Fatal and non-fatal accidents in sand collapse prevention civil engineering work in Japan in 1999-2021

sand collapse prevention civil engineering work industry Code No.030108

Type of accidents in sand collapse prevention civil engineering work in 1999-2021

Type of accidents	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Type of accidents
fall from height	117	117	93	82	67	60	72	57	51	53	44	32	47	38	40	44	24	21	19	32	29	28	31	1,198	fall from height
falling to same level	44	30	36	19	29	18	18	11	13	17	11	16	7	11	16	15	7	7	8	6	13	6	7	365	falling to same level
crash	15	20	10	11	5	10	11	9	6	4	4	6	3	1	5	3	1	1	3	7	1	4	3	143	crash
struck by flying or falling object	43	51	35	31	24	28	21	21	15	14	13	13	18	20	16	13	10	7	11	7	7	7	10	435	struck by flying or falling object
collapse	20	17	15	18	21	10	13	6	7	5	4	5	4	1	4	1	5	2	1	1	4	6	4	174	collapse
crashed by	29	23	20	23	20	15	13	12	29	7	10	9	9	7	17	8	7	11	5	11	8	9	8	310	crashed by
caught in/between	51	33	26	33	31	21	19	18	18	19	14	12	12	18	11	13	9	6	15	10	12	7	9	417	caught in/between
cut	12	10	10	3	17	8	6	4	5	5	7	4	4	3	4	7	2	3	4	4	4	5	1	132	cut
injury to the sole of the foot	1	1	2		1		1			2			1										1	10	injury to the sole of the foot
drown																									drown
contact to high/low- temperature	2	1	1		2	1			1		1	2		1	3				1	1	1	1	1	20	contact to high/low- temperature

contact to harmful																									contact to
		1	1	1				1	1	2	1	1	1	1	1	1							3	16	harmful
substance																									substance
electric shock																									electric shock
explosion	1																							1	explosion
burst											1													1	burst
fire													1				1		1					3	fire
traffic accident (public	2	7	7	6	1	4	4	5	4	4	7	2	3	7	2	5	1	5	3	2	1	2	5	89	traffic accident
road)							4	J	4	4	,		3						3						(public road)
traffic accident				1											1									2	traffic accident
(others)				•																					(others)
reaction to																									reaction to
motion/improper	7	7	2	8	6	6	4	3	1	3	1	4	4		2	1	3	2	2	2	4	1	2	75	motion/improper
motion																									motion
others	1	3	3		1		3	1	1		2		1	1						1			5	23	others
unclassifiable					1				1								1							3	unclassifiable
total	345	321	261	236	226	181	185	148	153	135	120	106	115	109	122	111	71	65	73	84	84	76	90	3,417	total

Causal agents (large) of fatal and non-fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Causal (L) agents	1000	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Causal (L)
Causar (L) agents		2000	2001	2002	2003	2004	2003	2000	2007	2000	2003	2010	2011	2012	2013	2014	2013	2010	2017	2010	2017	2020	2021		agents
machine	61	43	49	27	45	27	28	24	26	27	12	18	19	15	22	22	19	13	10	17	20	19	9	572	machine
crane, conveying																									crane,

machine	27	33	21	39	33	35	29	19	19	17	25	15	14	19	20	15	7	16	12	13	11	6	13	458	conveying
machine																									machine
athor aguinment	31	28	19	25	16	12	21	18	21	7	16	4	10	9	12	12	9	6	8	9	10	9	13	325	other
other equipment	31	20	19	25	10	12	21	10	21	/	10	4	10		12	12		6	0			9	13	323	equipment
tompovom buildings																									temporary
temporary buildings, establishments	99	80	78	51	55	40	35	37	28	33	27	37	22	18	26	28	15	15	17	15	20	14	15	805	buildings,
establishments																									establishments
substance, material	41	53	32	27	19	20	18	14	12	16	9	15	13	15	8	6	3	3	6	7	6	5	9	357	substance,
substance, material))	32	27	19	20	10	14	12			را	13				J.							337	material
load	2	2	2	5	2	3	4	2	2	5	4		1	1	1	2	1	1	2	1	2	1	1	47	load
environment	80	78	60	59	55	42	48	33	43	29	26	16	35	31	32	26	14	11	17	21	13	21	24	814	environment
others	4	4		3	1	2	2	1	2	1	1	1	1	1	1		3		1	1	2	1	6	39	others
total	345	321	261	236	226	181	185	148	153	135	120	106	115	109	122	111	71	65	73	84	84	76	90	3,417	total

Causal agents (middle) of fatal and non-fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Causal (M) agents	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Causal (M) agents
engine																									engine
power transmission mechanism	1																			1				2	power transmission mechanism
woodworking machine	7	6	6	3	11	4	2	4	3	4	4	1	3	1	1	4		2	3		4	1		74	woodworking machine

