



## Translated Paper

# Incorporation of citizens' opinions into the process of earthquake ruins maintenance: A case study of the Great East Japan earthquake ruins in Miyagi Prefecture

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### Abstract

The Great East Japan Earthquake struck in March 2011, causing a huge tsunami on the northeastern coast of Japan. In the disaster area, there has been a movement to preserve the damaged structures as earthquake ruins. In this study, the characteristics of establishing consensus were investigated by clarifying how the earthquake ruins have been preserved and removed, and how the opinions of citizens were accounted for in the process of maintaining these sites. The study focused on 21 earthquake ruins in Miyagi Prefecture, which were the closest to the epicenter. We extracted 30 elements from the earthquake ruins maintenance process and created labels for them. From these, we prepared time-series charts and flowcharts and discussed the relation between entities and citizens' opinions regarding the maintenance process. We clarified four stages pertaining to the preserved ruins and found four types of relationships between the major opinions and treatment decisions. Furthermore, the periods following the earthquake were divided into three phases: pioneering, deliberation, and implementation. Consequently, we suggested that citizens' opinions, coupled with expert advice, could be used to help establish consensus in an incremental manner when making administrative decisions.

### Keywords

citizen participation, earthquake ruins, Great East Japan earthquake, maintenance process, time-series charts

## 1. Background/Research Purpose

Many buildings and other structures were damaged by the Great East Japan Earthquake and tsunami, which occurred on March 11, 2011. Most of these structures have been removed, but parts of them are being preserved as “earthquake ruins” and expected to help serve as reminders of the necessity of disaster prevention measures. There are various issues related to preserving earthquake ruins. It has been reported that people who live around earthquake ruins have various opinions regarding decisions about their removal, preservation, and temporary preservation; thus, consensus building is a topic that must be addressed.<sup>1</sup> Some people insisted on the removal of the earthquake ruins based on the belief that the cost and labor required for their preservation should be allocated to other

projects, or on the assertion that there was no desire to remind residents of the sadness and suffering of the disaster by maintaining the ruins. By contrast, some felt the ruins should be preserved for future generations to visit and used as a means of disaster prevention education. After the disaster, many volunteers visited the area to support reconstruction and evaluated the earthquake ruins as a symbol of the disaster. The Japanese government organized a special earthquake recovery budget; to access this funding, municipalities had to submit to the government their reconstruction project plans. The government has approved funding for the preservation of earthquake ruins since 2013; however, it decided that the ruins' maintenance costs should be borne by the municipalities. Municipalities have been forced to make difficult decisions based on citizens' opinions under various time- and budget-related constraints.

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The tsunami following the Great East Japan Earthquake affected six prefectures along the Pacific coast, especially the Tohoku region. Before this, there had never been an instance of so many municipalities working simultaneously on reconstruction projects and earthquake ruin preservation. In Japan, natural disasters are frequent, and thus, it is necessary to accumulate data about the maintenance of earthquake ruins from the Great East Japan Earthquake for future applications. However, at present, research on earthquake ruins is focused on producing case reports of preservation trends in each municipality.<sup>2</sup>

Furthermore, opportunities to talk about the removed earthquake ruins are decreasing. For example, even though there were calls to preserve the ruins, there have been cases in which they were removed regardless. Therefore, it is necessary to clarify the overall process of the preservation and removal efforts, including those related to the earthquake ruins that were not preserved.

To date, the ruins of many buildings destroyed by natural disasters have been preserved in Japan. Following the Unzen–Fugendake eruption and the Niigata Chuetsu Earthquake, the process of preserving the affected elementary schools and houses was reported.<sup>3,4</sup> In addition, the evaluations of residents after the preservation of earthquake ruins and public's awareness of the preparation process for the reconstruction plan were investigated.<sup>5,6</sup> However, there is room for additional research regarding the relation between the maintenance of earthquake ruins and citizens' opinions.

Earthquake ruins are public facilities typically maintained by municipalities. Previous studies have indicated that, in the case of existing public facilities, citizen participation in the maintenance process develops into citizen-municipality collaboration, and building a framework for citizen participation, beginning with the planning stage, leads to sustainable citizen participation management.<sup>7,8</sup> In addition, Miyagi Prefecture has stated that it is necessary to use the earthquake ruins to teach earthquake-related lessons based on the opinions gathered at a conference of experts, and that the government, organizations, and citizens of the prefecture must participate in imparting them to others.<sup>9</sup> In the Tohoku region, where a declining birthrate and an aging population are anticipated in the future, sustainable preservation and the use of earthquake ruins are issues that should be addressed. When doing so, the collaboration between municipalities and citizens is indispensable. Each municipality should maintain earthquake ruins in ways that reflect citizens' opinions and to conduct management operations rooted in cooperation with them. However, during the disaster recovery stage, both municipalities and citizens are in a state of emergency. There are many differences between the public's participation in the maintenance process and in processes related to other general public facilities; thus, it is considered difficult to simply apply the findings of previous studies to this context.

The purpose of this study is to clarify the maintenance process for earthquake ruins, with a focus on the hearing public opinions and the municipalities' consensus building efforts. We first assert that the process of preserving earthquake ruins and soliciting citizen participation has unique characteristics, even if the steps taken during the process are similar to those related to other public facilities. The status of the maintenance process and public hearings is, thus, clarified. Next, we assert that municipalities have made decisions related to the preservation of earthquake ruins based on the opinions of most citizens. To facilitate consensus building and future citizen

collaboration, the relation between preservation decisions and citizen opinions is analyzed. Finally, we consider the means of engaging with citizens during the earthquake ruin maintenance process.

## 2. Research Objective/Method

Miyagi Prefecture was the closest to the epicenter of the earthquake, and many of its structures were damaged. According to the Miyagi Prefecture Earthquake Ruins Expert Conference, held in December 2013, of the 15 municipalities along the coast, Shiogama, Tagajo, Watari, Matsushima, Shichigahama, and Rifu had no candidates for preserving the earthquake ruins. These municipalities were excluded from the survey because they could not confirm whether they had considered the preservation of earthquake ruins.<sup>10</sup> In this study, we conducted a literature survey of the remaining nine municipalities: Sendai, Ishinomaki, Kesenuma, Natori, Higashimatsushima, Yamamoto, Onagawa, Minamisanriku, and Iwanuma.

First, we extracted data on actions related to the maintenance of earthquake ruins, including decisions about preserving, removing, and temporarily preserving them, from materials gathered from municipalities and the press. We made a list of the times and contents of the actions and analyzed the process that was indicated for the deliberation and implementation of steps for earthquake ruins' maintenance [Note 1]. Twenty-one municipalities and earthquake ruin sites were identified in eight municipalities (Figure 1), excluding Iwanuma [Note 2]. Many of these ruins were made of reinforced concrete; except for four cases, all were left in their original locations. Three buildings in Onagawa made of reinforced concrete were knocked down by the tsunami near their original locations, and a third was knocked down by the water and moved a dozen meters from its original location. The *No. 18 Kyotokumaru* was a fishing vessel about 60 m long. The tsunami moved it about 750 m inland from the port.

Next, we reviewed the actions organized in the list above individually and created a label representing the contents. The labels were categorized by subject, ie, "municipalities" or "citizens." When the number of labels was large, grouping was performed for each label. The candidates for earthquake ruins, including those privately owned once, were all preserved by municipalities. Therefore, we classified the actions of municipalities by the stages of the maintenance process with reference to the previous studies and ensured correspondence with the labels.

In addition, we created a time-series chart with coded labels and groups and a list for each earthquake ruin. The table also summarizes the reconstruction trends in the prefectures and by the government. We categorized the cases that met the guidelines of the preservation policy and those in which ruins were not preserved in the time-series chart, and devised an outline of the maintenance stage, division of time, and process of soliciting opinions. Furthermore, a flow diagram representing the maintenance process was created, and the relation between the flow and subject of the action was considered. In addition, we extracted data on citizen meetings from the list and organized the methods, subjects, time, and contents. The characteristics of citizen meetings were diverse, and the relation between preservation decisions and citizen opinion was considered. Finally, we addressed the approach to consensus building with citizens regarding the maintenance process for earthquake ruins.

