Occupational hazard

Type	Classification	Case	Summary
Occupational hazard	Falls	Case 1	During bridge repair work, a worker fell from the work platform into a river while installing a suspended scaffold, resulting in death.
		Case 2	A staircase was cut into pieces for removal, and an attempt was made to lift it with a 25-t crane; however, the staircase landing collapsed, and two victims who were on the landing fell into the riverbed with it, one of whom was injured.
	Tipping over	Case 3	The left foot of a worker got caught between two Esper pins while carrying a scaffolding board (200 mm × 4,000 mm, approx. 18 kg) and handing it to a worker on the lower scaffolding. The worker lost balance and fell, leading to an ankle injury.
		Case 4	A sheet pile swung while being hoisted, causing the rigging worker to get caught between the pile behind them and fall, resulting in injury to the back of their left hand.
	Tipping over (heavy machinery)	Case 5	Work to change a setup was being conducted without laying a steel plate. This caused the ground beneath the outrigger on the riverside to sink while the load was being turned, resulting in the 60-t crawler crane tipping over.
	Crashes (hit by object)	Case 6	While pulling up an anchor using a lifting barge, lowering it onto the deck of a pump dredging barge, and removing the sling, the anchor, which had not been temporarily secured, fell into the river along with the victim. The anchor hit the victim, injuring their right foot.
	Caught/ stuck	Case 7	During the production of large sandbags, a sandbag came off the sandbag-filling aid, and while reinstalling it, the right hand of a rigging worker was caught between the backhoe bucket and the sandbag-filling aid, resulting in injury.
		Case 8	While unloading materials, a transport company driver was performing rigging work when their finger got caught. The load was pulled by the backhoe (first-tier subcontractor operation), resulting in injury to the finger.
	Cuts/ abrasions	Case 9	While cutting brushwood into small pieces with a chainsaw, with another worker loading it manually, the brushwood became entangled with vines and other materials. The resulting movement of the brushwood caused the chainsaw blade to hit the hand of the worker cutting it, which resulted in injury.

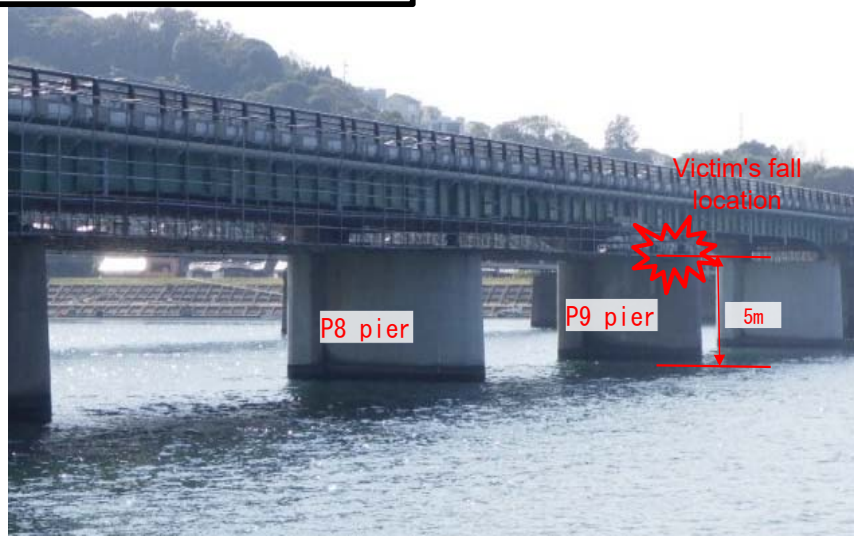
■Case 1: Construction worker accident (occupational hazard) [Falls]

Accident summary

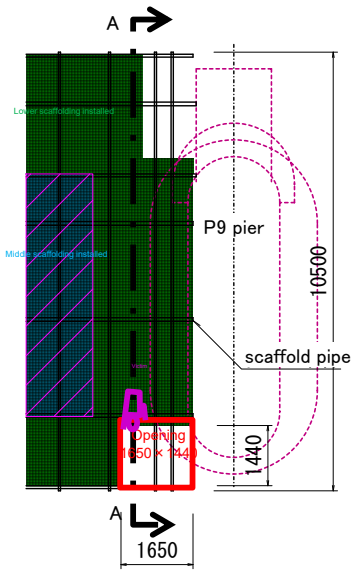
During bridge repair work, a worker fell from the work platform into a river while installing a suspended scaffold, resulting in death. [One fatality]

Accident occurrence situation

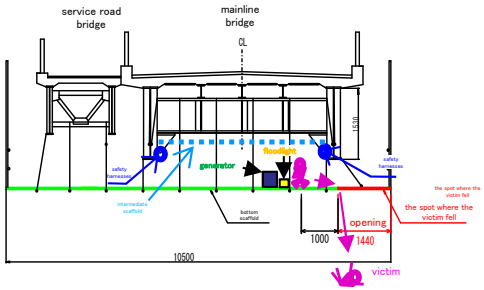
Overall view



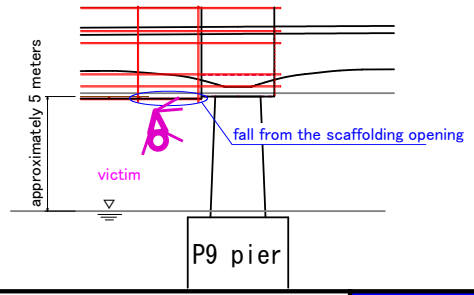
Plan view



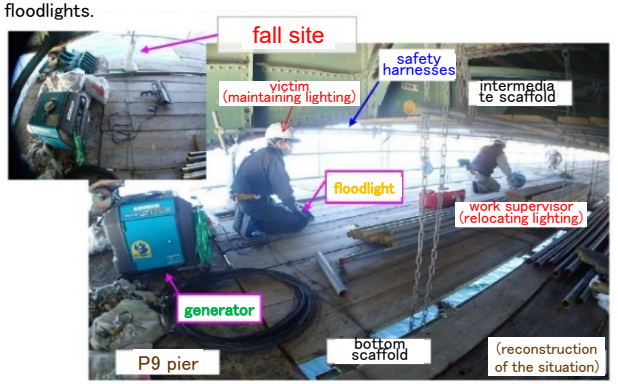
A–A cross section



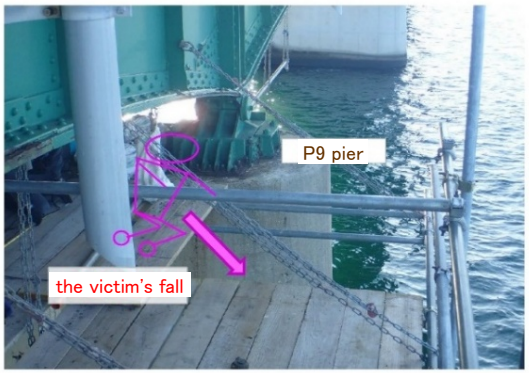
Side view



1.The work supervisor moved one floodlight and one generator to the victim's location. After that, the supervisor instructed the victim to illuminate the Matsue side (P8 side), as the supervisor was relocating the remaining two floodlights.



2. The work supervisor heard a splash and turned around to see that the victim had fallen into the river.
(It is assumed that the victim somehow went under the girder and fell.)



Cause of accident

- An opening was observed when the scaffold was used as a work platform; however, despite the risk of danger to workers if they fell from that point, no cover was provided. In addition, no other necessary measures were taken to prevent occupational hazards.
- The scope of use of safety harnesses for work near the edge of the work platform was unclear.

Contractor's measures to prevent recurrence

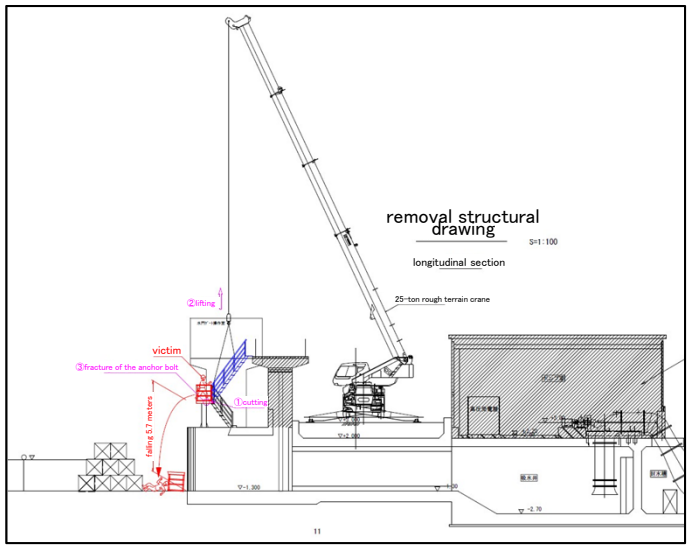
- Change the scaffolding assembly method to prevent openings from occurring near the piers of the suspended scaffolding.
- Change the lighting equipment from one system to two and install headlights on the helmets.
- Clearly mark areas where safety belts (harnesses) must be used with restraint ropes and banners and use safety belts when working within those areas.
- Change the number of lifelines from two to five and use fluorescent lifelines to make them easier to see at night.
- Ensure all workers wear life jackets when working on scaffolding.

