical changes and developments, to enable visitors to understand the role of the kiln in the hard charcoal production and utilization system from the sequence of coal production processes (gathering raw materials, firing the kiln, extracting and cooling the charcoal) to transportation to Shuseikan, as well as the use of hard charcoal in the reverberatory furnace, etc., the city will install explanation boards for the site of the charcoal kiln based on excavation survey results, in addition to installing planar markers indicating the locations, scales, and structures of the underground archaeological remains of related facilities.

Where explanation boards are installed, and planar markers laid down for underground archaeological remains, care will be taken to harmonize these with the terrain and the natural landscape surrounding the site of the charcoal kiln. Where necessary, measures for the safety of paths leading to the kiln in order to maintain a safe observation environment.

2. Policy

The policy consisting of following five items has been set to approach conservation:

(1) Promoting research and study

The city will undertake the following research and surveys.

The historical document survey will seek to elucidate the entirety of the hard charcoal production system, including the sequence of the processes conducted at the Terayama Charcoal Kiln and the locations of the related facilities at that time, while the excavation survey will focus on understanding the actual state of the storehouse remains and other related facilities, as well as elucidating the structure of the kiln. Where the excavation survey reveals carbide, this will be subjected to a physico-chemical analysis. At the same time of the historical document and excavation surveys, the city will also conduct measurement and ground surveys as necessary. In addition, displacement measurements of the kiln masonry will be continued to identify and analyze the behavior of each stone materials. A visitor survey will be undertaken to confirm the extent of visitor impact on conservation of the component part, while monitoring will also be implemented to identify any changes in the component part.

(2) Conserving, reinforcing and stabilizing of materials, substance and structures of masonry of the kiln

To maintain constituent elements of Terayama Charcoal Kiln contributing to the Outstanding Universal Value, such as the kiln masonry, etc. the city will engage in regular monitoring, and if damaged areas, or areas where damage could potentially occur, are discovered, will undertake systematic restoration in order of priority as determined with reference to the views of experts, etc., to stabilize and strengthen those areas. Restoration of exposed structures will be undertaken with due sensitivity to maintaining the structures and materials used at the time. Underground archaeological remains that have so far been detected will be given a protective earth layer of an appropriate thickness and then maintained in a stable condition underground.

(3) Illustrating the hard charcoal-production system at the component part

The city will explain to visitors (a) the hard charcoal production system, (b) the role that the kiln played in the Shuseikan Project; and (c) the connection to other historic sites in the area. The results of surveys conducted by the city will be actively reflected in the content of explanations and exhibits.

(4) Arranging and improving landscape from a scenic perspective

The city will preserve the *Castanopsis sieboldii* and tan oak trees within the component part which supplied the raw materials for the kiln, and concrete installation and barrier fences that were added later period will be arranged for landscape. In the buffer zone, the city will maintain the surrounding forests where *Castanopsis sieboldii* and tan oak are distributed, as well as working to maintain a safe and pleasant walking environment along the nature trail.

Where monitoring identifies spots that have or might have a negative impact on the landscape, the owner of the spot will improve the landscape to prevent or mitigate that impact based on the views of experts and in conjunction with the city and other relevant administrative institutions.

(5) Implementing projects

The city will set out a clear implementation schedule that delineates short, medium and long-term phases and the various projects to be addressed within those phases to ensure the steady and phased implementation of the Programme.

The owners and managers of each of the component parts of Area 2 Kagoshima and the related buffer zones will be responsible for managing and operating the each project regarded as necessary for the three phases pursuant to the Programme. In addition to the owners and managers, the Government of Japan and Kagoshima Prefectural Government, local neighborhood associations, NPOs, and other relevant institutions and groups will coordinate at the Shuseikan Conservation Council and the Partnership Council for Modern Industrial Heritage Sites in Kagoshima to ensure steady progress on each of the conservation and restoration projects.

3. Methods**(1) Research and Study**

The city will undertake the following surveys.

(a) Historical document surveys

Because Nariakira Shimadzu dispatched Yamamoto Tosuke to Kii and Kumano region to collect information in preparation for building the kiln, a survey will be conducted on the structure of kilns and the hard charcoal production process in Kii and Kumano, and information will be collected on Nishu Oteyama (Miyakonojo City and Ayacho, Higashimorokata district in Miyazaki Prefecture), which was managed by the Yamamoto family.

(b) Excavation surveys

Additional excavation surveys will be conducted on the structure of the interior of the kiln masonry, as well as surveys of facilities related to the charcoal-producing process (setting materials in the kiln, firing the kiln, refining and cooling the charcoal, etc.) and the remains of these. Where an excavation survey reveals carbide, this will be subjected to a physico-chemical analysis.

(c) Measurement and ground surveys

Measurement and ground surveys will be conducted as necessary based on the results of the historical document and excavation surveys. In addition, displacement measurements of the kiln masonry will be continued to identify and analyze the behavior of the each stone materials.

(d) Visitor surveys

The city will conduct a survey on visitor numbers, as well as observations of visitor behavior and the length of their visits, to ascertain their impact on the state of the component part as well as the degree of visitor satisfaction.

(g) Monitoring

Every year city will inspect the component part and the buffer zone and ascertain their current state. Individual data for the component part will comprise detailed records of the parts and materials of each constituent element, while individual data for the buffer zone will comprise records of the landscape from multiple points selected within and outside the component part. Monitoring charts aggregating the above information will also be used.

(2) Conservation and restoration**(a) Target**

The city will conserve and restore masonry and other constituent elements of the component part contributing to the Outstanding Universal Value. The location of each of these elements is noted in **Figure2**.

(b) Basic concept and methods**Charcoal kiln (including the foreground) and monument to the charcoal kiln**

Where areas of the kiln masonry are found to have loosened or swollen, the city will conduct displacement measurement surveys over multiple years and, based on the results, specify which areas need to be restored, undertaking that work using the optimal methods. The extent of restoration work will be kept to a minimum pursuant to expert guidance. If sheets for covering, sandbags, or other items have been temporarily installed to prevent rain damage, these will be removed before the restoration work.

While no areas of the monument to the kiln (**Figure 2**) appear to be in need of urgent repair at this point, the state of the monument will be monitored and restoration work undertaken if any deterioration or damage is identified.

(3) Presentation of the component part in light of hard charcoal production system

In the scope of the component part, all the constituent elements of the hard charcoal production system, including the kiln, the flat ground where the related facilities are thought to have been located, and the surrounding forests are converged. The city will therefore treat the area as one unified zone, using the component part not only as a tourism resource but also as a resource contributing to school and social education as well as regional revitalization. Zoning is shown in **Figure 4**.

(a) Tour route

A route will be set out between the car park of Terayama Fureai Park around 800 meters to the south of the component part and the car park to be built next to Prefectural Road 220 around 100 meters west, using the nature trail to take visitors through to the kiln and its foreground (**Figure 5**).

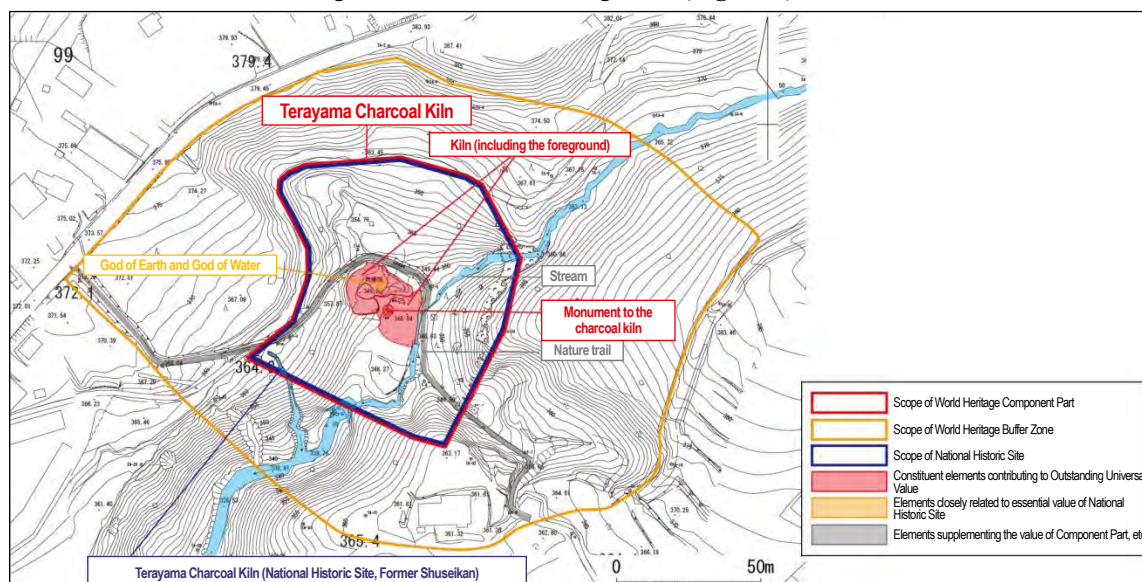


Figure 2: Constituent elements, subject to conservation and restoration, etc.

(b) Planar markers for presentation of underground archaeological remains and environmental improvement

An excavation survey will be undertaken of the original related facilities such as storehouse and others. Based on the results, planar markers will be installed to provide information on the locations, scales, and structures of underground archaeological remains. In the foreground of the kiln, a layer of earth will be maintained to protect underground archaeological remains. The stone monument standing to the southeast of the kiln obstructs the front view of the kiln and will therefore be moved to a more appropriate spot. Improvements will be made to rain runoff on the nature trail and the surface of the trail.

(c) Arranging and improving landscape and planting vegetation

The artificial wooden fence that restricts visitors from going inside the masonry of the kiln will be upgraded into a barrier of a design and materials suited to the landscape. The concrete embankment along the edge of the stream will be arranged using natural stone in a way that maintains continuity with the downstream stone embankment. Cedars and other trees planted in later years will be progressively felled while maintaining and planting the *Castanopsis sieboldii* and tan oak trees which supplied the raw materials for hard charcoal.

(d) Guidance and information boards

A World Heritage Plaque as one of the Sites of Japan's Meiji Industrial Revolution will be set up in the foreground, highlighting the Outstanding Universal Value of the World Heritage property as a whole and the fact that the kiln is one of the 23 component parts of the property. The results of future surveys will be reflected in the content of guidance boards, etc., for related facilities in the vicinity of the kiln.

(e) Administrative and utility facilities

Given trends in visitor numbers, a car park and toilets will be set up next to Prefectural Road 220 at the western end of the nature trail, which is close to the kiln (**Figure 5**).

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

The city and the relevant administrative institutions will conserve the excellent local environment and landscape through regulations pursuant to the Landscape Act, the Natural Parks Act, and the City Planning Act.

The city will also work to protect the wild *Castanopsis sieboldii* and tan oak trees which supplied the raw material for charcoal, as well as maintaining a good walking environment along the nature trail.

4. Projects Implementation

(1) Order of priorities

The schedule for implementation of those projects which should be undertaken on a priority basis in the each zone will be as in **Table 2**. Projects which will be given particular priority in the short term phase are as follows:

- Masonry displacement measurement and kinetic analysis
- Restoration of the kiln and the kiln monument
- Establishment of a World Heritage Plaque
- Improvement of the surface of the nature trail

Category	Project	Short term					Medium term	Long term
		2017	2018	2019	2020	2021	2022-31	2032 onward
(1) Research and study	(a) Additional research on kiln structure							
	(b) Excavation surveys on storehouse remains and other related facilities							
	(c) Masonry displacement measurement and kinetic analysis							
(2) Conservation and restoration of buildings and historical and archaeological remains and objects	(d) Restoration of kiln and monument of kiln							
(3) Presentation and Public utilization in light of industrial systems	(e) keeping earth layer for the foreground							
	(f) Protection of the wild <i>Castanopsis sieboldii</i> and tan oak trees which were the raw material for charcoal							
	(g) Establishment of a new carpark and toilets based on visitor trends							
	(h) Installation of a World Heritage Plaque							
	(i) Improvement of the surface of the nature trail							
	(j) Improvement of nature trail drainage							
	(k) Upgrading of barrier fence							
	(l) Arrangement of concrete water channel for landscape							
	(m) Updating of guidance boards based on survey results							
	(n) Installation of planar markers for underground archaeological remains of storehouse and other related facilities							
	(o) Shifting of the monument							

Table 2: Project implementation schedule

(2) Review of implementation schedule

The schedule will be reviewed after the medium-term phase (15 years) based on the state of project progress. Where new measures need to be taken, a review will be considered prior to that time.

(3) Other

Kagoshima City has carried out conservation and restoration work, etc. for the Shuseikan 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 2 million yen was spent in FY2016 (including the amount spent for improvement of visiting path) and 3 million yen has been budgeted for FY2017 (including the amount earmarked for masonry displacement measurement and kinetic analysis), 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.



Figure 3: Conceptual drawing after project completion of Terayama Charcoal Kiln

5. Basic plan

The Terayama Charcoal Kiln basic plan and conceptual drawing after projects completion of the component part are shown in **Figures 4 and 5**.