To ensure objectivity when creating labels and groups, the first author created label names and group proposals, and then,

No.	Municipalities	Earthquake ruins	Preservation	Use before the Earthquake
1	Sendai City	Former Arahama Elementary School	✓	Elementary school
2		Building foundation after collective relocation	✓	Private homes
3	Ishinomaki City	Former Kadonowaki Elementary School	✓	Elementary school
4		Former Okawa Elementary School	✓	Elementary school
5	Kesenuma City	<i>No. 18 Kyotokumaru</i>	-	Fishing vessel
6		Former Kesenuma Koyo High School	✓	High school
7		JR railway bridge	-	Railway bridge
8		Omosegawa sluice gate	-	Sluice gate
9	City of Natori	Hotel Seaside Palace	-	Amusement park hotel
10		Former Sasanao Kamaboko factory head office	-	Factory
11		Former Yuriage Junior High School	-	Junior high school
12	Higashi Matsushima City	Former Yuriage Elementary School	-	Elementary school
13		Former Nobiru Station Platform	✓	Station platform
14	Yamamoto Town	Former Nobiru Elementary School	-	Elementary school
15		Former Hamaichi Elementary School	-	Elementary school
16	Onagawa Town	Hotel Kanponoyado Matsushima	-	Hotel
17		Former Nakahama Elementary School	✓	Elementary school
18	Minamisanriku Town	Former Onagawa police station	✓	Police station
19		Onagawa Supplement building	-	Drug store
20		Enoshima Kyosai Kaikan building	-	Cooperative organization hotel
21	Minamisanriku Town	Disaster prevention center	✓	Public office

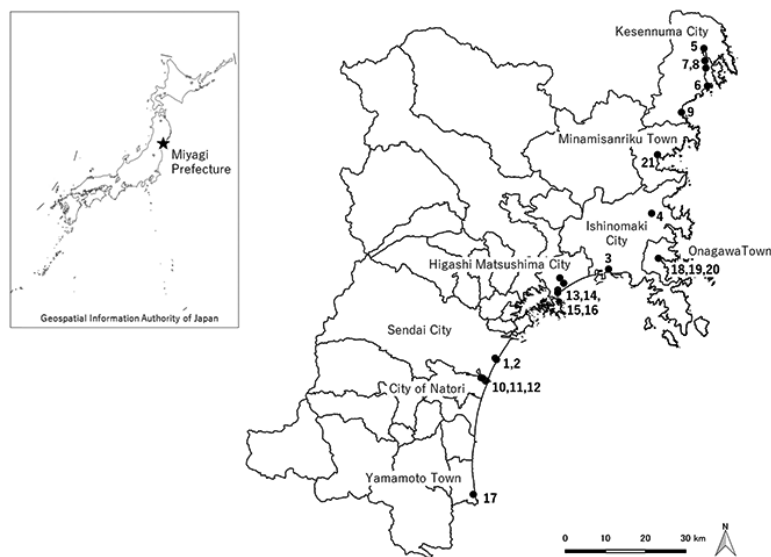


Figure 1. Map of earthquake ruin sites in Miyagi Prefecture

the co-authors examined the proposals individually and discussed them [Note 3].<sup>11</sup>

### 3. Creating Lists and Labels

Based on the survey results, a list of 128 cases related to the maintenance process was created. The subjects in the list were divided into municipalities, citizens, experts, and owners [Note 4]. For each list, a label was created to indicate the contents. The example of Sendai is shown to depict how the contents and labels of the list were created (Table 1). The labels and their contents were organized by subject (Tables 2 and 3).

Of the 30 types of labels, 20 types were related to municipalities' actions. These labels were classified into nine groups, represented by codes A–I. In addition, with reference to the previous studies, the (a) treatment decision stage was added to the (b) basic concept stage, (c) design stage, and (d) operation stage, which are the development stages of public facilities [Note 5].<sup>7,8,12</sup>

As for the codes themselves, the treatment decision stage comprised codes A–D. This revealed the intention to understand preservation or temporary preservation as follows. A: *Indication of choice of treatment decision* included an

indication of understanding of preservation. B: *Preparation for treatment decision* included a survey of the current situation. C: *Pronouncement of the treatment decision* included a statement of the preservation policy. D: *Post-decision process of selected treatment* included fostering the understanding regarding the preservation or dismantling of a site and handling requests to the rethink the selected treatment.

The treatment options that could be selected during the treatment decision stage included (i) preservation, (ii) temporary preservation, and (iii) exclusion from the preservation. When preservation was selected, the development stage had already advanced to the basic concept stage or beyond; the basic concept stage was indicated by the letter “E” and consisted of deliberation on the concept of preservation and use policy. Furthermore, the design stage was indicated by the letter “F” and included an examination of maintenance and exhibition methods, as well as preservation work, while the operation stage was indicated by the letter “G” and included public release and extended maintenance. We used “H” to designate temporary preservation, which referred to initiating an ownership transfer to the prefecture. This was only confirmed in one case. Finally, exclusion from preservation was indicated by letter “I” and indicated removal [Note 6].

**Table 1. Sample list of labels for the maintenance process followed in Sendai**

No.	Date	Action	Code	Label
1	2013.6	The city council considers the former Arahama Elementary School building a suitable candidate for earthquake ruin preservation.	B	Selection of candidates
2	2013	A survey is conducted on the residual structural performance of the former Arahama Elementary School building.	B	Survey of current situation
3	2013.7-2014.12	The Committee for the Consideration of Earthquake Recovery and Memorials (reconsidered 10 times): The issue concerned the earthquake memorial project. One of the themes was the preservation of the building foundations of the Arahama settlement and the former Arahama Primary School as earthquake ruins.	B	Deliberation on lessons from earthquakes
4	2013.1	The mayor announces the preservation policy for the former Arahama Elementary School building.	C	Pronouncement of preservation
5	2014.12	The report by the Committee for the Consideration of Earthquake Recovery and Memorials mentions the preservation of the former Arahama Elementary School building and the building foundations of the Arahama settlement.	I	Emphasis on value
6	2015.1	The report from the Miyagi Prefecture Earthquake Ruins Expert Conference concludes that "It is highly worthwhile to preserve as earthquake ruins", the former Arahama Elementary School building and the building foundations of the Arahama settlement.	I	Emphasis on value
7	2015.2-4	A questionnaire on establishing an earthquake memorial in the Arahama area for the district's inhabitants is administered.	3	Selection of preservation, dismantlement, etc.
8	2015.3	The Sendai City Earthquake Disaster Recovery Promotion Headquarters meeting includes discussions on earthquake ruin preservation. It is decided that devising a concrete method for preserving the former Arahama Elementary School building as an earthquake ruin will be required within the current fiscal year. Based on the opinions of the housing sites' former owners, a decision is made to consider preserving a part of the building foundations in the Arahama area as a long-term project.	E	Deliberation on the policy of preservation and utilization
9	2015.4	A formal pronouncement of the preservation of the former Arahama Primary School building is made.	C	Pronouncement of preservation
10	2015.10-11	A questionnaire on whether to consider the former Arahama Elementary School an earthquake ruins in the Arahama area is distributed to the district's inhabitants.	5	Drafting of a policy for preservation and use
11	2015.11	The basic policy for the preservation of earthquake ruins in the Arahama area is determined and measures are formulated for preserving the current state of the former Arahama Primary School building.	E	Deliberation on the policy of preservation and utilization
12	2015.12	At a regular meeting of the city council, the preservation policy for the building foundations in the Arahama area is announced.	C	Pronouncement of preservation
13	2016.10-2017.3	The exhibition contents of "the former Arahama Elementary School earthquake ruin preservation and exhibition project" are discussed and created.	F	Deliberation on the method of maintenance and exhibition
14	2017.3	Maintenance work for preservation at the site of the former Arahama Primary School building is completed.	F	Preservation
15	2017.4	The earthquake ruin "The former Arahama Primary School" is opened to the public.	G	Public release
16	2017.9	A formal announcement is made regarding the preservation of part of the building foundations in the Arahama area.	C	Pronouncement of preservation
17	2018-	Measures for preserving the building foundations in the Arahama area are designed and implemented.	F	Deliberation on the method of maintenance and exhibition

The actions related to the adoption of citizens' opinions were classified as the entity "citizen." Focusing on the role of citizens' opinions in the maintenance process, five codes, represented by numbers 1–5, were created. Opinions on 1. *Discussion of earthquake traditions* referred to the use of earthquake ruins throughout the project to teach lessons about earthquakes. Next, 2. *Candidate selection* indicated asking for opinions or submissions for earthquake ruins' candidate sites from citizens. Opinions on 3. *The treatment options of preservation, dismantlement, etc.* were those regarding the treatment of specific earthquake ruins. Codes 1–3 were classified as opinions related to the treatment decision stage, while 4. *Proposal for preservation and use* referred to proposed methods of use and the exhibition of specific earthquake ruins. Opinions on 5. *The*

*drafting of a policy for preservation and use* were those of citizens concerning the preservation and use policies of the earthquake ruins prepared by municipalities. Codes 4 and 5 were classified as opinions related to the basic concept stage. For other data, the actions of experts were indicated by codes I–III and those of the owners of the earthquake ruins were indicated by IV and V.

#### 4. Earthquake Ruins' Maintenance Process

##### 4.1 Preparation of time-series chart

Using the labels and group codes (Tables 2 and 3), a time-series chart was prepared (Table 4), which lists the status of the maintenance process for each earthquake ruin in chronological

**Table 2.** Labels of actions pertaining to the maintenance process in municipalities

	Group	Code	Label	Action content
(a) Treatment decision stage	Indication of choice of treatment decision Preparation for treatment decision	A	Understanding of preservation Temporary leave	Indication of understanding of preservation Act of leaving temporarily
		B	Survey of current situation	Investigation of the current situation, including residual structures and maintenance possibilities
			Deliberation on lessons from earthquakes	Deliberation on lessons to be communicated about earthquakes
			Selection of candidates	Selection of earthquake ruins as candidates for preservation
	Pronouncement of treatment decision	C	Proposal of ownership transfer to the prefecture	Proposal of ownership transfer of earthquake ruins to the prefecture
			Pronouncement of preservation	Pronouncement of the preservation of earthquake ruins
			Pronouncement of exclusion from preservation	Pronouncement of the removal or diversion of earthquake ruins
	Post-decision process of selected treatment	D	Exclusion from candidacy	Pronouncement of exclusion from preservation candidacy
			Acceptance of ownership transfer to the prefecture	Acceptance of ownership transfer of earthquake ruins to the prefecture
			Attempt to foster understanding	Attempt to foster understanding regarding preservation or dismantling
(i) Preservation	(b) Basic concept stage	E	Ideas for preservation	Indication of ideas for preservation
			Deliberation on the policy of preservation and use	Deliberation or decision on the policy of preservation and use
	(c) Design stage	F	Deliberation on the method of maintenance and exhibition	Deliberation or decision on the concrete method of exhibition, design and maintenance
			Preservation	Realization of construction for preservation
	(d) Operation stage	G	Public release	Implementation of preservation measures and the act of opening the site to the public
			Extended maintenance	Addition of new maintenance measures and extension of the preservation zone
(ii) Temporary preservation		H	Implementation of ownership transfer to the prefecture	Implementation of ownership transfer of earthquake ruins to the prefecture
(iii) Exclusion from preservation		I	Removal	Demolition and removal of ruins

Refers to time-series chart (Table 4).

order. The vertical axis indicates the name of the ruin, while the horizontal axis indicates month-long intervals from March 2011 through August 2018.