										11										II I		
					ll .																	machine
	11.1	3				2	1	1	1	1				1	1		3		1		18	metal manufacturing
							•			•				•	•							machine
7	2	6	4	E	2	2	1	2	2	2	1	4	1	2		1	2	1	2	1	6.1	general
	3	0	4)	2	٥	ı)		1	4		3		1			3	ı	04	machine
																						mobile
																	1		1		2	silviculture machine
2	17	18	16	9	8	4	9	10	5	5	5	7	3	2	9	4	2	5	2	3	167	crane
																						conveying
15	17	12	16	20	7	15	7	9	8	8	11	10	9	5	6	7	10	5	2	8	237	machine
4	5	3	3		4		1	6	2	1	3	3	3		1	1	1	1	2	2	54	vehicle
																					1	pressure vessel
																						chemical
																						facilities
																						welding
																						equipment
	_																					kiln, caldron
												1									1	electric
																						equipment
4	6	4	6	5	5	4		3	3	1	2	2	5	2		4	1			1	72	human power
	_																					machine, tools
	15	2 17 15 17 4 5	2 17 18 15 17 12 4 5 3	2 17 18 16 15 17 12 16 4 5 3 3	2 17 18 16 9 15 17 12 16 20 4 5 3 3	2 17 18 16 9 8 15 17 12 16 20 7 4 5 3 3 4 1	2 17 18 16 9 8 4 15 17 12 16 20 7 15 4 5 3 3 4 1	2 17 18 16 9 8 4 9 15 17 12 16 20 7 15 7 4 5 3 3 4 1 1 1 1 1 1 1 1	2 17 18 16 9 8 4 9 10 15 17 12 16 20 7 15 7 9 4 5 3 3 4 1 6	2 17 18 16 9 8 4 9 10 5 15 17 12 16 20 7 15 7 9 8 4 5 3 3 4 1 6 2 1	2 17 18 16 9 8 4 9 10 5 5 15 17 12 16 20 7 15 7 9 8 8 4 5 3 3 4 1 6 2 1	2 17 18 16 9 8 4 9 10 5 5 5 15 17 12 16 20 7 15 7 9 8 8 11 4 5 3 3 4 1 6 2 1 3	2 17 18 16 9 8 4 9 10 5 5 5 7 15 17 12 16 20 7 15 7 9 8 8 11 10 4 5 3 3 4 1 6 2 1 3 3 4 5 3 4 1 6 2 1 3 3	2 17 18 16 9 8 4 9 10 5 5 5 7 3 15 17 12 16 20 7 15 7 9 8 8 11 10 9 4 5 3 3 4 1 6 2 1 3 3 3 3 3 4 1 6 2 1 3 3 3 4 5 3 3 4 1 6 2 1 3 3 3 3 4 1 6 2 1 3 3 3 4 5 3 3 4 1 6 2 1 3 3 3 4 5 6 7 7 9 8 8 11 10 9 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 <	2 17 18 16 9 8 4 9 10 5 5 5 7 3 2 15 17 12 16 20 7 15 7 9 8 8 11 10 9 5 4 5 3 3 4 1 6 2 1 3 3 3	2 17 18 16 9 8 4 9 10 5 5 5 7 3 2 9 15 17 12 16 20 7 15 7 9 8 8 11 10 9 5 6 4 5 3 3 4 1 6 2 1 3 3 3 1	2 17 18 16 9 8 4 9 10 5 5 5 7 3 2 9 4 15 17 12 16 20 7 15 7 9 8 8 11 10 9 5 6 7 4 5 3 3 4 1 6 2 1 3 3 3 1 1 1	2 17 18 16 9 8 4 9 10 5 5 5 7 3 2 9 4 2 15 17 12 16 20 7 15 7 9 8 8 11 10 9 5 6 7 10 4 5 3 3 4 1 6 2 1 3 3 3 1 1 1	1	2 17 18 16 9 8 4 9 10 5 5 5 7 3 2 9 4 2 5 2 15 17 12 16 20 7 15 7 9 8 8 11 10 9 5 6 7 10 5 2 4 5 3 3 4 1 6 2 1 3 3 3 1 1 1 1 2 4 5 3 3 4 1 6 2 1 3 3 3 1 1 1 1 2 4 5 3 3 4 1 6 2 1 3 3 3 1 1 1 1 2 4 5 6 7 10 5 2 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1<	2 17 18 16 9 8 4 9 10 5 5 5 7 3 2 9 4 2 5 2 3 15 17 12 16 20 7 15 7 9 8 8 11 10 9 5 6 7 10 5 2 8 4 5 3 3 4 1 6 2 1 3 3 3 1 1 1 1 2 2 3 3 4 1 6 2 1 3 3 3 1 1 1 1 2 2 4 5 3 3 4 1 6 2 1 3 3 3 1 1 1 1 2 2 4 5 6 7 10 5 2 8 1 1 1 1 1 1 1 1 1 1 1<	7 3 6 4 5 2 3 1 2 3 2 1 4 1 3 1 2 1 3 1 2 1 3 1 2 1 3 1 2 1 3 1 1 1 3 1 64 2 17 18 16 9 8 4 9 10 5 5 5 7 3 2 9 4 2 5 2 3 167 15 17 12 16 20 7 15 7 9 8 8 11 10 9 5 6 7 10 5 2 8 237 4 5 3 3 4 1 6 2 1 3 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

tools	20	19	15	18	12	5	16	11	14	7	13	1	9	6	9	6	7	4	4	6	9	9	11	231	tools
other equipments,	2	3		1		1		2	3					1		1		2		2	1		1	20	other equipments, facilities
temporary buildings, establishments	99	80	78	51	55	40	35	37	28	33	27	37	22	18	26	28	15	15	17	15	20	14	15	805	temporary buildings, establishments
hazards, harmful substances	1	1	2	1				1	1		1	1		1	1				1				2	14	hazards, harmful substances
materials	40	52	30	26	19	20	18	13	11	16	8	14	13	14	7	6	3	3	5	7	6	5	7	343	materials
load	2	2	2	5	2	3	4	2	2	5	4		1	1	1	2	1	1	2	1	2	1	1	47	load
natural environment	80	78	60	59	55	42	48	33	43	29	26	16	35	31	32	26	14	11	17	21	13	21	24	814	natural environment
other causal agent										1	1		1									1	5	9	other causal
no causal agent	3	4		3	1	2	2	1	1			1			1		2		1	1	2		1	26	no causal agent
unclassifiable	1								1					1			1							4	unclassifiable
total	345	321	261	236	226	181	185	148	153	135	120	106	115	109	122	111	71	65	73	84	84	76	90	3,417	total