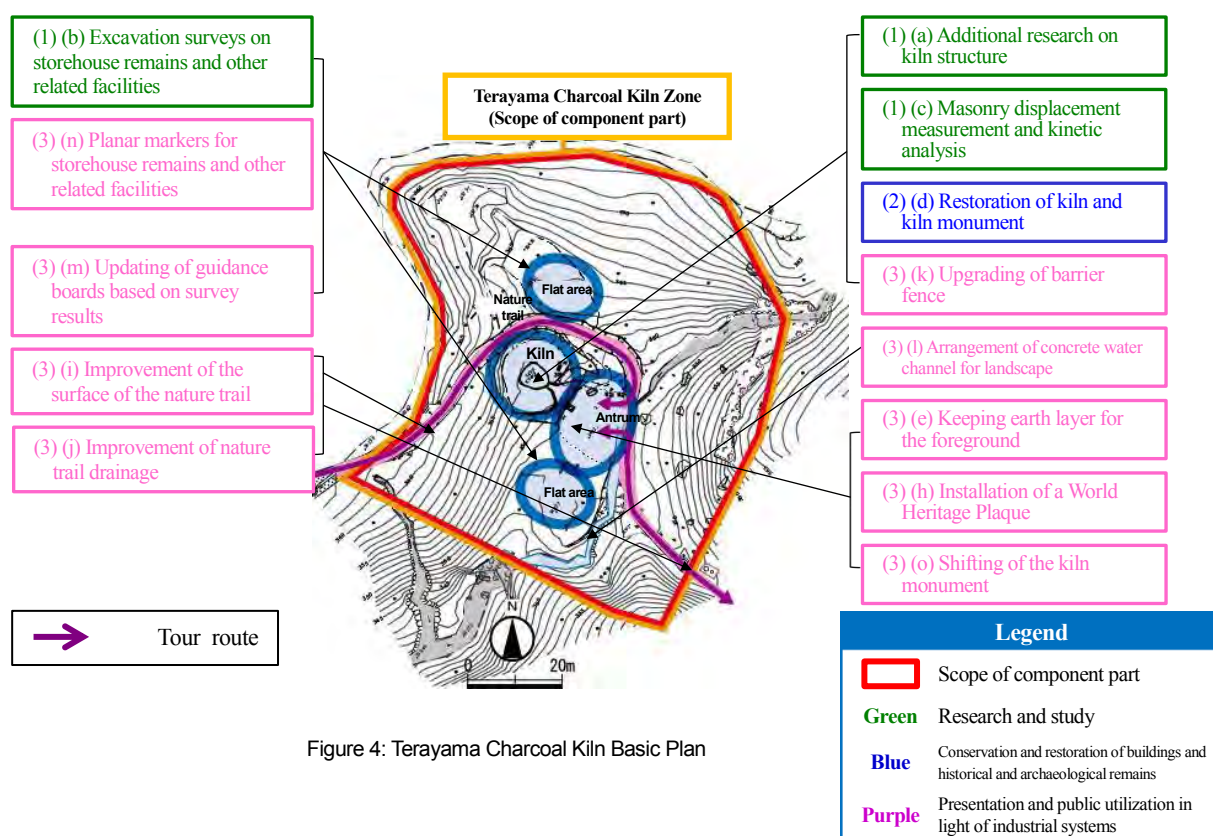


Figure 4: Terayama Charcoal Kiln Basic Plan

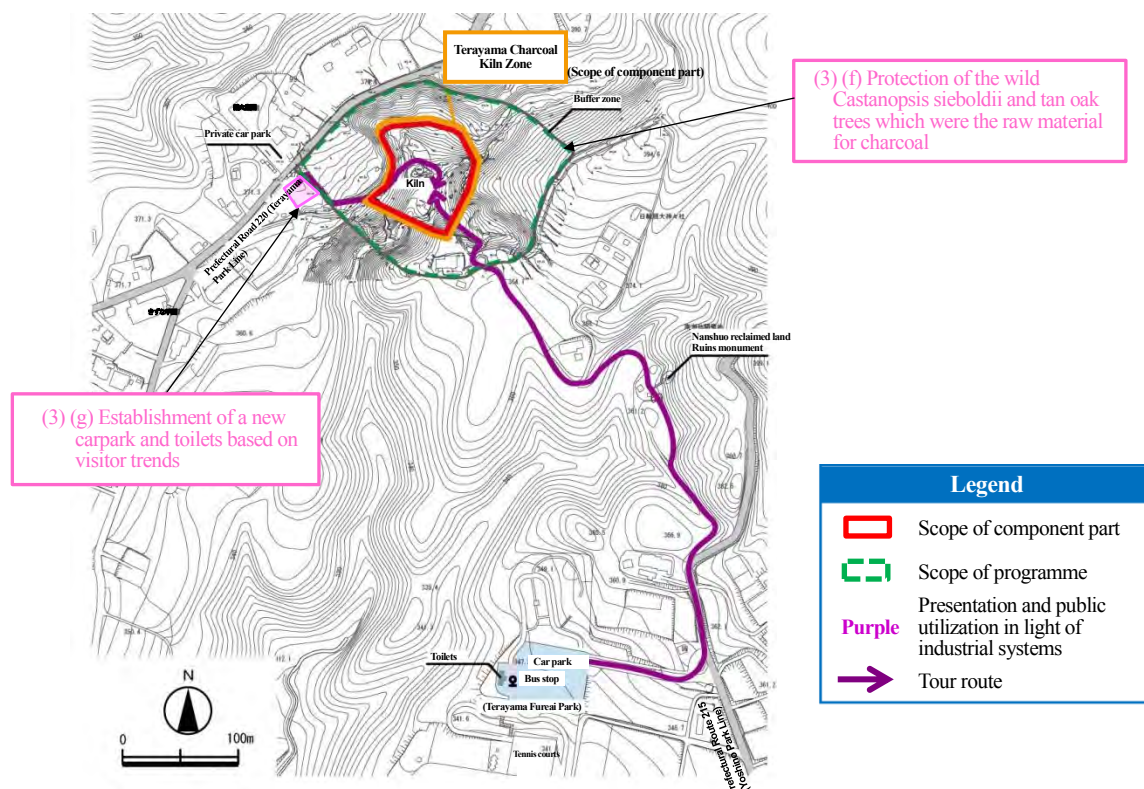


Figure 5: Terayama Charcoal Kiln vicinity Basic Plan

6. Others

The Conservation, Restoration, Presentation and Public Utilization Plan for Terayama Charcoal Kiln, which became a source of “Conservation Work Programme and Implementation Programme” is available on Kagoshima City’s web site. <http://www.city.kagoshima.lg.jp/kanko/sekaiisan/bunkazai-sekaiisan/syuufuku-koukaikatsuyoukeikaku2.html>

Conservation work programme and implementation programme for Sekiyoshi Sluice Gate of Yoshino Leat (Area 2 Kagoshima/ Component Part 2-3)

Kagoshima City drew up a “Conservation Work Programme and Implementation Programme” for Sekiyoshi Sluice Gate of Yoshino Leat in FY 2016 and 2017, pursuant to Recommendation b) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2015. The Programme comprises detailed measures for the conservation and restoration 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”).

1. Approach to Conservation

To maintain the remains of the leat that was modified for conveying water to the waterwheel that powered Shuseikan, and its settings in favorable condition for future generations, while at the same time enhancing the value and attractiveness of these, and visitor environment.

The Sekiyoshi Sluice Gate of Yoshino Leat is a gate of the leat modified to supply water that drove a waterwheel as a source of power for the Shuseikan Project. Among the Sites of Japan’s Meiji Industrial Revolution, it is part of the Shuseikan industrial system, a component part that shows the phase of trial and error experiment in the steelmaking field, and in the shipbuilding field, up to the phase of direct importation of Western technology.

In the Conservation Management Plan (CMP) for Sekiyoshi Sluice Gate of Yoshino Leat, which was prepared for nomination of “Sites of Japan’s Meiji Industrial Revolution” for World Heritage inscription. The list of elements constituting Sekiyoshi Sluice Gate of Yoshino Leat and their value categories are shown as **Table 1**.

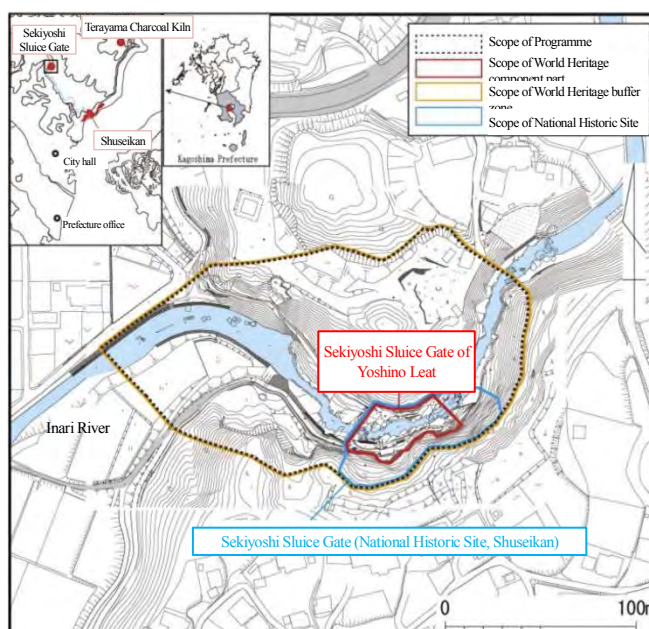


Figure 1. Scope of Programme

Area	Time Period	Element	Value to the actors		
			OUV	Nation	Region
Sekiyoshi Area	Shuseikan Project Phase I	Remains of the sluice gate (Genroku period)	○	○	○
		Monument to Water god Suiten	○	○	○
	Later period	Remains of the sluice gate (Taisho period)			○
		Monument commemorating the repair works			○

Table 1: The list of elements constituting Sekiyoshi Sluice Gate of Yoshino Leat and their value categories

Out of these elements in the **Table 1**, which the Conservation Work Programme for Sekiyoshi Sluice Gate of Yoshino Leat will mainly focus on the constituent elements that contribute to the Outstanding Universal Value, due attention will also be given to the elements that represent the value categorized as national and/or regional respectively, and others in view of the process of historical changes and developments of the component part.

Based on the approach for conservation and categorized value of elements mentioned above, Kagoshima City will firmly conduct projects for conservation, restoration and presentation of the component part with a central focus on the following three points.

Kagoshima City serving as the leading entity to carry out conservation and restoration of the constituent elements contributing to the Outstanding Universal Value, such as the remains of the sluice gate (Genroku Period: 1691-1704), dam remains representing its use through the Edo Period, the leat still in use today, and the surrounding rural landscape and natural environment. Explanatory displays will be enhanced so visitors can understand not only its function as a sluice gate (water intake) but its geographical and functional relationship to the Shuseikan Project; moreover, a safe facilities for visitors will be installed.

(1) Undertake conservation work and arrangement and improvement of landscape of remains representing the process of modification of sluice gate and its historical changes and developments

The scope of the component part and its buffer zone encompasses remains and facilities belonging to each period from the Edo Period to the Taisho and Showa eras. The current sluice gate was modified in the Taisho era. It is used even today for irrigation water and still deeply relevant to the lives and occupations of people in the area. In consideration of these factors, the city under the cooperation of related institutions, while adopting a basic policy of maintaining the settings of the sluice gate as modified in the Taisho era, will arrange the concrete installations and other features added in Showa era and after to the extent that their use for irrigation water is not hindered.

(2) Explain sluice gate's role in Shuseikan Project and historical changes and developments comprehensibly

The Sekiyoshi Sluice Gate connects in a direct line to Shuseikan, serving as the water source for the waterwheel that powered the blast furnace, cannon-boring mill, etc. To help visitors readily grasp this role of the sluice gate in the Shuseikan Project, considering the process of historical changes and developments of the Sekiyoshi Sluice Gate of Yoshino Leat, the city will provide explanation of the mechanism by which water was diverted from the river and of the changes and developments of industrial systems, from creation through extension, improvement, and modification, while reflecting the results of surveys to be conducted.

(3) Work to improve observing environment in consideration of remains and landscape, and to maintain historic settings

The city will improve the visiting path, etc., to ensure a safe observation for visitors.

In making these improvements to the visiting path and installing guidance and explanatory boards, due consideration will be made for harmonious scale, design, and layout so as not to adversely impact the remains and landscape. Efforts will also be made to conserve the rural landscape and natural environment of the area around the Inari River, which is estimated to be largely unchanged from the original era.

2. Policy

The policy consisting of following five items has been set to approach conservation.

(1) Promoting research and study

Kagoshima City will undertake the following researches and studies.

Historical document surveys will be conducted to shed light on the water utilization systems used by the Shuseikan Project, such as their damming methods. Excavation surveys will study the leat remains buried under the current visiting path from the time of the Shuseikan Project and look for traces of modifications over time. In parallel with these studies, the necessary measurement and ground surveys will be carried out to examine the mechanism and functions of waterwheel power. In addition, visitor surveys will be conducted to confirm the extent of visitor impact on the component part, and monitoring will be carried out to identify ongoing changes to the component part.

(2) Conserving and restoring the Sluice Gate and other remains (preserving, reinforcing, and stabilizing materials, substance, and structure)

To maintain constituent elements of Sekiyoshi Sluice Gate of Yoshino Leat contributing to the Outstanding Universal Value, such as the sluice gate of the leat, etc. the city will engage in regular monitoring, and if damaged areas, or areas where damage could potentially occur, are discovered, will undertake systematic restoration in order of priority as determined with reference to the views of experts, etc., to stabilize and strengthen those areas. Restoration of exposed structures will be undertaken with due sensitivity to maintaining the structures and materials used at the time. Underground archaeological remains under the visiting path that have so far been detected will be given a protective earth layer of an appropriate thickness and then maintained in a stable condition underground.

(3) Illustrating industrial systems in Shuseikan Project

Kagoshima City will provide easy-to-understand explanation of (1) the Sekiyoshi Sluice Gate's water intake system, (2) the role of the gate within the industrial systems of the Shuseikan Project, and (3) their relationship to nearby historic sites. The findings of upcoming investigative studies to be undertaken by the city will be actively reflected in the exhibits and descriptions.

(4) Arranging and improving landscape from a scenic perspective

The city, working with the owner of the relevant site, will properly manage the densely growing trees and other greenery on the slopes next to the visiting path to avoid overgrowth, and also carry out arrangement of the sandbags, concrete installations, etc., added in later years. In the buffer zone, measures will be taken to conserve the sluice gate, the forest environment along the Inari River, which serves as the water source, and the pastoral scenery along its downstream watershed.

In case monitoring confirms places with an actual or potential adverse impact on the landscape, the owners of the relevant sites, with support from the city and other relevant administrative institutions, will conduct arrangement and other improvements to prevent or mitigate the impact, taking into account the views of experts, etc.

(5) Implementing projects

The city will set out a clear implementation schedule that delineates short, medium and long-term phases and the various projects to be addressed within those phases to ensure the steady and phased implementation of the Programme.

The owners and managers of the each of the component parts of Area 2 Kagoshima and the related buffer zones will be responsible for managing and operating the each project regarded as necessary for the three phases pursuant to the Programme. In addition to the owners and managers, the Government of Japan and Kagoshima Prefectural Government, local neighborhood associations, NPOs, and other relevant institutions and groups will coordinate at the Shuseikan Conservation Council and the Partnership Council for Modern Industrial Heritage Sites in Kagoshima to ensure steady progress on each of the conservation and restoration projects.

3. Methods**(1) Research and study**

The city will undertake following surveys.

(a) Historical document surveys

Studies will attempt to clarify the water utilization systems, such as damming methods, used at the time, by means of comparisons with other water intake dams in Japan of the same period. A comprehensive survey will be made especially of the civil engineering techniques of the Satsuma Clan, which is believed to have accumulated a wealth of experience and knowledge from flood control work at the Kiso River (in the Nobi Plain) and rivers in – its own domain.

(b) Excavation surveys

To clarify the functions of the intake at the time of the Shuseikan Project and the history of modifications in the Taisho era, excavation surveys will study the old leat remains buried directly under the current visiting path.

(c) Measurement and ground surveys

Measurement and ground surveys will be conducted as necessary based on the results of the historical document and excavation surveys. The mechanism and functions of waterwheel power will also be investigated.

(d) Visitor surveys

The city will conduct a survey on visitor numbers, as well as observations of visitor behavior and the length of their visits, to ascertain their impact on the state of component part as well as the degree of visitor satisfaction.

(e) Monitoring

Every year city will inspect the component part and the buffer zone and ascertain their current state. Individual data for the component part will comprise detailed records of the parts and materials of each constituent element, while individual data for the buffer zone will comprise records of the landscape from multiple points selected within and outside the component part. Monitoring charts aggregating the above information will also be used.

(2) Conservation and restoration**(a) Target**

The city will conserve the sluice gate (Genroku Period, 1688-1704) and other constituent elements of the component part contributing to the Outstanding Universal Value. The location of each of these elements is noted in **Figure 2**.

(b) Basic concept and methods

Remains of the sluice gate (Genroku Period) and Monument to Water god Suiten

At present there are no elements seen to be in need of urgent repair, but the situation will be monitored and repairs made if damage or deterioration is found.

(3) Presentation of industrial systems in Shuseikan Project

The Sekiyoshi Sluice Gate component part encompasses many elements, concentrated around the Inari River, including the intake and sluice gate that were operated during the time of the Shuseikan Project, remains that were modified in the Taisho era, and other elements showing the changes that the sluice gate underwent over time. Viewing these many elements as pertaining to one cohesive zone, the city will utilize the site not only as a tourism resource but as a resource that contributes to school education, education of the general public, and community enrichment. The zoning is shown in **Figure 4**.

(a) Tour routes

Tour routes will be provided from the bus stop approximately 300 meters west of the component part, from the parking lot of the Sekiyoshi Sluice Gate, and from the bus stop approximately 700 meters southwest of the component part, each of them running along the waterway to the site (**Figure 5**).

(b) Planner markers for presentation of underground archaeological remains and improvement of the environment

The underground archaeological remains of the former leat which lies directly under the path near the sluice gate will be indicated on the paved surface of the path. These indications will reflect the results of planned excavation surveys.

