

Construction of emergency temporary housing for the 2024 Noto Peninsula earthquake and Oku-Noto heavy rains

Ishikawa Prefecture Civil Engineering Department, Building and Housing Division

1. Status of Construction of Emergency Temporary Housings after the 2024 Noto Peninsula Earthquake and Heavy Rains in Oku-Noto

2. What is Emergency Temporary Housing?

3. Issues and Future plans

4. Reference Materials

Status of emergency temporary housing



Provision of temporary housing (7,168 units)

[Earthquake] 6,882 units ➤ All completed
(~December 23, 2020)

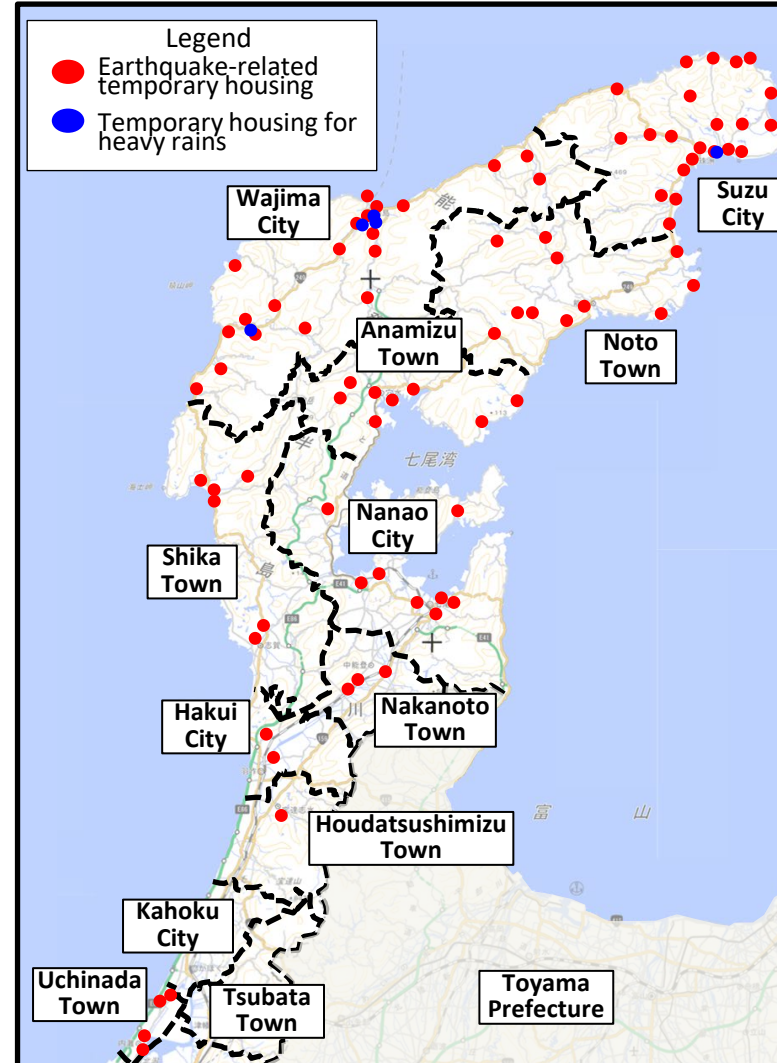
[All areas damaged by flooding caused by heavy rains have been restored]

[Heavy Rain] 286 houses ➤ All completed
(~March 28, 2020)



Kamayatanicho No. 1 Housing Complex (Wajima City)

Location of temporary housing



Number of temporary housing units (earthquake)		
City/town name	Number of housing complexes	Number of houses
Nanao City	13	575
Wajima City	44	2,897
Suzu City	45	1,718
Hakui City	2	67
Uchinada Town	6	95
Shika Town	10	393
Houdatsushimizu Town	1	4
Nakanoto Town	3	30
Anamizu Town	19	532
Noto Town	16	571
total	159	6,882

Number of temporary housing units (heavy rain)		
City/town name	Number of housing complexes	Number of houses
Wajima City	4	264
Suzu City	1	twenty two
total	5	286

Building Types of Temporary Housing

The building type will be decided taking into consideration the needs of the disaster victims and municipalities, land availability, the capacity to supply and the priority among areas.

structure	Prefabricated Housing	Wooden Type Housing	
Overview	Supply quickly and in large quantities, Quickly end evacuation phase	By positioning it as city-owned housing, It is possible to be shifted its status to a permanent home	
Period	In principle, for two years (extendable depending on situation of the)	In principle, for a period of two years (with specifications allowing conversion to municipal housing after two years)	
Construction	About 1 to 2 months	About 2 to 3.5 months	
Place	Municipal land, school grounds, etc.	Near previous home, etc.	
Number of completed units	5,565 units (77.6%)	1,570 units (21.9%)	33 units (0.5%)
Exterior	Tenement house (Contemporary type)	Tenement house (Community-Oriented type)	Detached house style (Hometown-Return Type)
	 Misakicho No. 1 Housing Estate (Suzu City)	 Mitsuumachi No. 1 Housing Estate (Wajima City)	 Shimokaragawa 2nd Housing Complex (Anamizu Town)

Conventional Type Prefabricated light steel frame single-story (Japan Prefabricated Construction Suppliers and Manufacturers Association)



Marine Town Housing Complex 2 [2DK etc.] Wajima City and an example of the same structure



Exterior



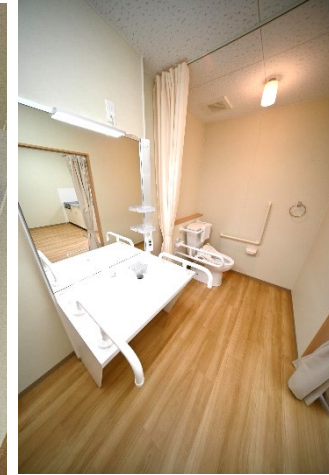
Residential Unit



Lounge / Community Hall



Western-style room and
kitchen



Washroom/
Toilet



Bathroom

Conventional Type Prefabricated light steel frame single-story (Japan Prefabricated Construction Suppliers and Manufactures Association)



Construction Workflow



Before construction
begins



H steel foundation



Construction 1



Construction 2



Water tank/septic tank



Interior (finishing)



Interior (insulation)



Interior (base)

Conventional Type Moving House single-story (MH Association)



Marine Town No. 1 Housing Complex [2DK, etc.] Wajima City and other examples of similar structure



