

ILC Site – Specific Activities by Tohoku ILC Project Development Center

TILC **東北ILC事業推進センター**
Tohoku ILC Project Development Center

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Outline

1. Overview of Tohoku ILC Project Development Center
2. Geological Survey
3. Civil Engineering
4. Regional Bases for Equipment Assembly/Inspection
5. ILC Main Campus
6. Environmental Assessment
7. ILC City Planning
8. Summary

1. Overview of Tohoku ILC Project Development Center

Tohoku ILC Project Development Center : 2020.08.06



IDT (International Development Team) : 2020.08.02

➤ Missions

- Finalize regional detailed plans for the ILC Project
- Finalize local decision issues for constructing the ILC
- Take activities with a closer cooperation with IDT, KEK and AAA

➤ Organization Body

- 3 Universities: Tohoku, Iwate, Iwate Prefectural
- 2 Prefectures: Miyagi, Iwate
- 13 Cities: Sendai, Kesenuma, Tome, Kurihara, Osaki, Morioka, Ofunato, Hanamaki, Kitakami, Tono, Ichinoseki, Oshu, Rikuzentakata
- 4 Towns: Nishiwaga, Kanegasaki, Hiraizumi, Sumita
- Iwate Prefecture ILC Promotion Council

➤ Working Issues

- ① Topographical and geological survey of the candidate construction site, study of the layout of facilities such as tunnels, and Civil engineering design
- ② Examination of logistics and assembly bases for the ILC accelerator and detector components
- ③ Study on the environment and community development to accommodate researchers and their families
- ④ Activities to promote local residents' understanding of ILC construction
- ⑤ Promotion of accelerator-related industries
- ⑥ Study of the impact on the natural environment, society, and economy
- ⑦ Local carbon-neutral and green ILC initiatives

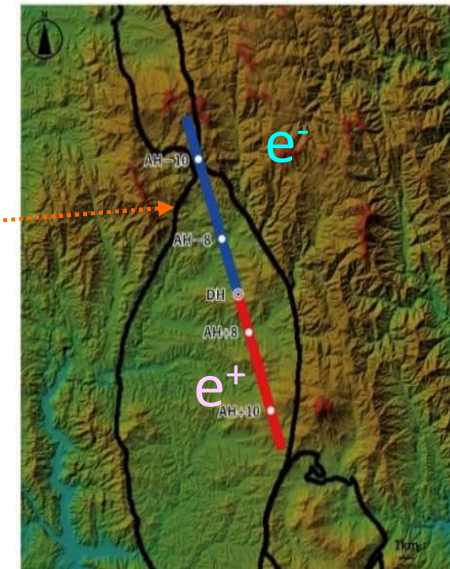
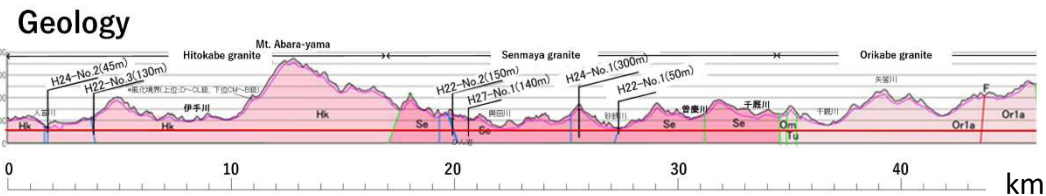
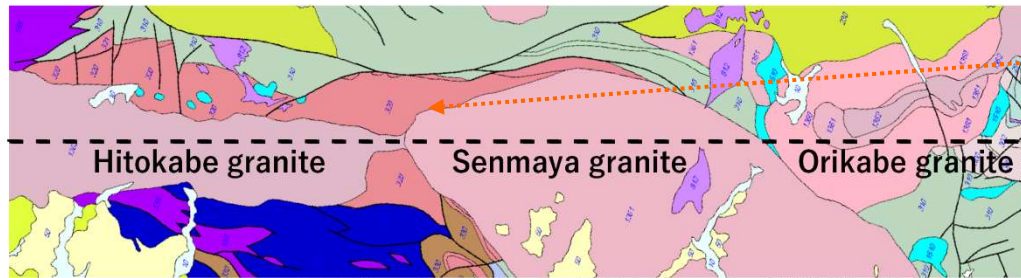