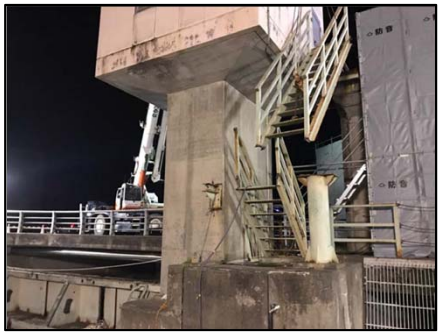
■Case 2: Construction worker accident (occupational hazard) [Falls]

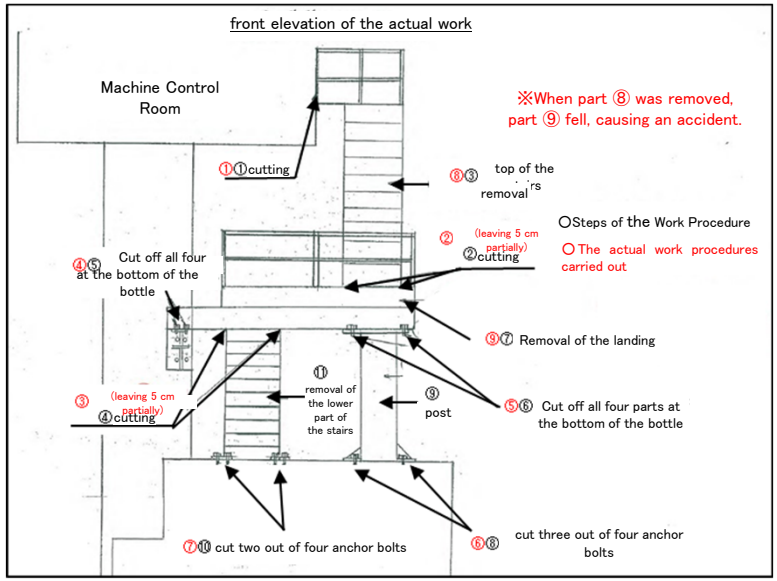
Accident summary

While removing the steel stairs installed in the watergate operation room, two workers fell along with the stairs as they landed, resulting in injuries to both workers. [Two injuries (one serious, one minor)]

Accident occurrence situation







Cause of accident

(1) A work procedure manual was created; however, the work was not performed according to the procedure.
(2) The handover between the person who worked during the day and the person who worked at night was not sufficiently thorough.
(3) If the worker had performed the lifting work after completing the rigging work and had completely descended the stairs instead of the landing before performing the lifting work, the worker would not have been involved in the fall.

Contractor's measures to prevent recurrence

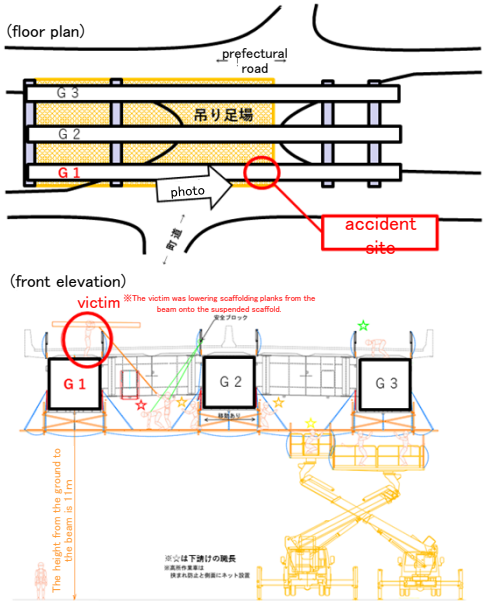
(1) During the daily morning assembly, confirm the procedures in the work procedure manual, ensure all involved parties are aware, and keep records. In addition, conduct RAKY based on the work procedure manual and ensure that the staff of the main contractor participates.
Ensure that the staff of the main contractor and the safety officer of the subcontractor check whether the work is being performed in accordance with the work procedure manual and RAKY and keep a record of it.
(2) The staff of the main contractor should keep a record of work that continues overnight by taking photographs and drawings at the end of the work.
When taking over from the night to day shift, the staff of the main contractor should confirm and communicate any issues to the day and night shift foremen and workers at the morning assembly. Conversely, when taking over from day to night, the staff of the main contractor should communicate any issues to the night shift foremen and workers after communicating them to the main contractor.
(3) During lifting work, if the possibility of contact exists or the scaffolding is unstable, the staff should go to a safe place and carry out the work.

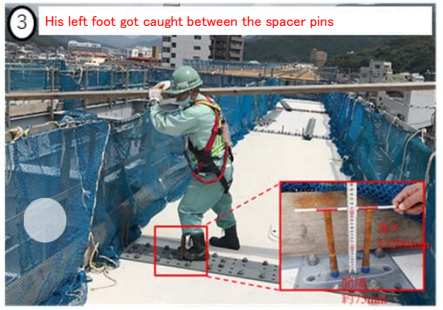
■Case 3: Construction worker accident (occupational hazard) [Tipping over]

Accident summary

The left foot of a worker got caught between two Esper pins at the top joint of a steel box girder. The worker lost balance and fell, leading to an ankle injury. [One injury]

Accident occurrence situation





Cause of accident

- The toes of the worker got caught in the gap (75 mm) between the Esper pins.
- The warning signs to raise safety awareness among workers were insufficient.
- Although the lighting necessary for the work was provided and the Esper pins were visible, the worker let their guard down just before completing the work.

Contractor's measures to prevent recurrence

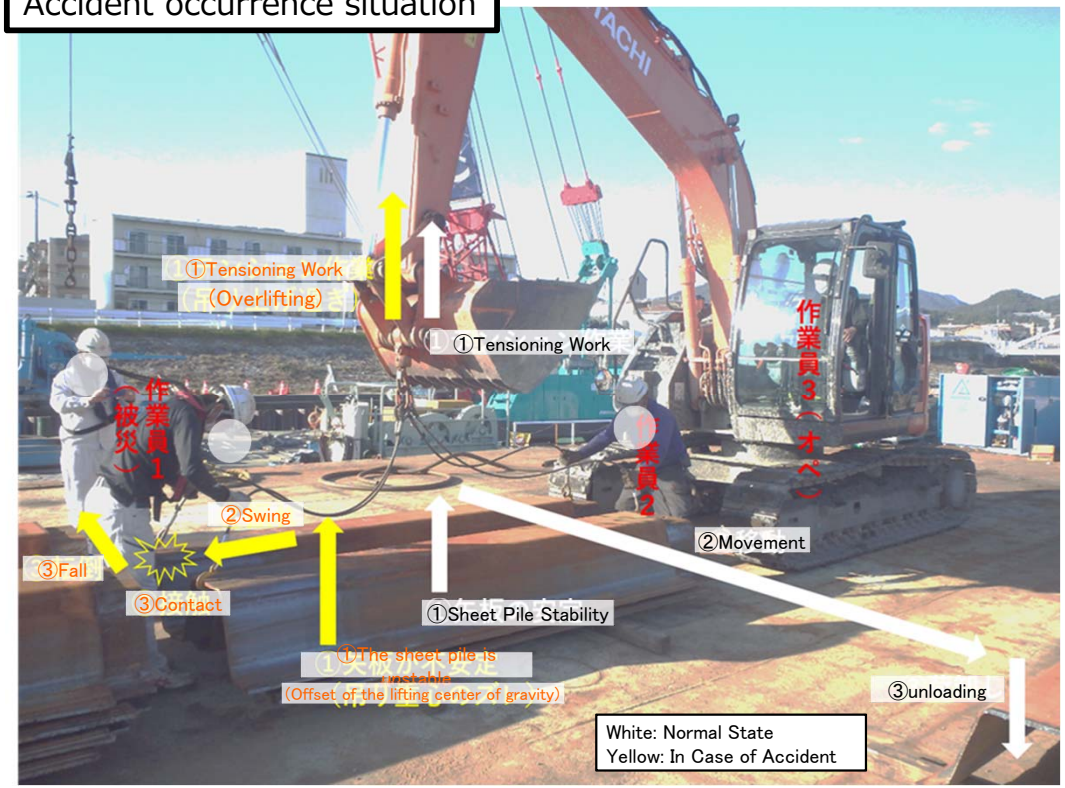
- Cover the Esper pins near the center of the girder with traffic cones to prevent workers from getting their toes caught in the pins. In addition, cover the Esper pins on the web side with protective covers and wrap them with masking tape and stretch film in two layers.
- Indicate the material handover locations to avoid transferring scaffolding materials near locations where workers are likely to get caught, such as splices.
- Install additional warning signs in locations that are easily visible to workers.
- Install lighting equipment (e.g., jack rope lights) on the handrails on the bridge surface to further emphasize the presence of Esper pins.
- Add a note to the work procedure manual to check that the lights are on when assembling the scaffolding and to check the handover locations, travel distances, and obstacles along the route when transporting materials. Hold a meeting to re-familiarize workers with the work procedure.

■Case 4: Construction worker accident (occupational hazard) [Tipping over]

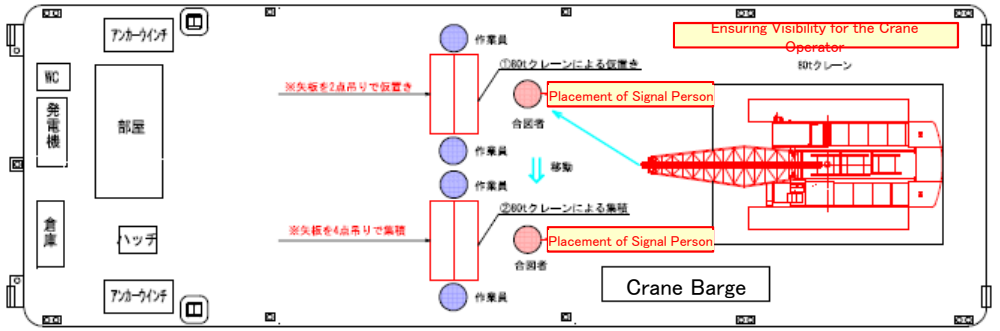
Accident summary

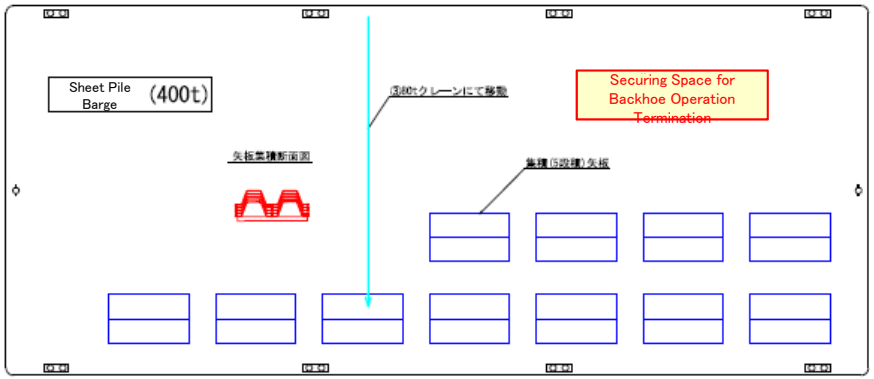
A sheet pile swung while being hoisted, causing the rigging worker to get caught between the pile behind them and fall, resulting in injury to the back of their left hand. [One injury]

Accident occurrence situation



Preventive measures against recurrence





Cause of accident

(1) The lifting center of gravity was shifted owing to crane work. (Difficult to see from the BH operator)
(2) The sheet pile swung owing to an error from the operator (over-lifting). (Difficult to see from the BH operator)
(3) A temporary pile of sheet piles was behind the rigging worker, providing no escape route.
(4) No procedure manual was provided for the temporary placement of sheet piles on the barge.