#### 4.2 Preparation of flowcharts

A flowchart showing the maintenance process for each site was created based on the list related to the maintenance process and the labels and group codes (Figures 2–6). In the flowcharts, municipalities' actions were the main axes, the order of the actions was shown on the vertical axes, and the relationships among the subjects, citizens, and experts were arranged. Parts of the flowcharts were excerpted as follows.

#### 4.3 Cases of preservation policies

Nine earthquake ruins, those in Sendai, Ishinomaki, Kesenuma, Higashimatsushima, Yamamoto, Onagawa, and Minamisanriku, had preservation policies. Using a time-series chart, the following points were clarified. Onagawa was the first to consider preservation; Minamisanriku followed a unique process, including ownership transfer to the prefecture; and earthquake ruins generally followed a four-stage maintenance process.

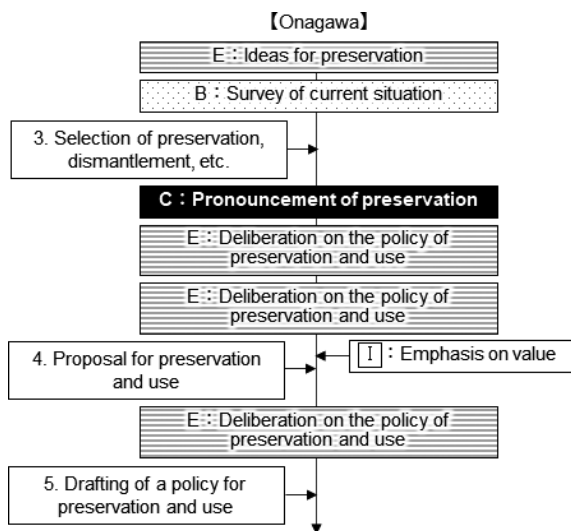
When a preservation policy was selected, the maintenance process usually consisted of making the treatment decision, formulating the basic concept, executing the design stage, and executing the operation stage. At the time of the survey, most of these processes were in the design stage [Note 7]. However, Higashimatsushima, Yamamoto, and Onagawa began at the basic concept stage [Note 8]. The average period from the beginning of a municipality's deliberation on the issue to the announcement of a treatment decision was ~2.5 years [Note 9]. In addition, during preparation for the treatment decision and basic concept stages, each municipality held meetings and formed committees comprising experts and stakeholders; through these, discussions on the fates of the earthquake ruins were confirmed [Note 10]. In the first half of 2016, the pronouncement of a treatment decision was confirmed for almost all earthquake ruins, and the treatment decision stage was completed.

Onagawa showed interest in preservation early on, including illustrations of the preserved earthquake ruins in its reconstruction plan formulated in September 2011, which attracted widespread attention. The formal preservation policy of the former Onagawa police station (Figure 2) was announced in late

**Table 3. Labels of actions pertaining to the maintenance process for citizens/experts/owners**

	Subject	Code	Label	Action content
Citizens	(a) Treatment decision stage	1	Discussion on earthquake traditions	Expression of opinions about earthquake ruins in the context of the entire project on earthquake traditions
		2	Candidate selection	Expression of opinions about selection of candidate sites from the earthquake ruins
		3	Selection of preservation, dismantlement, etc.	Expression of opinions about treatment options of preservation, dismantlement, leave, etc.
	(b) Basic concept stage	4	Proposal for preservation and use	Proposal of opinions about the method of preservation and use
		5	Drafting of a policy for preservation and use	Expression of opinions about drafting a policy for preservation and use
Experts	I	Emphasis on value	Emphasis placed on the value of earthquake ruins	
	II	Proposal for addition of the site as a candidate for preservation	Proposal to add the site as a candidate, considering the value of the earthquake ruins	
	III	Decision about whether to add the site as a candidate for preservation	Decision on whether to add the site as a candidate, considering the value of the earthquake ruins	
Owners	IV	Intention to not preserve the site	Expression of the owner's intention to not preserve the ruins	
	V	Intention to preserve the site	Expression of the owner's intention to preserve the ruins	

Refers to time-series chart (Table 4).



**Figure 2. Flowchart for the former Onagawa police station**

2013, before the Miyagi Prefecture Earthquake Ruins Expert Conference indicated the site's value, and it was the earliest that such a plan was released [Note 11]. Before the decision was made, local junior high-school students had proposed the idea of preserving the earthquake ruins to the mayor [Note 12]. Workshops on using the earthquake ruins and conducting site tours for citizens to explain the drafting of the preservation policy were held after its announcement.

Excluding Onagawa, these deliberations began in earnest in late 2013. Figure 3 shows an example of the former Arahama Elementary School. In deciding on that site's preservation policy, the city committee, including the experts and the Miyagi Prefecture Earthquake Ruins Expert Conference, indicated the site's value. In addition, questionnaires were administered to the former residents of the areas around the ruins to confirm that most did not oppose the preservation plan and to ensure that they had reviewed the proposed preservation policy.

Sendai announced its first preservation policy in late 2013 and expressed the content of its preservation efforts through discussions and hearings. In summary, the city announced three iterations of preservation policies.

In April 2011, immediately after the earthquake, the mayor of Minamisanriku indicated the town's intention to preserve the affected Disaster Prevention Center (Figure 4) as an earthquake ruin. However, the town reversed its plan in favor of a removal policy in September of the same year, and the town council adopted an "early removal" plan from the three petition types it had received: postponement and reconsideration of removal, preservation, and early removal. By contrast, Miyagi Prefecture experts pointed out the ruins' value during the Miyagi Prefecture Earthquake Ruins Expert Conference and proposed transferring ownership of the ruins to Miyagi Prefecture. Minamisanriku solicited citizens' opinions about the ownership transfer and accepted the request, given that ~60% agreed with the idea. It was decided that the ruins would remain under the management of the prefecture until 2031 and that the measures to be taken by the town would be reconsidered at that time. Only the Disaster Prevention Center had previously been considered as a subject of transfer of ownership to its prefecture while a temporary preservation policy was being devised. The Center's case had attracted widespread attention for its unique approach to the ownership transfer, and the varied opinions of citizens regarding preservation and removal were featured in the press.

Based on the time-series table and the flowchart, it is apparent that citizens' opinions were solicited during the deliberation and treatment decision stages. The preservation policies were announced in response to the opinions of the citizens and experts who attended meetings, and several pioneering cases were found to have influenced the decisions made in other municipalities.

**4.4 Cases of exclusion from preservation**

Twelve earthquake ruins, in Kesenuma, Natori, Higashimatsushima, and Onagawa, were excluded from preservation. Most of them had already been dismantled and removed; however, some had been converted into factories or lodging facilities,

Table 4. Time series chart for the maintenance process

No.	Municipalities	Earthquake ruins	Preservation	Stage	2011		2012		2013		2014		2015		2016		2017		2018	
					First half	Second half	First half	Second half	First half	Second half	First half	Second half	First half	Second half	First half	Second half	First half	Second half	First half	Second half
1	Sendai City	Former Arahama Elementary School	✓	(a)-(b)-(c)-(d)																
2		Building foundation after collective relocation	✓	(a)-(b)-(c)																
3	Ishinomaki City	Former Kadonowaki Elementary School	✓	(a)-(b)-(c)																
4		Former Okawa Elementary School	✓	(a)-(b)-(c)																
5		No. 18 Kyotokumaru	-	(b)-(a)																
6	Kesennuma City	Former Kesennuma Koyo High School	✓	(a)-(b)-(c)-(d)																
7		JR railway bridge	-	(a)																
8		Onosogawa sluice gate	-	(a)																
9		Hotel Seaside Palace	-	(a)																
10		Former Sasanao Kamaboko factory head office	-	(a)																
11	City of Natori	Former Yuniage Junior High School	-	(a)																
12		Former Yuniage Elementary School	-	(a)																
13		Former Nobiru Station Platform	✓	(b)-(a)-(c)-(d)																
14	Higashi Matsu shima City	Former Nobiru Elementary School	-	(a)-(b)																
15		Former Hamauchi Elementary School	-	(a)-(b)																
16		Hotel Kanponoyado Matsushima	-	(b)-(a)																
17	Yamamoto Town	Former Nakahama Elementary School	✓	(b)-(a)-(b)-(c)																
18		Former Onagawa police station	✓	(b)-(a)-(b)																
19	Onagawa Town	Onagawa Supplement building	-	(b)-(a)																
20		Enoshima Kyosai Kaikan building	-	(b)-(a)																
21	Minami sarrnu Town	Disaster prevention center	✓	(a)-(c)																
		Miyagi Prefecture Government																		

**Municipalities**

- A Indication of choice of treatment decision
- B Preparation for treatment decision
- C Pronouncement of treatment decision
- D Post-decision process of selected treatment
- E Basic concept stage
- F Design stage
- G Operation stage
- H Temporary preservation
- I Exclusion from preservation

**Citizens**

- 1 Discussion on earthquake traditions
- 2 Candidate selection
- 3 Selection of preservation, dismantlement, etc.
- 4 Proposal for preservation and use
- 5 Drafting of a policy for preservation and use

**Experts / Owners**

- 1 Emphasis on value
- 2 Proposal for addition of the site as a candidate for preservation
- 3 Decision about whether to add the site as a candidate for preservation
- 4 Intention to not preserve the site
- 5 Intention to preserve the site

**status of recovery**

- x1 Miyagi Prefecture Earthquake Ruins Expert Conference.
- x2 Expert conference on transferring the memories of and lessons learned from the Great East Japan Earthquake.
- x3 The number of residents of emergency temporary housing was very high.
- x4 The reconstruction agency decided to support the preservation of earthquake ruins.