AAA: Advanced Accelerator Association
promoting Science & Technology

2. Geological Survey

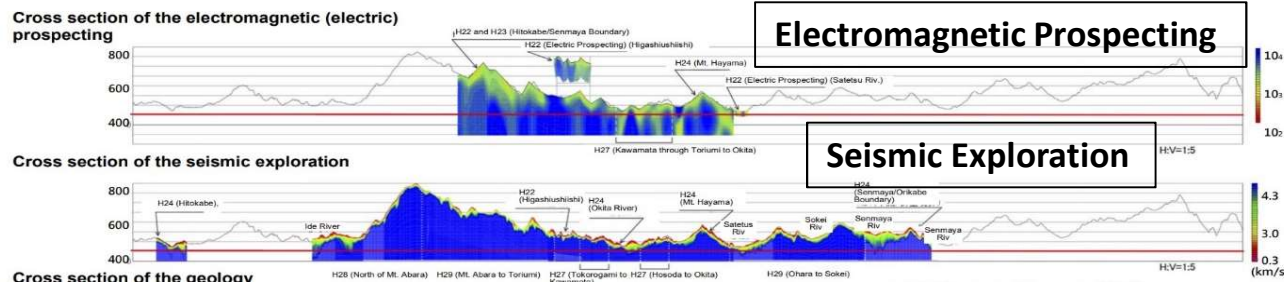
➤ ILC Location

ILC site area : strong granite bedrock shown by pink colors over 50 km, with few vibrations and no fault lines

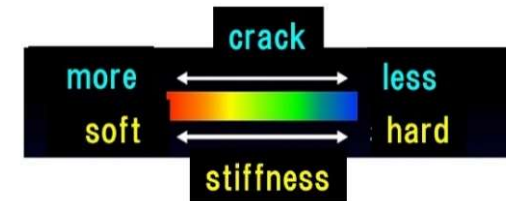


collaboration with Tohoku university in 2022~2023

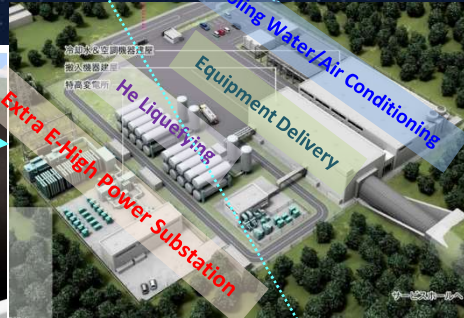
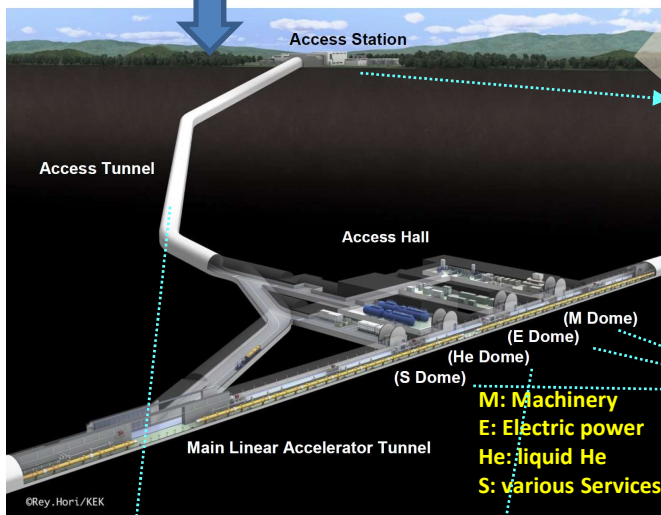
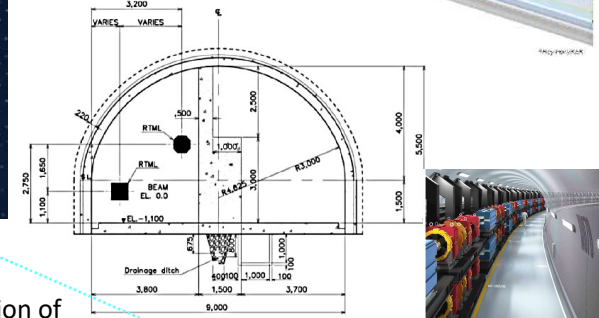
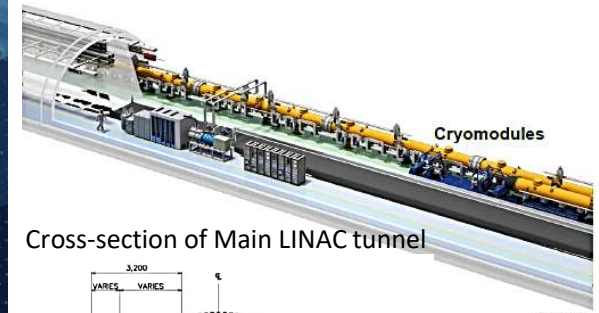
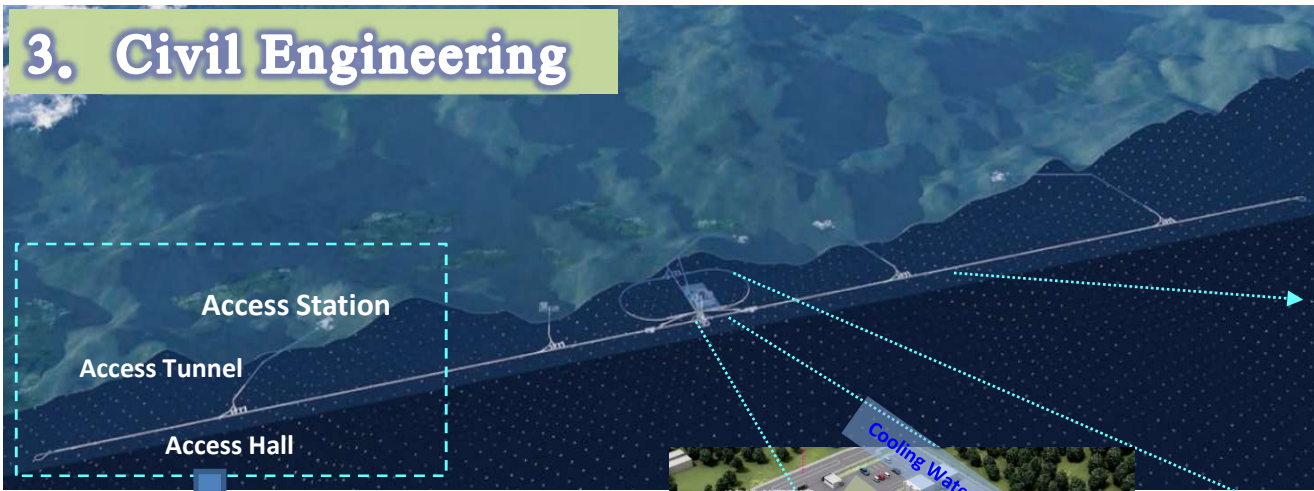
➤ Survey