Causal agents (small) of fatal and non-fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Causal (S) agents	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Causal (S) agents

engine																						engine
power transmission mechanism																	1				1	power transmission mechanism
circular sawing machine		3	3	2		3	1	1		2	1		2			1		1			20	circular sawing machine
band sawing machine																						band sawing machine
wood planer machine																						wood planer machine
hollow chisel mortiser, wood borer																						hollow chisel mortiser, wood borer
chamfering machine, router, woodworking milling machine																						chamfering machine, router, woodworking milling machine
chain saw		3	8		3		2	3	1	1		1	2		2	2		2	1		31	chain saw
other woodworking machines					1		1											1			3	other woodworking machines
leveling, transporting or loading machine		5	3	3	3	8	4		4	1	3	2	1	3	3	1	1	4		1		leveling, transporting or loading machine
excavating machine		22	14	15	15	6	8	3	5	10	6	10	12	5	2	3	7	8	8	4	163	excavating machine
foundation work machine			1	1			1				2			1					1	1	8	foundation work

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hardening machine					1			2						2						5	hardening machine
demolition machine			1		1	3		1							1			1		8	demolition machine
vehicle for high lift work												1								1	vehicle for high lift work
other construction machines		9	6	2	2	5	2	1	2	2	5	3	6	3	1	2	3	3	2	59	other construction machines
lathe																					lathe
drill press, milling machine																					drill press, milling machine
grinding machine, buffing machine			1		1	1	1		1				1	1		2		1		10	grinding machine, buffing machine
power press																					power press
forging pressure																					forging pressure hammer
shearing machine																					shearing machine
other metal manufacturing machines			2		1			1								1				5	other metal manufacturing machines
centrifugal machine																					centrifugal machine
mixer, grinder			1					2												3	mixer, grinder
roll machine (except printingroll machine)																					roll machine (except printingroll machine)
injection molding																					injection molding

machine																						machine
food manufacturing machine																						food manufacturing
printing machine																						printing machine
industrial robot																						industrial robot
other general power machines		7	5	5	2	3	1	2	1	2	1	4	1	3		1	2	1	3	1	45	other general power machines
felling machine																	1		1		2	felling machine
mobile logging																						mobile logging machine
skyline yarding machine																						skyline yarding machine
other mobile																						other mobile
silviculture machine																						silviculture machine
crane			8	2		2	3		2		2	4	1			1		1	1		27	crane
mobile crane		2	10	6	6		6	10	2	4	2	3	2	2	8	2	2	4	1	3	75	mobile crane
derrick crane																						derrick crane
elevator, lift																						elevator, lift
cargo lifting appliance																						cargo lifting appliance
gondola																						gondola
lumberyard																						lumberyard
equipment, logging				1	1	1			1		1										5	equipment, logging
cableway																						cableway

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simple skyline																								simple skyline
yarding equipment																								yarding equipment
other powered							1	1				1					1	1					5	other powered
crane																								crane
truck	8	<u> </u>		5		12	5	7	5	6	6	5	6	7	7	4	6	5	7	5	2	6	114	truck
forklift																1							1	forklift
railway equipment								1	1		1								1			2	6	railway equipment
conveyor				1		1		1					1						1				5	conveyor
loader				1					1					1									3	loader
straddle carrier																								straddle carrier
rough terrain hauler	2	2		3		1	1			1		2	1	1	1			1					14	rough terrain hauler
other powered	5			2		6	1	6		2	1	1	3	1	1			1					31	other powered
conveying machines													3										31	conveying machines
cars, bus,	4			3			4		1	6	2	1	3	3	3		1	1	1	1	2	2	38	cars, bus,
motorcycle									<u> </u>								<u> </u>	<u> </u>	<u> </u>	<u> </u>				motorcycle
railway vehicle																								railway vehicle
other vehicles																								other vehicles
boiler																								boiler
pressure vessel																								pressure vessel
other pressure																								other pressure
vessels																								vessels
chemical facilities																								chemical facilities
gas welding																								gas welding

equipment																						equipment
arc welding equipment																						arc welding equipment
other welding																						other welding equipment
kiln, caldron																						kiln, caldron
industrial dryer																						industrial dryer
other kiln, caldron																						other kiln, caldron
transmission												1									1	transmission
electric power facilities																						electric power
other electrical equipment																						other electrical equipment
human power cranes																						human power
human power																						human power
human power						1						1				1					3	human power
hand tool		4	4	5	5	3		3	3	1	2	1	5	2		3	1			1	43	hand tool
ladder		7	8	9	7	7	3	8		4	2	4	4	3	3	2	4	6	5	5	91	ladder
slinging tool		2	2	1		2	1	2			1	1		3			1	1	2	3	22	slinging tool
other tools		6	2	6	4	5	3	3	1	5	3	4	2	1	1	2	1	2	2	3	56	other tools
other equipment,																						other equipment,