(c) Arranging and improving landscape and planting vegetation

The densely growing trees on the slopes along the visiting path will be properly trimmed and pruned as directed by experts. In so doing, since the bamboo on the hillside is believed to have historical significance, being planted by the Satsuma Clan for stabilizing the embankment at least from the Tempo era (1830-1844), care will be taken to protect and cultivate it. The sandbags, sluice, concrete walls, and other installations added in later years will

undergo arrangement while maintaining the irrigation water function.

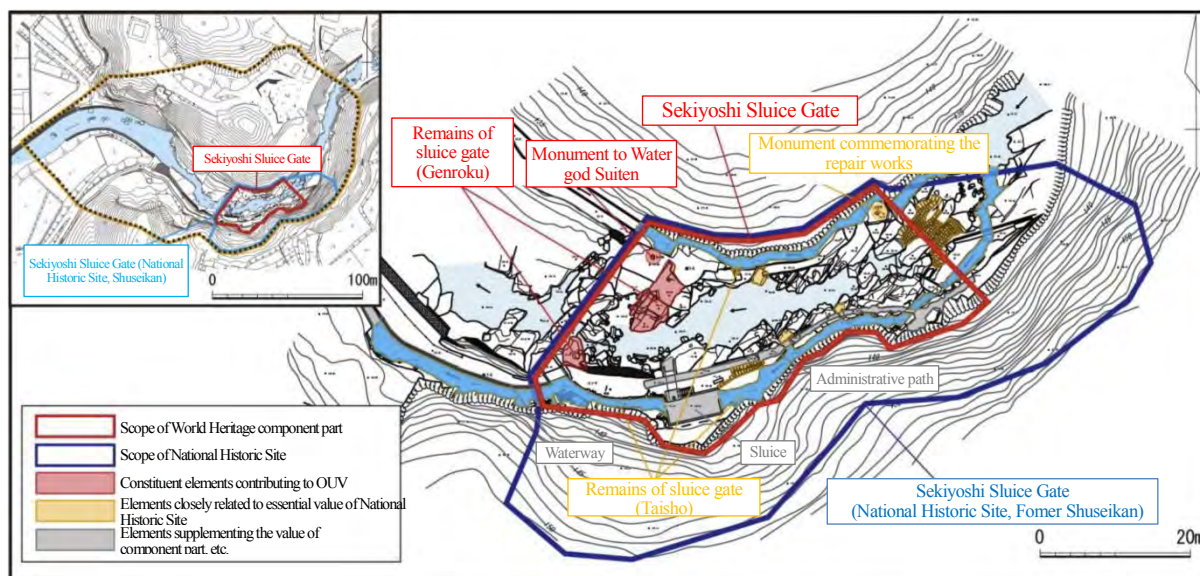


Figure 2. Elements subject to conservation and restoration etc.

(d) Guidance and information boards

A World Heritage Plaque as one of the “Sites of Japan’s Meiji Industrial Revolution” will be installed in an open space near the visiting path indicating the Outstanding Universal Value of the World Heritage property as a whole and making clear that the Sekiyoshi Sluice Gate is one of 23 component parts. The results of surveys to be conducted hereafter on damming methods, the state of underground archaeological remains under the visiting path, etc., will be reflected in the information boards.

(e) Administrative facilities

New guardrails will be installed along the visiting path to ensure a safe viewing environment for visitors, while avoiding impact on the underground archaeological remains and maintaining harmony with the landscape.

Considering the expected visitor numbers, parking lots and toilets will be installed in a place closer to the component part than the present location.

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

The city and the relevant administrative institutions will preserve conserve the excellent local environment and landscape through regulations pursuant to the City Planning Act, Landscape Act, and other laws. Moreover, the city, working with the respective site owners, will preserve the bamboo planted as a traditional means of stabilizing the embankment, and manage the densely growing trees on the slopes to a more appropriate level of greenery on the hillside along the visiting path.

4. Project Implementation

(1) Order of priorities

The schedule for implementation of those projects which should be undertaken on a priority basis in the each zone will be as in **Table 2**. Projects which will be given particular priority in the short term phase are as follows:

- Excavation surveys of old leat remains and stone walls under visiting path
- Restoration of sluice gate (Genroku Period) remains and Monument to Water god Suiten
- Establishment of a World Heritage Plaque
- Installation of guardrails

(2) Review of the implementation schedule

The schedule will be reviewed after the medium-term phase (15 years) based on the state of project progress. Where new measures need to be taken, a review will be considered prior to that time.

Category	Project	Short term					Mid term	Long term
		2017	2018	2019	2020	2021	2022-31	2032 onward
(1) Research and study	a. Excavation surveys of old leat remains and stone walls under visiting path							
(2) Conservation and Restoration	b. Restoration of sluice gate remains (Genroku Period) and Monument to Water god Suiten							
(3) Presentation and public utilization in light of industrial system	c. Management of trees growing on hillside							
	d. Plans for parking lots and toilets based on visitor trends, etc.							
	e. Establishment of World Heritage Plaque							
	f. Planar marker of old waterway remains under visiting path							
	g. Installation of guardrails							
	h. Easy-to-understand explanations of damming methods, etc.							
	i. Arrangement for concrete installations							
	j. Research of waterwheel power mechanism and functions							

Table 2. Project schedule

(3) Other

Kagoshima City has carried out conservation and restoration work, etc. for the Shuseikan 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 3 million yen was spent in FY2016 (including the amount spent for historical document survey) and 3 million yen has been budgeted for FY2017 (including the amount earmarked for excavation survey of underground archaeological remains directly under the visiting path and of stone walls), 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.



Figure 3 Conceptional drawing after project completion of Sekiyoshi Sluice Gate of Yoshino Leat

5. Basic plan

The Sekiyoshi Sluice Gate basic plan and conceptional drawing after projects completion of the site are shown in Figures 4 and 5.

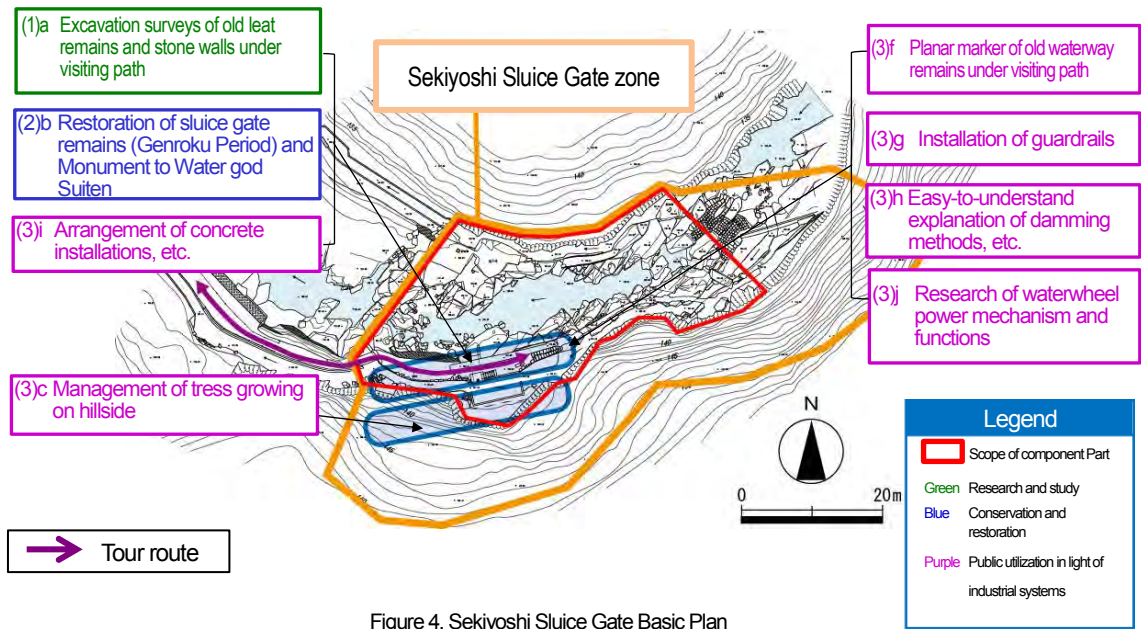
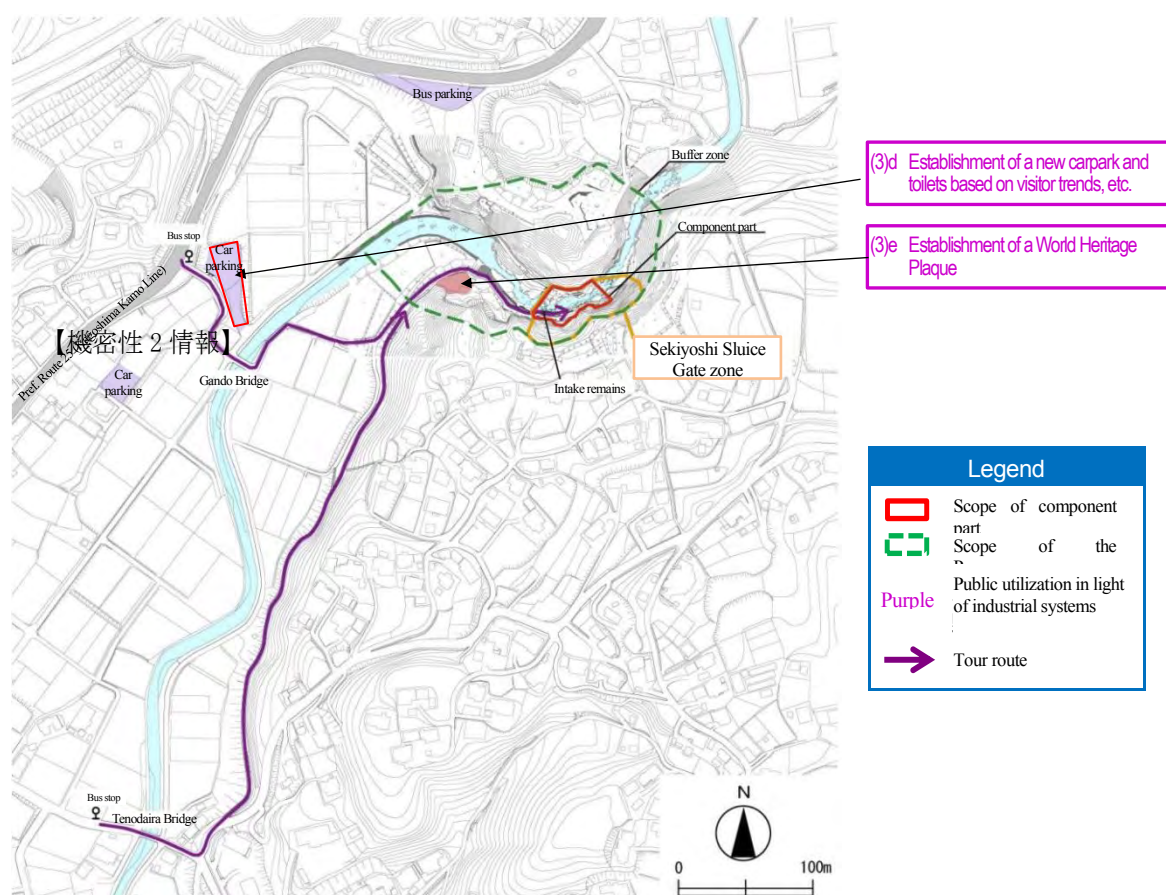


Figure 4. Sekiyoshi Sluice Gate Basic Plan



6. Others

The Conservation, Restoration, Presentation and Public Utilization Plan for Sekiyoshi Sluice Gate of Yoshino Leat, which became a source of “Conservation Work Programme and Implementation Programme” is available on Kagoshima City’s web site. <<http://www.city.kagoshima.lg.jp/kanko/sekaiisan/bunkazai-sekaiisan/syuufuku-koukaikatsuyoukeikaku2.html>>

Conservation work programme and implementation programme for Nirayama Reverberatory Furnaces (Area 3 Nirayama/ Component Part 3-1)

Izunokuni City drew up a “Conservation Work Programme and Implementation Programme” for Nirayama Reverberatory Furnaces in FY 2016 and 2017, pursuant to Recommendation b) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2015. The Programme comprises detailed measures for the conservation and restoration 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”).

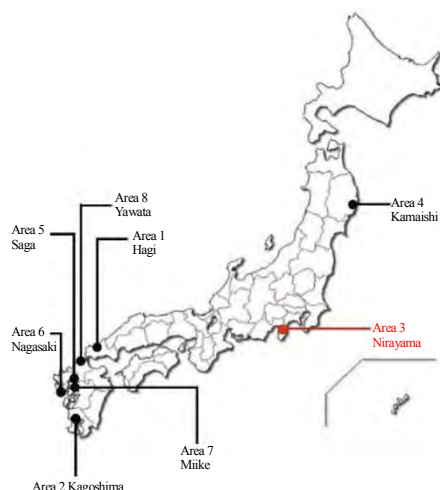


Figure 1. Location of Area 3 Nirayama

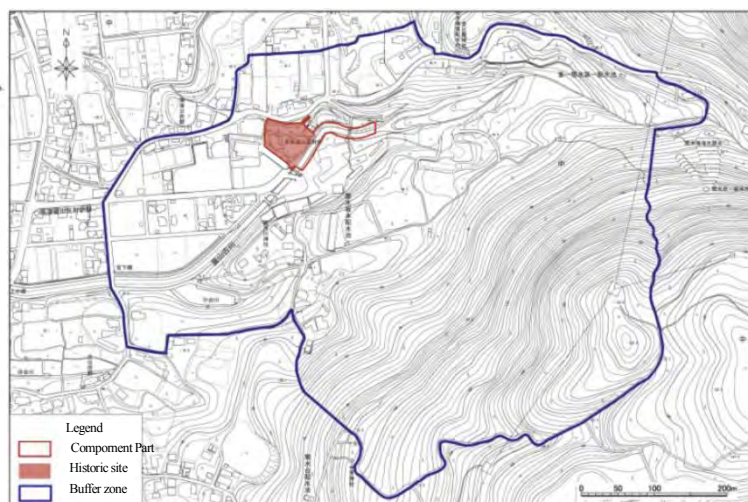


Figure 2. Scope of the Programme

1. Approach to conservation

Izunokuni City envisions Nirayama Reverberatory Furnaces as a space that symbolizes and embodies Japan’s quest to introduce modern iron-making technology at the end of the Edo period. To realize this Vision, the city will strengthen preservation, and conduct the conservation work from four perspectives: preserve, inform, enhance and utilize.

Nirayama Reverberatory Furnaces is the component part corresponding to the first of three stages reflecting the Outstanding Universal Value of the Sites of Japan’s Meiji Industrial Revolution. This stage extended from the 1850s through the early 1860s, the end of the Edo period. In the Conservation Management Plan (CMP) for Nirayama Reverberatory Furnaces, which was prepared for nomination of “Sites of Japan’s Meiji Industrial Revolution” for World Heritage inscription. The elements constituting Nirayama Reverberatory Furnaces and their value categories are shown as **Table1**.

Section	Element	Classified value		
		OUV	National government	Local government
Historic Site	Reverberatory furnace (two twin structures each housing two furnaces)	○	○	○
	Buried cultural properties	○	○	○
	Stone monument			○
River Section	Length: 144m	○	○	○

Table 1: The list of elements constituting Nirayama Reverberatory Furnaces and their value categories

Out of these elements in the **Table 1**, while the Conservation Work Programme for Nirayama Reverberatory Furnaces will mainly focus on the constituent elements that contribute to the Outstanding Universal Value, due attention will also be given to the elements that represent the value categorized as national and/or regional respectively, and others in view of the process of historical changes and developments of the component part.

Based on the approach for conservation and categorized value of elements mentioned above, Izunokuni City will firmly conduct projects for conservation, restoration and presentation of the component part with a central focus on the following four points.