Exterior



Residential Unit



Lounge / Community Hall



Western-style room and
kitchen



Washroom/
Toilet



Bathroom

Conventional Type Moving House single-story (MH Association)



Construction Workflow



Before construction
begins



Unit Production 1



Unit Production 2



Unit completed



Water tank/septic tank



Unit installation



Unit transportation



Flat plate foundation

Conventional Type Trailer House single-story (RV/TH Association)



Togi 1st Housing Complex [2DK and others] Shika Town



Exterior



Residential Unit



Lounge/Community Hall



Western-style room and
kitchen



Bathroom

Conventional Type Trailer House single-story (RV/TH Association)



Construction Workflow

Before Unit transportation



Unit transportation



Unit installation complete

Community-Oriented type Wooden, traditional frame, single-story (Ishikawa Prefecture Wood and Housing Association)



Mitsuimachi No. 1 Housing Complex [2DK and others] Wajima City



Exterior



Residential Unit



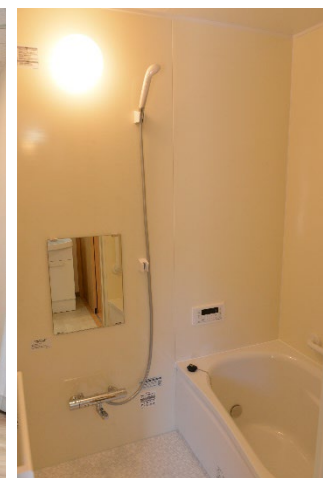
Lounge / Community Hall



Japanese-style room/
Western-style room



Washroom/
Toilet



Bathroom

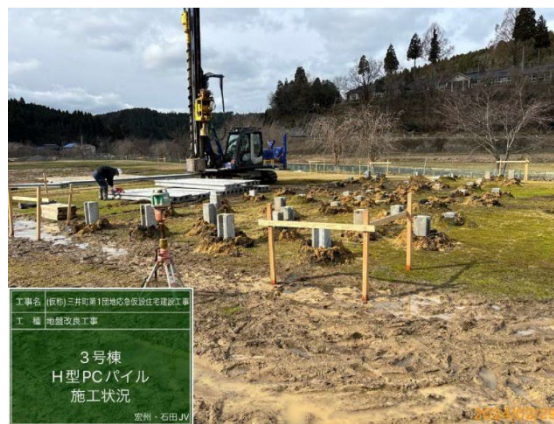
Community-Oriented type Wooden, traditional frame, single-story (Ishikawa Prefecture Wood and Housing Association)



Construction Workflow



Before construction
begins



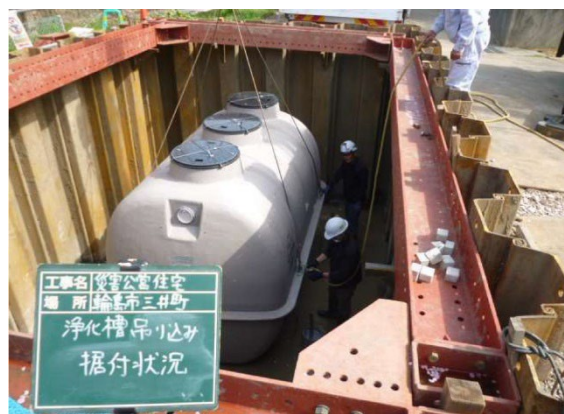
Ground improvement



Foundation



Building



Septic tank



Interior



Outer wall



Roof

Hometown-Return Type

Wooden, traditional frame, single-story
(Ishikawa Prefecture Wood and Housing Association)



Muro Danchi [2DK and others] Uchinada Town



Exterior



Residential Unit



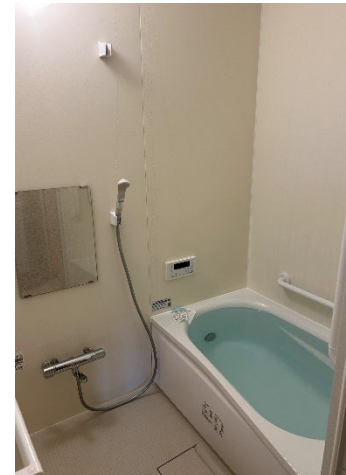
Covered Walkway



Kitchen, Western-style room,
Japanese-style room



Toilet



Bathroom

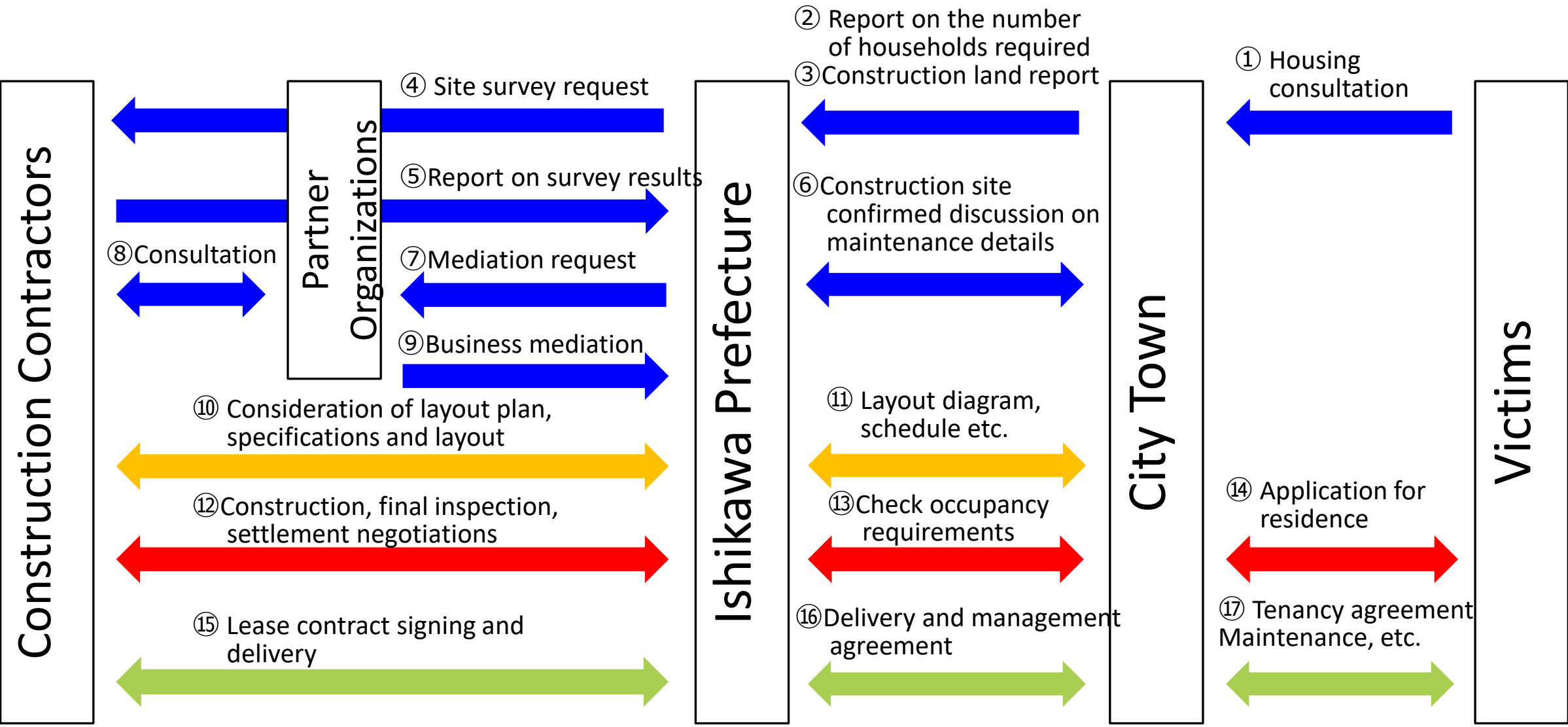
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Flow of construction of temporary housing