facilities					2	3					1		1		2		2	1		1	13	facilities
scaffolding		23	9	11	6	4	7	7	5	4	3	5	9	3	4	1	4	3	1		109	scaffolding
timbering		6	3	2	2	2	3	1	1	1								1			22	timbering
stairs, landing stage		3	5	2	1	3	3	1	1	1	1	4	3	1			1	2	1	1	34	stairs, landing stage
opening								1			1			1				1			4	opening
roof, beam, haze, crossbeam, principal rafter					3		1		1					1	1						7	roof, beam, haze, crossbeam, principal rafter
working platform, boot board		7	7	2	4	1	6	3	2	1			4		1	1			1	3	43	working platform, boot board
passage		12	7	3	4	2	3	4	7	2	1	6	2	2	4	6	4	5	3	2	79	passage
building, establishment		24	21	14	11	13	6	9	15	7	8	4	6	6	3	6	6	7	7	5	178	building, establishment
other temporary buildings, establishments		3	3	1	6	3	4	1	5	6	4	7	4	1	2	3		1	1	4	59	other temporary buildings, establishments
explosive substance																						explosive substance
inflammable substance					1											1					2	inflammable substance
inflammable gas																						inflammable gas
harmful substance		1						1			1									2	5	harmful substance
radiation																						radiation
other hazards,		1				1			1			1									4	other hazards, harmful substances

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metal material		12		11		6	5	4	7	2	7	2	6	2	1	1	1	2	2	3	2	2	78	metal material
lumber, bamboo		5		2		5	2	4	3	1	3	4	3	3			1		3		2	3	44	lumber, bamboo
stone, sand, substance		9		3		6	3	1	2	4	4	2		2	3	2		1	1	2			45	stone, sand, substance
other materials		4		3		1	3	2	4	1		5	5		2		1	2	1	1	1	2	38	other materials
load		2		2		3	2	2	4	4		1	1	1	2	1		2	1	2	1		31	load
machine/equipment as load						1			1								1					1	4	machine/equipment as load
natural ground, rock		44		45		34	25	28	24	17	12	23	22	18	17	10	5	7	12	11	17	15	386	natural ground, rock
standing tree		10		8		11	6	11	5	7	1	11	6	8	7	2	6	5	5	1	3	7	120	standing tree
water		1								1	1		1						1				5	water
abnormal environment																								abnormal environment
high/cold temperature environment		1					1	1		1	1		1	3				1	1		1	1	13	high/cold temperature environment
other environments		4		2		3	1	3			1	1	1	3	2	2		4	2	1		1	31	other environments
other causal agent									1	1		1									1	5	9	other causal agent
no causal agent				1		2	1	1			1			1		2		1	1	2		1	14	no causal agent
unclassifiable								1					1			1							3	unclassifiable
total		261		226		185	148	153	135	120	106	115	109	122	111	71	65	73	84	84	76	90	2,334	total

Workers age of fatal and non-fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Age	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Age
19 years old or less	8	7	5	4	3	3	1		1			5		1	2	3	2		1		1		2	49	19 years old or less
20-29	26	29	30	30	19	12	19	17	14	9	10	6	8	9	5	10	6	6	6	6	4	7	7	295	20-29
30-39	33	25	28	21	34	28	23	28	14	21	16	12	20	23	18	10	12	5	9	9	6	10	18	423	30-39
40-49	51	47	44	27	39	37	22	16	17	22	14	17	30	15	19	21	12	14	14	12	14	15	19	538	40-49
50-59	106	87	80	71	73	53	71	56	57	42	37	32	26	28	34	28	19	20	13	19	16	20	16	1,004	50-59
60 years old or	121	126	74	83	58	48	49	31	50	41	43	34	31	33	44	39	20	20	30	38	43	24	28	1,108	60 years old or
more	121	120																20					20	'	more
total	345	321	261	236	226	181	185	148	153	135	120	106	115	109	122	111	71	65	73	84	84	76	90	3,417	total

Workers' number of workplace of fatal and non-fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Workers scale	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Workers scale
9 workers or less	137	124	108	102	99	87	80	80	68	56	65	60	62	53	51	52	27	27	32	46	43	38	44	1,541	9 workers or less
10-29	142	143	113	101	81	63	79	47	73	59	47	40	39	47	54	46	32	33	34	30	30	30	38	1,401	10-29
30-49	46	38	33	23	32	24	17	13	12	16	3	6	6	8	7	10	9	3	6	7	11	5	6	341	30-49
50-99	13	14	6	7	11	6	5	7		1	5		6		8	2	3	1	1	1		3	1	101	50-99
100-299	7	2	1	3	3	1	4	1		3			2	1	2	1		1					1	33	100-299
300 workers or																									300 workers or
more																									more
total	345	321	261	236	226	181	185	148	153	135	120	106	115	109	122	111	71	65	73	84	84	76	90	3,417	total