Contractor's measures to prevent recurrence

(1) Stop the lifting work with the backhoe and use the 80-t crane installed on the crane barge to secure space and ensure visibility for the operator.
(2) Assign a new signaler and re-educate the operators to follow their signals while working. Thoroughly inform them of the following: "Place the hook in the center of the center of gravity," "Check that the hook has not come off," and "Stop lifting once after the ground is cleared."
(3) Stop the lifting work with the backhoe and use the 80-t crane installed on the crane barge to secure space and ensure an evacuation area for the workers.
(4) Prepare a work procedure manual for temporarily placing sheet piles on the barge.

■Case 5: Construction worker accident (occupational hazard) [Tipping over (heavy machinery)]

Accident summary

Work to change a setup was being conducted without laying a steel plate. This caused the ground beneath the outrigger on the riverside to sink while the load was being turned, resulting in the 60-t crawler crane tipping over. [No injuries]

Accident occurrence situation

Cause of accident

Cofferdam sheet piles were being driven owing to parallel construction work involving the revetment. The accident occurred while driving the sheet piles with a 60-t crawler crane. The setup was being changed (moving 5 × 10 steel plates weighing about 900 kg) to drive the sheet piles in the next area.

The changeover work was conducted without laying the steel plate, which caused the ground under the outrigger on the riverside to sink while the load was being turned, causing the 60-t crawler crane to tip over.

Contractor's measures to prevent recurrence

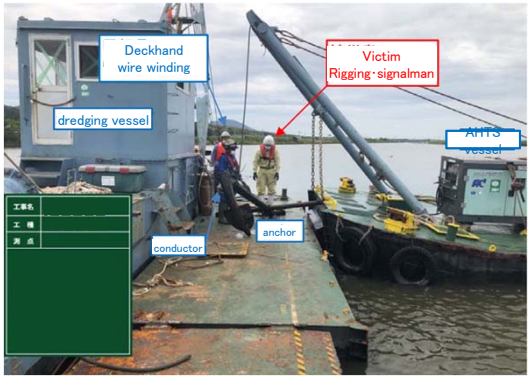
・Add "crawler crane relocation work" to the work procedure manual.
(i) Assign controllers during the steel plate relocation work.
(ii) Use a crane-equipped backhoe for the steel plate relocation work.
・Add the construction plan for the work to the work procedure manual and read it over again with the relevant workers to raise awareness of the importance of using the steel plate. In addition, always educate new entrants.
・Check the construction plan during on-site KY activities before starting work.
・As with the main sheet pile work, ensure the main contractor is present for each task during the steel plate relocation work, and keep an inspection record in the daily inspection report.

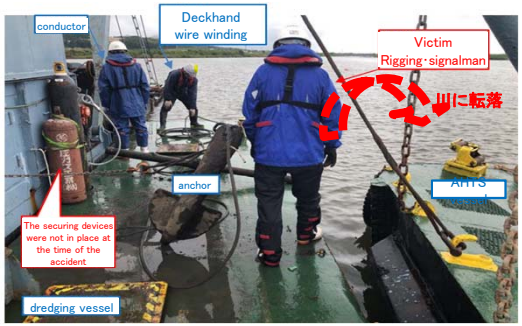
■Case 6: Construction worker accident (occupational hazard) [Crashes (hit by object)]

Accident summary

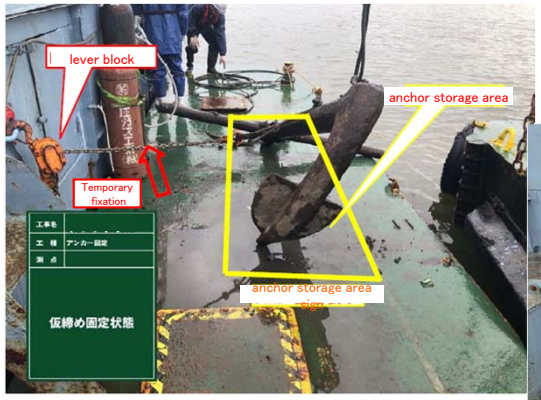
While pulling up an anchor using a lifting barge, lowering it onto the deck of a pump dredging barge, and removing the sling, the anchor, which had not been temporarily secured, fell into the river along with the victim. The anchor hit the victim, injuring their right foot. [One injury]

Accident occurrence situation



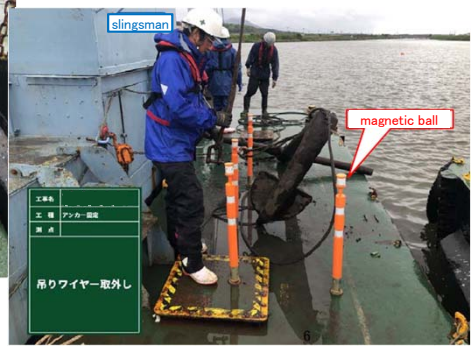


Measures to prevent recurrence



↑Temporary securing before removing the sling

↓"No entry" sign



Cause of accident

・Although a work procedure manual for dredging work was available, a work procedure manual for temporarily placing the anchor was not provided.

・The victim removed the sling wire while lowering the anchor without checking the condition of the anchor.

・The anchor was not secured after removing the sling wire; however, the victim entered the vicinity of the anchor, which was not a passageway, while moving to retrieve a can of diesel fuel for the pump dredging barge loaded onto the anchor lifting barge.

・The supervisor removed the sling wire when the victim placed the anchor in an unstable manner but left the area to prepare the securing device without giving instructions to the victim. In addition, the other deckhand was winding the anchor wire, so they could not see the damaged area and could not warn the victim.

Contractor's measures to prevent recurrence

・Create a work procedure manual for temporary anchor placement and provide retraining.

・Do not perform other work until the anchor is secured. In addition, do not enter the restricted area until the anchor is secured.

・Set the procedure for temporary anchor placement as follows, and do not remove the sling wire immediately after the anchor is lowered.

(1) Determine the location for lowering the anchor on the pump dredging barge, surround the temporary location with magnetic poles, and post a "no entry" sign.

(2) Land the anchor hoisted by the anchor lifting barge at the temporary location on the pump dredging barge, check the position and balance while hanging from the sling, temporarily secure it, remove the sling wire, secure it permanently, and check the securing condition.

・Ensure the work supervisor remains in the work area and gives instructions regarding the work.

・Thoroughly re-educate workers on the dangers of working onboard through safety training.

■Case 7: Construction worker accident (occupational hazard) [Caught / stuck]

Accident summary	An injury occurred when the right hand of a worker was caught between a sandbag-making auxiliary tool and a backhoe bucket while making a large sandbag. [One injury]

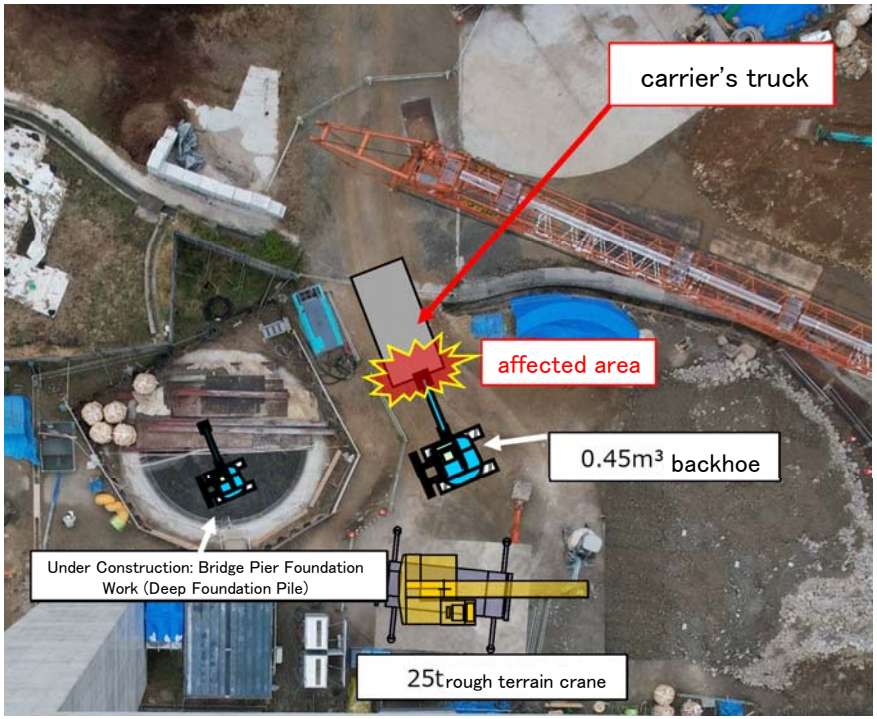
Accident occurrence situation

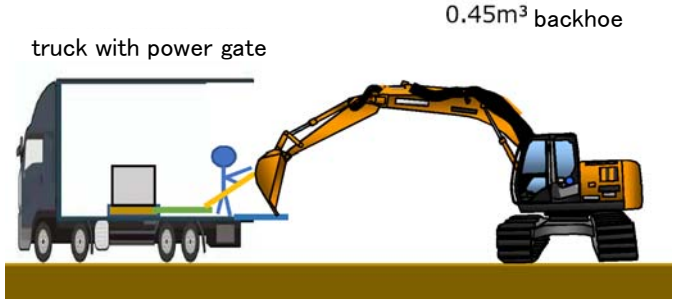
Cause of accident	・This accident occurred while making a sandbag, in which the sandbag-filling aid suddenly came off. The right hand of the rigging worker got caught between the backhoe bucket and the sandbag-filling aid while placing the sandbag on the crane device again on the backhoe, resulting in injury. This occurred in the process of reinstalling the sandbag. ・The accident is believed to have occurred because the controller neglected to take the necessary precautions to guide the backhoe, despite the rigging worker being within the working radius of the heavy equipment.
Contractor's measures to prevent recurrence	・In the event of an unforeseen incident, stop the work immediately and do not resume until safety is confirmed. In addition, contact the supervising engineer immediately. Resume construction after reviewing and adding any necessary notes. ・Conduct checks to see if the position of the controller has a blind spot, such as at the bucket. The controller should only signal to resume work after ensuring that no workers are within the working radius, including the blind spot.