Basic Agreement on the Construction of Temporary Housing in the Event of a Disaster



- ❑ When a disaster occurs, the construction of temporary housing must be completed as quickly as possible.
- ❑ Based on the construction request from the prefecture under the agreement, construction can be completed quickly with the help of construction companies from the association.
- ❑ This time, in order to construct a large number of temporary housing units more quickly due to the widespread damage, agreements were signed with multiple organizations.

Example of a letter of agreement

災害時における応急仮設住宅の建設に関する協定書	
(趣 旨)	(協 議)
第1条 この協定は、石川県地域防災計画に基づく災害時における応急仮設住宅（以下「住宅」という。）の建設に関して、石川県（以下「甲」という。）が一般社団法人石川県木造住宅協会（以下「乙」という。）と締結するものとする。	第10条 この協定に定めるもののほか必要な事項については、その都度甲乙協議のうえ定めるものとする。
(定 義)	(有効期間)
第2条 この協定において「住宅」というのは、前条第1項第1号に規定する（所要の手續）を必要とするものをいう。	第11条 この協定の有効期間は、この協定の締結の日から1年間とする。ただし、有効期間満了の日の1か月前までに、甲乙いずれからも書面による申出がないときは、この協定は、その都度甲乙協議のうえ定めるものとする。
第3条 甲は、住宅の建設に必要な事項は電話等によることとし、提出しなければならない。	
(協 力)	
第4条 乙は、前条の（協 力）のあっせんを行うものとする。	
(住宅建築)	
第5条 乙のあっせんは、当該市町の長、（費用の負担及び支払）を必要とする。	
第6条 丙が前条の住宅の建設に必要とする費用を速やかに支払（連絡窓口）するものとする。	
第7条 この協定の業務に関する連絡窓口は、甲においては石川県土木建築住宅課、乙においては一般社団法人石川県木造住宅協会担当部とする。	
(報 告)	
第8条 乙は、住宅建設について、協力できる生産能力及び建設能力等の状況を毎年1回甲に報告するものとする。ただし、甲が必要と認めた場合は乙に対して随時報告を求めることができる。	
(会員名簿等の提供)	
第9条 乙は、本協定に係る乙の業務担当部員名簿及び乙に加盟する会員の名簿を毎年1回甲に提供するものとし、部員及び会員に異動があった場合は、甲に報告するものとする。	

What's included

- Assistance in mediating construction companies
- Reporting on production and construction capacity, contractor list

Not included

- Amount, building specifications, procurement method, etc.

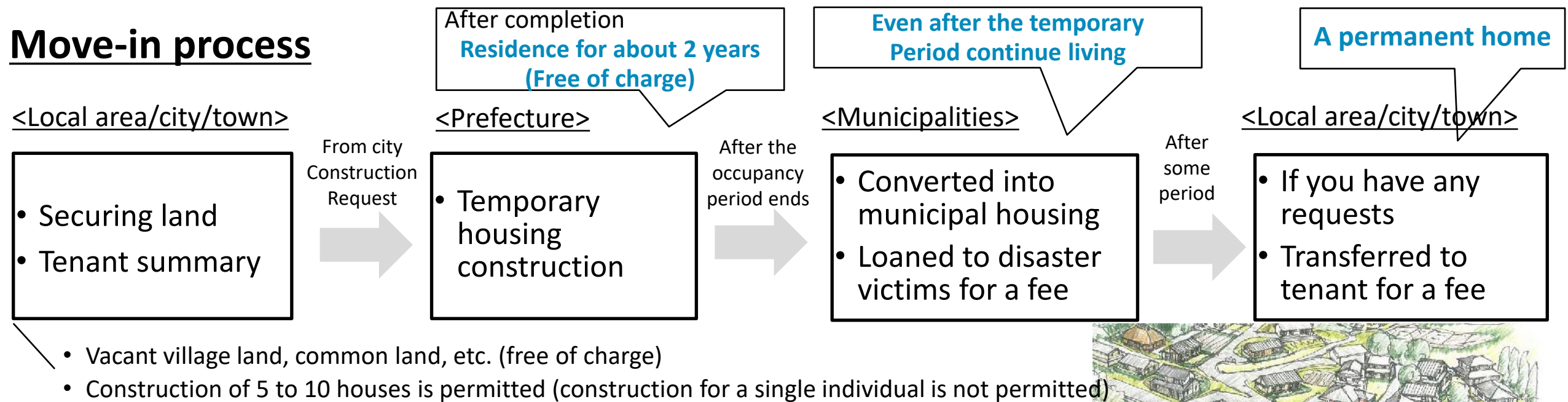
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The building type will be decided taking into consideration the needs of the disaster victims and municipalities, land availability, the capacity to supply and the priority among areas.