**Experts / Owners**

- x5 The disposal of disaster waste was completed.
- x6 Basic infrastructure (roads, rivers, water supply and sewerage, etc.) was restored.
- x7 All the disaster prevention collective relocation plans were developed.

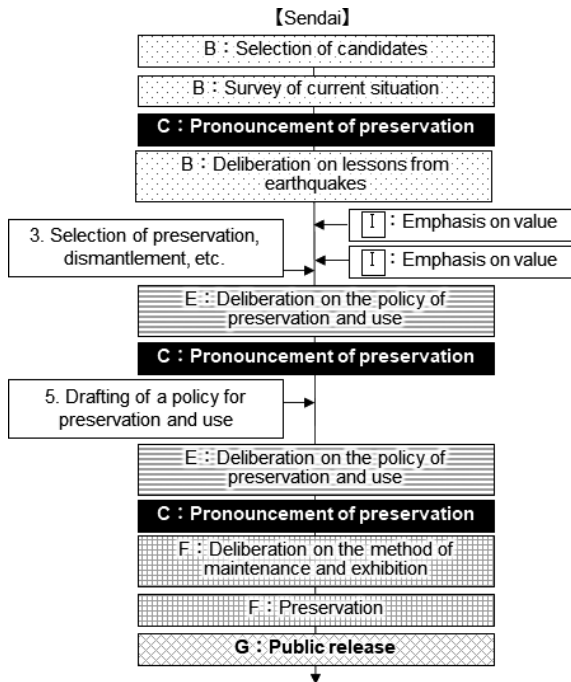


Figure 3. Flowchart for the former Arahama Elementary School

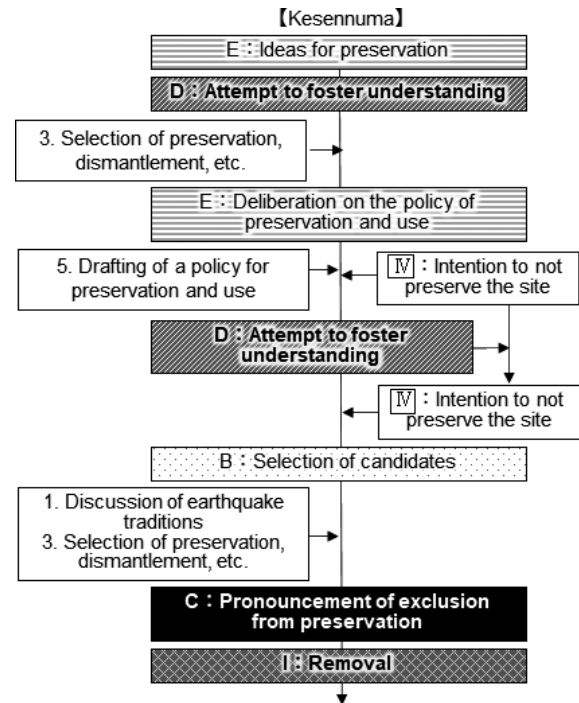


Figure 5. Flowchart for No. 18 Kyotokumaru

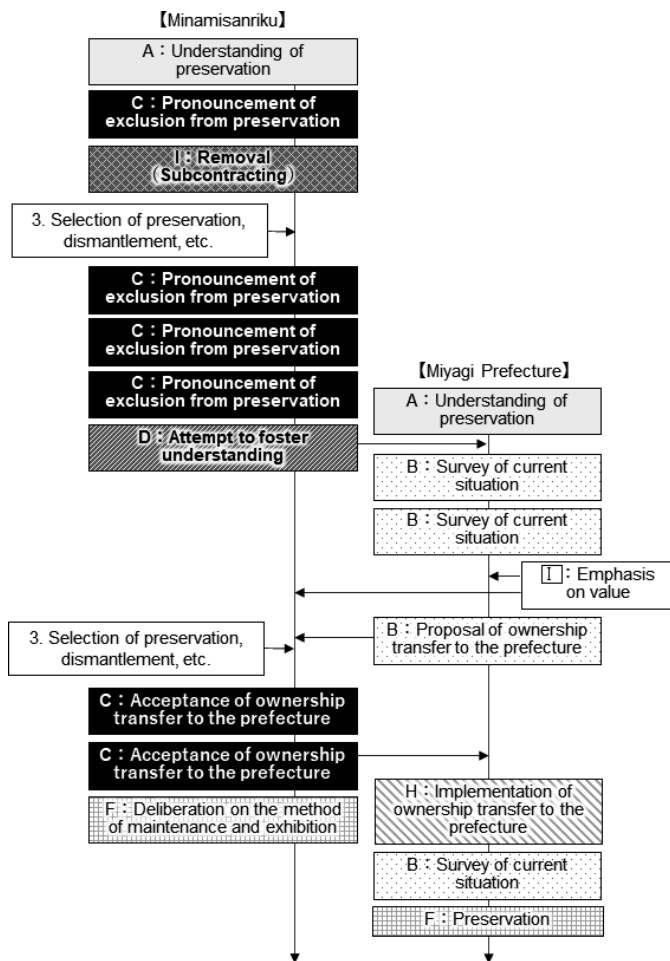


Figure 4. Flowchart for the Disaster Prevention Center

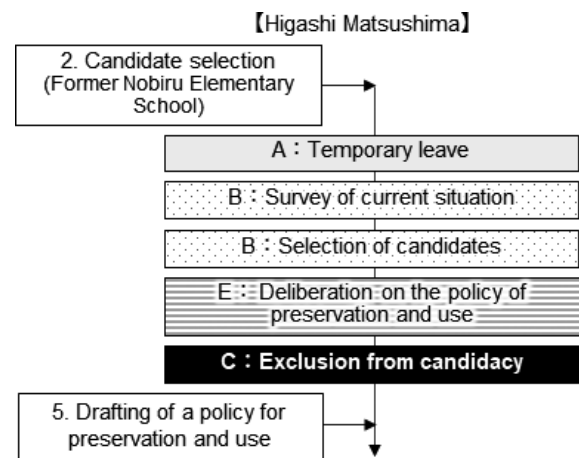


Figure 6. Flow chart for the former Nobiru and Hamaichi Elementary Schools

uch as the former Nobiru and Hamaichi Elementary Schools. From the time-series chart and the flowcharts of these cases, the processes that led to these sites' exclusion from preservation were classified into "inverted" and "exclusion" types.

No. 18 Kyotokumaru, the former Sasanao Kamaboko factory, and the Hotel Kanponoyado Matsushima were classified as "inverted-type" sites. They were once slated for preservation, but the policy changed, and they were removed from the preservation plans. A large fishing vessel, No. 18 Kyotokumaru (Figure 5) in Kesenuma, had been pushed ashore by the tsunami. Initially, it was slated for preservation, but this changed once the opinions of its owners and the citizens came to light. In December 2012, the city unveiled a designer's rendering of an earthquake memorial park featuring the preserved earthquake ruins; this was completed before similar efforts

were made by other municipalities [Note 13]. The city asked the owner of the vessel and the Ministry of Land, Infrastructure, Transport, and Tourism to cooperate with the preservation policy, but the owner failed to change his removal plans despite repeated requests to do so, mainly because some residents wanted to remove the vessel. The city changed its preservation plan because, in July 2013, ~70% of the citizen respondents to a questionnaire stated that they did not think it was necessary to preserve No. 18 Kyotokumaru. The mayor noted that this contributed to the abandonment of preservation efforts, besides the lack of governmental financial support.<sup>13</sup> Three months after the city decided to remove the vessel, the government announced plans to provide financial support for the maintenance of the earthquake ruins.

Next, in Natori, the owner of the Sasanao Kamaboko boiled fish paste factory was willing to preserve the damaged factory, and the city had been considering its preservation since soliciting public comments. However, shortly after the announcement of its selection for preservation, the city council repeatedly voiced opposition to it and some citizens raised questions about the factory's preservation. Based on these concerns, the city abandoned the preservation efforts.

The "inverted-type" maintenance process in the above two cases could not be confirmed as having begun during the treatment decision stage. These cases also failed to follow the order of the four previously mentioned stages. However, Higashi Matsushima decided on a preservation policy after making preparations for a treatment decision and considering the policy of preservation and use; nevertheless, there was no proposal in the public offering for preservation subcontracting, and thus, the preservation efforts were abandoned.

Cases other than those described above were classified as "exclusion" types. The case of Higashimatsushima (Figure 6) is an example of this type. In these cases, when each municipality considered the preservation of multiple candidate sites, other sites were chosen and excluded from the preservation plans.