■Case 8: Construction worker accident (occupational hazard) [Caught/stuck]

Accident summary A sling was placed on materials being unloaded by pulling using heavy machinery. The hand of a worker was caught, trapping their fingers, which resulted in injury. [One injury]

Accident occurrence situation





(1) An attempt was made to hook a nylon sling onto a backhoe to pull out the materials; however, the sling did not reach the backhoe.
*Using a backhoe for an unintended purpose

(2) As the sling did not reach the backhoe, the hand holding the nylon sling was caught in the backhoe when the bucket was pulled to move the backhoe, resulting in the thumb being severed.

Cause of accident

・Failure to follow work instructions and work conducted in a different way without reporting to the main contractor.
・Use of equipment for an unintended purpose (pushing materials with a backhoe).
・Failure to check the safety of nearby workers and call out to them when operating heavy equipment.

Contractor's measures to prevent recurrence

・Ensure to perform work as originally instructed. After confirming the work division using the material unloading work division confirmation sheet, follow the work procedure manual while working.
・Ensure to perform work that does not violate regulations, such as unintended use. Add this to the construction plan and revise daily safety materials so all workers are aware of it. Add to the KY activity table and work plan.
・When performing work, ensure that the heavy equipment operator and personnel working in the surrounding area call out to each other and confirm safety before performing the work.

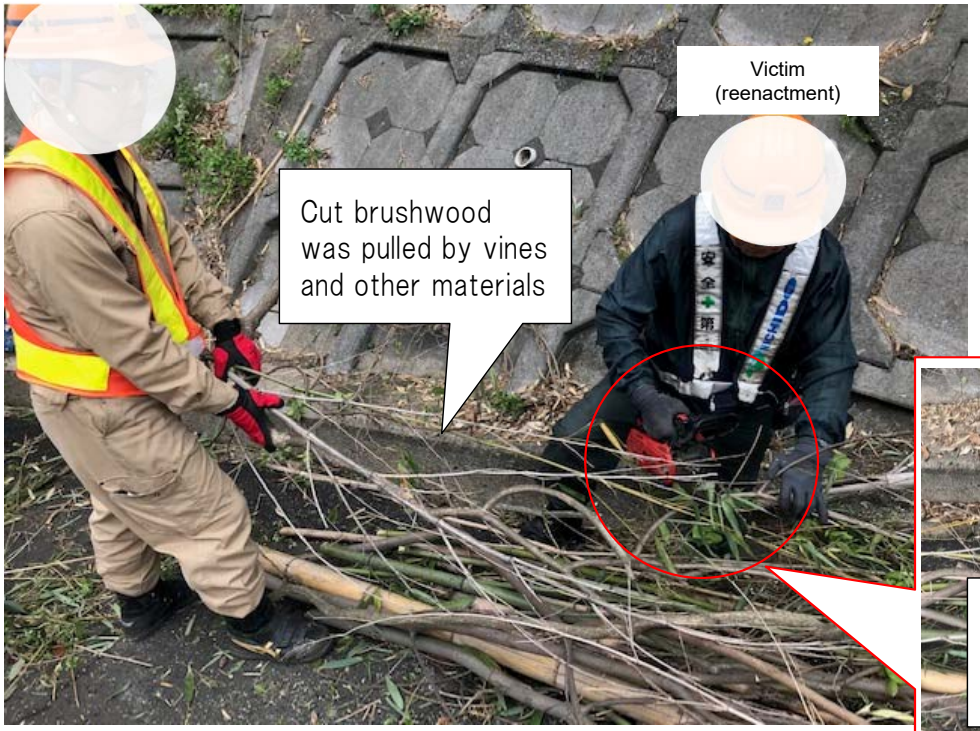
■Case 9: Construction worker accident (occupational hazard) [Cuts/abrasions]

Accident summary

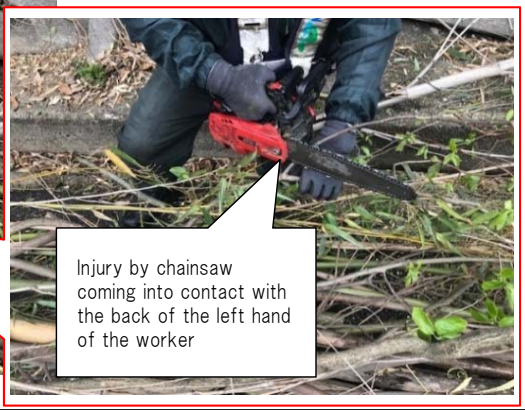
While cutting brushwood into small pieces with a chainsaw, with another worker was loading it manually, the brushwood became entangled with vines and other materials. The resulting movement of the brushwood caused the chainsaw blade to hit the hand of the worker cutting it, which resulted in injury. [One injury]

Accident occurrence situation (image)

After chopping up brushwood with a chainsaw, loaded onto a dump truck



(Reference) Protective clothing to prevent cuts on lower extremities



Cause of accident

・When the worker was loading the brushwood after the chopping work was completed, they tried to load it without checking that the brushwood undergoing cutting was entangled with vines and other materials.
・The main contractor did not provide the necessary guidance to subcontractors, such as precautions to take when using chainsaws and wearing protective clothing.

Contractor's measures to prevent recurrence

・Separate the task of tree-cutting from that of transporting accumulated brushwood for safety considerations.
・Require that all workers undergo hazard awareness training to improve safety awareness.
・Establish specific work procedures for felling trees with chainsaws and review the procedures during morning assemblies before work begins.
・Wear cut-resistant gloves and protective clothing for the lower extremities when felling trees with chainsaws.

Public hazard

Type	Classification	Case	Summary
Public disaster	Damage to buried objects, etc.	Case 10	Damage to buried water pipes (one store) during floor digging using a small backhoe.
		Case 11	During excavation work to lay pipes on the sidewalk, the bucket of a backhoe came into contact with an unidentified water distribution pipe facility and damaged it.
		Case 12	During concrete chipping work to determine the position of the sidewalk's hanging hardware in the renewal of an overhanging sidewalk, a buried communication cable (φ65mm) was damaged.
		Case 13	During filling and shaping work on the slope of a levee using a 0.25m3 backhoe as part of embankment slope repair work, the protective tube of a crisis management water level gauge buried in the ground was caught and damaged.
		Case 14	A boring machine that was used to drill holes for anchors during the construction of a retaining wall (natural ground reinforcement soil), came into contact with an information box and damaged it.
	General vehicle damage	Case 15	When the backhoe was turning, the arm came into contact with an overhead line (communication line), damaging the cable fixing bracket, and the bracket came loose and fell onto the city road, after which a general vehicle passed by, damaging the vehicle's body.
		Case 16	A solar rotating light installed near a parking area for one-way alternating traffic restriction was knocked over by a gust of wind, and came into contact with a parked general vehicle, damaging it.
	Facility damage	Case 17	During work to update the lighting in a tunnel, the lighting control line laid on the cable rack was mistaken for an optical cable for road management, and the optical cable was accidentally cut.
	Personal injury accidents	Case 18	A single-tube barricade was used to prevent entry to the business site as a parking lot for construction workers, but the victim tripped over a step of about 3.5 cm that remained on the business site and leaned onto the single-tube barricade, “falling” along with the single-tube barricade to the bottom of the embankment (H = approx. 4.4 m), resulting in injury.
	Overhead line damage	Case 19	During the work of pouring crushed stone for the foundation of the staircase construction, a backhoe came into contact with the power line of the sluice gate when it turned and severed the power line.
		Case 20	When a truck with a 4 t crane was transporting scaffolding materials and entering the national highway, it neglected to retract the boom, catching the overhead line and causing the utility pole to tilt.
		Case 21	During floor excavation work to install a retaining wall on a public-private section boundary, a power pole was tilted and the cable (communication line) was damaged.
		Case 22	When the backhoe that was used to load the base reinforcement blocks was moving after completing the work, its arm came into contact with the communication line, causing the utility pole to tilt and the wire to sag, and also cutting the lifting wire supporting the load of the communication line.
		Case 23	After concrete was poured, a 0.45m3 backhoe came into contact with an overhead line (electricity) while moving, causing damage.

■Case 10: Public damage accident (public hazard) [General vehicle damage]

Accident summary Damage to buried water pipes (one store) during floor digging using a small backhoe. [Buried pipe damage]

Accident occurrence situation

Cause of accident

・During a prior consultation with the waterworks manager, the location and depth of the pipes were not explicit.
・ Although the construction was carefully conducted, the water supply pipe was installed shallower than expected, causing it to come into contact with and be damaged by the backhoe bucket.

Contractor's measures to prevent recurrence

・Add items for buried objects and overhead lines to the checklist for internal safety patrols. Confirm and warn site personnel during patrols.

・Manually excavate near the buried object and make a thorough visual confirmation of buried objects.

・Post signboards and actual objects at the location of the buried object to make it “visible.”

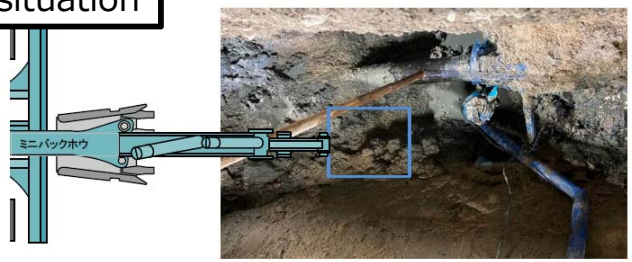
・In addition, collect information from residents near the site to confirm the presence or absence of buried objects and consider the data.