Month	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Month
January	38	33	24	17	19	18	10	18	15	14	12	14	11	11	9	8	5	3	5	4	9	4	6	307	January
February	29	31	19	30	24	18	16	16	8	14	11	10	9	8	8	8	7	7	7	6	8	2	8	304	February
March	25	23	29	19	23	21	11	10	19	10	6	7	14	8	12	8	11	5	6	5	4	7	4	287	March
April	26	24	16	12	8	9	15	9	3	6	5	8	4	10	5	4	5	5	3	6	6	5	6	200	April
May	26	19	16	21	16	14	11	10	11	8	10	13	16	8	3	8	5	6	9		7	8	6	251	May
June	21	22	16	12	15	16	16	13	9	7	6	7	9	8	9	5		3	4	6	6	6	8	224	June
July	28	29	27	26	16	15	18	12	9	12	9	6	10	16	18	14	9	3	6	11	6	5	10	315	July
August	23	26	17	17	16	14	13	21	14	6	6	10	8	7	14	9	9	8	8	5	8	7	9	275	August
September	31	29	24	17	23	8	11	10	19	17	13	10	7	7	15	11	3	7	7	14	7	10	5	305	September
October	36	30	26	23	21	22	25	7	13	9	17	8	6	11	12	11	9	10	4	12	7	4	11	334	October
November	41	24	26	23	23	17	24	13	10	16	13	9	13	9	10	17	7	5	9	5	10	8	9	341	November
December	21	31	21	19	22	9	15	9	23	16	12	4	8	6	7	8	1	3	5	10	6	10	8	274	December
total	345	321	261	236	226	181	185	148	153	135	120	106	115	109	122	111	71	65	73	84	84	76	90	3,417	total

Prefecture of fatal and non-fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Prefecture	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Prefecture
Hokkaido	17	10	16		13		8	7	4	6	14	6	5	4	4	1	3		4	6	8	3	9	148	Hokkaido
Aomori	3	2	5		3		4	2	4	1	3	1	2	1	1		3	1	1	1	2	2		42	Aomori
lwate	4	1	6		1		1		3	1	1	1	3	3	1	2			1	4		1	1	35	lwate

Miyagi	3			1				2	3	1	1		2	3	2				1		1	20	Miyagi
Akita	5	8	5	7	2	1	2	1	1	2			3	1	1					3	1	43	Akita
Yamagata	1	4	2	2				1		1	1		1	2	2						2	19	Yamagata
Fukushima	5	6	1	4	1		2				1	3	1	2						3		29	Fukushima
Ibaraki	2	1	1						1				1		1							7	Ibaraki
Tochigi	3	3	3	2	3	3	1	1	3	2	4	2		1		1			1			33	Tochigi
Gunma	7	12	15	7	5	4	3	4	4	4	2		5	2	4	1	2	2	6	1	6	96	Gunma
Saitama	1			4	2															1	2	10	Saitama
Chiba		3			2	2	1				1			1		1			1			12	Chiba
Tokyo	1		6	3	8	2	2	1	2		1	2	2	3	4	3	5		1	1	2	49	Tokyo
Kanagawa	10	5	5	12	7		1	1	4	2	4	2	1	2	3		2			3	1	65	Kanagawa
Niigata	12	10	7	7	8	13	4	8	3	3	1	2	2	6	1	4	1	2	2		2	98	Niigata
Toyama	13	7	5	6	4	1	6	1	2	2	2	6	4	1			3	2	1		5	71	Toyama
Ishikawa	3	1	4	2	3	1	3	5	3	2	2		1	2	1					2	3	38	Ishikawa
Fukui	21	17	7	11	8	7	4	4	3	2	1	2	2	2		1		1	3		2	98	Fukui
Yamanashi	6	8	7	6	4	5	6	11	4	1	6		5	3	3	2	3	2	2	4		88	Yamanashi
Nagano	19	18	14	10	8	8	15	5	6	3	4	5	8	4	5		6	4	3	3	8	156	Nagano
Gifu	25	27	10	11	5	7	5	6	2	2	6	6	5	2	5		2		1	2	4	133	Gifu
Shizuoka	7	8	6	7	5	5	8	4	7	2	4	3	4	5	6	4	9	4	2	2	4	106	Shizuoka
Aichi	9	8	4	4	5	2	2	2	3	2	1		1	2		1			1	1		48	Aichi
Mie	12	13	2	4	5	5	4	4	2	1	1	2	1	1		1	1		3	1	1	64	Mie
Shiga	2	4	2	1	1	2		1	3	1			1					1	1		1	21	Shiga
Kyoto	5	1	1		1	2	3				1	1			1	1	1			2	3	23	Kyoto

Osaka	2				1		1		1				1				1	1				8	Osaka
Hyogo	2	9	7	8	8	10	6	7	3	4	2	3	6	4		3		2	5	1	2	92	Hyogo
Nara	7	7	1	5	1	2	3		3	4		1	4	3		1			1	2		45	Nara
Wakayama	8	6	12	4	2	1		2		4	5	5	4	2			1	1		1		58	Wakayama
Tottori	1	1	4		1	2	4	3	3	1	2	3		3	1	1	1				3	34	Tottori
Shimane	7	6	4	3	1			1		1	3	6	4	4		1	1	1	1		1	45	Shimane
Okayama	8	8	5	6	3	2		2		1	1	1	2	1			3	1	3	2	2	51	Okayama
Hiroshima	13	11	11	8	6	5	1	3	3	3	1	1	1	2		6	2	4	6	7	1	95	Hiroshima
Yamaguchi	2	5	6	2	4	2	2	5	2	3	7	1	1	1		3		2	2	2	1	53	Yamaguchi
Tokushima	6	13	17	10	10	13	9	7	3	5	1	6	2	6	3	2	1	3	1	1		119	Tokushima
Kagawa	1	1	2		4			1			1	1	1	2	1		1		1		1	18	Kagawa
Ehime	13	12	9	9	9	3	4	4	3	3	6	11	7	4	3	5	6	10	4	6		131	Ehime
Kochi	20	24	13	5	5	6	7	7	4	8	3	4	4	9	1	5	1	4	4	11	6	151	Kochi
Fukuoka	6	7	3	3	4	6	4	3	5	6	2	1	5	5	4	1	3	6	5		4	83	Fukuoka
Saga	1	1	2		1				1	1	1		3		1			3		1		16	Saga
Nagasaki	7	1	2	3	2	2	1		1	4	1	1		5	1		2	2		2		37	Nagasaki
Kumamoto	4	8	7	4	6	1	2	2	3	5	4	4	3	2	2	4	2	1	5		1	70	Kumamoto
Oita	18	6	6	6	1	4	9	6	3	4	4	5	8	4	3	2	1	7	4		5	106	Oita
Miyazaki	5	4	5	2	1		2		1	1	2	2	1	1		1				2		30	Miyazaki
Kagoshima	18	14	11	20	14	10	15	12	7	7	15	7	8	5	6	9	6	7	3	3	5	202	Kagoshima
Okinawa					1							2	1									4	Okinawa
total	345	321	261	226	185	148	153	135	120	106	115	109	122	111	71	65	73	84	84	76	90	3,000	total