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Period	In principle, for two years (extendable depending on situation of the)	In principle, for a period of two years (with specifications allowing conversion to municipal housing after two years)	
Construction	About 1 to 2 months	About 2 to 3.5 months	
Place	Municipal land, school grounds, etc.	Near previous home, etc.	
Number of completed units	30 to 100 or more units	Approximately 10 to 50 houses	About 5 to 10 houses
Exterior	Tenement house (Contemporary type)	Tenement house (Community-Oriented type)	Detached house style (Hometown-Return Type)
	 Misakicho No. 1 Housing Estate (Suzu City)	 Mitsuumachi No. 1 Housing Estate (Wajima City)	 Shimokaragawa 2nd Housing Complex (Anamizu Town)

Hometown-Return Type

Move-in process

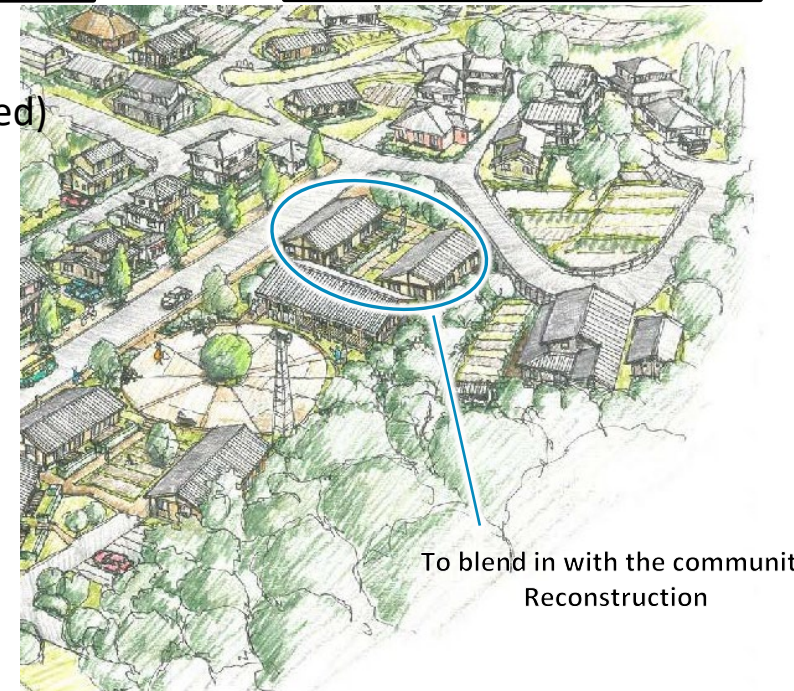


[Advantages]

- Even those who find it difficult to rebuild their homes can continue to live in their local areas into the future.

[Disadvantages]

- It takes time to move in (selecting land and reaching an agreement with the landowner)
- Land is basically donated to the city or town (to be used as city-owned housing in the future)



⇒ Construction proceeded while carefully understanding the local needs through cities and towns.

Emergency Temporary Housing Layout



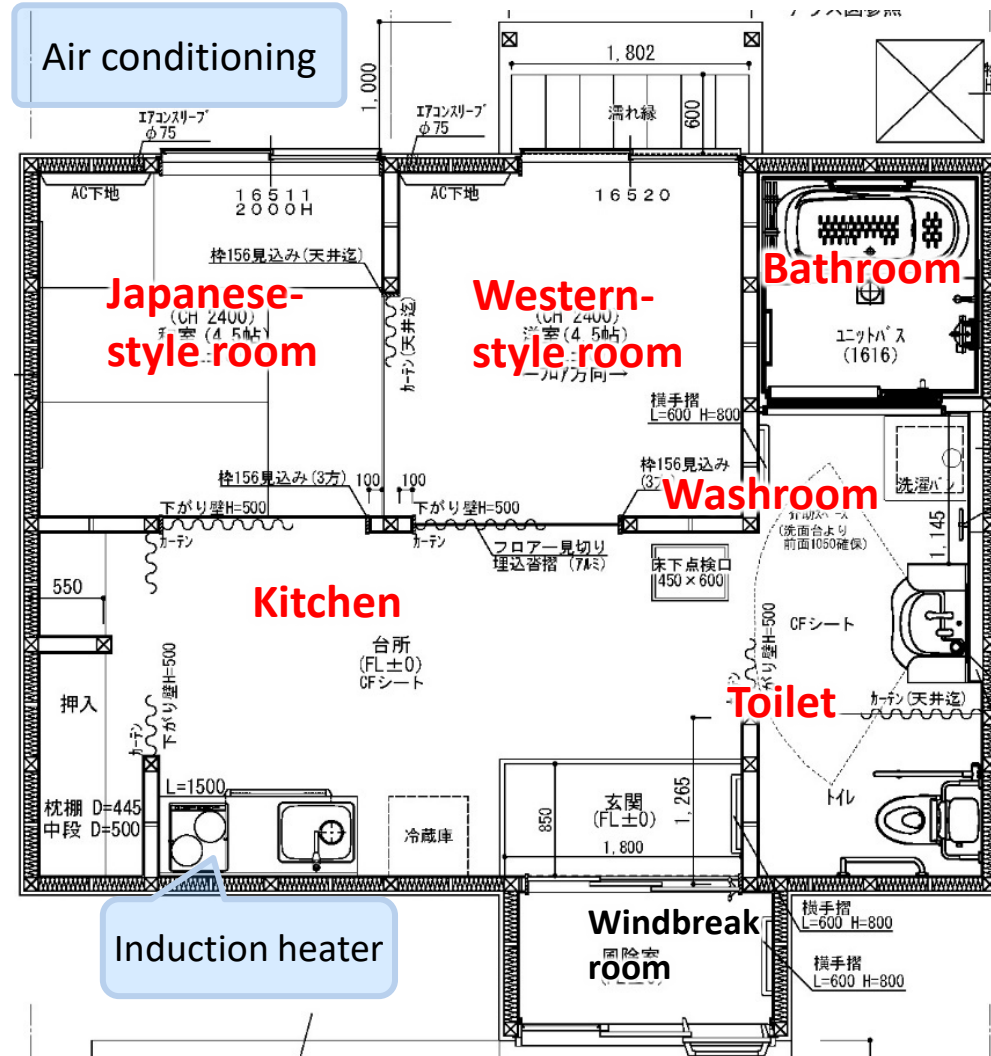
Regardless of the structure, the size is 1-2 people (20m²), 2-4 people (30m²), 4 or more people (40m²). There are three basic types: In addition, housing units for wheelchair users are provided. (Example: Wheelchair accessible 2DK type)

Wooden house with 2 or more rooms



No steps in the residence

Cold weather specifications
(Insulation for walls, etc.,
(Insulated sashes are used.)