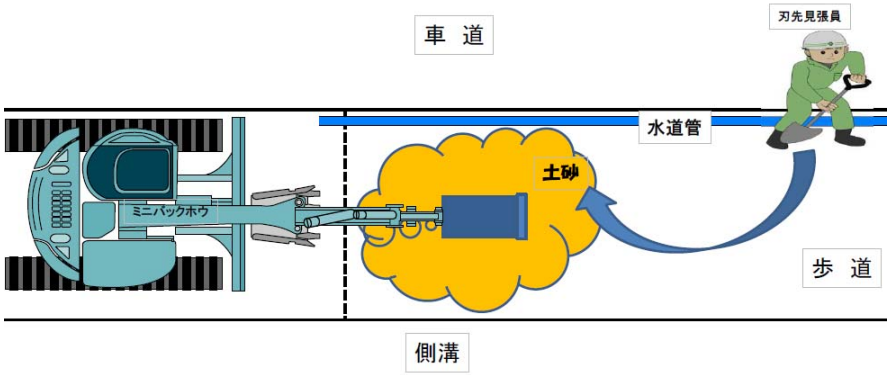
■Case 11: Public damage accident (public hazard) [General vehicle damage]

Accident summary

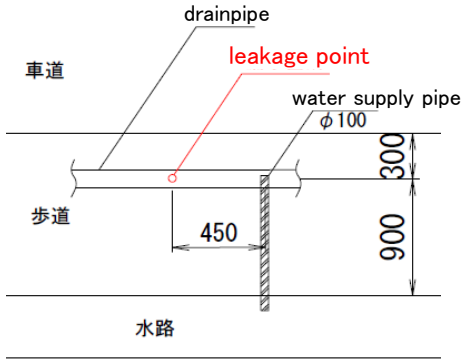
Excavation work was conducted while checking the pipes laid underneath the sidewalk. Heavy machinery was used to remove soil that had been excavated by hand, which came into contact with and damaged a water supply pipe (closed) not listed on the ledger. [Buried pipe damage]

Accident occurrence situation

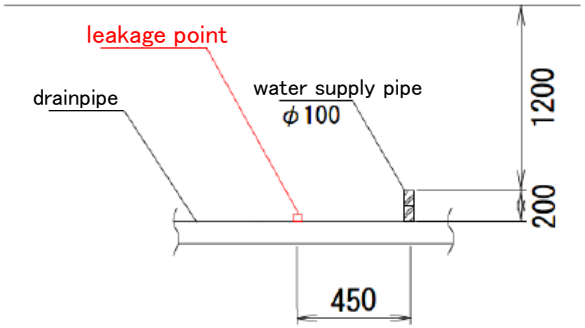




Plan view



Cross-section



Cause of accident

・The existence of unknown facilities (e.g., closed parts) not listed in the ledger was made known in prior discussions with the manager, and a trial excavation survey was conducted. The manager indicated that no unknown facilities were nearby, considering the relative positions of the water supply pipes ahead and behind. Thus, the workers let their guard down.
・The workers forgot to contact the client because they prioritized the restoration work for the leak.
・The stop valve of the buried water supply pipe was installed using a simple method; however, the pipe leaked owing to water pressure.

Contractor's measures to prevent recurrence

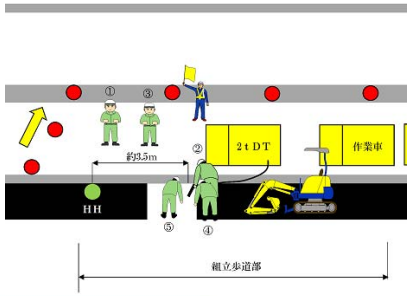
・Do not place too much faith in the preliminary survey results. On days when work is to be done near buried pipes, instruct workers to work with caution, thoroughly informing them in the work instructions of the possible presence of unknown facilities.
・Ensure to promptly report the emergency to the client and take appropriate measures.
・Share the construction process with the manager, and if a similar structure is confirmed, contact the manager and carry out construction while checking the soundness and taking appropriate measures.

■Case 12: Public damage accident (public hazard) [General vehicle damage]

Accident summary

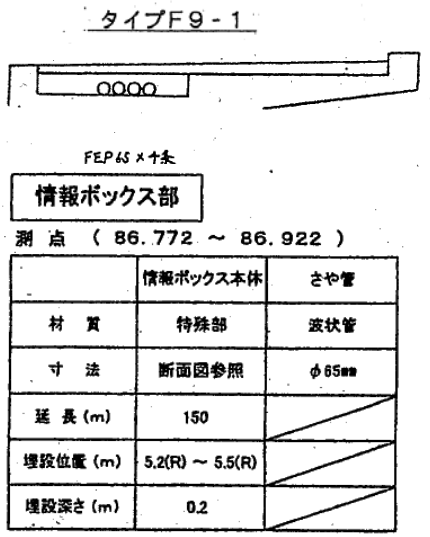
A buried communication cable (ϕ = 65 mm) was damaged during concrete chipping work to renew an overhanging sidewalk by determining the position of its hanging hardware. [Buried cable damage]

Accident occurrence situation



[Damage situation]

[Cross-section]



	情報ボックス本体	さや管
材 質	特殊部	波状管
寸 法	断面図参照	φ65mm
延 長 (m)	150	
埋設位置 (m)	5.2(R) ～ 5.5(R)	
埋設深さ (m)	0.2	

Information box ledger (excerpt)

Cause of accident

・The information in the management ledger was overconfident, and the work plan was created without directly checking the location of the buried pipes or understanding the detailed structure, after which instructions were given to the subcontractor.
・Work continued despite the situation being different from the assumption made for the underground buried facility in the management ledger.
・Work was conducted with the preconceived notion that the pipes were inside the roadbed material; however, as no crushed stone was found, work continued, and the work was conducted beyond the buried depth recorded in the ledger.
・Discussions were held on the assumption that work would be conducted after relocating the cable; however, no new consultation was made despite changing the work to before the relocation.

Contractor's measures to prevent recurrence

・Temporarily suspend work if an event that differs from the work plan for the day occurs, hold consultations with the main contractor, and revise the work plan before work is resumed.
・Share the purpose and intent of the work in daily KY activities and promptly share information (report, liaise, and consult) in response to changes to the situation while conducting the work with appropriate judgment.
・After the detailed structure is understood, check the location of the buried pipe directly without relying too much on the management ledger.

■Case 13: Public damage accident (public hazard) [General vehicle damage]

Accident summary

The protective pipe of a water level gauge buried in the ground got caught and damaged when repairing the slope of a levee by filling holes and shaping the slope with a backhoe. [Buried pipe damage]

Accident occurrence situation

Cause of accident

・Obstacles and piping were not checked in advance using ledgers, and the location of the piping was unknown.
・An obstacle (water level gauge) was observed on site, and the main body of the water level gauge was also on the levee; however, the water level gauge pipe was not noticed when checking the repair area on site before conducting the repair.

Contractor's measures to prevent recurrence

・Check for obstacles in advance using the ledger provided by the client.
・Report to the supervisor and obtain information if details about the obstacle are unclear.
・Have the supervising engineer and work chief of the subcontractor check the surrounding area to confirm the presence of any obstacles and the repair procedure when inspecting the repair area before conducting repair work.
・If the heavy equipment operator has difficulty seeing the end of the bucket while working, have a supervisor stationed to eliminate blind spots and guide the operator.

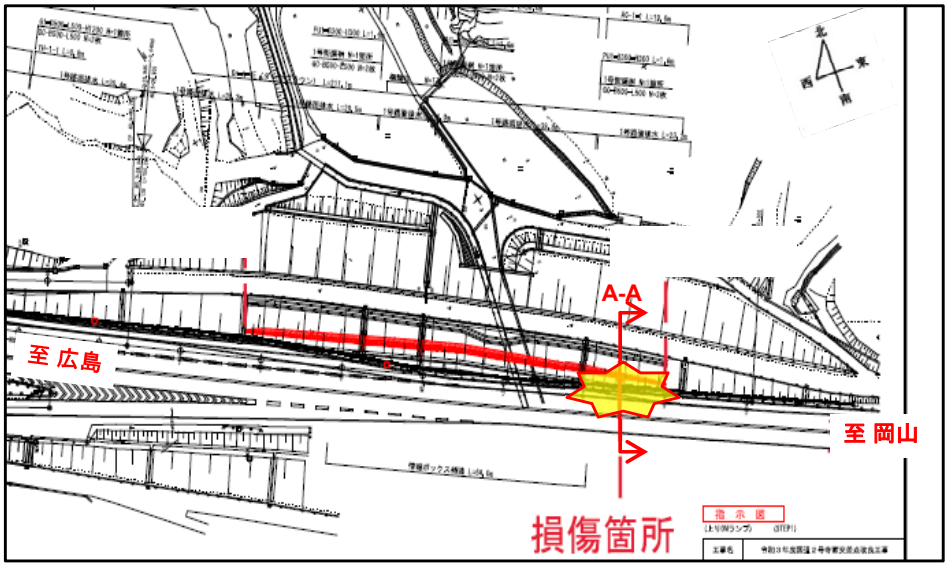
■Case 14: Public damage accident (public hazard) [General vehicle damage]

Accident summary

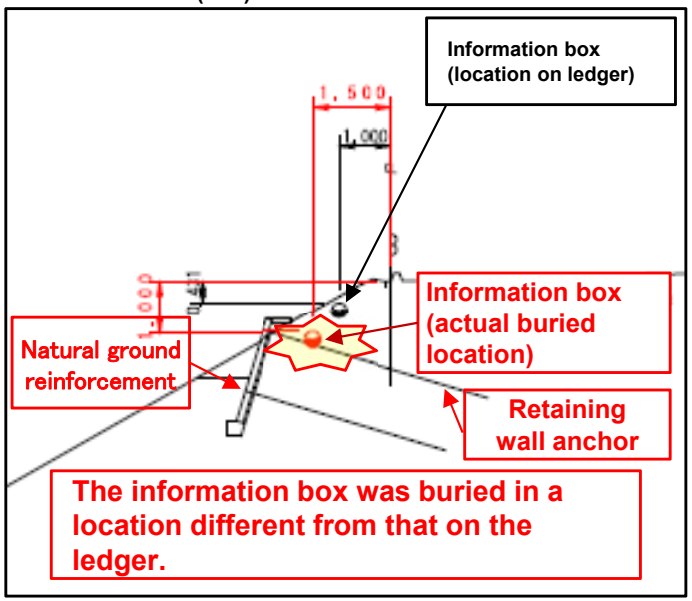
Four cable sheaths were damaged in an information box during anchor installation for a retaining wall (natural ground reinforcement method). [Buried cable damage]

Accident occurrence situation

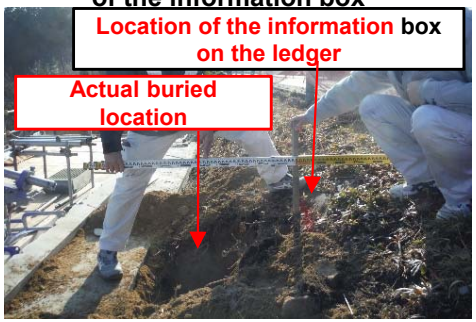
■Plan view



■Cross-section (A-A)



■Damage confirmation status of the information box



■Trial excavation status (trial excavation confirmed after the accident)

Cause of accident

- A discrepancy was observed between the location of the information box on the ledger and the on-site location.
- Confirmation of the location of the buried object was insufficient.