Fatal and non-fatal accidents mean fatal and non-fatal injuries and occupational diseases with work absence of 4 days and more. Data of 2011 year include fatal and non-fatal accidents caused by Great East Japan Earthquake in 2011.

Data sources: https://anzeninfo.mhlw.go.jp/user/anzen/tok/anst00.htm (MHLW, Japan)

Return to https://www.jisha.or.jp/english/statistics/2021e_industry.html

Fatal accidents in sand collapse prevention civil engineering work in Japan in 1999-2021

sand collapse prevention civil engineering work industry Code No.030108

Type of fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Type of accidents	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Type of accidents
fall from height	9	12	7	3	5	5	7	2	9	8	4	2	5	2	3	2	1	3		3	1	2	2	97	fall from height
falling to same level	1	1	2		1	1	1		1			2		1										11	falling to same
crash						1								1										2	crash
struck by flying or falling object	1	2	1	3		2		3	2		1	1		2	1	1								20	struck by flying or falling object
collapse	3	3		5	3	1			2		2	2	1		2			1			1			26	collapse
crashed by	1	5	1		1	2	1		3	1	1	1	1		3			3	1	1	1		1	28	crashed by
caught in/between	2		2	2	1		2			1														10	caught in/between
cut	1																							1	cut

	7																								
injury to the sole of																									injury to the sole
the foot																									of the foot
drown																									drown
contact to high/low-																									contact to
temperature																									high/low-
temperature																									temperature
contact to harmful																									contact to
substance																									harmful
																									substance
electric shock																									electric shock
explosion																									explosion
burst																									burst
fire																									fire
traffic accident (public			1						1		1					1						2	1	7	traffic accident
road)																ľ							ľ		(public road)
traffic accident (athors)																									traffic accident
traffic accident (others)																									(others)
reaction to																									reaction to
motion/improper																									motion/improper
motion																									motion
others																	1							1	others
unclassifiable																									unclassifiable
total 18	8	23	14	13	11	12	11	5	18	10	9	8	7	6	9	4	2	7	1	4	3	4	4	203	total

Causal (L) agents	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	3 2014	2015	2016	2017	2018	2019	2020	2021	total	Causal (L) agents
machine	8	4	4	2	3		2		4	3		2		2	1	1				1		1	1	39	machine
crane, conveying machine	1	2	3	3	2	7	4		4	2	2	2			1	2		1			1	3	1		crane, conveying machine
other equipment		2					1	2					1								1		2	9	other equipment
temporary buildings, establishments	5	5	3	1	3	2	3	1	3	4	1	3	2		2			2							temporary buildings, establishments
substance, material		1						1						1										3	substance, material
load																									load
environment	4	9	4	7	3	3	1	1	7	1	6	1	4	2	5	1	1	4	1	3	1			69	environment
others														1			1							2	others
total	18	23	14	13	11	12	11	5	18	10	9	8	7	6	9	4	2	7	1	4	3	4	4	203	total

Causal agents (middle) of fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Causal (M) agents	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Causal (M)
addar (m) agents	.,,,,				2003	2001		2000				2010			2013		2013	2010	2017	2010	2017			totai	agents

engine							1													1	engine
power transmission mechanism																					power transmission mechanism
woodworking machine	1																			1	woodworking machine
construction machine	7	4	4	2	3		1	4	3		2	2	1	1		1		1	1	37	construction machine
metal manufacturing machine																					metal manufacturing machine
general machine																					general machine
mobile silviculture machine																					mobile silviculture machine
crane		2		1		4	2		2		1		1	1	1		1	1		17	crane
conveying machine	1		3	2	1	3	2	4		2	1			1						20	conveying machine
vehicle					1													2	1	4	vehicle
pressure vessel																					pressure vessel
chemical facilities																					chemical facilities
welding equipment																					welding equipment