For entrances, toilets, and bathrooms
Install handrails

Washroom, bathroom, toilet



Wheelchair Accessible

kitchen



Wheelchair Accessible

Construction of temporary housing complexes



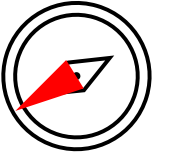
Example of urban development (Mitsuimachi No. 1 housing complex)

The wooden row house uses local timber for the PERIMETER WALL and flooring, and black tile roofs, blending in with the surrounding scenery.

Other outdoor equipment: Water tank, septic tank, exterior lighting, security cameras, etc.

Childcare households
Wheelchair users
Household Units
Meeting House
Community Square
Housing for single elderly people

Total number of houses	68 units
1DK	39 units
2DK	20 units
3DK	6 units
Wheelchair accessible 1DK	2 units
Wheelchair accessible 2DK	1 unit



Exterior



Each residential building (barrier-free)



Installing ramps and outdoor corridors

Meeting room (90m²)



The facility is centered around a square, a meeting place, a facility for families with children, and a facility for wheelchair users. Single-family homes for elderly people are connected by wooden decks.

Community Square



Community Zone (Watching)

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Obstacles for Constructing Emergency Temporary housing (at the beginning)



- Various obstacles in construction of temporary housing following this earthquake.
 - **Damage to infrastructure**
 - Due to road damage, it took a long time to get to the site from Kanazawa. **The time spent on-site has been limited.**
 - Due to the cut off of electricity, water and sewage services, **it was not possible to stay overnight at the site.**
 - **Lack of materials**
 - **There is a shortage of crushed stone, concrete, asphalt**, etc. as road restoration work is being carried out at the same time.
 - **Lack of human resources**
 - **Local construction companies were also affected** by the disaster, and there is no **accommodation available on-site, making it difficult to gather people.**
 - **Lack of candidate sites**
 - It took a long time to select a candidate site due to **damage to the site itself.**

1. Advance preparation

- Select as many as possible (damage to the candidate site itself, damage to roads, etc.)
- Coordination of areas for the Self-Defense Forces and fire departments, disaster waste disposal sites, etc.
- When considering permanent housing, If conduct survey on, various laws and regulations, infrastructure status, etc. If you do your research beforehand, can get started quickly.

2. How to Handling Hazard Areas

- How much is acceptable? (Red zone, cliff ordinance is no, flooding depth criteria?)
- Areas expected to be flooded
 - (Non-Structural Measures: informing residents, securing evacuation routes)
 - (Structural Measures: raising the ground level, installing drainage pump)

Future issues (②Selection of business operators)



1. Advance preparation

- After considering what type of housing to supply, the quantity and speed of supply, etc.
- It is advisable to make an agreement
- Before signing the agreement, standard drawings and post-completion repairs and maintenance
- It is advisable to check the system

2. Contract method

- Every Contract is Lease Contract by Ishikawa Prefecture
Advantage: Can request everything from house construction to demolition all at once.
No need to register assets
Disadvantages: Since the contract is made at the time of delivery, price negotiations may be difficult.

Future issues (③ Additional work)



Main additional work carried out in response to requests after occupancy

① Barrier-free access

Elderly people who are having difficulty living due to disabilities, illness, or reduced physical abilities, so additional handrails were installed.

② Exterior lighting installation

Although exterior lighting had been installed, there were complaints that some of the pathways and parking lots were dark so exterior lighting was added.

③ Parking lot paving

The parking lot is paved with crushed stone, and there were comments that it would be difficult to remove snow in the winter. Rescue expenses were not approved, so the municipalities had to carry out the project as a fund-raising project.

Next Steps

Temporary housing occupancy status (5/1)

All construction work has been completed, and most of the victims **have secured temporary housing**.

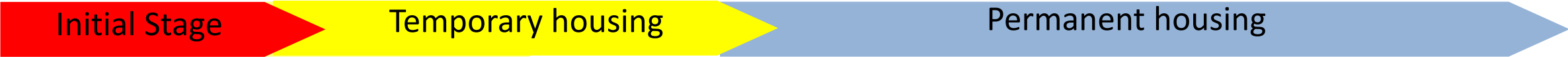
Primary evacuation center	1.5th evacuation shelter	Secondary evacuation center
Approximately 34,000 people	Approximately 500 people	Approximately 5,000 people



Constructed type	Rented type	Public housing	total
6,628 units	2,981 units	423 units	10,032 units
13,661 people	6,590 people	838 people	21,089 people

*Maximum number for each

Housing transition policy



Evacuation Center



Emergency Temporary housing



Reconstructing the original house
(Purchase/Repair)

Private rental housing

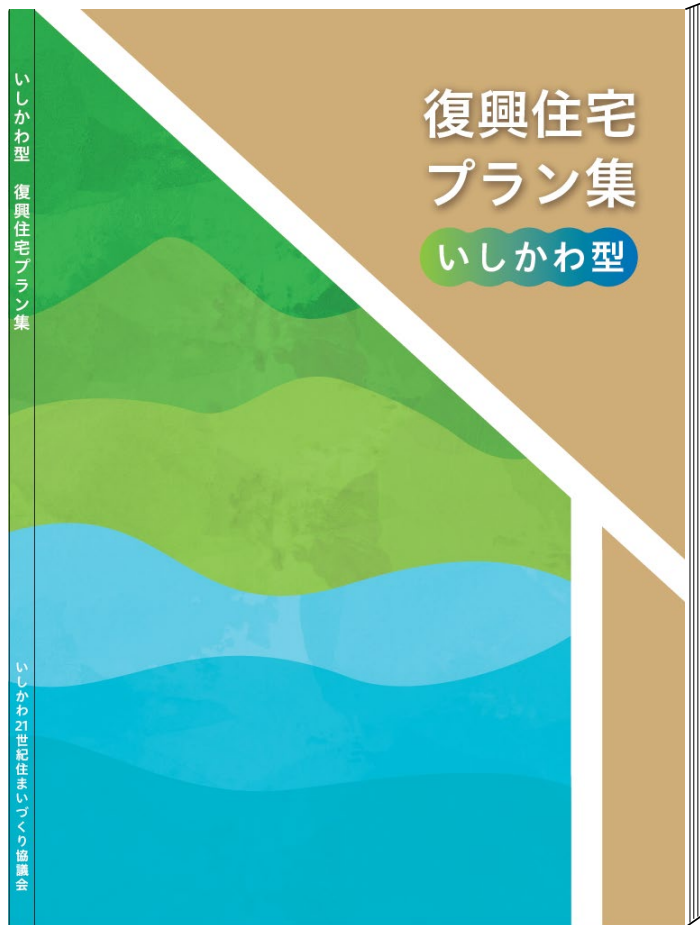
Reconstruction public housing
(Approximately 3,000 units)



Ishikawa-style reconstruction housing model plan collection



- The theme of the project was "**New Noto Life-style connected with the community**" to help people have a concrete image of what it would be like to build a home, created a collection of plans that includes housing design plans and various support systems for rebuilding homes
- Available on the website URL: <https://www.pref.ishikawa.lg.jp/kenju/jyuutakupuran.html> The booklets will be distributed to all households living in temporary emergency housing in stages.