In November 2013, the Reconstruction Agency announced that it would support the initial costs required for the preservation of one site per municipality.<sup>14</sup> In response to this announcement, municipalities began full-scale deliberations. The number of earthquake ruins allowed by the preservation policy was essentially one per municipality [Note 14], indicating that the plans were made based on the assumption that each municipality would have only one candidate. The "exclusion-type" maintenance process was identical to that of earthquake ruins that had been selected for preservation, until the treatment decision stage was reached.

#### 4.5 Reconstruction trends and periods

The bottom row of the time-series chart shows the actions of the prefecture and government reconstruction efforts. In conjunction with the trends in earthquake ruin maintenance in each municipality, the three periods were divided as shown at the top of the chart.

The period from the occurrence of the disaster through the second half of 2013, when the pioneering cases in the preservation of earthquake ruins were being deliberated on, was defined as the "pioneering period." The second half of 2013 was when No. 18 Kyotokumaru was removed from consideration and the former Onagawa police station was designated for preservation, as well as when the Reconstruction Agency announced its intention to support the initial cost of site preservation. In addition, during this time, the number of

residents in temporary housing hit its peak, and the decision rate for Disaster Prevention Collective Relocation reached 100%. Moreover, the government's support was determined, and the treatment decisions of two cases that attracted the public's attention became precedents. It is likely that municipalities began to consider the matter in earnest due to these factors.

The "consideration period" lasted from the first half of 2014 through the first half of 2016, when almost all municipalities made decisions regarding their earthquake ruins. The disposal of all disaster-related wastes in Miyagi Prefecture was completed in March 2014. At this time, when municipalities were entering a new stage of town reconstruction development, it was considered appropriate to begin discussing the fate of the earthquake ruins in earnest. In 2014, the Miyagi Prefecture Earthquake Ruins Expert Conference was held and the ruins were examined. Targets for consideration were selected based on the opinions of those in each municipality [Note 15], and the value of the nine earthquake ruins was identified in seven municipalities. These nine candidates were preserved by their municipalities.

The second half of 2016 and beyond was defined as the "implementation period." Each municipality began designing and constructing the sites to be preserved, and the ruins not protected by the preservation policy were removed or converted for other uses. For earthquake ruins, which became the target of the preservation policy, specific exhibition methods were examined and implemented, and some earthquake ruins were opened to the public.

## 5. Citizens' Opinions During the Maintenance Process

### 5.1 Overview of hearings on citizens' opinions

From the list of 128 items related to the maintenance process, 37 were chosen for gathering citizens' opinions [Note 16]; their summaries were created and their correspondence with the labels created in the previous chapter (Table 3) was identified (Table 5).

The opinion-solicitation hearings included 10 questionnaires and 10 meetings, which comprised exchanges of opinions and public hearings, eight workshops, four sessions for public comments, and four submissions of proposals and requests. The opinions conveyed through the city council were classified as "other" (1 case). The hearings included citizens, residents, and district community associations in the areas surrounding the earthquake ruins; junior and senior high-school students; and former students (in cases where the earthquake ruin was a school). The number of gathered opinions varied from a few to 1000. Focusing on how these were gathered, 83% were compiled via municipalities' solicitation efforts, while 17% were opinions expressed by citizens spontaneously, regardless of whether they were officially heard (Figure 7).

Looking at a breakdown of the methods, 31 cases occurred in contexts planned by municipalities and included 27 opinion-gathering questionnaires, meetings, and workshops. Citizens were observed to be giving spontaneous opinions six times in four documented contexts. The content of the opinions in 37 cases was varied and included appeals for the preservation or removal of earthquake ruins and suggestions for using them for various purposes.

### 5.2 Attributes of efforts to solicit citizens' opinions

Figures 8 and 9 show the labels and methods of soliciting citizens' opinions during three periods in the time-series chart.

Table 5. Summary of citizens' opinions and relevant labels

No.	Municipality	Method	Object	Date	Contents	Label
1	Sendai City	Questionnaire	<p>■ Former inhabitants: 239 respondents</p>	<2015.2.4>	<p>■ Questionnaire on the earthquake memorial in the Arahama area: Regarding the preservation of the earthquake ruins, "agree" or "no opinion" comprised 92.9% of responses regarding the former Arahama Elementary School building; such responses comprised 64.4% of the questions regarding the building's foundation.</p>	3
2		Questionnaire	<p>■ Former inhabitants: 302 respondents</p>	<2015.10.11>	<p>■ Questionnaire on the former Arahama Elementary School as an earthquake ruin: Regarding the preservation and use policy for the former Arahama Elementary School, 90.7% chose "good" or "basically good." Regarding the use of the building's foundation after collective relocation was selected, 91.3% chose "good" or "basically good."</p>	5
3	Ishinomaki City	Questionnaire	<p>■ Citizens: 687 respondents</p>	<2014.1.2>	<p>■ Questionnaire on how to convey earthquake experiences to others (Citizen): Regarding how to convey earthquake experiences to others, 63.6% of respondents said that "preservation of earthquake ruins" was "necessary." As a candidate for preservation, 58.6% suggested the former Kadonowaki Elementary School, which received maximum votes.</p>	1
4		Questionnaire	<p>■ Students: 720 respondents</p>	<2014.1.2>	<p>■ Questionnaire on how to convey earthquake experiences to others (junior high-school and high-school students): Regarding how to convey earthquake experiences to others, 67.8% of respondents said that "preservation of earthquake ruins" was "necessary." As a candidate for preservation, 39.1% suggested the former Kadonowaki Elementary School, which received maximum votes.</p>	1
5		Questionnaire	<p>■ Citizens: 938 respondents</p>	<2015.10.10>	<p>■ Questionnaire: Regarding what should be done with the former Kadonowaki Elementary School, 40.1% responded "dismantle," 41.1% chose "partial preservation," and 17.7% chose "whole preservation." Regarding what should be done with the former Okawa Elementary School, 37.2% responded "dismantle," 32.1% chose "partial preservation," and 28.3% chose "whole preservation."</p>	3
6		Questionnaire	<p>■ Inhabitants and land owners: 464 respondents</p>	<2015.10.10>	<p>■ Questionnaire: Regarding what should be done with the former Kadonowaki Elementary School, 48.1% responded "dismantle," 36.8% chose "partial preservation," and 15.0% chose "whole preservation." Regarding what should be done with the former Okawa Elementary School, 54.4% responded "dismantle," 20.4% chose "partial preservation," and 24.6% chose "whole preservation."</p>	3
7		Meeting	<p>■ District Community Association: 9 people</p>	<2015.10.11>	<p>■ Opinion-exchange meeting with the New Kadonowaki District Recovery Development Association: There were many reasons given to support dismantling the ruins, such as "many people feel sick and fearful" and "it looks like a spectacle." Some suggested preserving the site to establish museums or exhibitions of earthquake records for use in town development and regional revitalization.</p>	3
8		Meeting	<p>■ District Community Association: 20 people</p>	<2015.10.11>	<p>■ Opinion-exchange meeting with the Okawa District Recovery Association: Many people supported preservation. Opinions such as "we should spend time talking with the district's residents," "we should consider the issue carefully so as not to regret our decision after dismantlement," and "the opinions of experts and children should be incorporated into the process" were expressed.</p>	3
9		Meeting	<p>■ Citizens: 40 people</p>	<2016.2>	<p>■ Public hearing on the former Kadonowaki Elementary School: Among the nine people who expressed their opinions, five supported preservation and three supported dismantling the site. The remaining respondents maintained that this issue "should not be decided in a hurried manner."</p>	3
10		Meeting	<p>■ Citizens: 70 people</p>	<2016.2>	<p>■ Public hearing on the former Okawa Elementary School: Among the 12 people who expressed their opinions, eight supported preservation and four supported dismantling the site. "Save it and use it for the future" and "preservation funds should be used for other reconstruction projects" were cited as reasons for the expressed opinions.</p>	3
11		Public offering	<p>■ Former students: 44 respondents</p>	<2016.3>	<p>■ Solicitation of the opinions of former students: At a meeting at the former Kadonowaki Elementary School, 20 people favored preservation, 13 favored dismantling the site, and five people were "others" who expressed their affection for their alma mater. At a meeting at the former Okawa Elementary School, four people favored preservation, and two favored dismantling the site.</p>	3
12-13		Workshop	<p>■ Citizens: 20 people</p>	<2018.6.7>	<p>■ Workshop to discuss the use of the former Kadonowaki Elementary School building (held twice): Approximately 20 people, including residents, were present; they were divided into four groups and exchanged opinions based on the draft. A policy of expanding the preservation area symmetrically was decided on.</p>	5

Table 5. (Continued)