	_		_							<u> </u>						<u> </u>	<u> </u>			<u> </u>	<u> </u>		_	<u> </u>	
kiln, caldron																									kiln, caldron
electric equipment																									electric
electric equipment																									equipment
human power machine,																									human power
tools																									machine, tools
tools		2					1	2					1								1		2	9	tools
other equipments,																									other
facilities																									equipments,
																									facilities
temporary buildings,																									temporary
establishments	5	5	3	1	3	2	3	1	3	4	1	3	2		2			2						40	buildings,
																									establishments
hazards, harmful																									hazards,
substances																									harmful
Substances																									substances
materials		1						1						1										3	materials
load																									load
																									natural
natural environment	4	9	4		3	3	l l			I	6		4	2	5		l	4	ľ	3	I			69	environment
other causal agent																									other causal
other causal agent																									agent
no causal agent																	1							1	no causal
no causal agent																									agent
unclassifiable														1										1	unclassifiable

total	18	23	14	13	11	12	11	5	18	10	9	8	7	6	9	4	2	7	1	4	3	4	4	203	total	
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Causal agents (small) of fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Causal (S) agents	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Causal (S) agents
engine							1																	1	engine
power transmission																									power transmission
mechanism																									mechanism
circular sawing	1																							1	circular sawing
machine	•																								machine
band sawing																									band sawing
machine																									machine
wood planer																									wood planer
machine																									machine
hollow chisel																									hollow chisel
mortiser, wood																									mortiser, wood
borer																									borer
chamfering																									chamfering
machine, router,																									machine, router,
woodworking																									woodworking
milling machine																									milling machine
chain saw																									chain saw
other woodworking																									other woodworking
machines																									machines

leveling,																		leveling,
transporting or				1		1	1	1		1							5	transporting or
loading machine																		loading machine
excavating machine	7	4	3	1	3		2	1	1	1	1	1		1	1	1	28	excavating machine
foundation work																		foundation work
machine																		machine
hardening machine																		hardening machine
demolition machine								1									1	demolition machine
vehicle for high lift																		vehicle for high lift
work																		work
other construction			1				1		1								3	other construction
machines																	3	machines
lathe																		lathe
drill press, milling																		drill press, milling
machine																		machine
grinding machine,																		grinding machine,
buffing machine																		buffing machine
power press																		power press
forging pressure																		forging pressure
hammer																		hammer
shearing machine																		shearing machine
other metal																		other metal
manufacturing																		manufacturing
machines																		machines

centrifugal machine																centrifugal machine
mixer, grinder																mixer, grinder
roll machine (except printingroll machine)																roll machine (except printingroll machine)
injection molding machine																injection molding
food manufacturing machine																food manufacturing
printing machine																printing machine
industrial robot																industrial robot
other general power machines																other general power machines
felling machine																felling machine
mobile logging machine																mobile logging machine
skyline yarding machine																skyline yarding machine
other mobile silviculture machine																other mobile silviculture machine
crane	1		1	2		1	1			1					7	crane
mobile crane	1	1	3			1			1		1		1	1	10	mobile crane
derrick crane																derrick crane
elevator, lift																elevator, lift

cargo lifting																	cargo lifting
appliance																	appliance
gondola																	gondola
lumberyard																	lumberyard
equipment, logging																	equipment, logging
cableway																	cableway
simple skyline																	simple skyline
yarding equipment																	yarding equipment
other powered																	other powered
crane																	crane
truck		2	1			1	1	1	1		1					8	truck
forklift					1											1	forklift
railway equipment																	railway equipment
conveyor																	conveyor
loader																	loader
straddle carrier																	straddle carrier
rough terrain hauler	1	1	1	1			1									5	rough terrain hauler
other powered								1								6	other powered
conveying machines					2		2	l I								6	conveying machines
cars, bus,																	cars, bus,
motorcycle				 										2	1	4	motorcycle
railway vehicle																	railway vehicle
other vehicles																	other vehicles
boiler																	boiler

		 	 	 ==	 ==	 							
pressure vessel													pressure vessel
other pressure													other pressure
vessels													vessels
chemical facilities													chemical facilities
gas welding													gas welding
equipment													equipment
arc welding													arc welding
equipment													equipment
other welding													other welding
equipment													equipment
kiln, caldron													kiln, caldron
industrial dryer													industrial dryer
other kiln, caldron													other kiln, caldron
transmission													transmission
electric power													electric power
facilities													facilities
other electrical													other electrical
equipment													equipment
human power													human power
cranes													cranes
human power													human power
hauling equipment													hauling equipment
human power													human power
machine													machine

hand tool																					hand tool
ladder																					ladder
slinging tool		1						1										1	1	4	slinging tool
other tools		1					1	1					1						1	5	other tools
other equipment,																					other equipment,
facilities																					facilities
scaffolding	1	2	1	1	1						1					1				8	scaffolding
timbering		1				1							1							3	timbering
stairs, landing stage	1																			1	stairs, landing stage
opening																					opening
roof, beam, haze,																					roof, beam, haze,
crossbeam,										1										1	crossbeam,
principal rafter																					principal rafter
working platform,	1																			1	working platform,
boot board																					boot board
passage		1							1			1								3	passage
building,	2	1	2			1	3	1	2	2			1	2		1				18	building,
establishment		_						_													establishment
other temporary																					other temporary
buildings,					2					1		2									buildings,
establishments																					establishments
explosive substance																					explosive substance
inflammable																					inflammable
substance																					substance

inflammable gas																								inflammable gas
harmful substance																								harmful substance
radiation																								radiation
other hazards,																								other hazards,
harmful substances																								harmful substances
metal material								1						1									2	metal material
lumber, bamboo																								lumber, bamboo
stone, sand,		1																					1	stone, sand,
substance		I																					I	substance
other materials																								other materials
load																								load
machine/equipment																								machine/equipment
as load																								as load
natural ground,	4	4	3	6	3	3	1	1	6	1	5		3	1	3	1	1	2		2	1		51	natural ground,
rock										•				•										rock
standing tree		3	1	1					1		1	1	1	1	2			2	1	1			16	standing tree
water																								water
abnormal																								abnormal
environment																								environment
high/cold																								high/cold
temperature																								temperature
environment																								environment
other environments		2																					2	other environments
other causal agent																								other causal agent

no causal agent																	1							1	no causal agent
unclassifiable														1										1	unclassifiable
total	18	23	14	13	11	12	11	5	18	10	9	8	7	6	9	4	2	7	1	4	3	4	4	203	total