- Electromagnetic Prospecting (**crack**)
 - Seismic Exploration (**stiffness**)
 - Boring & Borehole Camera (**rock quality**)
- ➔ presence of low-crack, very stiff and high quality granite

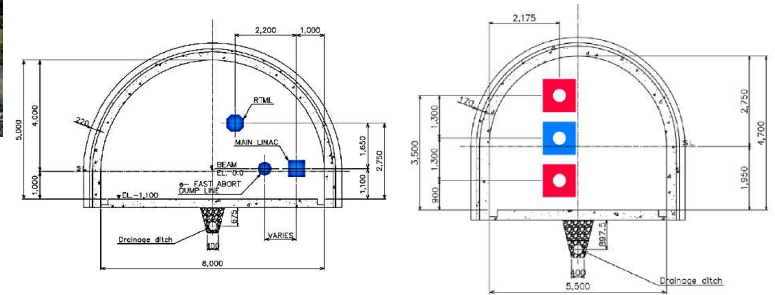


3. Civil Engineering

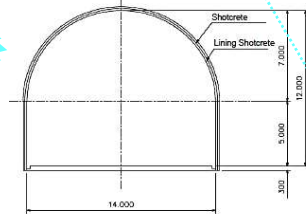


Cross-section of Beam Delivery

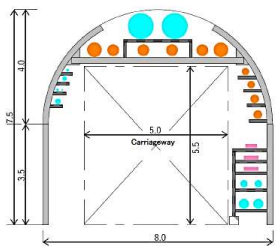
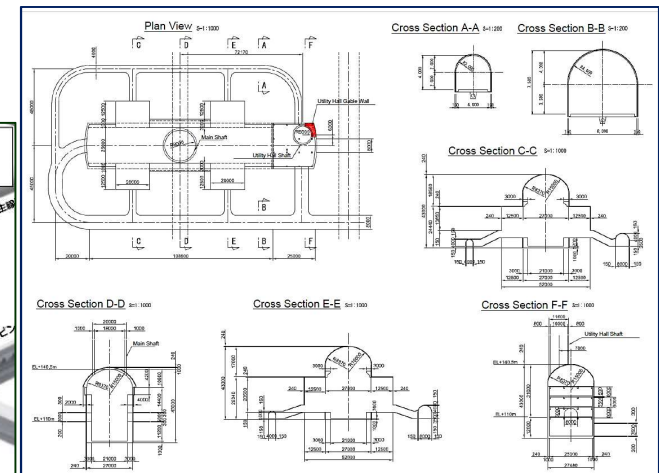
Cross-section of Damping Ring



