Fatal and non-fatal accidents in gravel digging in Japan in 1999-2021

gravel digging industry Code No.020202

Type of accidents in gravel digging 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	31	35	34	23	25	23	31	21	26	25	16	14	23	13	17	17	23	17	16	20	20	22	25	517	fall from height
falling to same level	15	18	14	10	9	7	11	8	8	10	11	4	10	11	10	15	9	5	6	7	8	6	9	221	falling to same level
crash	6	14	6	7	4	4	5	7	2	1	4	5	5	1	2	1	1	2	1	6	3	2	1	90	crash
struck by flying or falling object	15	12	15	15	12	5	9	8	6	6	8	8	6	3	4	5	6	8	1	6	3	8	1	170	struck by flying or falling object
collapse	5	2	5	6	1	3	1	3	3		1	1	2	1			2	1	2	2	1			42	collapse
crashed by	9	7		5	9	1	7	7	7	4	5	5	2	2	4	3	2	3	2	2	3	5	3	97	crashed by
caught in/between	22	31	35	37	31	36	30	25	26	20	16	17	16	22	18	24	12	6	12	12	18	13	15	494	caught in/between
cut		2	3	6		2		4	2					3		2	1	1	3	1	2	1		33	cut
injury to the sole of the foot	1						1		1															3	injury to the sole of the foot
drown		1			1	1		1							1	1		1						7	drown
contact to high/low- temperature	4		5	1	1	1	1		1								1		2		1	1		19	contact to high/low- temperature

contact to harmful																									contact to
substance																1					1			2	harmful
substance																									substance
electric shock		1				1																		2	electric shock
explosion			2											2										4	explosion
burst								1							1									2	burst
fire																									fire
traffic accident (public	2	4	6	6	2		1		5	1	4		3	2	1		2	4	3	3	1	1	3	54	traffic accident
road)		4	6	6	2		I		5		4		3	2				4	3	3	I	I	3	34	(public road)
traffic accident																	2							2	traffic accident
(others)																									(others)
reaction to																									reaction to
motion/improper	10	9	3	1	6	11	3	3	2	1	2	3	3	2	4	5	1		1	1	4	3	6	84	motion/improper
motion																									motion
others	1	1					1	1	1								2		1	1				9	others
unclassifiable			1																					1	unclassifiable
total	121	137	129	117	101	95	101	89	90	68	67	57	70	62	62	74	64	48	50	61	65	62	63	1,853	total

Causal agents (large) of fatal and non-fatal accidents in gravel digging 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	2010	2020	2021		Causal (L)
Causai (L) agents		2000	2001	2002	2003	2004	2003	2000	2007	2000	2009	2010	2011	2012	2013	2014	2013	2010	2017	2010	2019	2020	2021	ll l	agents
machine	23	28	41	33	22	25	28	18	21	9	12	15	16	11	11	16	10	7	11	19	14	16	11	417	machine
crane, conveying																									crane,

machine	33	34	30	37	33	32	23	30	34	31	28	15	26	22	23	25	31	23	19	23	21	20	25	618	conveying
macrime																									machine
ath or a guinmont	14	17	11	10	12		13	11	11		6	8		6	6		6	3	8	5		7	6	193	other
other equipment	14	17	11		12	4	13	11	11	8		0	6			8	0	3	0	3			6	193	equipment
to many a many lavel discours																									temporary
temporary buildings, establishments	21	24	19	15	16	14	19	14	9	8	12	7	16	9	12	15	9	7	7	5	14	9	9	290	buildings,
establistifferits																									establishments
substance, material	13	16	17	12	10	7	13	6	6	10	3	5	2	8	3	4	3	4	3	7	5	3	2	162	substance,
substance, material	13	10	17	12			13					5					3		3			3		102	material
load	1	3	2		1	1	1	1	2		1	1					1							15	load
environment	9	11	6	7	3	9	3	6	7	2	3	4	4	4	5	3	3	4	2	1	4	4	5	109	environment
others	7	4	3	3	4	3	1	3			2	2		2	2	3	1			1		3	5	49	others
total	121	137	129	117	101	95	101	89	90	68	67	57	70	62	62	74	64	48	50	61	65	62	63	1,853	total

Causal agents (middle) of fatal and non-fatal accidents in gravel digging 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				1										1										2	engine
power transmission mechanism	3	3	5	2	3	3	4	1	1	2					1		1	1	2		3	2	1	38	power transmission mechanism
woodworking machine		1	1	2					1				1	1		2	1				1			11	woodworking machine