Contractor's measures to prevent recurrence

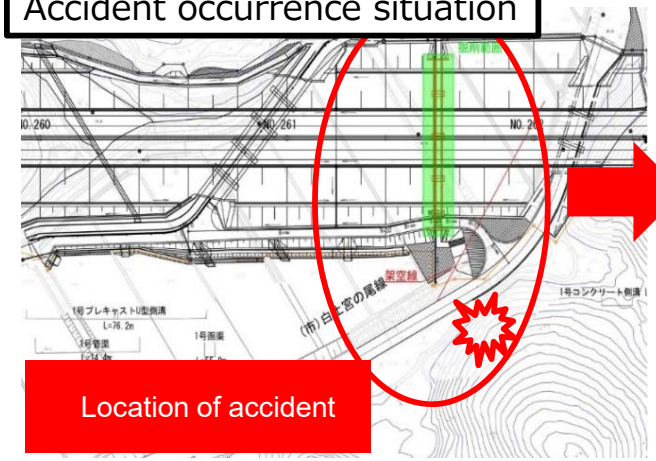
- Always conduct a buried object survey by trial excavation to confirm that the answers given during burial consultation are consistent with those on-site.
- Conduct a trial excavation survey of the buried object (information box) and confirm that its position and height do not affect the anchor.
- Expose the information box behind the natural reinforcement soil, visually confirm, and drill holes for the anchor.

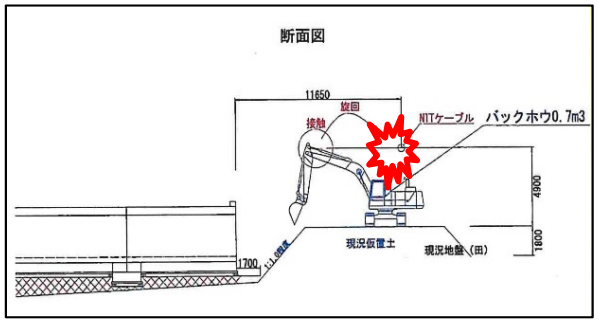
■Case 15: Public damage accident (public hazard) [General vehicle damage]

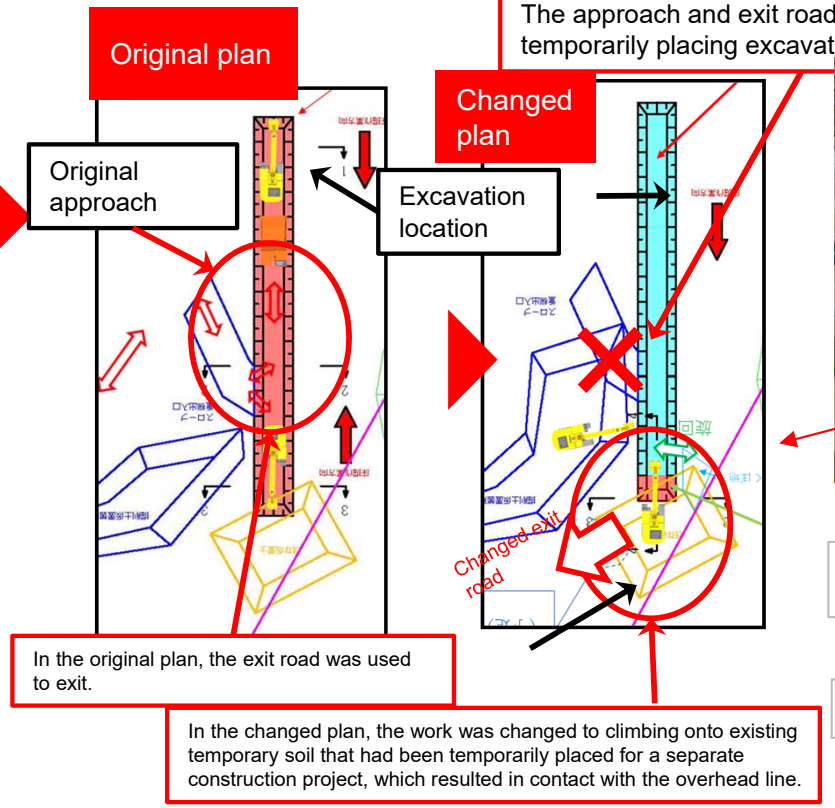
Accident summary

The arm of a backhoe came into contact with an overhead line (NTT) during a turn, damaging the cable fixing bracket. The loose fixing bracket scattered and fell onto a city road, hitting and damaging part of the body of a passing vehicle. [General vehicle damage]

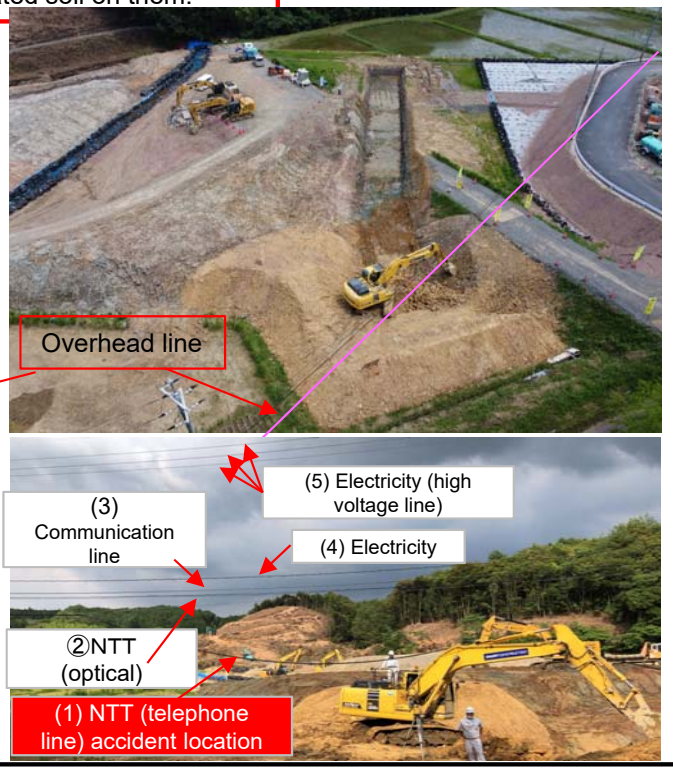
Accident occurrence situation







The approach and exit roads were blocked by temporarily placing excavated soil on them.



Cause of accident

・No reconfirmation was conducted with the owner of the publicly occupied property.
・No warning signs were provided regarding the overhead line.
・The subcontractor performed the work using a different construction method than the instructed method. In addition, the main contractor did not provide appropriate guidance.

Contractor's measures to prevent recurrence

・If the position of the overhead line is changed within the construction area, check before starting work and consult with the occupying company.
・Ensure a distance of 2 m from the overhead line and install a guard fence to prevent entry.
・Use the created work plan and review it with the staff of the main contractor and all workers at morning assemblies. When making changes to the work, check with the staff of the main contractor, create a written work plan, and ensure all workers are informed again before commencing work.

■Case 16: Public damage accident (public hazard) [General vehicle damage]

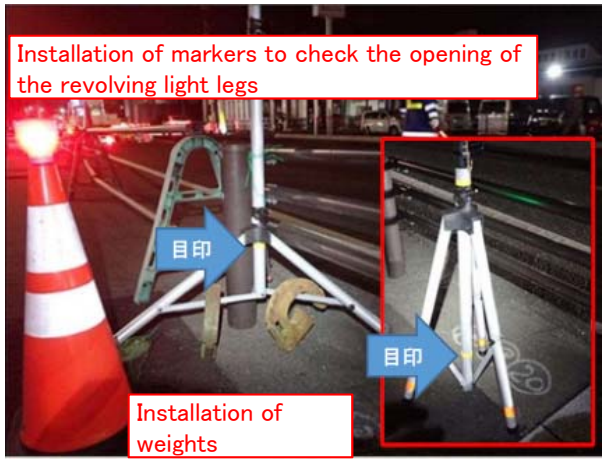
Accident summary

A solar rotating light installed near a parking area for one-way alternating traffic restriction got knocked over by a gust of wind and came into contact with and damaged a parked vehicle. [General vehicle damage]

Accident occurrence situation

Measures to prevent recurrence

*Changed stopping position so that revolving light will not come into contact with stopped vehicles even if it tips over



Cause of accident

・The solar revolving light did not have a weight attached and was installed on the roadside without being fixed.
・The tripod of the solar revolving light was used without being fully extended.
・The method for handling the equipment was not fully understood.

Contractor's measures to prevent recurrence

・When installing the solar rotating light, attach two 5 kg weights to the legs of the stand and tie them to the posts (sidewalk side) of the crossing prevention fence to prevent it from tipping over.
・Place a new marker (yellow tape) at the lowest position of the solar rotating light tripod and visually check that it is properly spread out.
・Change the stopping position of the rotating light to a position that prevents it from coming into contact with stopped vehicles even if it tips over.