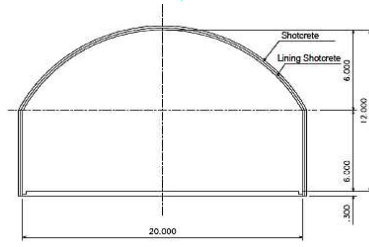
Cross-section of S/E/M dome



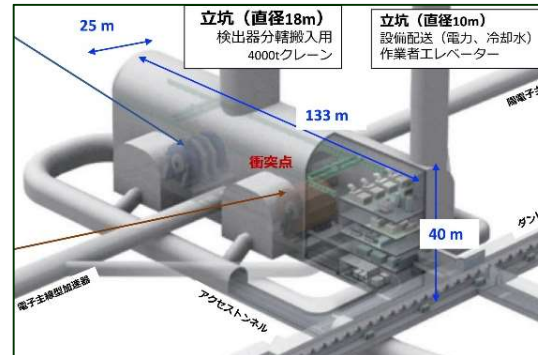
Detector Hall/ Peripheral tunnels



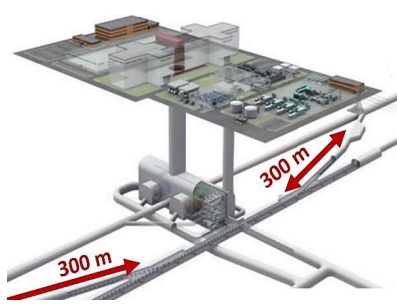
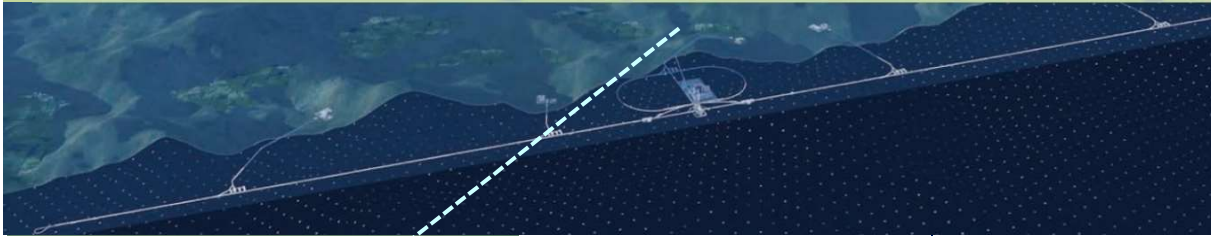
Piping & Cabling in Access Tunnel



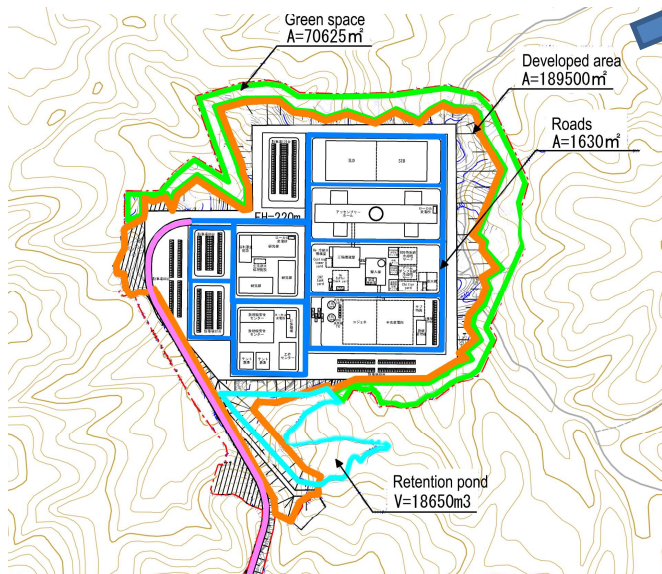
Cross-section of He dome



ILC Satellite Campus (Collision Point Campus)