Workers age of fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Age	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Age
19 years old or less												1												1	19 years old or less
20-29		1			2		1		1												1			6	20-29
30-39	2	1	2	2	2	3	4		2	1	2		1	2										24	30-39
40-49	5	6	1	1	2			1	2	3			3		2	1		2				2		31	40-49
50-59	5	5	4	4	3	8	1	3	8	1	1	3	2	1	3	2	2	2		3	1	1	1	64	50-59
60 years old or more	6	10	7	6	2	1	5	1	5	5	6	4	1	3	4	1		3	1	1	1	1	3	77	60 years old or more
total	18	23	14	13	11	12	11	5	18	10	9	8	7	6	9	4	2	7	1	4	3	4	4	203	total

Workers' number of workplace of fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Workers scale	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Workers scale
9 workers or less	4	7	5	6	6	4	6	5	6	2	5	4	4	5	3	2		2	1	2		3	1	83	9 workers or less
10-29	11	8	6	3	2	7	2		10	7	4	3	1	1	5	2		4		1	2	1	1	81	10-29
30-49	1	7	2	3	2	1	3		1			1			1			1		1			2	26	30-49
50-99	1	1	1	1									2				2				1			9	50-99
1																									

100-299	1				1				1	1														4	100-299
300 workers or																									300 workers or
more																									more
total	18	23	14	13	11	12	11	5	18	10	9	8	7	6	9	4	2	7	1	4	3	4	4	203	total

Month of fatal accidents in sand collapse prevention civil engineering work in 1999-2021

Month	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Month
January	2	3	1	2	1				2	1	1		2	1										16	January
February	1	1	1			3	1			1	1	1	1	1				2			1			15	February
March		5			1		1	1	3	2			2		1	1								17	March
April	5		2	1			1			1					1		1	1				1	1	15	April
May		3	4			1			1		1			1		1								12	May
June	1	1	1		1	2	1		1						1			1			1		1	12	June
July	2	1	3	4		1	1		1		2	1		1			1	2						20	July
August	1	2		2	1	1		1	3			1			3	1		1	1					18	August
September	1	2	1	1		1	2	1	3	1	1	4	1							1		1	1	22	September
October		2	1	1	4	2			1	1	3	1	1	1		1				2	1			22	October
November	3	2		1	3	1	1	2	2	2				1	3							1		22	November
December	2	1		1			3		1	1										1		1	1	12	December
total	18	23	14	13	11	12	11	5	18	10	9	8	7	6	9	4	2	7	1	4	3	4	4	203	total

Prefecture	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	total	Prefecture
Hokkaido	1	2	1		2	2	2	1	1		1			1					1		1	1		17	Hokkaido
Aomori				1						1	1											1		4	Aomori
lwate														1									1	2	lwate
Miyagi	1			1																				2	Miyagi
Akita												1					1							2	Akita
Yamagata				1																				1	Yamagata
Fukushima	1												1											2	Fukushim
Ibaraki																									Ibaraki
Tochigi							1		1															2	Tochigi
Gunma			1		1				1														1	4	Gunma
Saitama																									Saitama
Chiba									1															1	Chiba
Tokyo			1				1		1															3	Tokyo
Kanagawa	1					1	3			1	2				1									9	Kanagawa
Niigata	1	1	1		2											1					1			7	Niigata
Toyama	1		2				1		1				1											6	Toyama
Ishikawa	1					3				1		1				1								7	Ishikawa
Fukui	1	2	1						2	1														7	Fukui
Yamanashi		1	1	3	1	1			3	2			1		1									14	Yamanasl
Nagano		3	2								1		1		2						1	1	1	12	Nagano
Gifu		3		1				1				1												6	Gifu

Shizuoka	2	1		1		1			2		1				2			1	1			12	Shizuoka
Aichi	1			1	1							1										4	Aichi
Mie	1	1																1				3	Mie
Shiga																							Shiga
Kyoto																							Kyoto
Osaka																							Osaka
Hyogo			1								1		2			1				1		6	Hyogo
Nara	1																	1				2	Nara
Wakayama																							Wakayama
Tottori																							Tottori
Shimane														1	1						1	3	Shimane
Okayama		1						1														2	Okayama
Hiroshima		3	1																1			5	Hiroshima
Yamaguchi			1			1						1						2				5	Yamaguchi
Tokushima		1	1		1			1				1										5	Tokushima
Kagawa						1																1	Kagawa
Ehime						1	1		1	1		1		1				1				7	Ehime
Kochi	3	3																				6	Kochi
Fukuoka				3				1		1	1				1		1					8	Fukuoka
Saga	1	1													1							3	Saga
Nagasaki					1						1		1									3	Nagasaki
Kumamoto					2					1				1		1						5	Kumamoto
Oita				1			1					1		1					1			5	Oita

Miyazaki									1															1	Miyazaki
Kagoshima	1					1	1		3	1								1		1				9	Kagoshima
Okinawa																									Okinawa
total	18	23	14	13	11	12	11	5	18	10	9	8	7	6	9	4	2	7	1	4	3	4	4	203	total

Data sources: https://anzeninfo.mhlw.go.jp/user/anzen/tok/anst00.htm (MHLW, Japan)

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