No.	Municipality	Method	Object	Date	Contents	Label
14	Kesennuma City	Meeting	■District Community Association	<2012.11>	■Opinion-exchange meeting with the Shishiori District Development Association: The city explained that, to preserve No. 18 <i>Kyotokumaru</i> , an enclosure should be made, the psychological burden should be reduced, etc. The community association administered its own questionnaire to 50 people, and ~80% opposed the vessel's preservation.	3
15		Meeting	■Inhabitants: 160 people	<2012.12>	■Opinion-exchange meeting between the mayor and residents: An illustration and trial calculations for preserving No. 18 <i>Kyotokumaru</i> in the memorial park were presented. Responses including "district residents opposed preservation," "preserve it to teach the lessons of tsunamis to future generations," and "questionnaires for residents were required" were expressed by respondents.	5
16-17		Questionnaire	■Citizens: 15,408 respondents	<2013.7>	■Questionnaire on tsunami evacuation: When asked "what seems necessary for communicating the memories and records of the earthquake for posterity," 16.9% of respondents said that "preservation of physical objects such as damaged buildings and vessels" was necessary. Regarding No. 18 <i>Kyotokumaru</i> , "preservation is desirable" was cited by 16.2% of respondents, "preservation of part of the hull or a substitute" was chosen by 15.5%, and "no need to preserve it" was noted by 68.3%.	1 3
18		Meeting	■Inhabitants: about 20 people	<2013.12>	■Municipal meeting with residents in the Hashikami district: Successive voices called for the preservation of the former Kesennuma Koyo High School building as an earthquake ruin. The prefectural Board of Education adopted a plan to dismantle the building.	3
19		Submission	■District Community Association	<2014.2>	■Submission of the "town development plan proposal" by the Hashikami District Promotion Association: A 13-item proposal to the city including the preservation of former Kesennuma Koyo High School building as an earthquake ruin was submitted. It was suggested that the school building be used as a permanent exhibition space for earthquake record keeping halls.	4
20		Workshop	■Inhabitants: 60 people	<2016.6>	■Debriefing meeting on town development in Hashikami district/workshop: City staff explained the status of the district and its plans, such as the maintenance outline for the former Kesennuma Koyo High School building. Participants were divided into seven groups, who proposed uses for the earthquake ruins.	4
21	City of Natari	Public offering	■Citizens: 10 respondents	<2014.3-4>	■Solicitation of citizens' opinions on earthquake ruin preservation candidates: As candidates for preservation, 10 were nominated, including the former Yuriage Junior High School, former Yuriage Elementary School, Tozenji temple, former Sasanao Kamaboko factory head office, and damaged houses.	2
22		Other	■Citizens: 8 respondents	<2014.11>	■Presentation of residents' opinions before the city council: Nine opinions were received concerning the preservation of the former Sasanao Kamaboko factory head office, and eight dissenting opinions were reported to the city council members. "The cost is large" and "preservation while keeping the signboard is inappropriate" were cited as reasons for such opinions. The city council members asked the city to review the policy.	3
23	Higashimatsushima City	Submission	■Local organization	<2012.9>	■Submission of requests by local organizations: The Association for Deliberating on Nobiru/Miyato District Reconstruction and Recovery submitted 11 requests, including ones for the "preservation of the former Nobiru Elementary School, former Nobiru station, former Naruse Dai-ni Junior High School, and Hotel Kanponoyado Matsushima as a tsunami heritage and evacuation building for residents and tourists."	2
24		Public offering	■Citizens: 21 respondents	<2015.6-7>	■Public comments on the drafting of the earthquake ruin preservation and use policy: Opinions including approval or disapproval regarding the plan to preserve and use the four facilities of the former Nobiru Station Platform, former Nobiru Elementary School, former Hamaichi Elementary School, and Hotel Kanponoyado Matsushima as earthquake ruin preservation sites were compiled. Most people agreed that the former Nobiru Station Platform should be preserved.	5

Table 5. (Continued)

No.	Municipality	Method	Object	Date	Contents	Label
25	Yamamoto Town	Questionnaire	■ All citizen households: 1903 respondents	<2014.3-5>	■ Questionnaire on methods of conveying earthquake experiences to others: As methods of communicating earthquake experiences to others, 33.6% cited preservation of "earthquake ruins, such as the buildings damaged by the earthquake," and 66.6% answered that preserving and using the former Nakahama Elementary School as an earthquake ruin site would be useful for communicating earthquake experiences to others.	4
26		Questionnaire	■ Students: 313 respondents	<2014.3-5>	■ Questionnaire for junior high-school students: 75.4% said that preserving and using the former Nakahama Elementary School as an earthquake ruin site would be useful for communicating earthquake experiences to others. "To communicate the importance of protecting our lives," "to communicate the threat of the disaster to visitors from outside the town," etc., were cited as reasons for the expressed opinions.	4
27		Workshop	■ Citizens: 60 people	<2014.11>	■ Workshop on the preservation of the former Nakahama Elementary School: The workshop was co-organized by the town and the Minamisanriku Geopark Preparation Committee. The participants were divided into groups of about six or seven people, who discussed the plans and types of uses for the site based on the preservation image suggested by the town. Opinions on preservation for disaster education and securing maintenance funds were expressed by participants.	5
28-32		Workshop Meeting	■ Citizens/Participants	<2016.7-2017.2>	■ Outsourcing of the formulated basic plan of the earthquake ruins maintenance project: Three workshops and two opinion-exchange meetings were conducted, and a basic plan prepared based on the opinions of the area's inhabitants.	4
33	Onagawa Town	Submission	■ Students: 5 people	<2013.10>	■ Proposal by junior high-school students to the mayor to preserve earthquake ruins: The town's mayor met five junior high-school students, who proposed preserving the three buildings as earthquake ruins sites.	3
34		Workshop	■ Citizens: approximately 40 people	<2015.11>	■ Park-planning workshop "message to the next generation and the earthquake ruins": After the mayor explained the preservation process for earthquake ruins and examined the situation of the memorial park, the six groups expressed what they would like to communicate through the preservation of earthquake ruins.	4
35		Meeting	■ Citizens: 6 people	<2017.12>	■ Former Onagawa police station site tour for citizens: The town's staff explained the maintenance plan. Its intention was to incorporate the opinions of townspeople into the design work.	5
36	Minamisanriku Town	Submission	■ Citizens	<2012.8-9>	■ Petitions pertaining to the treatment of the disaster prevention center: Three types of petitions, postponement and reconsideration of dismantlement of the disaster prevention center, preservation, and early dismantlement were submitted to the town council, which adopted the early dismantlement petition during a regular meeting in September.	3
37		Public offering	■ Citizens: 588 respondents	<2015.4>	■ Solicitation of citizens' opinions on the transfer of ownership of the Disaster Prevention Center to the prefecture: Although opinions of each argument for and against the transfer were expressed, ~60% supported the transfer of ownership to the prefecture.	3

No. 18, 19, 22, 23, 33, 36 are sections containing the spontaneous opinions of citizens.

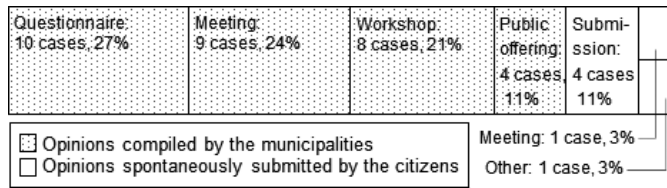


Figure 7. Sampling methods for gathering opinions

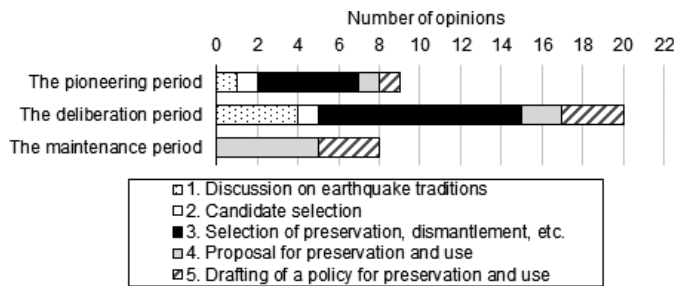


Figure 8. Citizens' opinions by period

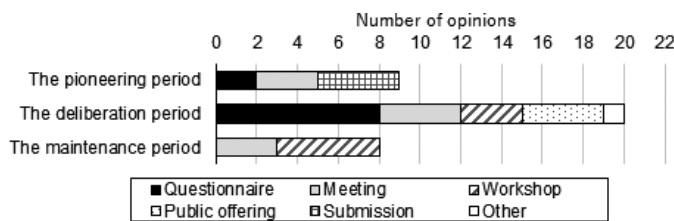


Figure 9. Sampling methods of opinions by period

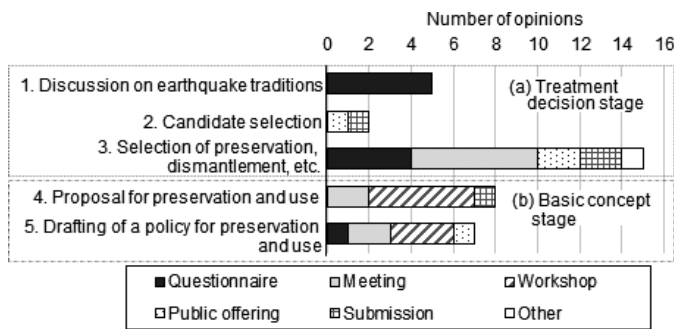


Figure 10. Opinion solicitation methods by label

Nine cases were heard during the pioneering period, 20 during the deliberation period, and eight during the implementation period. Approximately 80% of the opinions were heard during the deliberation period or earlier.

During the pioneering and consideration periods, opinions on elements of the treatment decision stage—such as 1. discussion on earthquake traditions, 2. candidate selection, and 3. selection of preservation, dismantlement, etc.—were solicited, and questionnaires were distributed or meetings were held. During the pioneering period, spontaneous document

submissions were made, suggesting that some citizens wanted to provide their opinions before the full-scale deliberation process began. During the implementation period, opinions were heard on elements of the basic concept stage—such as 4. The proposal for preservation and use and 5. The drafting of a policy for preservation and use—and workshops and meetings were held. Looking at the opinion-solicitation methods by label (Figure 10), opinions regarding elements of the treatment decision stage (22 cases) belonging to categories 1–3 were gathered by administering questionnaires and conducting meetings (15 in total).