① Ishikawa-style reconstruction housing model plan

- 55 Plan (30 groups)
- 27 plans for couples and singles, 28 plans for families

② Support for rebuilding homes

- Introduction of various support funds
- Support measures for rebuilding homes, home reconstruction interest subsidy program,
- Local welfare support temporary special benefit, etc.

Reverse mortgage type
Mortgage
Examples of use etc.

③ Financial plan and repayment plan

- Loan system and repayment simulation

④ Examples of resident land recovery and earthquake retrofitting

- Examples of projects to support the restoration of disaster-hit residential areas
- Examples of earthquake-proofing renovation work on houses

Slope repair
Liquefaction
countermeasures
Examples of

Example of a Model Plan

Eco-friendly and Resilient Houses

Unique Point of the Plan

- Built to withstand earthquakes, single-story structure with the highest seismic resistance (Grade 3)
- Bright, wide opening on the south side with a spacious bench for relaxing
- Designed for ease of housework with shortened movement lines for daily tasks

Overview of the Plan

- **Structure / Method:** Wooden construction, traditional post and beam method
- **Floor Area / Type:** 45.54 m² (13.8 tsubo), single-story
- **Standard Construction Period:** 4 months
- **Design:** Koshu Kensetsu Co., Ltd.
- **Estimated Construction Cost:** ¥17,380,000 (including tax)
- **Construction:** Koshu Kensetsu Co., Ltd.

Exterior Specification

- **Roof:** Japanese-style roof tiles (Wagawara)
- **Exterior Walls:** Fire-resistant siding with acrylic resin spray finish
- **Fixtures:** Aluminum fittings (YKK 330)

Interior Specification

- **Floor:** Colored flooring
- **Walls:** Vinyl wallpaper
- **Ceiling:** Vinyl wallpaper

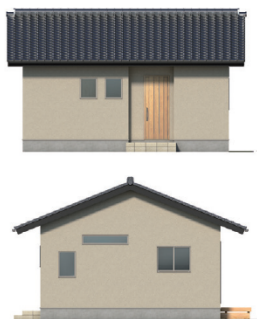
Items not included in cost

Soil survey, ground improvement costs, outdoor electrical work, outdoor plumbing work, air conditioner, curtains, furniture, application fees, registration fees

Floor Plan



Drawing



Interior Image



Free design



Exterior Image



Proposal from 5 point of view

① Community

- Open to the south, with a wide, relaxed bench area for gatherings

② Landscape

- Traditional black roof tiles; exterior colors harmonize with the surrounding streetscape

③ Localized Design

- Deep eaves, large entrance porch, and use of local wood for pillars

③ Housing Specification

- High seismic resistance (Grade 3), high thermal insulation (Grade 5), top-class energy efficiency (Grade 6), eco-friendly and barrier-free housing

⑤ Cost

- Compact design to reduce costs; no corridors and reduced floor area for cost efficiency

Contacts

• **Company Name:** Koshu Kensetsu Co., Ltd.
 • **Address:** 15-3, Nishikigaoka 1-chome, Kanazawa City, Ishikawa Prefecture

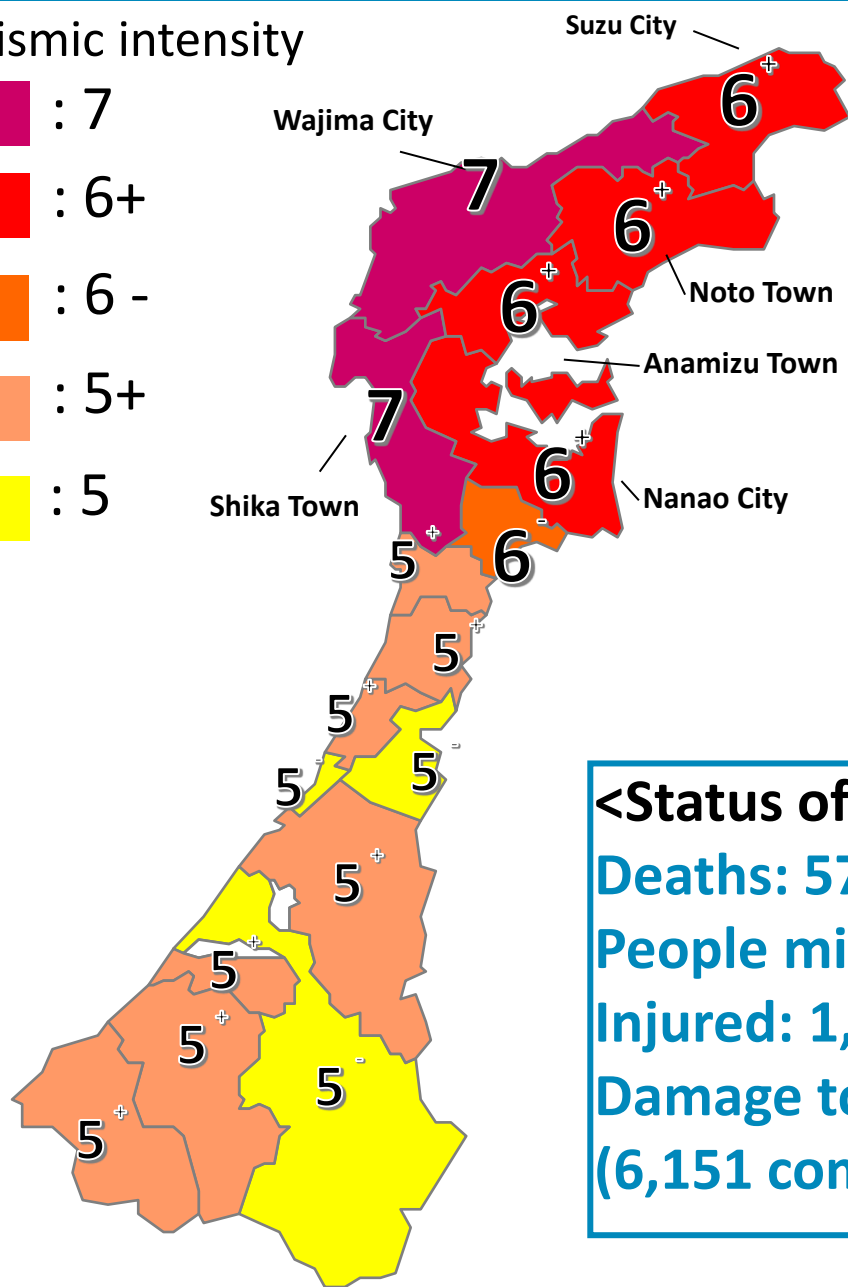
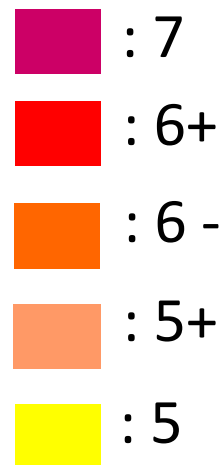
• **Representative Director:** Yamaguchi Bunji
 • **Project Manager:** Yamada Masahiro
 • **Phone Number:** 076-263-5355
 • **E-mail:** info@koshukensetsu.co.jp