➤ **Preserve:** Step up preservation of symbolic reverberatory furnaces and related facilities

The existing furnaces are a valuable testament to the spread of modern iron-making technology and serve as a symbol representing Nirayama Reverberatory Furnaces. Preserving and reinforcing their materials and structure will therefore be indispensable to realizing the future envisioned for them. To preserve the furnaces for future generations, Izunokuni City will endeavor to maintain their structure, including the steel truss on the wall exterior that was installed during later conservation and restoration work to ensure seismic integrity. For this purpose, the city will study from an authenticity standpoint conservation and restoration methods that accord top priority to preserving the bricks as they were at the time of construction, and factor those findings into the conservation and restoration.

For facilities and other features around the furnaces that existed at the time of operations, the city will identify and preserve the remains by investigating historical document and other records and by conducting an excavation survey.

➤ **Disseminate:** Foster an understanding of industrial systems related to cannon manufacturing among visitors by visual means

Izunokuni City will foster an understanding of industrial systems related to cannon manufacturing by showing how the existing furnaces and related facilities that remain underground were functionally integrated with the river area that supplied water for power (see **Figure 4**). To that end, vegetation will be thinned and the surrounding environment otherwise improved to allow easy observation of the design and structure of the furnaces. The guidance center (see **Figure 5**), Egawa Residence¹ and furnaces will also provide information and explanation that complement each other.

➤ **Enhance:** Maintain and improve the landscape so that people understand how it looked as a cannon factory

To help visitors picture the facilities as they were during operations and deepen their appreciation of their construction at the current site, Izunokuni City will provide information and explanation on the facilities' environs from multiple vantage points. It will also maintain scenic views and conduct any necessary arrangement and improvement of surrounding landscape with the understanding and support of local residents.

➤ **Utilize:** Use the site sustainably as a community symbol and center

Registration of Nirayama Reverberatory Furnaces as the component part of the World Heritage property has given them more attention than ever before. To ensure that this situation continues, however, it is vital that the entire community around the component part understand the Outstanding Universal Value of the World Heritage property including Nirayama Reverberatory Furnaces and deeply appreciate its meaning and importance. Based on that understanding, Izunokuni City will implement measures to sustainably use the component part, not only in terms of its historical and cultural symbolism for the community, but also as a center for promoting the area and disseminating information.

¹ **Egawa Residence**, located 1.7 kilometers directly north of Nirayama Reverberatory Furnaces, belonged to the Egawa family, which served as governors of Nirayama for generations under the Edo Shogunate, including Hidetatsu Egawa, who oversaw the construction of Nirayama Reverberatory Furnaces. The building is therefore important for a deeper understanding of the furnaces.

2. Policy

The policy consisting of following five items has been set to approach conservation:

(1) Conduct exploratory research

Izunokuni City will survey historical document and other records and also do excavation surveys to understand and shed light on industrial systems related to cannon manufacturing. It will also survey visitors to determine their impact on the component part, and conduct monitoring to identify changes over time.

Studies and tests needed to select the appropriate restoration methods for the furnaces, which will require periodic and continual repair, will also be conducted in a systematic manner.

(2) Preserve, reinforce, and stabilize the furnaces and the archaeological remains in terms of material, substance, and structure

Izunokuni City will undertake the necessary repairs based on due consideration for expert opinion, findings from necessary exploratory research, and other factors in accordance with any material degradation and structural instability that monitoring reveals.

(3) Illustrate the industrial systems on cannon manufacturing in the component part and the Area

To foster an understanding of industrial systems related to cannon manufacturing, Izunokuni City will set up appropriate pathways through the component part and its surroundings and provide explanation of the overall system and connections and roles between its individual elements, while also directing visitors to the Egawa Residence.

Efforts will be made to systematize the information provided. Explanatory boards for the component part, including underground archaeological remains, will employ a consistent design and format to more effectively communicate the functions and roles of each constituent element. Explanatory boards that show signs of aging will be replaced.

In addition to improving existing ground displays that indicate site features, the city will also make effective use of the findings of various exploratory studies by displaying or indicating on the ground surface locations and scales of any underground archaeological remains, etc., they reveal.

(4) Arrange and improve the landscape from the standpoint of scenic view

Izunokuni City will maintain and enhance the surrounding landscape, with a focus on areas along the access route (see **Figure 5**) in the buffer zone, and facilitate appropriate arranging of the landscape on private land.

It will set up vantage points so people can get an overall picture of the area around the reverberatory furnaces and industrial systems related to cannon manufacturing. Monitoring will be conducted at these vantage points to identify changes in the viewing landscape and devise arranging of the surrounding landscape and other measures.

(5) Implement projects

Izunokuni City will undertake conservation, restoration, presentation and public utilization based on shared policies under a unified organizational structure for all of the Sites of Japan's Meiji Industrial Revolution, while executing the program through sufficient cooperation among the relevant city departments.

The city will continually evaluate and revise the program and undertake optimization improvements to ensure that the program proceeds efficiently and effectively.

3. Methods

(1) Investigative studies

(a) Historical document surveys

Izunokuni City will continue its survey of collections of historical documents, photographs, and pictures related to Nirayama Reverberatory Furnaces. It will publish and widely disseminate research findings in a survey report and incorporate them into future projects for its conservation, restoration, presentation and public utilization.

(b) Excavation surveys

Izunokuni City will conduct excavation surveys to collect information on underground archaeological remains and artifacts to check their locations against the old pictures, as well as to improve understanding of industrial systems related to cannon manufacturing and industrial systems overall. For this purpose, the city will prioritize confirming the surrounding archaeological remnants of the full-scale boring apparatus shed and tentative boring apparatus shed, which played the important roles of hollowing out the cannon barrels in the manufacturing process (see **Figure 3**).

(c) Studies concerning furnace repairs

Izunokuni City will assess the extent of deterioration of each constituent element through monitoring.

Old photos from the time of construction revealed that the outer wall bricks of the chimney were plaster coated for protection. The necessary verification experiments with samples and other means will be conducted to determine whether plaster coating can be applied when restoring the furnaces in the future.

(d) Visitor surveys

Izunokuni City will conduct surveys to assess the impact of visitors on the component part, their satisfaction with the parking lot (see **Figure 5**) and conveniences, their level of understanding of the component part and its contribution to the Outstanding Universal Value of the World Heritage property, and the extent to which they venture to other facilities in the city, such as the Egawa Residence.

(e) Monitoring

Izunokuni City will periodically assess the condition of the component part and its buffer zone using monitoring charts that comprehensively and systematically aggregate current information.

The city will present the monitoring results as an annual report to the National Committee of Conservation and Management for Sites of Japan's Meiji Industrial Revolution following confirmation and agreement from Nirayama Conservation Council.

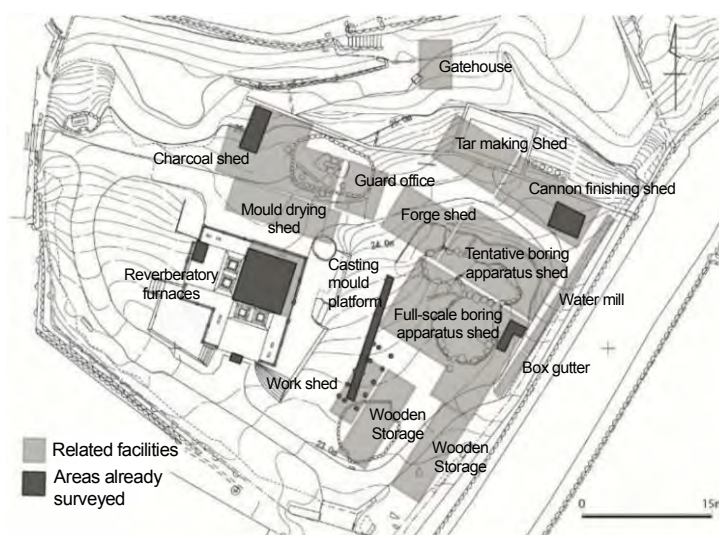


Figure 3. Ground plan showing locations of related facilities created from old pictures and areas excavated in past surveys

(2) Conservation and restoration of buildings and archaeological remains**(a) Conservation and Restoration of constituent elements that contribute to the Outstanding Universal Value****(i) Reverberatory furnaces**

Based on the extent of current deterioration of the exterior bricks of the chimney, Izunokuni City will conduct and complete within six year conservation and restoration as an urgent measure that prioritizes deteriorated parts.

When undertaking the above urgent conservation and restoration work for outer areas of the chimney where there is considerable deterioration, the city will replace materials to the minimum extent possible by, for example, removing just the deteriorated parts of the brick surface and using methods such as inlaying the cavity with molded new materials. For interior bricks and masonry, it will make repairs as needed after analyzing the results of surveys to date.

The city will undertake the subsequent phases of conservation and restoration work as appropriate based on full consideration of the best approaches to maintaining the structure and conserving the original bricks and in light of survey and research results (including results from trials of plaster coating on the outer brickwork of chimneys) and of the possibility of future improvements in conservation techniques.

(ii) Underground archaeological remains

The archaeological remains of the casting platform, an excavation of which by Izunokuni City (Nirayama Town at the time) in 1988 confirmed the side walls and what was left of the floor surface, were fragile wood of which only a little was left, and should be kept as it is in the ground.

If future excavation surveys confirm underground archaeological remains of facilities expected to have existed at the time of operations based on the historical document, such facilities should be properly conserved, with a planar display of the locations and scales of underground archaeological remains set up on the ground surface.

(iii) River area

Izunokuni City, which manages the nearby river, will conduct appropriate repairs of any damages identified through monitoring.

In the event of major damage from a disaster or for other reasons, the city will undertake restorations with materials and material qualities that are in keeping with the scenery and which ensure that the revetment is strong.

(b) Conservation and restoration of the elements closely related to the constituent elements contributing to the Outstanding Universal Value

Previous surveys have confirmed the structural integrity of the reinforced steel frames outside the reverberatory furnaces and chimney canopies. Given signs of some paint peeling and rust, however, Izunokuni City will perform the required conservation and restoration within six years.

(3) Presentation of the Furnaces emphasizing entire industrial system

The following items, (a) through (g), will generally be performed by Izunokuni City.

(a) Zoning

The city will carry out zoning of the component part (see **Figure 4**) and its vicinity to foster an understanding of industrial systems related to cannon manufacturing. Methods of presentation suitable to the outline and features of each zone are shown in **Table 2**.

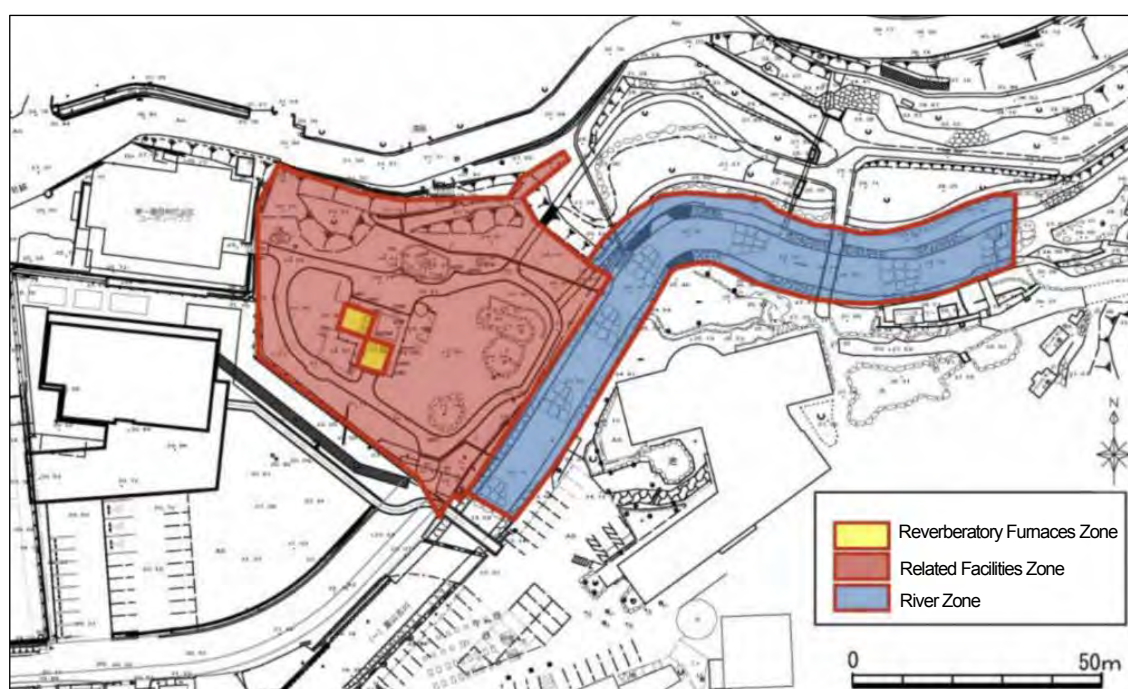


Figure 4. Zoning map

Zone name	Zone outline and features	Methods of presentation etc.
Reverberatory Furnaces Zone	Zone where furnaces are located	Preserve (through maintenance, conservation and restoration) valuable furnace remains, which survive in nearly complete condition. Publicly disclose all surveys, repairs, and other activities to the extent possible. Examples: Implement and disclose surveys and repairs
Related Facilities Zone	Zone where cannon manufacturing-related facilities existed	Build facilities designed to foster visitor understanding and actively undertake improvements of structures, etc., that are incompatible with the constituent elements contributing to the Outstanding Universal Value. Publicly disclose all excavation surveys to the extent possible. Examples: Planar display of the locations and scales of the underground archaeological remains, remove trees and pond
River Zone	Zone that supplied water for turbines to hollow out cannon barrels	Create environment that fosters understanding of role played by the river zone in industrial systems related to cannon manufacturing. Install paths and directional signs to guide visitors to the northeast park where they can see how the position of the river relates to that of the World Heritage component part (designated as a National Historic Site). Examples: Install explanatory and directional signs

Table 2: Outlines and features of zones and methods of presentation etc.

(b) Path planning

To manage visitor entry and effectively facilitate an understanding of the industrial system related to cannon manufacturing, the paths for the traffic of visitors to the component part and environs will be as follows (Figure 5).

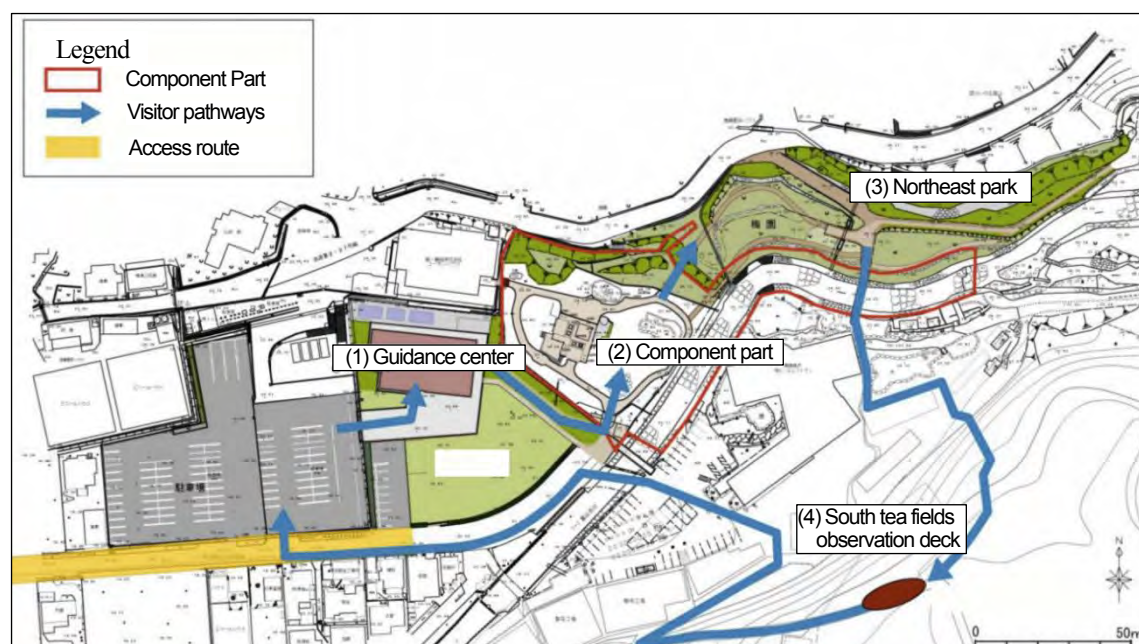


Figure 5. Paths

(1) Guidance center => (2) Component part area => (3) Northeast park => (4) South tea fields observation deck

(c) Topography and environmental improvements

The pond on the east side of the component part did not exist at the time of operation of the industrial systems related to cannon manufacturing and thus bears no connection to them; it will therefore be removed in conjunction with an excavation survey. All other existing topographical features will be preserved, not including minimal changes needed associated with excavation surveys needed for activities of conservation, restoration, presentation and public utilization and with the installation of displays indicating locations and scales of underground archaeological remains.