By contrast, among the methods used to gather opinions regarding the elements of the basic concept stage (15 cases) belonging to categories 4 and 5, the use of workshops (eight cases) was prominent. Among the various stages of citizen participation, questionnaires, meetings, and public presentations were classified as part of the consultation phase, and workshops were classified as part of the involvement phase, which is more akin to collaboration.<sup>7</sup> As time passed and the process progressed, the methods of gathering opinions from citizens became more collaborative.

### 5.3 Relation with treatment decisions

During the maintenance process, most of the citizens' opinions concerned the treatment decision stage (22 cases) and pertained to categories 1–3. The most common was category 3. Selection of preservation, dismantlement, etc. (15 cases). Accordingly, Figure 11 shows the relation between the solicitation of citizens' opinions and the actual treatment decisions that were made.

First, the subjects of the hearing in Table 5 were categorized as either “citizens” (opinions from citizens as a whole) or “residents” (opinions from residents in the areas surrounding the earthquake ruins). Next, the cases in which those “favoring preservation were the majority or dominant” and those in which those “opposing preservation were the majority or dominant” were classified into the categories of “preservation” or “exclusion from preservation.” In addition, the opinions of minors and requests for preservation were shown and those on uses for the earthquake ruins were excluded from the analysis.

Regarding the six cases of preservation, it was confirmed that most citizens and residents preferred preservation. These were classified as the “majority favor preservation” type. Three cases—such as that of the former Kesenuma Koyo High School, which was the subject of an early request for preservation—were excluded from the hearing. These were classified as the “preservation requested” type. In Ishinomaki, Yamamoto, and Onagawa, pro-preservation policies reflected the majority or dominant opinions of minors, including students of all ages [Note 17]. Regarding the earthquake ruins that were excluded from the preservation efforts, most citizens opposed the preservation of No. 18 Kyotokumaru and the former Sasanao Kamaboko factory head office. These were classified as the “majority oppose preservation” type. In other cases, there was no dominant opinion, and thus, these were classified as the “opinion unknown” type [Note 18]. This classification coincided almost entirely with the “inverted” and “exclusion” types in the previous chapter [Note 19].

Based on the information above, it can be seen that citizens' opinions had an influence on the treatment of the earthquake ruins. Each municipality attempted to preserve its ruins after confirming that most of its citizens supported the idea. In addition, in cases where preservation was considered in response to requests for preservation from the local community,

	Preservation				Exclusion from preservation				Citizens	Residents	Minors	Requests
	Citizens	Residents	Minors	Requests	Citizens	Residents	Minors	Requests				
Majority in favor of preservation	Former Arahama Elementary School		1 2									
	Building foundation after collective relocation		1 2									
	Former Kadonowaki Elementary School	3 5 9	6	4 11								
	Former Okawa Elementary School	3 5 10	8 7	11								
	Former Nakahama Elementary School	25		26								
Former Nobiru Station Platform	24										23	
Preservation requested	Former Kesennuma Koyo High School										18 19	
	Former Onagawa police station										33	33
	Disaster prevention center										36	36
Majority opposed to preservation	No. 18 Kyotokumaru							17	14 15			
	Former Sasanao Kamaboko factory head office							21 22				
	JR railway bridge Omosegawa sluice gate											
	Hotel Seaside Palace											
	Former Yuriage Junior High School											
	Former Yuriage Elementary School											21
	Former Nobiru Elementary School											24
Opinion unknown	Former Hamaichi Elementary School											24
	Hotel Kanponoyado Matsushima											24
	Onagawa Supplement building											33
	Enoshima Kyosai Kaikan building											33

**Citizens** Opinions from citizens as a whole

**Residents** Opinions from residents in the area surrounding the earthquake ruins

**Minors** Opinions of minors (e.g., primary, junior high, and high school students)

**Requests** Requests from citizens and residents

**No.** Opinions favoring preservation were the majority or dominant

**No.** Opinions opposed to preservation were the majority or dominant

**No.** The proportion of opinions was unknown

※ Numbers correspond to those in Table 5.

※ Opinions not mentioned during the decision-making process, Numbers 12, 13, 16, 20, 27–32, 34, 35, and 37, were excluded from the analysis.

Figure 11. Relation between citizens' opinions and decisions about the treatment of ruins

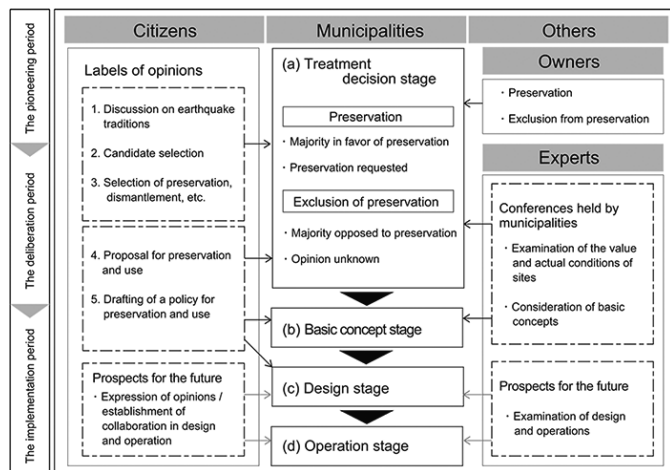


Figure 12. Elements of the maintenance process

municipalities did not always gather mass opinions. It was also clarified that opinions from citizens of all ages, not only from the adults, had been heard.

### 6. Conclusions

After analyzing the maintenance process for the earthquake ruins by using a time-series chart and a flowchart, the components of the maintenance process were obtained (Figure 12).

In case of the preservation policy, the order of the (a) treatment decision, (b) basic concept, (c) design, and (d) operation stages was essentially followed. Each municipality solicited citizens' opinions on 1. The discussion on earthquake traditions; 2. Candidate selection; 3. The choice of preservation, dismantlement, etc.; 4. Proposals for preservation and use; and 5. The drafting of a policy for preservation and use. The preservation policy was determined based on the sites' value, as judged by the experts. Cases that resulted in a site's

exclusion from preservation were classified as "inverted" or "exclusion." Finally, the maintenance terms were divided into pioneering, deliberation, and implementation periods.

Next, the properties of citizens' opinions were analyzed and examined in terms of their relation with the treatment decisions. Prior to the consideration period, opinions on elements of the treatment decision stage, represented by categories 1–3, were the main themes; questionnaires were distributed; and meetings were held. During the implementation period, workshops were held and opinions were mainly solicited regarding the basic concept stage, represented by categories 4 and 5. Approximately 20% of opinions were provided spontaneously. Regarding the relation between the treatment decision and content of opinions, the earthquake ruins selected for preservation were classified into the "majority in favor of preservation" and "preservation requested" types. Two types of ruins were excluded from the preservation efforts, "majority oppose preservation" and "opinion unknown," which almost entirely corresponded to the "inverted" and "exclusion" types, respectively. The treatment of the earthquake ruins was generally determined after confirming the opinions of most citizens; however, when there was a request for preservation from citizens, municipalities did not always gather mass opinions.

According to previous studies, it is desirable for the government, citizens, and experts to have an appropriate organizational structure in place regarding the design of public facilities and the citizens to participate in decision-making processes.<sup>7,8,12</sup> However, during the data compilation in this study, it became apparent that it was difficult to set up such a structure in the midst of emergency disaster recovery efforts. It was found that each municipality chose maintenance methods and policies while seeking out the opinions of its citizens through questionnaires and other means. About 2 years were spent carrying out the treatment decision process, during which the treatment of the earthquake ruins was determined and much of the research data were collected. The treatment decision stage is considered a key stage in the maintenance process of an earthquake ruin. Each municipality conducted various surveys and considered various elements during this stage,

besides soliciting the opinions of experts at meetings and on other occasions. Decisions were made afterward. Each municipality seemed to be attempting to build consensus among citizens by proceeding with the maintenance process in stages.

Based on the above, the following conclusions were drawn: (1) The mayor made the final decision about preserving or removing earthquake ruins. The citizens affected by the earthquake had varying opinions on what to do with the ruins. For this reason, it was difficult for them to discuss the matter and reach a conclusion amenable to all. The mayor, on behalf of the citizens, made the final preservation or removal decisions. (2) The mayor listened to the citizens' opinions before deciding what to do about the ruins. In the case of preservation efforts, opinions were elicited several times over a period of 2 years using various methods. The goal was to hear as many people's opinions as possible, not to combine them into one. In some cases, questionnaire results indicated that there were not many people opposed to the ruins' preservation. (3) Consensus building efforts related to the preservation of the ruins was not achieved with just one meeting. Instead, consensus was built incrementally over the course of several years, and by soliciting citizens' opinions many times. Various opinions, including those in favor of preservation and those in favor of removal, were aired, and experts were consulted about the value of the ruins' preservation efforts.

Reconstruction is ongoing, and the maintenance of the earthquake ruins is currently in the stage where citizen-municipality collaboration and sustainable facility operation can be considered. It is possible that the participation of citizens during the treatment decision stage may affect their willingness to collaborate with officials after the basic concept stage, particularly during the operation stage. An investigation of the relation between the earthquake ruins and citizens after the maintenance phase and an examination of sustainable methods for facilities' operations could be topics for future research.

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## Disclosure

The authors declare no conflict of interest.