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Situation regarding the Noto Peninsula earthquake in 2024



Seismic intensity



Time of occurrence:

Around 16:10 on January 1, 2024

Earthquake magnitude:

7.6 (maximum)

Seismic intensity in the prefecture

- Seismic intensity 7: Shika Town, Wajima City
- Seismic intensity 6+: Nanao City, Suzu City, Anamizu Town, Noto Town
- Seismic intensity 6-: Nakanoto Town

(All 19 cities and towns in the prefecture experienced a magnitude of 4 or higher.)

<Status of human and residential damage> As of April 30th

Deaths: 574 (346 disaster-related deaths)

People missing: 2

Injured: 1,269 (393 seriously injured)

**Damage to residential buildings: 116,069
(6,151 completely destroyed)**

Damage caused by the Noto Peninsula earthquake



**Road blockage and Collapse damage
(Suzu City and the entire Noto region)**



**Fire damage
Wajima Morning Market (Wajima City)**

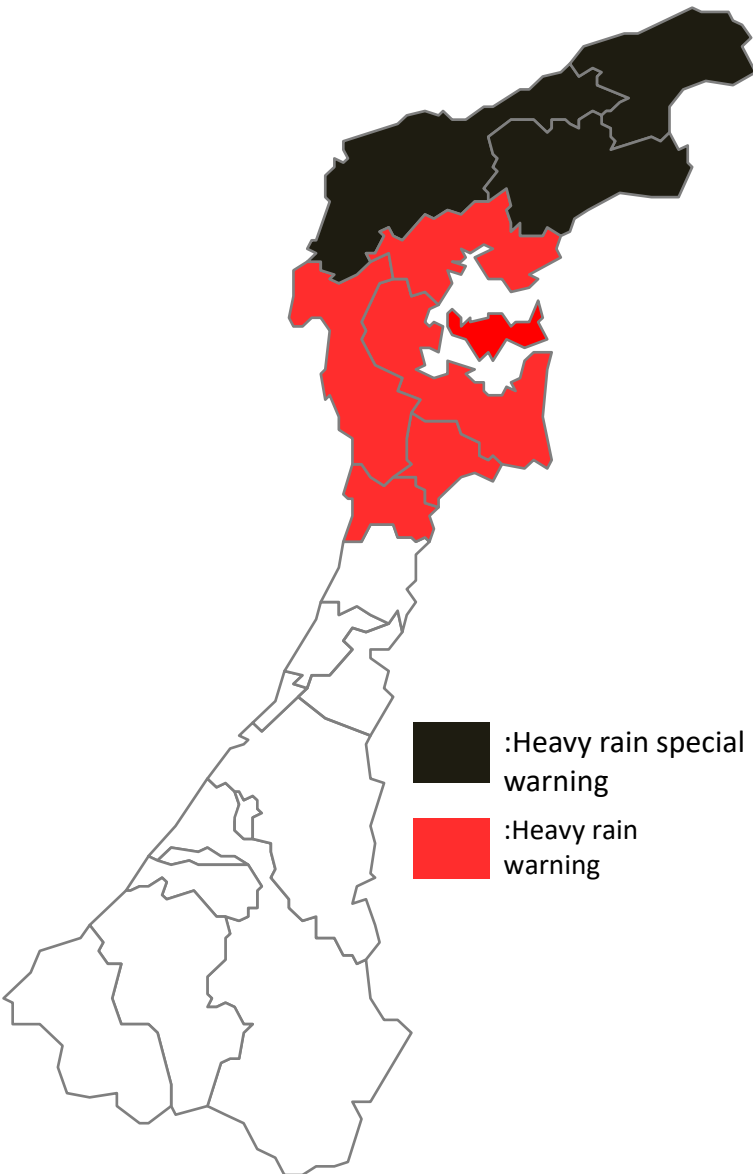


**Ground uplift (Wajima City (Japan Sea side))
Land subsidence (Noto region (Nanao Bay side))**



**Liquefaction, lateral flow
(Uchinada Town, etc.)**

Situation regarding the heavy rains in Oku-Noto in 2024



- A “linear rain band” which causes heavy rain in the same area was formed on September 21st, causing heavy rainfall mainly in the Oku-Noto region through the 22nd.
- The prefecture's first heavy rain special warning was issued for Wajima City, Suzu City, and Noto Town.
- Wajima and Suzu cities recorded the highest 24-hour rainfall ever recorded.

⇒ Just after eight months after the earthquake,
another major disaster occurred.