In principle, existing water supply and drainage facilities will be used under proper maintenance and management.

(d) Arranging landscape and planting vegetation

In principle, there will be no new tree planting.

The city will continue to maintain trees that shield and provide green cover for surrounding artificial structures.

At the same time, trees that compromise the visual wholeness between the National Historical Site and the river will be cut down to prevent interference with views of the furnaces from the northeast park, for example.

(e) Guidance and explanatory boards

The city will maintain, manage, repair, and update existing guidance and explanatory boards and exhibits so visitors can move easily along paths and better understand the component part.

Exhibits that display archaeological remains newly revealed by excavations and historical document surveys will be installed by more effective methods on the conditions that such archaeological remains are properly protected.

(f) Management and convenience facilities

The city will review the number and locations of existing benches as needed. There will be no new toilets to augment those in the guidance center.

For the observation space about 1.2 meters above ground near the furnaces, the city will install an enclosure or similar facilities needed to ensure safe and comfortable viewing for visitors.

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

Izunokuni City will maintain an attractive landscape and clear views of the component part from the approach road (access route shown in **Figure 5**) and the parking lot. The city will also encourage local residents to perform arrangement of the landscape such as planting trees and construct, expand, and modify buildings and structures in ways that harmonize with the component part and its environs.

The guidance center, lawn areas, and the northeast park adjacent to the component part also need to be maintained to ensure attractive views, as these lie along the visitor paths.

With regard to private commercial facilities and their premises on the other side of the river southeast of the component part, the city will work through adequate dialogue to build consensus with the owners on appearances, outdoor advertisements, etc., to ensure attractive landscape, and encourage proper installations, maintenance and improvements.

In other parts of the buffer zone, the city will restrict unordered development and conserve, maintain, and improve the landscape by, for example, encouraging the planting of trees and construction, expansion, and modification of buildings and structures in ways that harmonize with the component part and its environs. Regarding signboards and outdoor advertising, etc., the city will work through adequate dialogue to increase understanding and build consensus with the owners and managers on the purpose and significance of creating an attractive landscape, and encourage them to perform installations, maintenance, and improvements properly according to specific standards.

4. Project implementation

(1) Order of priorities

The schedule for implementing the projects based on the vision and the policy consisting of five items and methods for materializing that vision described in 1 through Section-3 above, as well as the order of priority for such projects, are as follows.

Izunokuni City will designate the 20 years that begin with FY 2017 and end around FY 2036 as the projects implementation period. This period comprises a short term (within six years), medium term (around six years), and a long term (around eight years). The periods and specific schedule of projects to be implemented in each term are described below (**Table 3**). It should be noted that conservation and restoration of the reverberatory furnaces will be given highest priority among all projects for conservation, restoration, presentation and public utilization within the component part, and this is to be completed in the short term (within six years).

Next on the order of priority is the installation of displays, etc., that aid visual understanding of the industrial system related to cannon manufacturing. All historical document and excavation surveys and installation, etc., of guidance and explanatory facilities will be started in stages in the short term (within six years) and completed in the medium term (within 12 years).

- Short term (within six years): Period for completing conservation and restoration of the reverberatory furnaces, beginning surveys and other projects necessary for the installation of facilities to aid visual understanding of industrial system related to cannon manufacturing, and implementing any other projects that need to be commenced immediately.
- Medium term (around six years): Period for completing surveys and other projects necessary for the installation of facilities to aid visual understanding of industrial system related to cannon manufacturing, and implementing any projects begun in the short term that need to be continued.
- Long term (around eight years): Period for implementing any projects begun in the short and medium terms that need to be continued.

Category	Project	Short term (2017-2022)	Medium term (2023-2028)	Long term (2029-2036)
Investigative studies	Historical document surveys	■		
	Excavation surveys	■	■	
	Studies concerning furnaces' repairs	■	■	
	Visitor surveys	■	■	■
	Monitoring	■	■	■
Conservation and restoration of structures and ruins	Furnaces' repairs	■		
	Repair reinforced steel frame and canopy	■		
Illustration of industrial systems	Pond removal		■	
	Tree removal		■	
	Repair and install guidance and explanatory boards	■		
	Set up planar display indicating the locations and scales of the underground archaeological remains		■	
Scenic landscaping	Maintain and improve landscape	■	■	■

(2) Review of the implementation schedule

Izunokuni City will conduct detailed verification and analysis of the state of progress of projects being implemented in each project term at a point when the term is approaching completion. It will then carefully examine projects that are appropriate to extend into the subsequent term and, upon examining said term, will make necessary revisions to the content and procedure of projects in that term.

(3) Implementation structure

Since the implementation schedule laid out in this Programme is integral to conserving and managing Nirayama Reverberatory Furnaces, Izunokuni City will advance the projects through closer collaboration with local residents under the same conservation framework determined in Nirayama Reverberatory Furnaces Conservation Management Plan (CMP) that constituted a part of the Nomination Document for World Heritage inscription in 2015 (Figure 6).

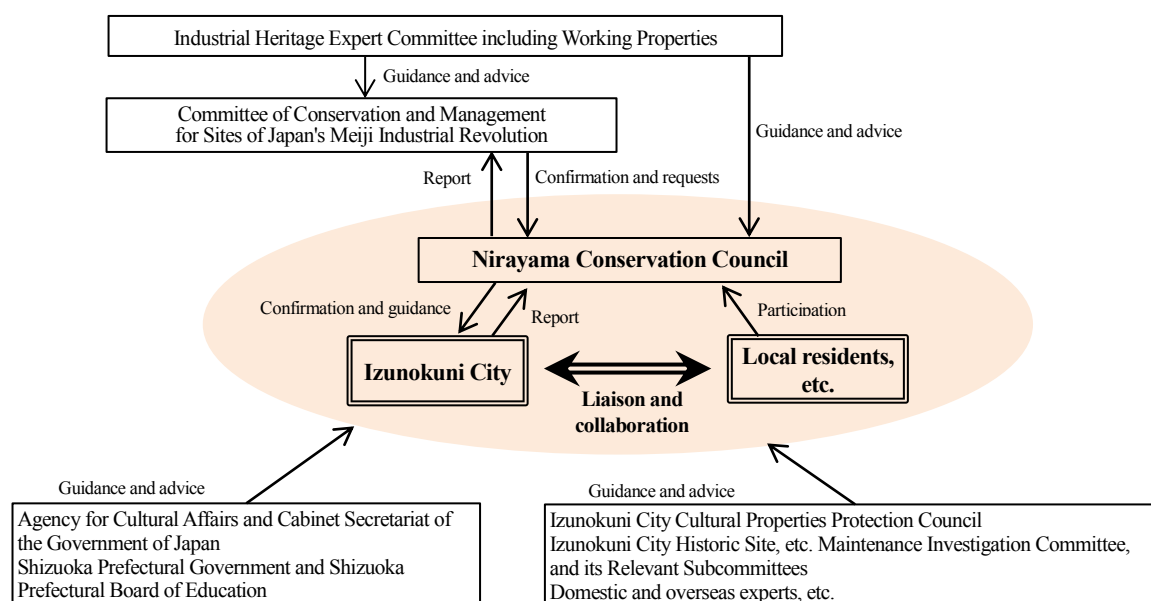


Figure 6. Implementation structure of projects

(4) Other

The city has carried out conservation and restoration work, etc. for the Nirayama Reverberatory Furnaces 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 485 million yen was spent in FY2016 (including the amount spent for establishment of a guidance center) and 18 million yen has been budgeted for FY2017 (including the amount earmarked for plan making), 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.



Figure 7. Coceptional drawing of the Component Part and its vicinity at completion of medium term (end of FY 2028)

5. Others

The Conservation, Restoration, Presentation and Public Utilization Plan for the Nirayama Reverberatory Furnaces, which became a source of “Conservation Work Programme and Implementation Programme” is available on Izunokuni City’s web site.

<<https://www.city.izunokuni.shizuoka.jp/hansyaro/keikaku/shouroku.html>>

Conservation work programme and implementation programme for Hashino Iron Mining and Smelting Site (Area 4 Kamaishi/ Component Part 4-1)

Kamaishi City drew up a “Conservation Work Programme and Implementation Programme” for Hashino Iron Mining and Smelting Site in FY 2016 and 2017, pursuant to Recommendation b) in Decision: 39 COM 8B. 14 as adopted by the World Heritage Committee at its 39th session in 2015. The Programme 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”).

1. Approach to conservation

Stably maintain remains in the birthplace of modern steelmaking, and disseminate information regarding the entire system of mining, transportation, and steelmaking.

Hashino Iron Mining and Smelting Site is important in that the following three elements¹ all remain as a consistent system from the dawn of Japan’s industrial revolution (1850s–): (i) the Smelting Site, which shows the introduction of blast furnace iron-making (including the river which served as the water source to turn the waterwheel that was the power source for the furnace facility), (ii) the Transportation Site used to carry the iron ore, and (iii) the Iron Mining Site, which carried on traditional techniques from early modern times (Figure 1).

In the Conservation Management Plan (CMP) for Hashino Iron Mining and Smelting Site, which was prepared for nomination of “Sites of Japan’s Meiji Industrial Revolution” for World Heritage inscription. The list of elements constituting Hashino Iron Mining and Smelting Site and their value categories are shown as Table 1.

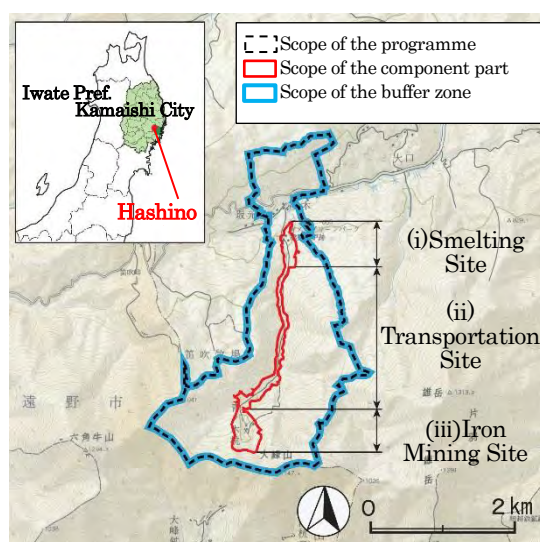


Figure 1 Scope of the Programme

Section	Period	Elements	Value of element		
			OUV	National value	Local value
Iron mining site	Hashino Iron Mine period	Remains of the surface mine workings A	○	○	○
		Remains of the underground mine workings	○	○	○
		Remains of the western flat area	○	○	○
		Remains of the eastern flat area	○	○	○
		The central stone wall	○	○	○
		Remains of the western flat area (including retaining stone wall)	○	○	○
		Remains of the eastern flat area (including retaining stone wall)	○	○	○
		Remains of the surface mine workings B	○	○	○
		The eastern stone wall	○	○	○

¹ Considering the steelmaking process, the order should be the Iron Mining Site, Transportation Site, and Smelting Site, but because the Smelting Site are the main subject of the conservation works for the time being, under this programme these are written in the order of (i) Smelting Site, (ii) Transportation Site, and (iii) Iron Mining Site.

		Remains of excavation	○	○	○
	Tanaka Ironworks period	The shallow underground mine workings			○
	Nittetsu Mining period	Remains of the powder magazine			○
		Remains of the tramroad			○
		Remains of the disposal yard for mullock			○
		Remains of the pithead (1)			○
		Remains of the pithead (2)			○
		Remains of the electric hoist house			○
		Remains of the pithead (3)			○
		Road			○
		Forests			○
Transportation site	Hashino Iron Mine period	Remains of the transportation site	○	○	○
	Tanaka Ironworks period, Nittetsu Mining period	Forest road / Forest maintenance road			○
		Forests			○
Smelting site	Hashino Iron Mine period	The first blast furnace and its associated facilities	○	○	○
		The second blast furnace and its associated facilities	○	○	○
		The third blast furnace and its associated facilities	○	○	○
		Remains of the watercourse	○	○	○
		Remains of the management office	○	○	○
		The foundation stones of the great gate and the shrine gate	○	○	○
		Remains of the shrine of the mountain and mine god	○	○	○
		The grave of Ichinosuke	○	○	○
		The stone monument enshrining the mountain and mine god and the Kannon stone dedicated to cattle and horses	○	○	○
		Remains of the quarry	○	○	○
		The associated buried cultural properties which are considered to have existed	○	○	○
		Futamatasawa River(Futamatasawa)	○	○	○
	Nittetsu Mining period	The wooden entrance gate of the shrine of the mountain and mine god		○	○
		The monument to commemorate the oldest blast furnace in Japan		○	○

Table 1: The elements constituting Hashino Iron Mining and Smelting Site and their value categories

Out of these elements in the Table 1, which the Conservation Work Programme for Hashino Iron Mining and Smelting Site will mainly focus on the constituent elements that contribute to the Outstanding Universal Value, due attention will also be given to the elements that represent the value categorized as national and/or regional respectively, and others in view of the process of historical changes and developments of the component part.

Based on the approach for conservation and categorized value of elements mentioned above, Kamaishi City will firmly conduct projects for conservation, restoration and presentation of the component part with a central focus on the following four points.

(1) Conservation and restoration – maintaining and enhancing a stable environment for the remains

Kamaishi City conserve the conditions of the remains of the surface mine workings, the stone structures of the blast furnaces, and other facilities of the time that still exist in fragments in a stable condition. While implementing follow-up observations using monitoring charts, the city will conduct repairs or restoration particularly on the stone walls that were the foundation of the construction at that time, the stone structures of

the blast furnaces, and other areas where swelling, loosening and falling-off is advancing, while minimizing the impact on the remains, and work to maintain and enhance the stable environment for the remains.

Because much of the underground archaeological remains have not been surveyed, the excavation surveys will be conducted within the minimal range.

(2) Presentation and Public utilization – providing information and explanations of the value of the sites using diverse methods

Kamaishi City will provide information and explanations to fully convey how the multiple remains were mutually related and together constituted an integrated system of mining, transportation and iron-making in the early modern era. In particular, the city will focus on providing information and explanations of how the (i) Smelting Site, (ii) Transportation Site, and (iii) Mining Site changed from the time of the Hashino Iron Mine period through to today. In addition, the city is striving for the conservation and management of the environment of the valley where the remains are located and of the forest that was the source of charcoal, and devising measures to recreate the type of forest that existed when the mine was operating so visitors to the Hashino Iron Mining and Smelting Site can experience a realistic sense of early modern iron manufacturing.