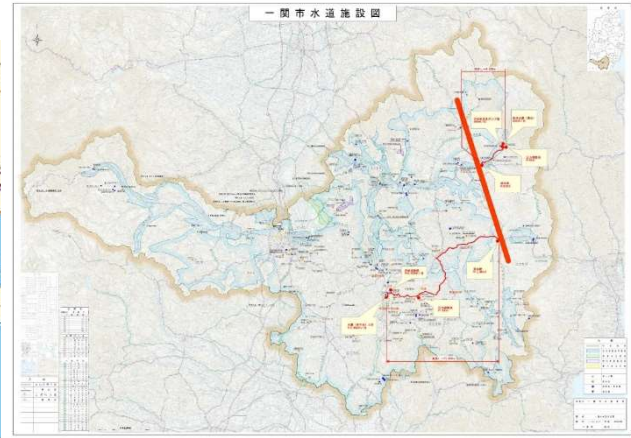
Candidate-site Diagram on Real Map



Electrical Equipment source/transformer/receiver



Industrial (Cooling) Water potential back-up sources



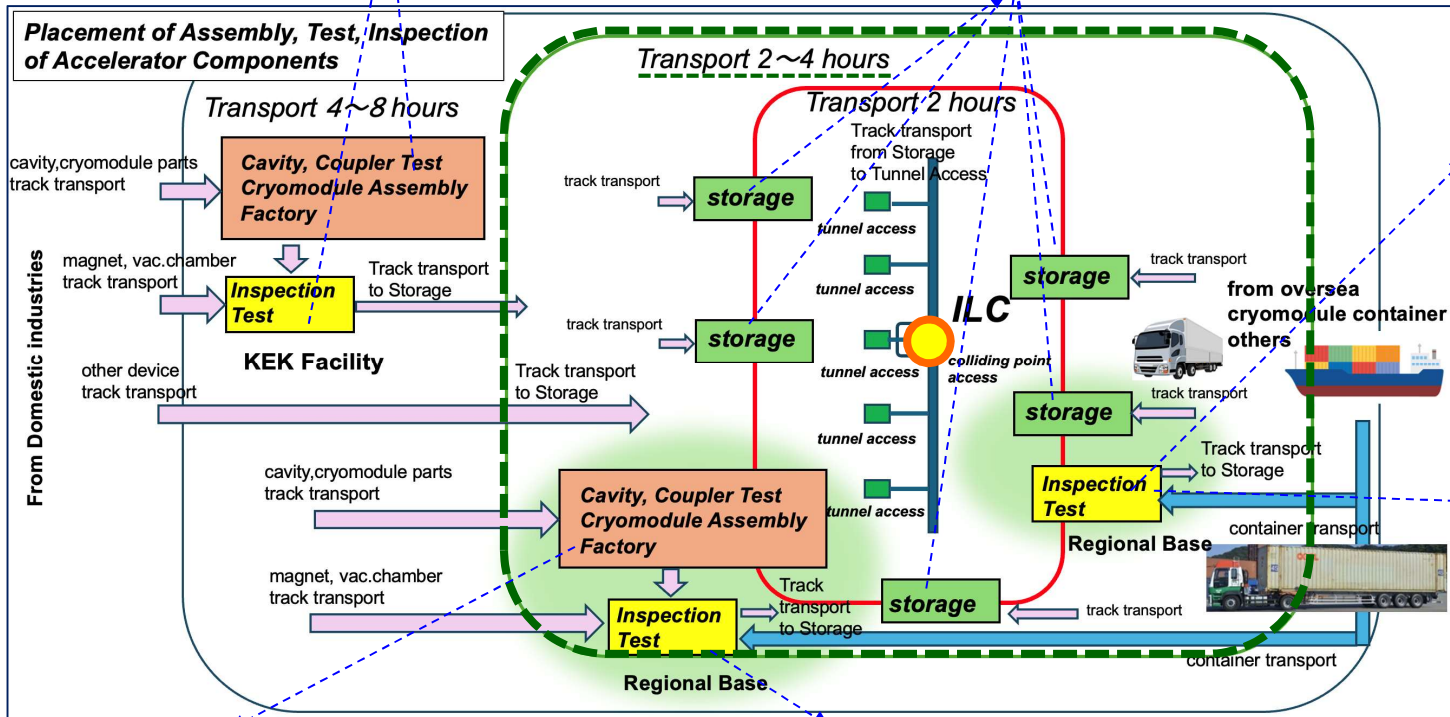
4. Regional Bases for Equipment Assembly/Inspection



**KEK Cryomodule Facility
COI Building**



**On-site Storage using
Playground of Closing School**



**Magnet Inspection and Test
On-site Facility**



**Waveguide Inspection
and Test On-site Facility**



**Cavity, Magnet, Computer,
Cryomodule Assembly Facility**

Cryomodule On-site Test Facility

location at major domestic ports, express ways,
and other major roads.



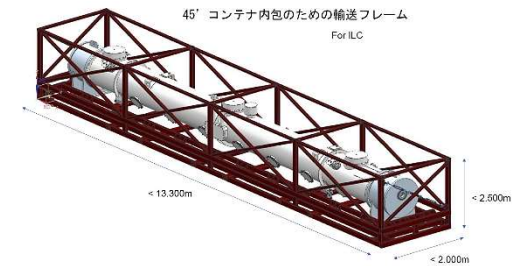
Investigation and Study of Expected Transportation Routes (2022 & 2023)

- Logistic Route : public highway sectors from major domestic ports, expressways and other major roads
 - Check items for transporting large-scale equipment in 45 Foot Container :
 - a cryomodule (up to 15 m) or a solenoid coil (up to 65 tons)
- Narrow Sections of Road
 → Fragile Bridges
 → Low Pedestrian Bridges or Tunnels