## Notes

Note 1) Local municipalities' data, meeting materials, and reports related to the earthquake ruins, and press releases were collected from their websites. Information was collected by consulting pages related to reconstruction, press releases, public relations, and public comments. "Press materials" are articles printed the day of the disaster or the following day in the Tohoku regional newspaper *Kohoku Shimpō* and the local newspaper, *Kahoku Ishinomaki*. Information about actions related to the maintenance process was extracted from articles that contained the phrase "earthquake ruins" and those that mentioned the names of candidates for preservation. Information was collected on municipalities' trends and citizens' opinions, excluding editorials and interviews with citizens. The content, subject, objective, and date related to these actions were extracted from these data and listed.

Note 2) Although Iwanuma preserved its housing foundation at Millennium Hope Hills Park, it was not included in this research because of the lack of documentation of the maintenance process, as it was integrated into the park.

Note 3) To improve the quality of this qualitative research, the investigator triangulation by Denzin was referenced when conducting it.

Note 4) Data on the solicitation of citizens' opinions were classified as "citizen" and included both events planned by municipalities and those spontaneously conducted by citizens. Meetings and committees composed of experts and

municipal officials were classified as "expert" because, even when they were hosted by municipalities, they were intended to incorporate expert opinions into the process.

Note 5) In the previous study, the development stage of public facilities was divided into the basic concept, design, and operation stages, and the requirements of citizen-participatory operation were considered.<sup>8</sup> These stages were also applied to other previous studies of public facilities' development processes.<sup>7,12</sup> Therefore, the 20 types of labels that were included in "municipality" as subjects were classified into those three stages. Considerable data corresponded to the stage that involved deliberating and deciding whether to preserve or remove the earthquake ruins, which occurred before the abovementioned stages. In this study, this is referred to as the treatment decision stage. The maintenance stage for the earthquake ruins was organized into four stages.

Note 6) Regarding the exclusion from the preservation policy, it was confirmed that, besides stipulating removal, it also included the diversion of factories. "Diversion" was regarded as the maintenance of facilities that were not earthquake ruins, which were excluded from the analysis objective.

Note 7) The former Arahama Elementary School and Nobiru Station Platform had already been maintained and reopened before the survey was conducted. The former Kesennuma Koyo High School had made a temporary trial run before the maintenance work began and a decision was made to expand the preservation area at the request of visitors.

Note 8) Higashimatsushima, Yamamoto, Onagawa, and Kesennuma (No. 18 Kyotokumaru) are indicated by "E: Idea for preservation" at the beginning of the maintenance process, which corresponds to the basic concept stage. Initially, the four municipalities indicated their preservation plans in documents, illustrations, and remarks, but the content was close to "A: Understanding of preservation." Thereafter, Higashimatsushima, Yamamoto, and Onagawa moved to "B: Preparation for treatment decision" and entered the treatment decision stage. However, Kesennuma announced two concrete plans for preservation, together with their maintenance costs, and proceeded to the basic concept stage in December 2012.

Note 9) The former Kesennuma Koyo High School required a full year to make its announcement of a formal preservation policy; this was the shortest term. Yamamoto advanced its maintenance plan for the preservation of the former Nakahama Elementary School incrementally, but it was unable to obtain the data officially announced in its preservation policy. In Minamisanriku, 4 years lapsed from the initial deliberation efforts to the announcement of a temporary conservation policy, which included a transfer of ownership to Miyagi Prefecture.

Note 10) The following were confirmed as conferences to deliberate on the earthquake ruins and traditions: the Sendai City Earthquake Reconstruction Memorial Committee (July 2013 to December 2014), Ishinomaki City Earthquake Tradition Committee (November 2013 to December 2014), Ishinomaki City Earthquake Ruins Coordination Conference (June 2015 to December 2015), Ishinomaki City Earthquake Ruins Deliberation Conference (former Okawa Elementary School building) (July 2016 to March 2017), Ishinomaki City Earthquake Ruins Deliberation Conference (former Kadowaki Elementary School building) (July 2016 to March 2017), Ishinomaki City Earthquake Tradition Deliberation Conference (July 2016 to March 2017), Kesennuma City Great East Japan Earthquake Tradition Deliberation Conference (November 2013 to March 2014), Kesennuma City Great East Japan Earthquake Ruins Deliberation Conference (October 2014 to April 2015), and Yamamoto Town Earthquake Tradition Deliberation Committee (March 2014 to January 2015).

Note 11) Onagawa may have been able to reach an early decision due to the small size of the municipality and the serious damage caused the disaster, especially in the central city area.

Note 12) Students' opinions were also solicited in Ishinomaki and Yamamoto using questionnaires and public hearings (Table 5). Both municipalities solicited opinions from former students and school officials because the earthquake ruins were former elementary schools.

Note 13) The reason that No. 18 Kyotokumaru was proposed as a candidate for maintenance during the early stage was probably that, if the policy had not been determined quickly, its location and size would have hindered the overall reconstruction efforts. Due to this early deliberation, Kesennuma received no financial support from the government or consideration from the prefecture conference. In addition, in terms of citizens' emotions, the decision was made soon after the disaster, which may have made it difficult to build a consensus.

Note 14) Sendai and Ishinomaki had announced their preservation policies for two earthquake ruins site.

Note 15) The conference noted the difficulty of making decisions only by municipality and decided to present which earthquake ruins should be preserved as the opinion of Miyagi Prefecture. Prior to the conference, in November 2013, a conference of 15 coastal municipalities of Miyagi Prefecture on the preservation of earthquake ruins was held. The candidates for preservation of earthquake ruins were considered. It was reported that the mayor of Minami-Sanriku approved the Disaster Prevention Center as a candidate.<sup>15</sup> The conference proposed that the former Yuriage Junior High School in Natori be considered, but abandoned this idea based on the city's intentions. The conference selected candidate earthquake ruins according to the intentions of each municipality.

Note 16) In all, 37 data sources were collected. Press materials included *Kahoku Shimpō* (morning edition): November 19 and December 10, 2012; January 24 and October 8, 2013; February 14, 2014; November 17 and 26 and February 14, 2016; December 12, 2017; *Kahoku Shimpō (Ishinomaki)*: September 16, 2012; June 30, 2015; March 1, November 15, and December 1 and 4, 2016; July 10, 2018; and “*Kahoku Shimpō (Kesennuma)*”: July 9, 2016. Municipalities’ materials included Sendai City: results of a questionnaire on the earthquake memorial in the Arahama area <<http://www.city.sendai.jp/fukko-jigyo/shise/koho/kisha/h27/04/chosa.html>>, accessed January 3, 2017; Sendai City: results of a questionnaire on the preservation of the ruins of Arahama Elementary School, etc. in the Arahama area, <<https://www.city.sendai.jp/shinsai/fukko/shise/koho/kisha/h27/11/questionnaire.html>>, accessed January 3, 2017; Ishinomaki City Earthquake Tradition Deliberation Committee: Proposal on the handing down of memories of the earthquake and the method for selecting and preserving earthquake ruins, December 2014; Kesennuma City: Kesennuma City, The Great East Japan Earthquake Tradition Deliberation Conference Report, May 2014; Kesennuma City: Press release document from August 5, 2013, “Questionnaire for citizens on the evacuation due to the tsunami, etc.: Questions 6-3, Questions on the No. 18 *Kyotokumaru*’s preservation,” August 5, 2013; Natori City: Public Information magazine *Natori* (October 1, 2014), p. 18, October 2014; Higashimatsushima City: Call for public comments, <<http://www.city.higashimatsushima.miyagi.jp/city/pub/index.html>>, accessed January 5, 2017; Yamamoto Town: About the Yamamoto Town Earthquake Tradition Deliberation Committee, <<http://www.town.yamamoto.miyagi.jp/soshiki/5/1266.html>>, accessed January 3, 2017; Yamamoto Town: Former Nakahama Elementary School Earthquake Ruin Preservation and Maintenance Project, <<http://www.town.yamamoto.miyagi.jp/soshiki/20/8051.html>>, accessed September 7, 2018; Onagawa Town: About the earthquake ruin, <<http://www.town.onagawa.miyagi.jp/hukkou/shinsai/ikou.html>>, accessed October 18, 2016; and Minamisanriku Town: Result of offering opinions on the ownership transfer to the prefecture of the Disaster Prevention Center, <<http://www.town.minamisanriku.miyagi.jp/index.cfm/8,7750,47,210.html>>, accessed January 9, 2017.

Note 17) Minors’ opinions concerning preservation were more positive than adults’ (Table 5; Ishinomaki, Yamamoto, etc.). The former Okawa Elementary School in Ishinomaki was the only earthquake ruin being considered under the preservation policy that received opposition to preservation from residents. In Ishinomaki, hearings at which almost half of the residents were opposed to preservation were held, even though the majority favored preservation. Under these difficult circumstances, it is possible that minors’ opinions were influential in determining the outcome of the treatment decision process. The influence of minors’ opinions on the process and the most appropriate way to solicit them will be the subject of future research.

Note 18) Some of the cases classified as “unknown” opinion types were confirmed to have been subject to some opinions or preservation requests from citizens. This was probably a result of the initial policy of financial support for one municipality at a site chosen by the Reconstruction Agency. For this reason, the municipality decided not to preserve it as an “exclusion” type. The validity of this judgment and the deliberation process that led to its exclusion is a subject for future research.

Note 19) The Hotel Kanponoyado Matsushima, which was excluded from preservation for financial reasons, was an “inverted” type in the flowchart analysis, but the opinion hearing status was “unknown,” which is included in the “exclusion” type.

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