(3) Clarification of the position of the “Hashino Iron Mining and Smelting Site” in the World Cultural Heritage “Sites of Japan’s Meiji Industrial Revolution”

Hashino Iron Mining and Smelting Site is an industrial remains representing the initial period of Japan’s industrial revolution in the field of iron and steel manufacturing, and it contributes to the Outstanding Universal Value of “Sites of Japan’s Meiji Industrial Revolution” as a specific example of the fusion of Western technology and Japanese indigenous traditional techniques. To advance the conservation, restoration, presentation and public utilization of the constituent elements themselves which contribute to the Outstanding Universal Value, and to grasp for deeper relations with other component parts of the property, Kamaishi City will disseminate the findings of the ongoing investigative surveys implemented by each of the cities and other bodies concerned in all Areas.

(4) Clarification of the position of the “Hashino Iron Mining and Smelting Site” as a base for urban development toward the future

Wide-ranging industrial and economic activities have spread in the urban areas of Kamaishi, and the traditions, spirit, arts and culture as a “City of Iron” have become rooted in the lives of the residents. From the perspective of encouraging these activities, Kamaishi City and related companies and organizations concerned will actively disseminate the identity of Kamaishi centered on the Hashino Iron Mining and Smelting Site.

2. Policy

The policy consisting of following five items has been set to approach conservation.

(1) Promoting research and study

With the purposes of reconfirming and further understanding of the Outstanding Universal Value and public utilization of the Hashino Iron Mining and Smelting Site as a resource for study and regional promotion, Kamaishi City is systematically implementing surveys for distribution of remains, measurement of topography, excavation of underground remains and other field surveys, as well as historical document surveys to clarify the mining, transportation and iron-making system.

Regular monitoring is conducted to grasp the state of the component part and buffer zone, applying annual report and monitoring charts. Visitor surveys are also carried out to understand visitor state and their impact on the component part.

(2) Maintaining, reinforcing, and stabilizing the materials, substance, and structure of the installations and historical and archaeological remains and objects

Kamaishi City will work on daily management of the remains while monitoring them with the basic aim of improving the conservation environment so that the historical and archaeological remains and objects are

maintained in a stable condition. At the same time, while making comprehensive judgments on the role and state of deterioration of each remains, the city will implement repair or restoration works for reinforcement, stabilization, etc. in a phased manner in order of priorities. In particular, records are being documented and restorations implemented on an urgent, priority basis for those areas that suffered damages from Typhoon No. 10 in August, 2016.

(3) Presenting and explaining of the mining, transportation, and iron-making system in the component part

The characteristics of each constituent elements in the mining, transportation, and iron-making system must emerge based on the differences in the history, location, and how the historical and archaeological remains and objects remain at each of the three sections ((i) Smelting Site, (ii) Transportation Site, and (iii) Iron Mining Site). To those ends, Kamaishi City provides information so that visitors can gain an appropriate understanding of the process of mining (iii) => transportation (ii) => iron-making (i). Furthermore, the city provides information on the entire mining, transportation, and iron-making system including the river which served as the water source to turn the waterwheel that was the power source for the blast furnace and the surrounding forest that was the source of the charcoal.

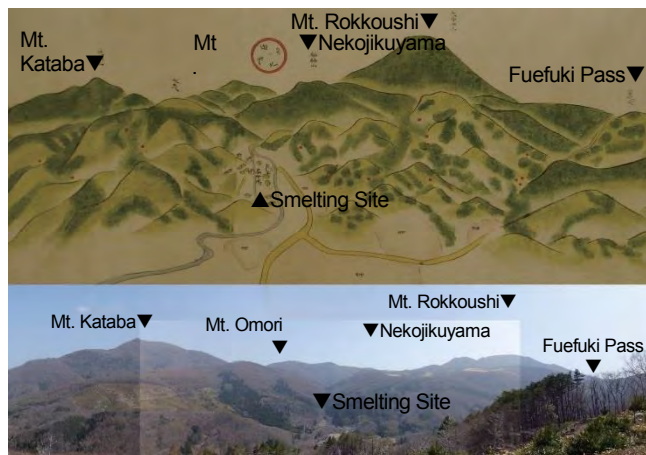


Figure 2 Comparison of historical drawing and present landscape

(4) Arranging and improving the environment from a landscape perspective

Hashino Iron Mining and Smelting Site is important in that the landscape pertaining to modern iron manufacturing still exists today, surrounded forest which was the source of the reducing agent and of the charcoal used as fuel for iron manufacturing. Because the present view toward the Hashino Iron Mining and Smelting Site including the Smelting Site from the prefectural road on the northern side of the component part has a strong resemblance to “Picture map of full view of the Hashino” (Figure 2) in “Picture scroll of the Hashino Iron Mine” (published in the 1860s), while maintaining the present landscape, Kamaishi City is devising improvement measures to approach the past landscape shown on the picture. The city will also take measures to set up a scenic viewpoint so that visitors can compare the present landscape with the historical drawings.

(5) Implementing projects

To ensure the phased and steady execution of the Programme, Kamaishi City sets a project execution schedule and incorporates it into this Programme, including project periods, implementation methods, and project implementation items in each year, necessary expenses, etc.

Also, projects listed in the Programme are clearly stated in the city’s comprehensive plan (presently, “Kamaishi City Reconstruction and Development Master Plan/Implementation Plan”), and sustainable projects are being advanced with the certain securing of budgets, giving consideration to the city’s financial state and the running costs after projects completion.

Moreover, the policies for managing and operating projects for the component part are shared relevant information among the owners and managers, and the sustainable management of the projects shared with the members of the community is being enhanced in collaboration with the Hashino Town Promotion Association, which is normally responsible for management of the projects open to the public and of the Hashino Iron

Mining and Smelting Site Information Center. In addition, Kamaishi City is promoting mutual ties among the responsible departments such as department of world heritage, cultural properties, and tourism, making improvements as a functional system, and implementing projects for training guides and capacity building of human resources engaged in conservation and restorations, surveys, etc.

3. Methods

(1) Research and study

(a) Field surveys (distribution surveys, measurement surveys, excavation surveys)

While conducting excavation surveys to clarify the functions and mutual relations of each of the remains of the Smelting Site, Kamaishi City is implementing distribution for surveys of remains on a priority basis to grasp the conditions of the transportation Site and Iron Mining Site. Excavation surveys are conducted within the minimum range to conserve the remains best, and remains maps are documented using three-dimensional measurements. Unless otherwise required for restoration from disaster, the excavation surveys are being implemented in the order No. 2 Blast Furnace area => No. 3 Blast Furnace area => No. 1 Blast Furnace area => Iron Mining Site.

(b) Historical documents surveys

Kamaishi City is confirming the locations and state of conservation of the original copies (historical documents) of texts published in “Hashino Blast Furnace Remains Investigation Report” (Kamaishi City, 1956) and “Kamaishi City Magazine Historical Materials Volume 4” (Kamaishi City Magazine Editorial Board, 1963), and preparing a register. After that, the city will also conduct interpretative surveys to clarify the process of historical changes and developments of iron manufacturing in Kamaishi including the history of the Hashino Iron Mining and Smelting Site, as well as the mining, transportation, and iron-making system at that time. The survey subjects include historical documents not only within Kamaishi City, but outside the city as well.

(c) Monitoring

In December 2016, Kamaishi City documented monitoring charts that comprehensively and systematically cover the constituent elements included in the component part. From now on, these will be used as the starting point for regularly grasping the conditions of the component parts and buffer zone. The monitoring results are reported to the Kamaishi Conservation Council for their opinion. In cases where a negative impact on the component part is confirmed, the cause is removed or countermeasures are implemented to mitigate the impact, with subsequent inspections and verifications of the effects.

(d) Survey on visitor numbers, behaviors and opinions

To verify project effects, grasp the impact of tourism pressure on conservation, and reflect findings in better ways of public utilizing World Heritage component part, Kamaishi City sets a questionnaire response box at the Hashino Iron Mining and Smelting Site Information Center and carries out surveys on visitor numbers, their behaviors, and their understandings and opinions.

(2) Conservations and restorations

(a) Subjects

The subjects of the conservations and restorations are the constituent elements of the Hashino Iron Mining and Smelting Site that contribute to the Outstanding Universal Value.

(b) Basic concept and methods

(i) Smelting Sites

a. First Blast Furnace

Regarding the multiple stone materials that have fallen and become buried at the northern and western perimeter of the stone works of the First Blast Furnace, because prior surveys have been able to specify the

original positions, in the future Kamaishi City will conduct detailed examinations through additional surveys, carry out restoration with dismantling, and work to stabilize the structure of the stone works by restoring the stone materials to their original positions.

b. Second Blast Furnace

The stone materials that were formerly used for the stone works of the Second Blast Furnace were re-used as foundation stone for the management office after the blast furnace operations ended, so Kamaishi City is stably maintaining their present condition by periodic monitoring and daily maintenance management, without pursuing restoration works.

c. Third Blast Furnace

The stone materials of the Third Blast Furnace show cracking and chipping, but the structure is presently stable, and does not require an urgent response. Consequently, while implementing periodic monitoring and daily maintenance management, Kamaishi City is conducting detailed investigations on the necessity of dismantling and restoration, in parallel with systematic excavation surveys and display of the surrounding remains.

d. Watercourse, etc.

The stone walls of the watercourse at the (i) Smelting Site have not been repaired since operations were suspended, so a lot of swelling, loosening and falling of stone materials is visible, but based on visual observations over the past ten years, the conditions do not demand immediate restoration. For that reason, for the time being, Kamaishi City will conduct monitoring through visual inspections in parallel with daily maintenance and management, and grasp the movement of the stone material through fixed point measurement surveys at locations where swelling and loosening is recognized. If the amount of movement increases and a judgment is reached that restoration with dismantling is necessary, trees that are causing harm will be removed and excavation surveys and restoration implemented.

Regarding the stone walls of the watercourse around the Second Blast Furnace where swelling, loosening and falling of stone materials is evident, excavation surveys will be conducted together with the display of the remains around the Second Blast Furnace and detailed examinations carried out on the necessity of restoration with dismantling.

(ii) Transportation Site and Iron Mining Site

a. Stone Walls

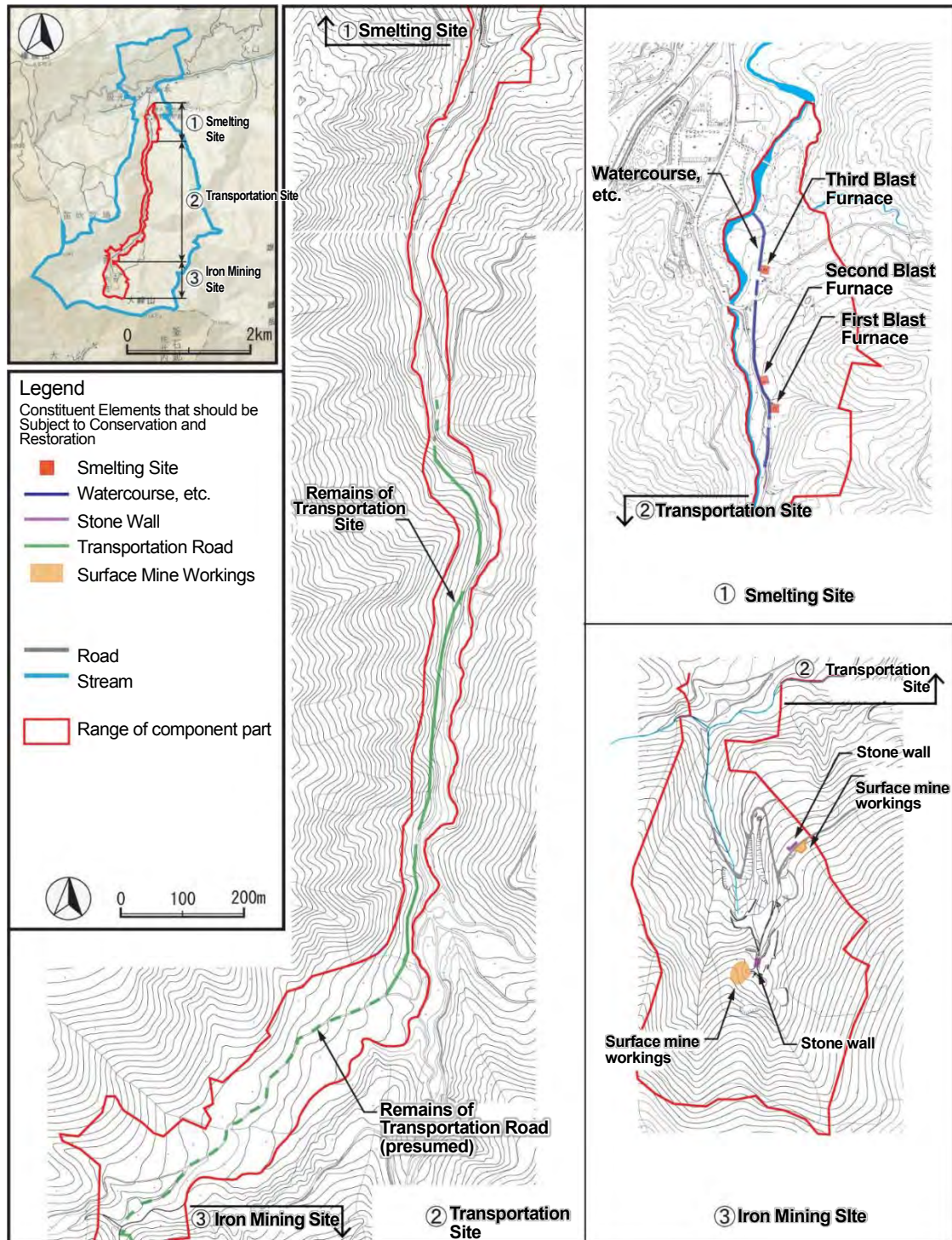
Kamaishi City will urgently prepare a record of the current conditions (conduct measurement surveys), and continue monitoring. Stone walls in unstable conditions will be reinforced using sandbags, gabions and other means, and stable conditions maintained. While the parts of the stone walls of the Iron Mining Site that fell from Typhoon No. 10 in August 2016 are presently maintaining stable conditions using sandbags as a temporary measure, survey and restoration works will be implemented in phases after the restoration of forest road and forest maintenance road are completed. Detailed investigations considering the precipitous terrain at the site will also be conducted on the possibility of constructing a new road for management, which would be used to bring in heavy machinery and transport materials for restoration.

b. Remains of Transportation Road and Surface Mine Workings

Kamaishi City is conducting periodic monitoring and daily maintenance and management, and maintaining the stable conditions of these remains. Kamaishi City is removing vegetation that impact on the remains following consultation with the owners (Forestry Agency, Nittetsu Mining Co., Ltd.).

(iii) Underground archaeological Remains (entire area of the component part)

The underground archaeological remains detected in excavation surveys are reinforced with river sand and other materials, and reburied. Thereafter, periodic visual monitoring is conducted so there is no adverse impact on the underground archaeological remains from subsidence of the protective earth layer, etc.