45 Feet Container
 Height : 2.896 m,
 Width : 2.438 m,
 Length : 13.716 m



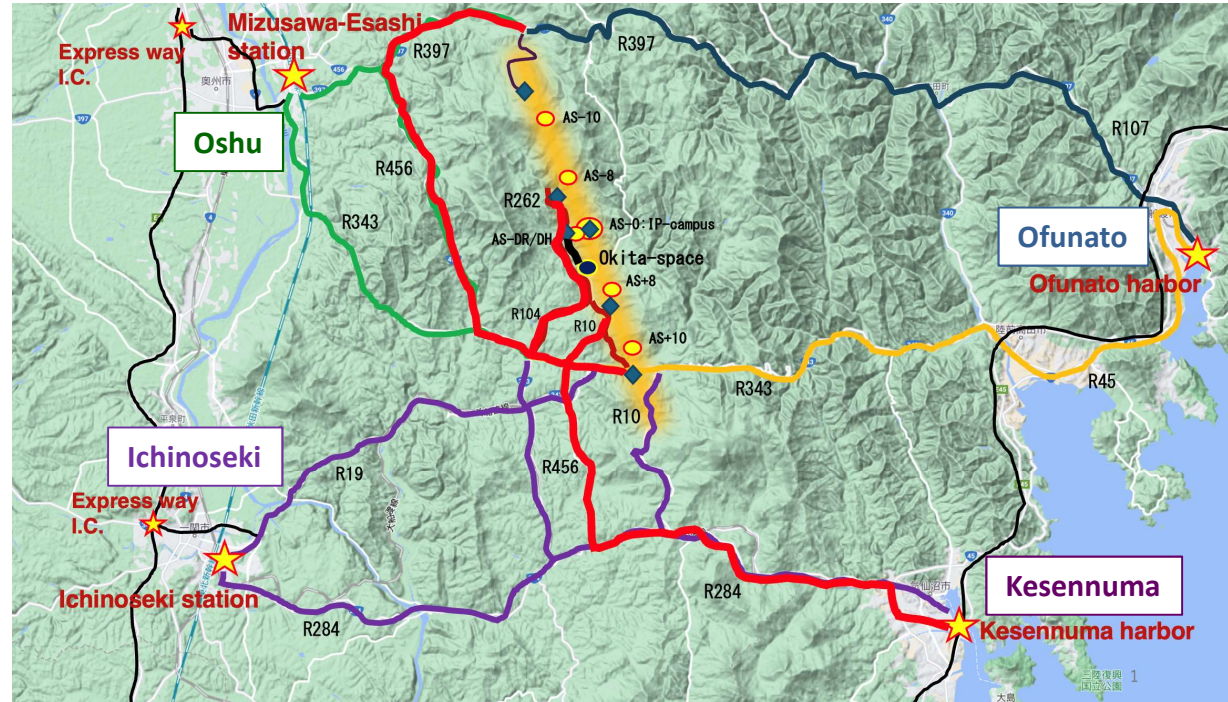
45 Feet Container-Frame for ILC



Detailed studies based on the candidate local logistic bases :
 Almost Done

Candidate Routes

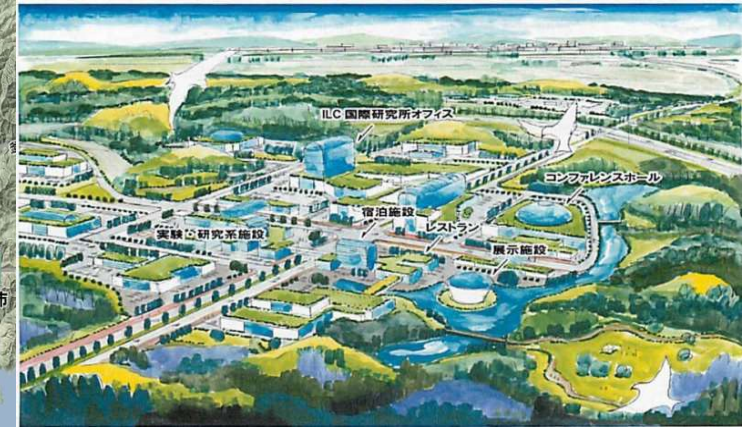
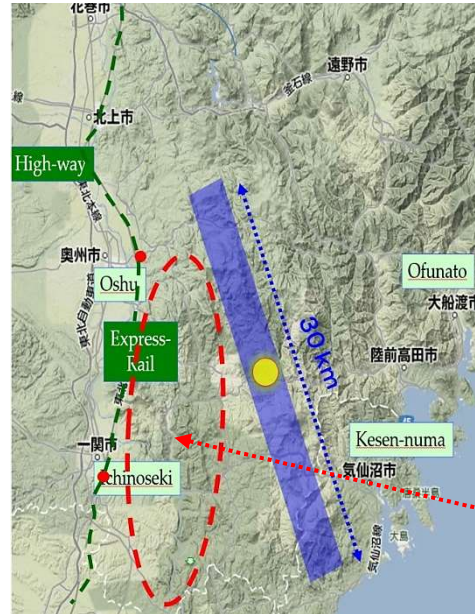
- Red : heavy cold box
- Black : 8m width detector solenoid
- Green : Oshu → ILC Site
- Violet : Ichinoseki & Kesenuma → ILC Site
- Yellow & Blue : Ofunato → ILC Site



5. ILC Main Campus

Requirements

- Area > 25 ha
- Distance from collision point < 30 km
- Additional area for future ~ 100 ha within 15 km of the central campus
- Housing facilities for researchers and their families < ~ 30 km of the central campus
- Support system from local business, government, and academia with achievements of outreach activities, etc.