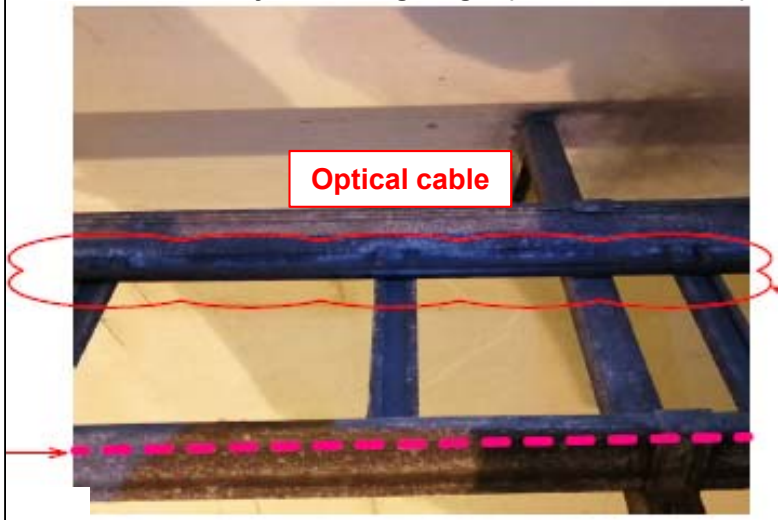
■Case 17: Public damage accident (public hazard) [Facility damage]

Accident summary

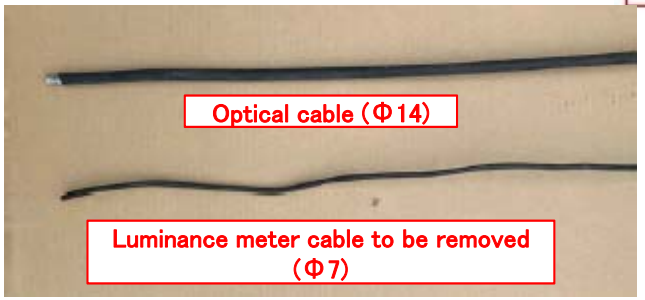
While updating the lighting in a tunnel, the lighting control line on the cable rack was mistaken for an optical cable for road management and accidentally cut. [One optical cable cut]

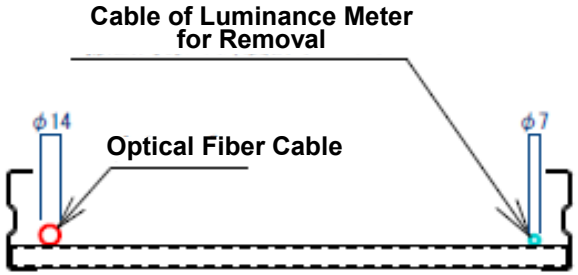
Accident occurrence situation

View of Cable Tray at Working Height (Before Installation)



Luminance meter cable to be removed (not visible due to the rack shadow)





Cable Tray Cross-Section

miscut optical fiber cable)

Optical Fiber Cable Cut Situation (Starting Point))

Cable of Luminance Meter for Removal

Cause of accident

・Since no excavation work was conducted, examining the checklist of occupied properties in the unique specifications and the adjacent construction plan of the information box was determined to be unnecessary.
・The luminance meter cable, which was located high up, was only visually inspected from below. However, recognizing the cable was not possible, as it was hidden by the parent beam of the cable rack. Hence, the optical cable was mistaken for the luminance meter cable.
・Because the sizes of the luminance meter cable and the optical cable were unknown, the luminance meter cable was mistaken for the optical cable and cut.

Contractor's measures to prevent recurrence

・Check cables within the construction area using road registers and on-site surveys, and check for duplications as necessary to avoid missing necessary measures.
・Closely inspect the object to be removed and pull the cable to confirm that it is the correct one.
・Determine the size and type of cable to be removed and mark the object in advance.

■Case 18: Public damage accident (public hazard) [Personal injury accidents]

Accident summary

The victim (third party) got injured after tripping over a step on the business site, falling over a single-pipe barricade, and then under the bank with the single-pipe barricade. [One injury]

Accident occurrence situation

Measures to prevent recurrence

Cause of accident

1) Regarding the victim "tripping over"
・The contractor removed the traffic rope that the river administrator had installed as a measure to prevent entry before the start of construction to provide a waiting area for vehicles and installed a single-pipe barricade closer to the riverside bank than the original position, enabling third parties to approach the steps on the business site.
・Barricades were installed to make it safer; however, tripping over the steps was unexpected.
2) Regarding the victim's "fall"
・The victim was startled by the headlights of a car and hurriedly tried to escape, tripping over a step, crashing into a single-pipe barricade, and falling under the bank (H = approx. 4.4 m) along with the barricade.

Contractor's measures to prevent recurrence

1) Regarding the victim "tripping over"
・Surround the area where the incident occurred with a single-pipe barricade to prevent third parties from approaching.
・Post "no entry" signs, lock the area daily, and install self-luminous lights to improve visibility at night.
2) Regarding the victim's "fall"
・Install the single-pipe barricade away from the bank and secure it with rebar and other materials.
3) Regarding the management of the construction site
・Integrate the construction site with the construction work and note whether the business land within the river area will be used for construction work in writing (e.g., a construction plan) so that the river administrator and contractor can be aware.

■Case 19: Public damage accident (public hazard) [Overhead line damage]

Accident summary	While pouring crushed stone for the foundation of a staircase under construction, a backhoe came into contact with and damaged the power line of the sluice gate during a turn. [One overhead line cut]

Accident occurrence situation

Situation at the time of accident

Measures to prevent recurrence

Measures to prevent recurrence

Cause of accident	While the backhoe was moving along the top of the embankment to pour and level the foundation of the staircase, the arm of the backhoe came into contact with the power lead-in line (for powering the culvert) that crosses above the top of the embankment, and the power line was cut.

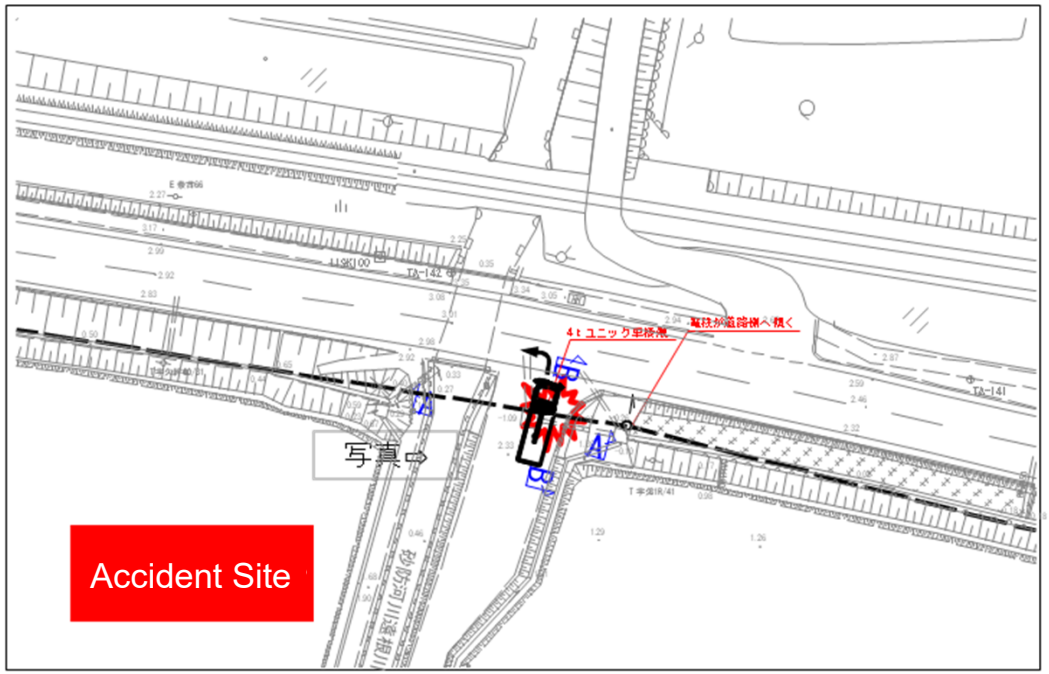
Contractor's measures to prevent recurrence	・For a self-propelled backhoe, self-propel with a boom height that considers the building limit. ・Post signboards to warn about overhead lines and station monitors. ・Share the work schedule with all workers through weekly schedules and ensure thorough implementation for all tasks. ・Check the work procedure manual and do not perform any unplanned work or placement. ・Thoroughly check the qualifications of backhoe operators and never allow unqualified personnel to perform work.

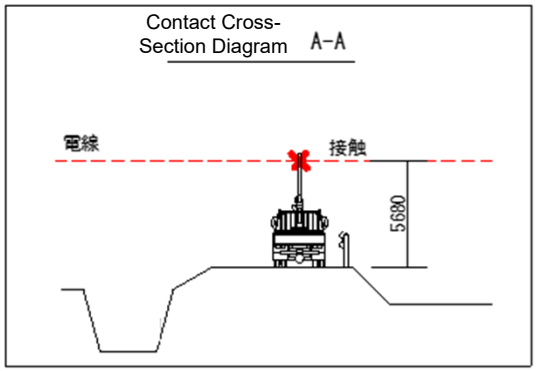
■Case 20: Public damage accident (public hazard) [Overhead line damage]

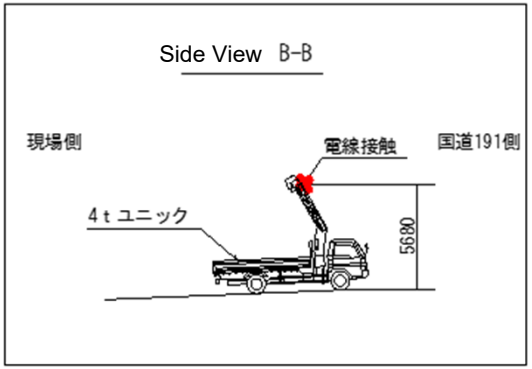
Accident summary

Workers forgot to store the boom of the crane when transporting scaffolding materials loaded onto a crane truck (4 t). Consequently, the boom came into contact with the overhead line and tilted the utility pole. [One utility pole tilted]

Accident occurrence situation







Cause of accident

・No proper guidance on routes to travel between sites via public roads, such as informing workers of the precautions and so on, was provided.
・Although the work involved the use of cranes, no proper guidance was provided on measures to take when transporting materials from the site.