(3) Presentation and public utilization considering the iron ore mining, transportation, and iron-making system

The sections (i) Smelting Site, (ii) Transportation Site and (iii) Iron Mining Site are set as the Smelting Site zone, Transportation Site zone, and Iron Mining Site zone, respectively, and each zone is divided into multiple blocs based on the policies for survey, conservation, restoration, presentation and public utilization for

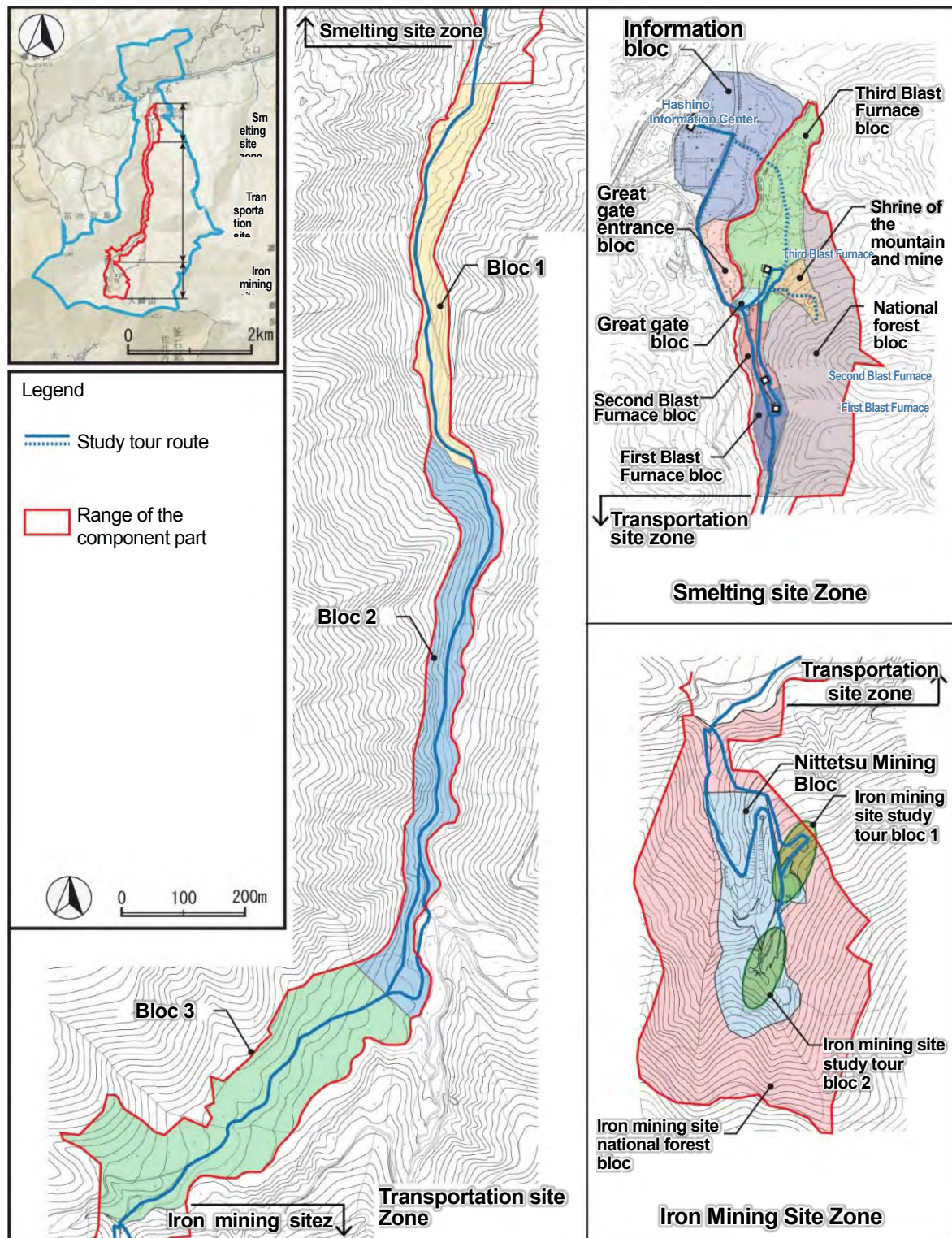


Figure 4 Bloc divisions and tour route in each zone

each zone (**Figure 4**). These blocs are divided by following; in smelting site zone, blocs are divided by the state of land utilization and efficient explanation method for iron making; in the transportation site zone, they are divided by the state of detection of remains; and in the iron mining site zone, they are divided by the state of land utilization (National forest/ Nittetsu Mining). In addition, in iron mining site zone, units are set where utilized publicly by the study tour approximately twice in a year.

Kamaishi City is installing information and explanation facilities, centered on the smelting site zone which

is normally open to the public, so that visitors can make study tours comfortably after understanding the iron ore mining, transportation, and iron-making system, and utilizing these as a venue for school education and social education and as a resource for regional revitalization and tourism.

Regarding the transportation site zone and iron mining site zone, which are not usually open to the public, study tours will be resumed, about twice a year, following the restoration from the damages caused by Typhoon No. 10 in 2016.

In particular, methods of installing facilities for public use in the smelting site zone being advanced by Kamaishi City are as follows.

(a) Study tour routes

Study tour routes are set so that the iron ore mining, transportation, and iron-making system at Hashino Iron Mining and Smelting Site can normally be understood in the area from the Hashino Iron Mining and Smelting Site Information Center to the Smelting Site (**Figure 4**).

Among the study tour routes, Kamaishi City will pave the road that was formerly a forest road after devising drainage methods, considering that the vehicles for management of the component part will pass and to prevent road surface damage from a disaster of the same scale as Typhoon No. 10 of August 2016. A car stop and signs that vehicles are prohibited from entering will be installed near the entrance to prevent entrance by public vehicles. Other study tour routes will be paved using earth-based paving materials, considering the landscape.

(b) Remains display and environment improvements

The smelting site zone is divided into areas where the remains presently exposed are maintained in their present condition, and where they are reburied underground for being preserved.

Regarding the underground archaeological remains that were discovered by excavation surveys, Kamaishi City will display these using other materials on the ground surface so their planar scale in two dimensions can be grasped.

In particular, the digitization for Second Blast Furnace will be started on a priority basis because the shed and earthen floor are drawn in detail in the “Picture Scroll of the Hashino Iron Mine” and after the excavation survey the planar scale of the surrounded remains will be displayed on the ground surface (**Figure 7**).

(c) Arranging and improving landscape and planting vegetation

Kamaishi City will cut and remove trees that have a adverse impact on both above-ground and underground remains of component part and other trees that affect the ecology such as parasitic plants (mistletoe), as well as trees that are dense and overgrown and have a negative effect on the landscape, using methods that do not impact on the underground archaeological remains. Also, to prevent the apperance of large animals that could harm visitors, mulberry and other trees that provide feed for such animals will be removed if they are nearby study tour routes.

(d) Information and explanation boards

Kamaishi City installs information boards and explanation boards with a consistent design and scale at locations selected considering the landscape.

(e) Management utility facilities

The parking lots near the Hashino Iron Mining and Smelting Site Information Center provide sufficient scale and functions as it is at present, so Kamaishi City will maintain the existing parking lots, without expansion. The using of the adjacent vacant land (former tennis court, former skating rink, etc.) will be determined after future surveys on the number of visitors (**Figure 5**).

The gazebo which is an existing rest facility inside the component part has deteriorated with age, so it will be removed. Rather than building a gazebo as a new rest facility, benches will be installed along study tour routes of the smelting site zone. Also, for the utility of visitors, toilets will be installed in the “Great gate Entrance Bloc” (**Figure 4**; smelting site zone), with the consent of the landowners.

(4) Improvement of the environment in the buffer zone

In the National Forest that makes up the majority of the buffer zone, the Sanriku-Chubu District Forest Office of Forestry Agency is working to recreate, as much as possible, the type of broadleaf (oak) and Japanese red pine forest believed to have been present at the time the Hashino Iron Mining and Smelting Site was operating through the systematic forest projects under the “Conservation, Management and Utilization Plan for Hometown Forest of the Hashino Iron Mining and Smelting Site” prepared based on “The Kyodo-no-mori (Hometown Forest) Preservation Agreement of the Hashino Iron Mining and Smelting Site” between the Director of the Sanriku-Chubu District Forest Office, Tohoku Regional Forest Office and the Mayor of Kamaishi City.

In the lands owned by the city that extend to the north of the component part, Kamaishi City will install toilets, benches and other utility facilities, while considering the landscape, and create a space where visitors can safely and comfortably rest (**Figure 5**). Land for a scenic viewpoint will be set along the prefectural road on the north side, and a plaza opened with explanation boards so visitors can readily compare the landscape today and when the site was operating (see **Figure 2**).

Kamaishi City is promoting understanding of the importance of conserving the landscape in the buffer zone to the private owners of the land to the north of the component part, and encouraging maintenance of the present land use and buildings. In particular, when owners rebuild their houses, etc., or divert agricultural land to other uses, intervention will be made to maintain the relict industrial landscape of the component part.

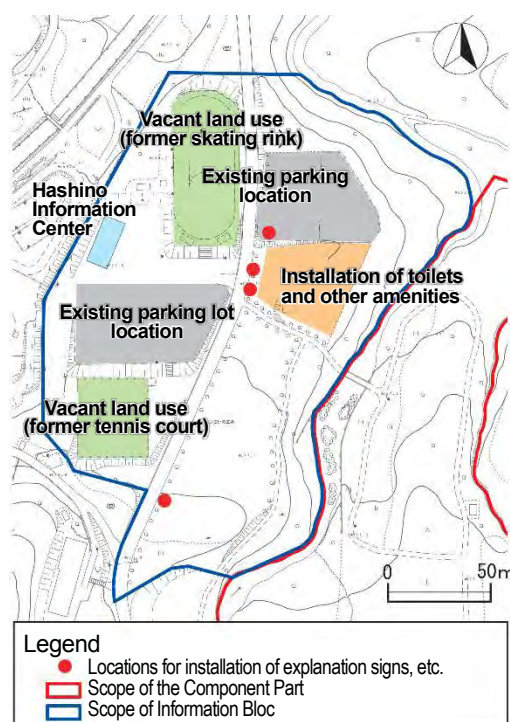


Figure 5: Information Bloc Public Use

4. Projects implementation

The projects implementation schedule is as shown in **Table 2**. The division of periods for the projects and priority of the execution items is as follows.

(1) Projects implementation based on short-term, mid-term, and long-term projects periods

Kamaishi City has prepared a 20-year projects implementation schedule starting from 2018 (**Table 2**). The works will be implemented in stages, with a five-year period for short-term and mid-term period and a 10-year period for long-term period. Restorations deemed urgent based on the future surveys and monitoring results will be implemented on an ongoing basis.

(2) Priority of implementation items

Regarding the damages from Typhoon No. 10 of FY2016, Kamaishi City made a document in FY2017 and is implementing full-scale restorations in stages from FY2017. A restoration report on (i) Smelting Site (smelting site zone) will be prepared in FY2018.² Regarding (ii) Transportation Site (transportation site zone) and (iii) Iron Mining Site (iron mining site zone), restorations will be conducted together with the restoration of the forest road and forest maintenance road, and a report prepared by FY2022.

In particular, in the short term Kamaishi City is giving high priority to projects that effectively combine restorations and the provision of information regarding the mining, transportation, and iron-making system. The city is making a planar display of the Second Blast Furnace and the underground archaeological remains in its surrounding area on the ground surface, and conducting restoration of the watercourses' stone walls with dismantling. Measurement surveys will also be conducted in the short term to belatedly grasp the current conditions of the Transportation Site and the Iron Mining Site, and precedence will be given in particular to measurement surveys of areas damaged by the October 2016 typhoon.

(3) Implementation schedule revisions

With the passage of the mid-term scheduled for FY2027, the implementation schedule will be revised based on the state of projects progress. In cases where new responses become necessary, revisions will be considered without waiting for FY2027.

(4) Other

Kamaishi City has carried out conservation and restoration work, etc. for the Hashino Iron Mining and Smelting Site 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 142 million yen was spent in FY2016 and 123 million yen has been budgeted for FY2017, both including costs incurred or earmarked for the restoration from Typhoon No.10 disaster and for establishment of related facilities for promoting public understanding, but excluding the cost for day-to-day maintenance.

² The response to "ICOMOS Technical Review regarding Typhoon Damage to the Hashino Iron Mining and Smelting Site" sent from the UNESCO World Heritage Center dated June 1, 2017 is attached as an **Annex** to this **Appendix b)-10**.

Category	Project		Short-term (2018-2022)					Mid-term (2023-2027)	Mid-term (2028-2037)		
		2017	2018	2019	2020	2021	2022				
Survey and Research	Measurement surveys		Transportation Site ³					Iron Mining Site ³			
	Excavation surveys	Typhoon related	Second Blast Furnace					Third Blast Furnace	First Blast Furnace	Introduce area of the	
	Survey on restoration of stone walls		Second Blast Furnace					Third Blast Furnace		First Blast Furnace	Introduce area of the
	Documents survey										
	Visitor survey										
	Monitoring (including survey on amount of movement)										
Restoration	Typhoon No. 10 damages restoration (Smelting Site)	Restoration of revetment, etc.									
	Typhoon No. 10 damages restoration (Transportation Site)		Transportation Site								
	Typhoon No. 10 damages restoration (Iron Mining Site)				Central stone walls						
	Typhoon No. 10 damages restoration written record preparation (including measurements)	Smelting Site	Transportation Site, Iron Mining Site								
	Restoration of blast furnaces and surrounding stone walls		Second Blast Furnace			Third Blast Furnace			First Blast Furnace		
Presentation and Utilization considering the mining, transportation, and iron-making system	Remains display					Second Blast Furnace		Third Blast Furnace	First Blast		
	Tree removal in public areas										
	Installation of study tour route, etc.	Typhoon related				Second Blast Furnace		Third Blast Furnace	First Blast		
	Installation of information boards, etc.					Second Blast Furnace		Third Blast Furnace	First Blast		
	Installation of amenities and rest facilities		dismantling of shed			Second Blast Furnace (bench)		Third Blast Furnace (bench)			
	Restoration of national forest										
Buffer zone environment improvement	Installation of utility facilities, etc.	Replacement of play equipment						Installation of Toilets			
	Securing observation points										
	Restoration of national forest										

Table 2: Project execution schedule³

³ The measurement surveys of the Transportation Site and Iron Mining Site referred at the top of the "Investigative Research" category does not include the urgent measurement survey of the Transportation Site and Iron Mining Site related to recovery from damages caused by Typhoon No. 10. The measurement survey to prepare a record pertaining to recovery from damages caused by Typhoon No. 10 is included in the "Restoration" category, and both are to be executed over the short term.