Main Campus Candidate Area

Evaluation Items

Process : Almost Done

1. Engineering assessment of research campus sites

- ① Status and outlook of infrastructure such as attached roads, water supply, sewerage and electricity supply
- ② Current status of land use, acquisition of land
- ③ Buried cultural heritage, restrictions on use, status of landowners
- ④ Expenditure on landscaping, height difference
- ⑤ Site area, land for future expansion
- ⑥ Disaster risk

2. Assessment of the location and environment as a laboratory (office)

- ⑦ Maintain the historical and cultural landscapes and natural ecosystems of the region
- ⑧ Campus shape, ease of movement and interaction

3. Assessment of access from the laboratory to underground facility sites, including central collision point

- ⑨ Access to and from the satellite campus at Central Collision Point
- ⑩ Access to and from both tunnel ends

4. Assessment of access to people and logistics from domestic and international sources

- ⑪ Access from major universities and research centres in Japan and from international airports
- ⑫ Access to logistics via major domestic ports, nearby ports, highways and public roads

5. Assessment of the commuting environment for researchers

- ⑬ Commuting environment from nearby cities

6. Environmental Assessment

Basic Policy

- Local Government regulations : Environmental Impact Assessment Act and the Environmental Impact Assessment Ordinance
- Ministry of the Environment : Strategic Environmental Assessment (SEA)

Assessment Implementing Body

- Unit to implement the ILC facility plan = KEK → Pre-Lab. → ILC Lab. + **Local Governments**

Preparatory Survey by Local Government

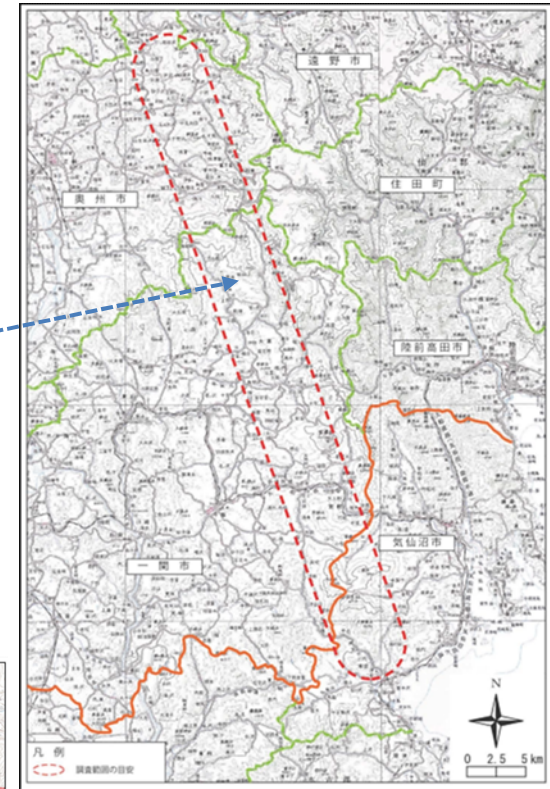
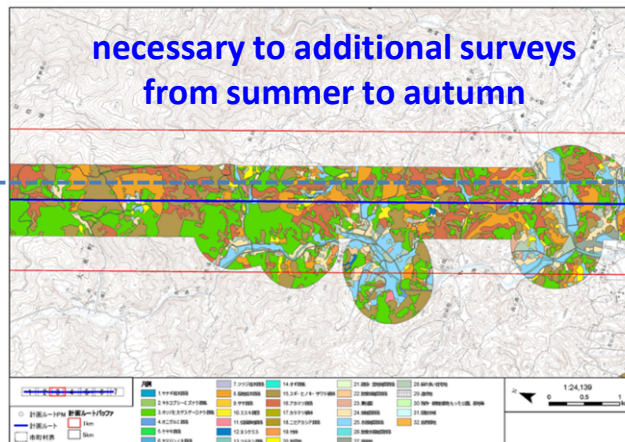
Iwate Prefecture

- carried out “Natural environment survey” related to the area of the ILC tunnel route
- formulated “Environmental impact assessment method (original draft)” that is expected to **be carried out by the ILC implementing body**

Overview of some results

- Vegetation map →
- Survey of raptors →

These Issues to be considered until constructing the ILC tunnel.



continuous surveys are required



ノスリ (H26.1.22 撮影)