<Status of human and residential damage> As of April 30th

Deaths: 16

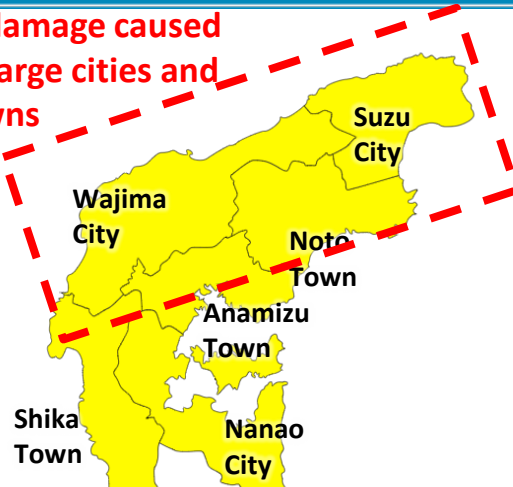
Missing people: 0

Injured: 47 (2 seriously injured)

**Damage to residential buildings: 1,859
(82 completely destroyed)**

Damage caused by heavy rain in Oku-Noto

**Especially the damage caused
by heavy rain Large cities and
towns**



River flooding
(Machino area, Wajima city)



River flooding and levee destruction
(Kutegawacho, Wajima City)



Urban flooding
(Wajima city center)

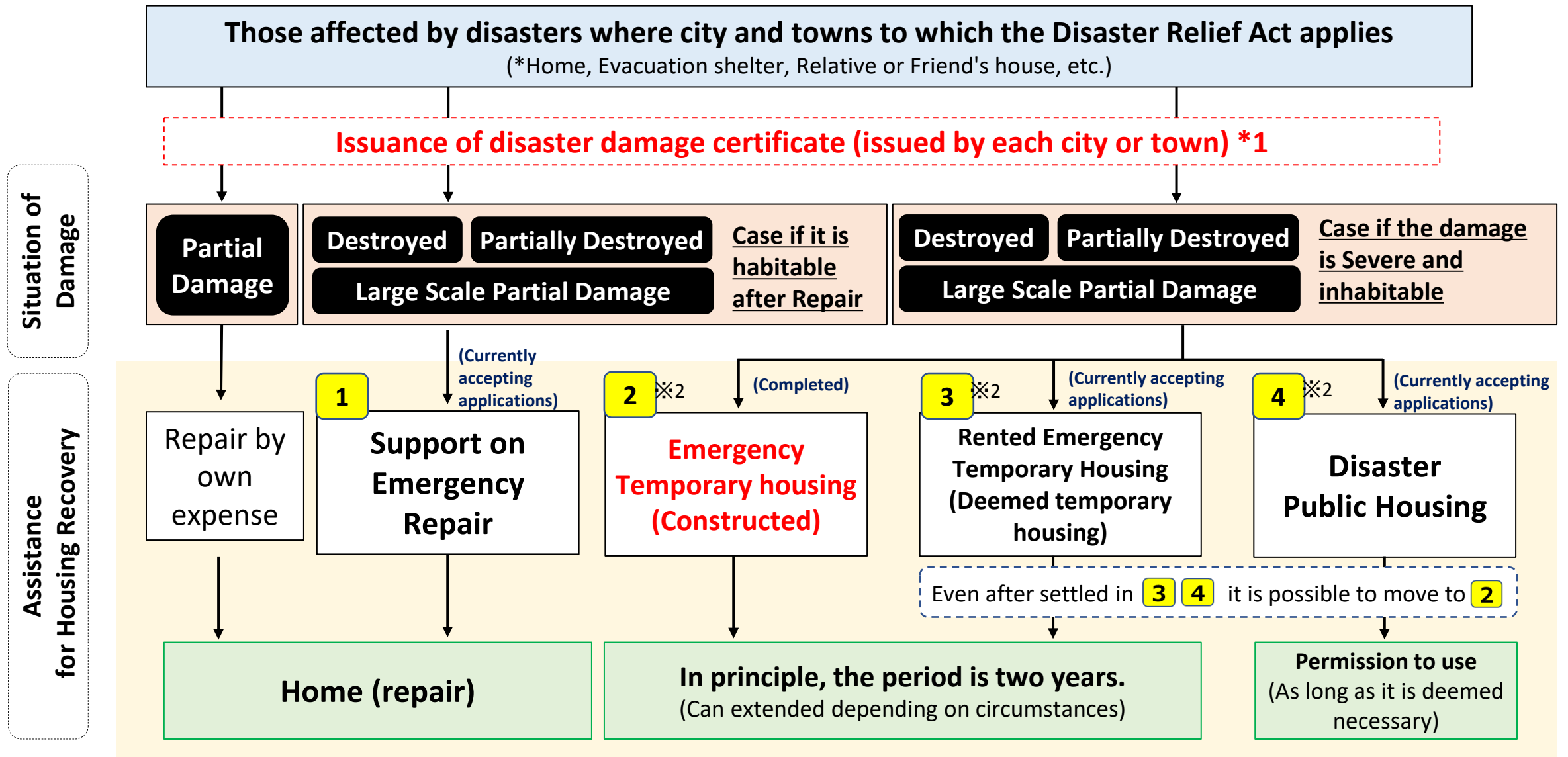


River flooding and levee destruction
(Wakayamacho, Suzu City)



Landslides and debris flows
(Otanicho, Suzu City)

Support on Emergency Housing



*1 Even before the issuance of a disaster damage certificate, the support of **1** or moving into temporary housing **2** **3** **4** is possible

*2 For houses in risk of being damaged by secondary disasters, lifelines being cut off, or under evacuation orders due to landslide, which the mayor of the city or town recognizes that the houses are inhabitable for a long period of time may use **2** **3** **4**

Eligible residents of temporary housing



The construction of emergency temporary housing is based on the Disaster Relief Act and is intended to provide housing to victims who have lost their homes due to disasters. Emergency temporary housing is provided for those who are unable to secure housing of their own means.

Target Beneficiaries

- (1) Those who homes have been **completely destroyed, burned down, or washed away** and who are now homeless
- (2) Those who houses have been **partially destroyed** (including those that have been partially destroyed to a medium or large extent) and cannot be reused as housing, and who are **forced to demolish** them
- (3) Those who there is a risk that houses will be damaged due to secondary disasters, etc., and **lifelines** (water, electricity, gas, roads, etc.) **are cut off**, and those who **have been ordered to evacuate** due to a landslide or other reason and deemed by the mayor of the municipality to be unable to live in their home for a long period of time.

Grant period

- (1) **Within two years from the date of completion of construction work**
- (2) In case living in rented housing or public housing at the time of the disaster, within one year from the date of moving in.
(If it is difficult to move into a new property within one year, the period can be extended up to two years.)

Expenses borne by residents

Utility fees, moving expenses, community association fees, etc. *Rent and parking are free