Contractor's measures to prevent recurrence

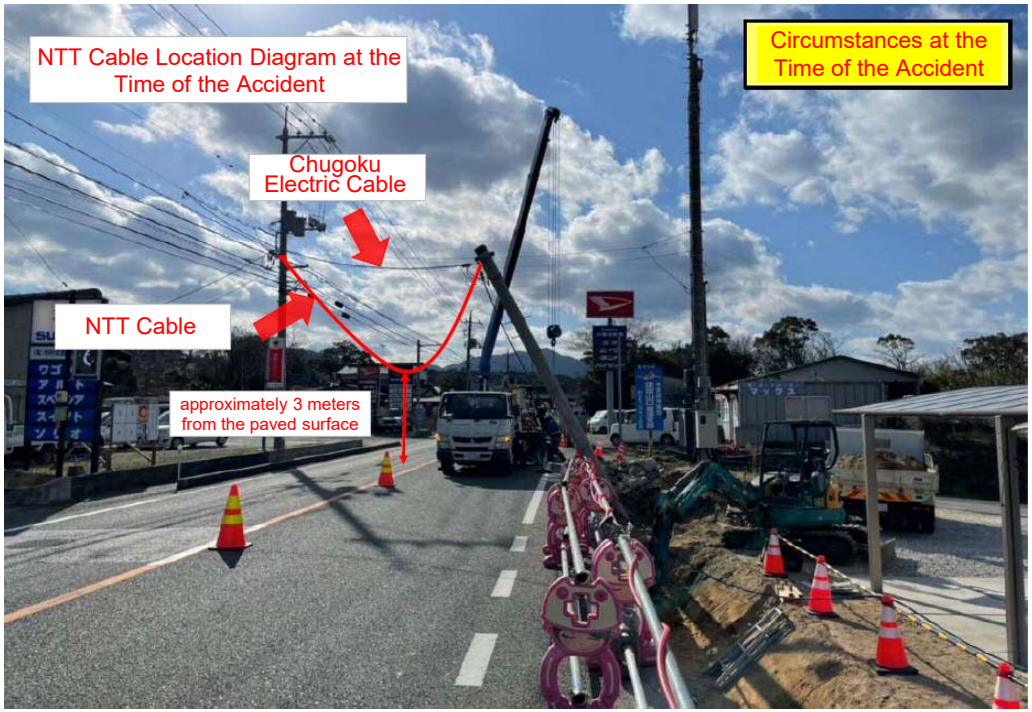
・Post the schedule for bringing in and taking out materials at morning assemblies and ensure everyone is informed.
・Place a "boom storage/check surroundings" reminder in a position that will be noticeable when opening and closing the door.
・Install a gate-type gate. (H = 3.8 m)
・Establish and create awareness surrounding exit rules (passing through a gate-type gate/checking the state of the package in a full-length mirror).
・Install a stop line in front of the gate.
・Place an overhead line reminder flag near the overhead line.

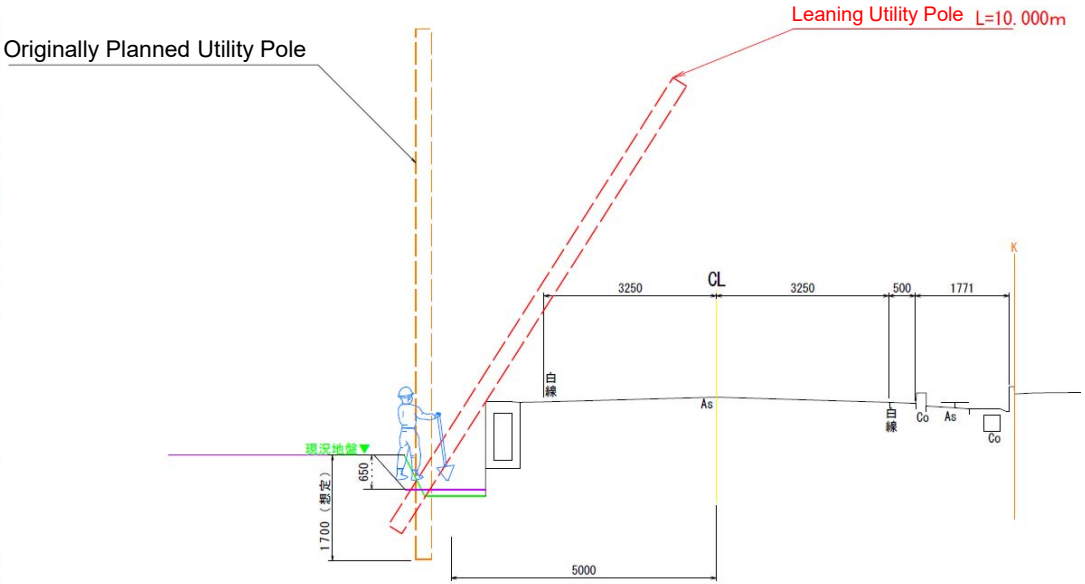
■Case 21: Public damage accident (public hazard) [Overhead line damage]

Accident summary

The power supply pole was tilted during floor excavation, damaging the overhead line (supply cable/communication line). [One overhead line cut]

Accident occurrence situation





Cause of accident

・Since heavy machinery and cranes that could affect the overhead line were not used, no discussions were held with the pole manager.
・The embedded depth of the pole was not confirmed with the pole manager, and construction was conducted based on the general embedding procedure communicated by the pole construction company and from past experience.
・The ground soil was relatively loose and could be manually excavated; however, work continued because it was determined that the machine would not tip over if the embedding was secured.

Contractor's measures to prevent recurrence

・Be sure to consult with the facility manager when an overhead line is within the construction area, even if it does not directly affect the construction.
・Check the utility poles and overhead lines within the construction area using the road register and on-site survey, and check for overlaps as necessary to avoid missing necessary measures.
・Temporarily halt work if the site manager of the main contractor determines that the soil is prone to collapse during excavation, then reconsider whether to continue construction.

■Case 22: Public damage accident (public hazard) [Overhead line damage]

Accident summary

While moving, the boom of the backhoe came into contact with the communication line, tilting the utility pole and cutting the hoisting wire of the communication line. [Utility pole tilted; one overhead line (hoisting wire) cut]

Accident occurrence situation

Accident occurrence situation

Measures to prevent recurrence

Measures to prevent recurrence

Cause of accident

- Safety patrols became a mere formality.
- Workers failed to follow accident prevention measures, such as warnings about overhead lines.
- Workers drove with the backhoe boom raised high.
- The backhoe path was uneven, and the driver was distracted by the road surface.

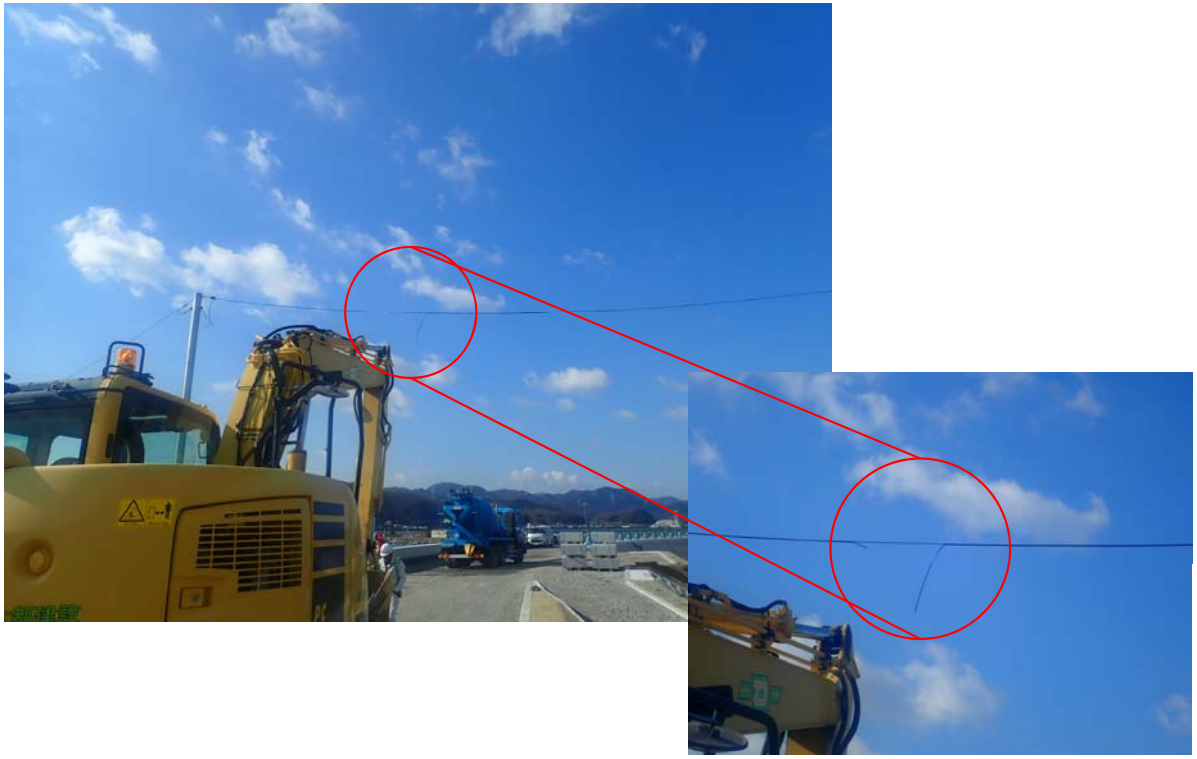
Contractor's measures to prevent recurrence

- Install a height limit tower 5 m in front of and behind the overhead line.
- Assign new full-time safety patrol officers who will conduct safety patrols to ensure work safety.
- Hold emergency safety meetings to raise awareness of safety management.
- Use a 4-t crane truck to conduct loading work instead of a backhoe (mobile crane specification).
- Level and compact the loading area and runway to eliminate unevenness.
- Have the site representative and supervising engineer check and begin work when implementing countermeasures.

■Case 23: Public damage accident (public hazard) [Overhead line damage]

Accident summary	The boom of a backhoe came into contact with an overhead line while moving, causing damage. [One overhead line (electricity) cut]

Accident occurrence situation



Measures to prevent recurrence

Cause of accident	・The monitor was supposed to be contacted when moving heavy equipment; however, since the monitor was not close and the moving distance was short, the heavy equipment operator moved the equipment at their discretion. Consequently, the boom came into contact with the overhead line and cut it.	Contractor's measures to prevent recurrence	・Install protective measures (gate-type height restrictions) on the overhead line. ・Always contact the monitor before moving the backhoe.