写真 2-2-1 定点調査実施状況

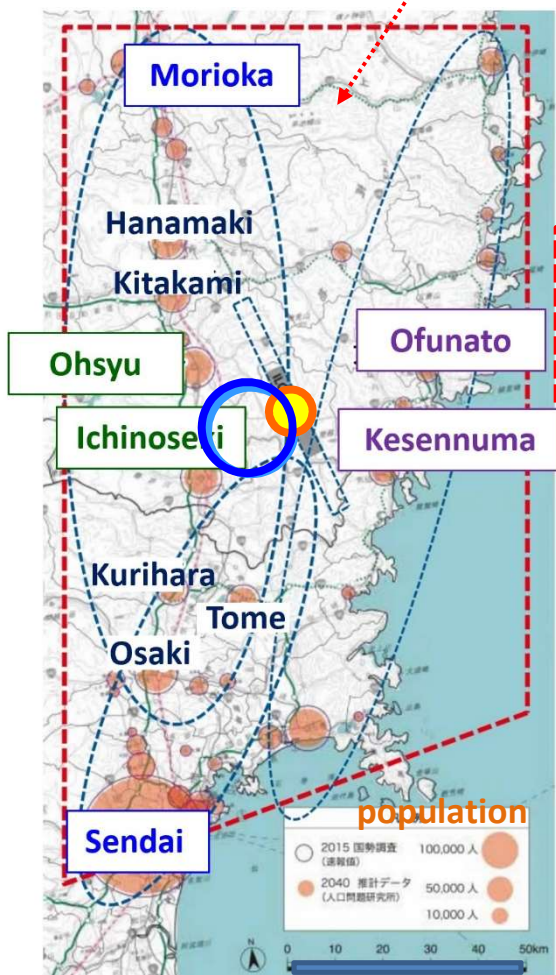
7. ILC City Planning

Concept of ILC City Planning

ILC City :

- A wider area stretching from Morioka to Sendai (~160 km) inside Red-Dashed Region
- Main/Satellite campus at its core

- Advanced Industrial Accumulation Bases in Morioka/Sendai
- Main Campus/Satellite Campus
- Residential Community Site
- Logistic Bases for shipping



Morioka : Advanced Industrial Accumulation Base

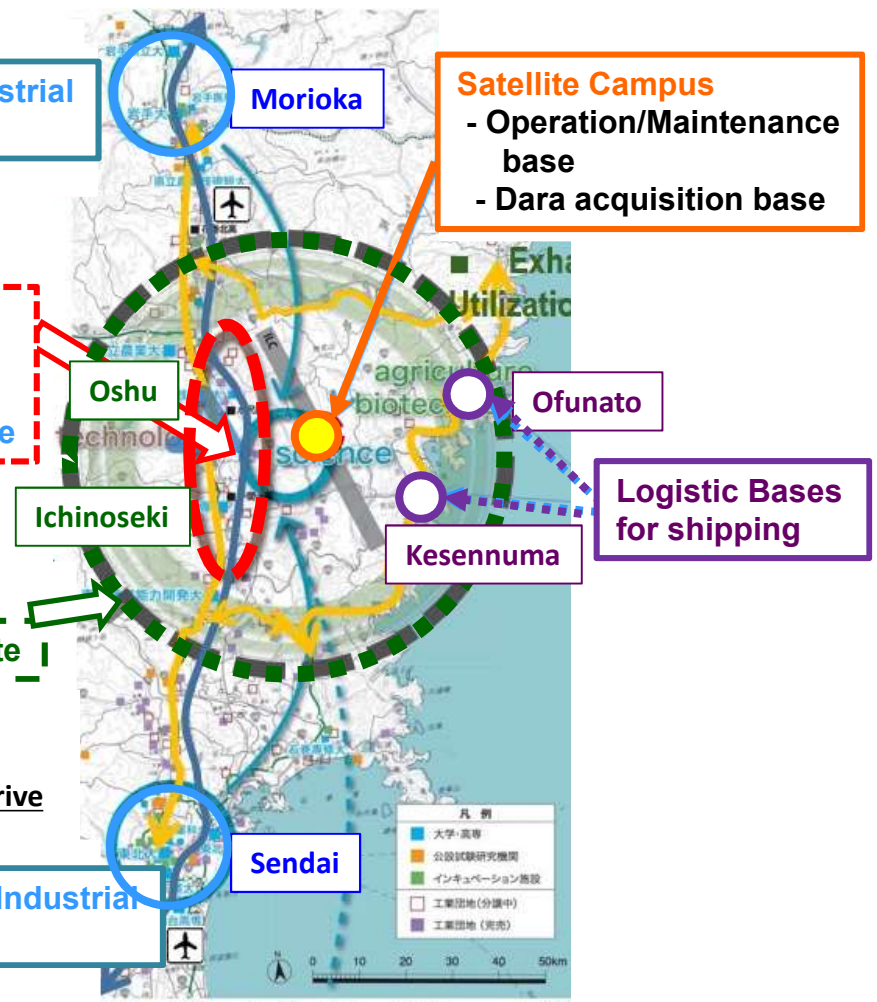
Main Campus
 - Research and development base
 - Advanced industry hub-base

Hotel for short-term stayers :
 - near the Main Campus

Residential Community Site

Housing for long-term stayers :
 - utilize local attractions
 - **distribute within 1 hour - drive from the main campus**

Sendai : Advanced Industrial Accumulation Base



source) "Tohoku and Kitakami Area Grand Design with ILC" processed by NTT

8. Summary



**For realizing the ILC project in Japan Now
Positive signals of intent from the Japanese Government are urgently needed.**

- ① The ILC is a plan that has gained international endorsement as a global project to be led and realised by Japan, and then Japan will take the lead in strengthening international cooperation and working towards an international agreement.
- ② **The ILC is a grand project, which will be Asia's First Large-scale International Science and Technology Centre, a grand plan including Science and Technology Creation, Economic Security, Creation of a new country, National Land Resilience, Concentration of Highly Skilled Human Resources, and Science/Technology Innovation.**

Urgent