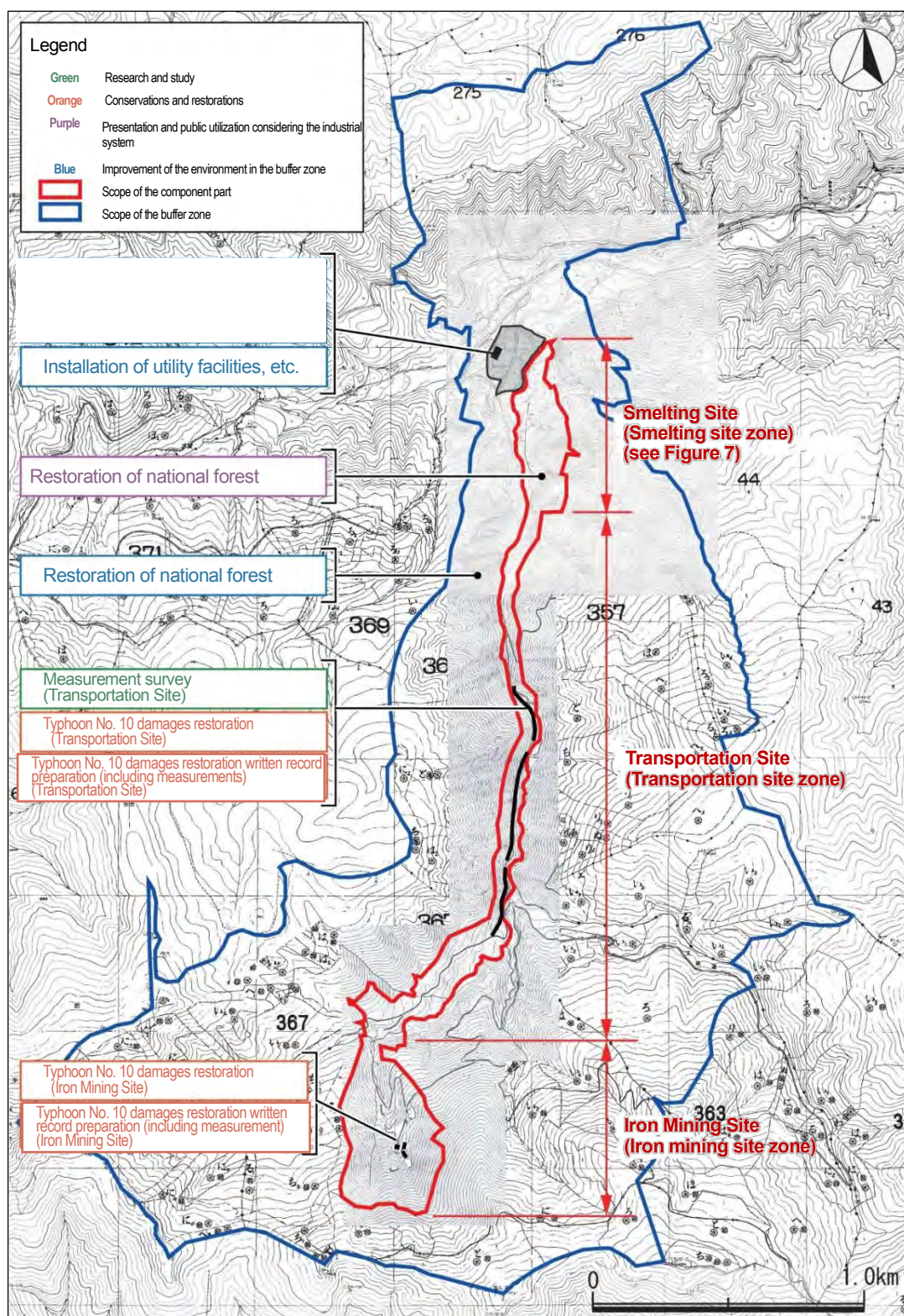


Figure 6: Hashino Iron Mining and Smelting Site Basic plan map (Short-term)

5. Basic plan

The master plan showing those project to be implemented at Hashino Iron Mine is as in **Figure 7** below.

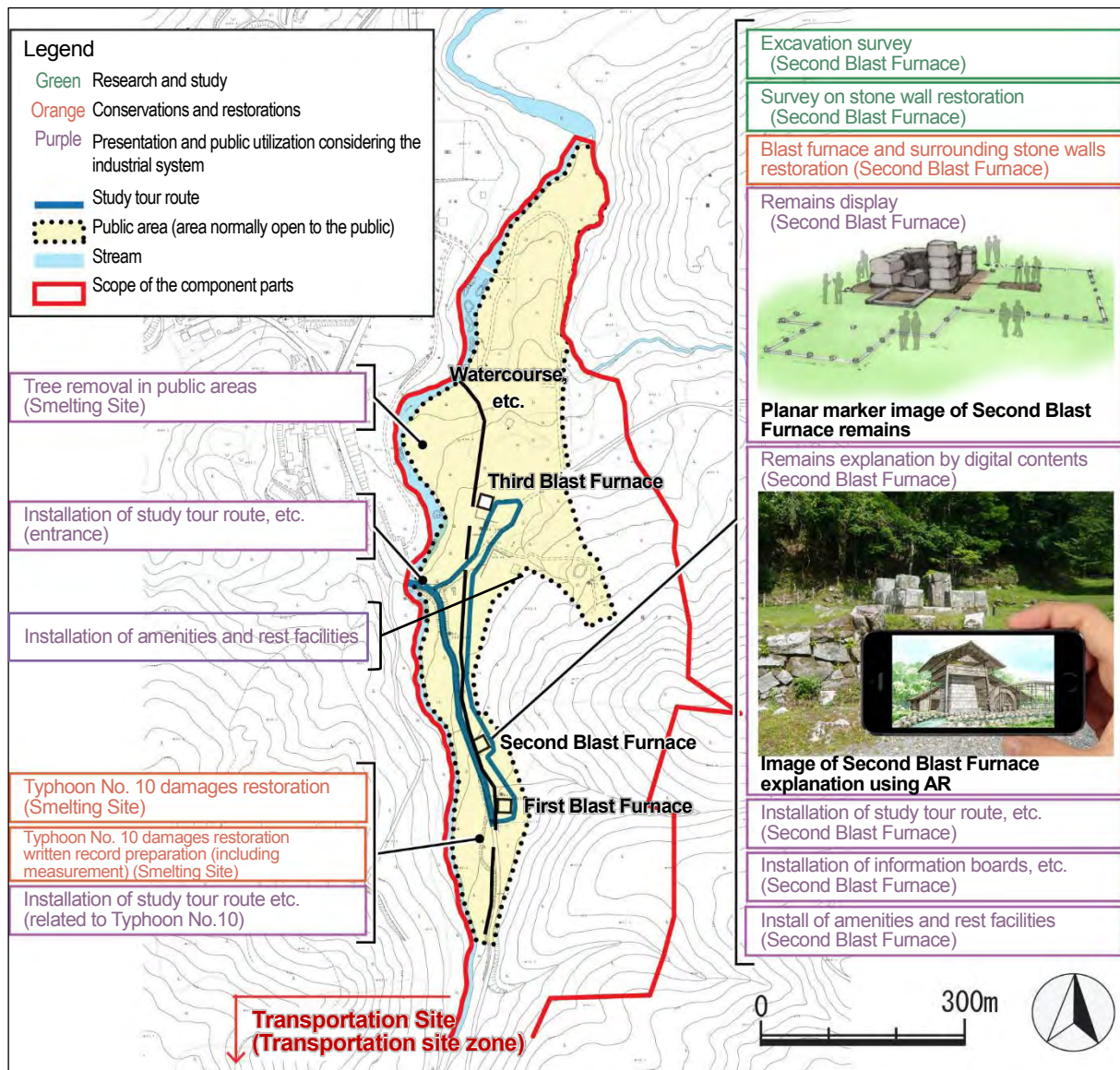


Figure 7 Hashino Iron Mine Basic Plan (Short-term) Transportation Site(Transportation site Zone) enlarged view

6. Others

The Conservation, Restoration, Presentation and Public Utilization Plan for Hashino Iron Mining and Smelting Site, which became a source of “Conservation Work Programme and Implementation Programme” is available on Kamaishi City’s web site.

<http://www.city.kamaishi.iwate.jp/shisei_joho/keikaku_torikumi/detail/1214190_2554.html>

(Annex)**Response to ICOMOS Technical Review on Typhoon Disaster Restoration of Hashino Iron Mining and Smelting Site (Area 4 Kamaishi/ Component Part 4-1)****1. Background**

On June 1st, 2017, the Government of Japan received the document of ICOMOS technical review via the World Heritage Centre regarding the report of “Information Document Concerning the Damages Caused by Typhoon No.10 on Hashino Iron Mining and Smelting Site (Area 4 Kamaishi/Component Part 4-1) and the Future Measures to Address the Damages” (hereinafter referred to as the “First Report”), which the Government of Japan submitted to the World Heritage Centre on December 22nd, 2016. This report (hereinafter referred to as “Second Report”) incorporates responses to the items recommended in said technical review.

2. Recommendations by ICOMOS in its technical review

- a. Ensure the damage is adequately documented;
- b. Review the Risk Management Plan in response to the disaster and its response;
- c. Ensure that the proposed restoration and conservation plan is coordinate with the wider prioritised conservation work programme for the nominated property and its component sites and implementation programme, requested by the Committee at the time of inscription;
- d. Provide a progress report on the restoration and conservation works to the World Heritage Center in its December 2017 report.

3. Response to recommendations by ICOMOS**(1) Written record of damages and restoration (Response to 2-a)**

Kamaishi City will accurately record the state of damage and restoration. Along with the progress of the restoration, restoration project reports will be published on the smelting site by March 2019 and on the transportation site and iron mining site by March 2023, with detailed diagrams of each remains.

(2) Risk management scheme revision (Response to 2-b)

Iwate Prefectural Government and Kamaishi City each prepared a regional disaster prevention plan in 1969 and 1973, respectively, based on the Basic Act on Disaster Control Measures (Act No. 223 of 1961). Following the damages from Typhoon No. 10 of 2016, Iwate Prefectural Government and Kamaishi City each revised portions of the contents of their regional disaster prevention plans in March 2017 and September 2017, respectively.

The Iwate Prefectural Disaster Management Plan and Kamaishi City Disaster Management Plan were both devised as comprehensive disaster prevention plans for the entire prefecture and the entire city, however they do not include specific disaster prevention plans for individual cultural properties such as Hashino Smelting Site designated as a National Historic Site, or the Hashino Iron Mining and Smelting Site, which is one of the component parts of the World Heritage “Sites of Japan’s Meiji Industrial Revolution”. For that reason, based on the Kamaishi City Disaster Management Plan, Kamaishi City will revise the Hashino Iron Mining and Smelting Site Conservation Management Plan (CMP) to add disaster prevention policies, method, etc. by FY2018. The revised plan will be promptly sent to the World Heritage Centre.

While future disaster response and prevention will be for the purpose of protecting the remains from disasters, there will not be construction works for large-scale prevention facilities that might have a great impact on the remains’ landscape, such as building of Sabo-dams and alteration of water channels. Rather, through the installation of multiple small-scale drainage facilities and other measures, the

response will take a direction expected to achieve a complementary effect. Also, precipitation gauges will be installed on land adjacent to the remains to collect objective data, and by conducting observations of the remains on a periodic basis using monitoring charts, efforts will be made, although visual, at early detection of danger levels. A detailed topographic map of the remains will be prepared so that restorations can be made immediately even in cases where there is a minor impact on the remains.

(3) Relation between the “Conservation, Restoration, Presentation and Public Utilization Plan” and the “Conservation Work Programme and Implementation Programme” (response to 2-c)

The “Conservation, Restoration, Presentation and Public Utilization Plan” mentioned in the First Report as being prepared is the source of the “Conservation Work Programme and Implementation Programme” pursuant to Recommendation b) included in the Decision (39COM 8B.14) of the World Heritage Committee. The disaster restoration works this time are positioned as top priority items under the same Plan and Programme, as shown in **Table 1**.

Category	Project		Short-term (2018-2022)					Mid-term (2023-2027)	Mid-term (2028-2037)		
		2017	2018	2019	2020	2021	2022				
Survey and Research	Measurement surveys		Transportation Site					Iron Mining Site			
	Excavation surveys	Typhoon related		Second Blast Furnace			Third Blast Furnace		First Blast Furnace	Introduce area of the site	
	Survey on restoration of stone walls			Second Blast Furnace			Third Blast Furnace		First Blast Furnace	Introduce area of the site	
	Documents survey										
	Visitor survey										
	Monitoring (including survey on amount of movement)										
Restoration	Typhoon No. 10 damages restoration (Smelting Site)	Restoration of revetment, etc.									
	Typhoon No. 10 damages restoration (Transportation Site)		Transportation Site								
	Typhoon No. 10 damages restoration (Iron Mining Site)				Central stone walls						
	Typhoon No. 10 damages restoration written record preparation (including measurements)	Smelting Site	Transportation Site, Iron Mining Site								
	Restoration of blast furnaces and surrounding stone walls			Second Blast Furnace			Third Blast Furnace		First Blast Furnace		
Presentation and Utilization considering the mining, transportation, and iron-making system	Remains display						Second Blast Furnace		Third Blast Furnace	First Blast Furnace	
	Tree removal in public areas										
	Installation of study tour route, etc.	Typhoon related					Second Blast Furnace		Third Blast Furnace	First Blast Furnace	
	Installation of information boards, etc.						Second Blast Furnace		Third Blast Furnace	First Blast Furnace	
	Installation of amenities and rest facilities		dismantling of shed			Second Blast Furnace (bench)		Third Blast Furnace (bench)			
	Restoration of national forest										
Buffer zone environment improvement	Installation of utility facilities, etc.	Replacement of play equipment					Installation of Toilets				
	Securing observation points										
	Restoration of national forest										

Table 1 Position of the disaster restoration works in the Conservation, Restoration, Presentation and Public Utilization Plan (same as under the Conservation Work Programme and Implementation Programme)
(indicates restoration works)

(4) Progress state of disaster restoration (Response to 2-d)

The progress state of the disaster restoration works as of December 2017 is as shown in **Table 2**.

Area	Elements Requiring Restoration	OUV	Damages Conditions	Restoration Response		Progress Status	Completion (Scheduled)
				Urgent Measures	Full-Scale Restoration		
Smelting Site	No. 1 Blast Furnace and associated facilities	○	The sand at the base of bellows was slightly washed away, turning the plain into a wetland.	-	Refilled manually November 2016.	Completed	2016
	No. 3 Blast Furnace and associated facilities	○	Scattered sediment, fallen trees nearby the site.	-	Fallen trees removed April 2017.	Completed	2017
	Remains of the watercourse	○	Scattered gravel and driftwood, exposed bottom surface.	-	Driftwood removed June 2017.	Completed	2017
	Remains of the management office	○	Exposed relic surface and relics, partially damaged stone wall, etc.	Cured with blue tarp October 2016	Implement contents confirmation survey within 2017; confirm the existence of remains and damages; resbre by spreading river sand, and returning the topsoil. Regarding the stone wall, because one stone has fallen, return it to its original location by comparing with photographs before Typhoon No. 10 and other materials.	Started	2017
	The foundation stones of the great gate and shrine gate	○	Accumulated sediment and fallen trees nearby the site, exposed water pipe.	-	Remove fallen trees and water pipe together with the forest road and river bank works within 2017.	Started	2017
	Futamasawa River (Futamasawa)	○	Collapsed riverbank of Futamasawa and fallen trees, collapsed retaining wall on the west side of the former campground, fallen fence, scattered sand.	-	Implement restoration works within 2017 (Futamasawa: Forestry Agency; Futamasawa River: Kamaishi City).	Started	2017
	Tour route		Runoff about 50cm wide.	Cured with blue tarp October 2016	Pavement works within 2017, after forest road restoration works.	Started	2017
Transportation Site	Remains of the transportation site	○	Slight outflow of the remains of transportation site at the south of Aonoki Bridge, scattered sand and driftwood, blocked road due to collapse of the slope.	-	Manual restoration works scheduled within 2018.	Not yet started	2018
	Forest road and forest maintenance road		Runoff about 1-meter wide (approx. 2 km).	-	Signed contract for disaster survey measurement design works in October 2016. Signed contract and began forest road restoration works in July 2017; scheduled to complete within 2017. Forest maintenance road to be repaired along with forest operations in stages from 2018.	Started	2022
Iron Mining Site	Remains of the surface mining A	○	Partially exposed remains of the surface mine workings, accumulated sediment.	Cured with sandbags to prevent inflow of earth and sand November 2016	Surveys and restoration will be implemented in stages after the completion of the forest road and forest maintenance road restoration. Also, the possibility of newly installing a management road for the purpose of bringing in heavy equipment for restoration and for transport of materials will be carefully investigated giving due consideration to the steep geography; aiming at completion by 2022.	Not yet started	2022
	Remains of the underground mine workings	○	Accumulated sediment.	Cured with sandbags to prevent inflow of earth and sand November 2016		Not yet started	2022
	Remains of central stone wall	○	Collapsed stone wall on the north side.	Cured with sandbags at locations where stone materials spilled out November 2016		Not yet started	2022

Table 2 State of progress of disaster restoration works as of December 2017