construction machine	13	12	22	10	13	15	16	9	7	4	6	8	11	6	8	9	5	5	6	12	7	9	7	220	construction
																									machine
metal manufacturing				2		3		1		1	1		1			1				1				11	metal manufacturing
machine																									machine
general machine	7	12	13	16	6	4	8	7	12	2	5	7	3	3	2	4	3	1	3	6	3	5	3	135	general
general machine									12									<u> </u>						133	machine
mobile silviculture																									mobile
machine																									silviculture
																									machine
crane	3		2	4	1	1		2	4	2	2		4			3	2	3	1		1	4	1	40	crane
conveying machine	28	30	25	32	31	31	19	28	27	28	26	14	20	19	21	21	27	18	18	21	20	16	21	541	conveying machine
vehicle	2	4	3	1	1		4		3	1		1	2	3	2	1	2	2		2			3	37	vehicle
pressure vessel												1								1				2	pressure vessel
chemical facilities																									chemical
Chemical facilities																									facilities
welding equipment	1																					1		2	welding
weiding equipment																								2	equipment
kiln, caldron																									kiln, caldron
alastris aquinment		1							1			1				1			1				1	6	electric
electric equipment									ľ			ľ											ľ	0	equipment
human power machine,			2	4	3		2	2	1	2		2	1	1	1	2	3	1	1		,	1		44	human power
tools	4	4	3	4) 			3	I	2	2		I	I		3] 				2			44	machine, tools

tools	7	6	5	6	5	1	8	5	7	5	4	1	3	4	4	2	2	2	6	3	4	5	3	98	tools
other equipments,	2	6	3		4	3	3	3	2	1		3	2	1	1	2	1			1	1		2	41	other equipments, facilities
temporary buildings, establishments	21	24	19	15	16	14	19	14	9	8	12	7	16	9	12	15	9	7	7	5	14	9	9	290	temporary buildings, establishments
hazards, harmful substances			1			1								2							2			6	hazards, harmful substances
materials	13	16	16	12	10	6	13	6	6	10	3	5	2	6	3	4	3	4	3	7	3	3	2	156	materials
load	1	3	2		1	1	1	1	2		1	1					1							15	load
natural environment	9	11	6	7	3	9	3	6	7	2	3	4	4	4	5	3	3	4	2	1	4	4	5	109	natural environment
other causal agent	1	1					1										1					1		5	other causal
no causal agent	5	3	2	2	4	3		3			2	2		2	2	3				1		2	5	41	no causal agent
unclassifiable	1		1	1																				3	unclassifiable
total	121	137	129	117	101	95	101	89	90	68	67	57	70	62	62	74	64	48	50	61	65	62	63	1,853	total

Causal agents (small) of fatal and non-fatal accidents in gravel digging 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 mechanism		5	3	4	1	1	2					1		1	1	2		3	2	1	27	power transmission mechanism
circular sawing machine														1				1			2	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		1				1					1		1								4	chain saw
other woodworking machines										1			1								2	other woodworking machines
leveling, transporting or loading machine		14	5	9	6	3	2	4	5	4	3	4	4	3	2	3	8	3	8	4	94	leveling, transporting or loading machine
excavating machine		7	8	5	2	4	2	2	2	7	3	3	4	2	2	2	2	4	1	2	64	excavating machine
foundation work machine				1																	1	foundation work

hardening machine																						hardening machine
demolition machine									1			1					1				3	demolition machine
vehicle for high lift																						vehicle for high lift
work																						work
other construction		1		1	1								1		1	1	1			1	8	other construction
machines		_			•								•				<u> </u>			ľ		machines
lathe																						lathe
drill press, milling																						drill press, milling
machine																						machine
grinding machine,					1					1							1				3	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							1	1					1								3	manufacturing
machines																						machines
centrifugal machine																						centrifugal machine
mixer, grinder		4	4	2	4	3		3	2	1	1		1	2			1	3	1	1	33	mixer, grinder
roll machine (except																						roll machine (except
printingroll				1																	1	printingroll
machine)																						machine)
injection molding																						injection molding

machine																						machine
food manufacturing																						food manufacturing
machine																						machine
printing machine																						printing machine
industrial robot																						industrial robot
other general		9	2	5	3	9	2	2	5	2	2	2	3	1	1	3	5		4	2	62	other general
power machines		9		3	3	9			5				3		ı	3	3		4		02	power machines
felling machine																						felling machine
mobile logging																						mobile logging
machine																						machine
skyline yarding																						skyline yarding
machine																						machine
other mobile																						other mobile
silviculture machine																						silviculture machine
crane			1				2			1			2	1	2	1					10	crane
mobile crane					2	3		1		3			1	1				1	2		14	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

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simple skyline yarding equipment																								simple skyline yarding equipment
other powered		2						1		1							1				2	1	8	other powered crane
truck		10		8		5	10	11	16	13	7	9	7	11	7	18	15	10	8	10	11	16	202	truck
forklift				1				1												1			3	forklift
railway equipment																								railway equipment
conveyor		15		20		12	17	13	12	10	7	9	11	10	14	8	3	6	8	7	5	5	192	conveyor
loader						1	1	1		2		2	1			1		1	3	2			15	loader
straddle carrier																								straddle carrier
rough terrain hauler																		1	1				2	rough terrain hauler
other powered conveying machines				2		1		1		1									1				6	other powered conveying machines
cars, bus,		2		1		3		3				2	2	1	1	1	2		1			3	22	cars, bus, motorcycle
railway vehicle																								railway vehicle
other vehicles		1				1			1		1		1	1		1			1				8	other vehicles
boiler																								boiler
pressure vessel																			1				1	pressure vessel
other pressure vessels											1												1	other pressure vessels
chemical facilities																								chemical facilities
gas welding																					1		1	gas welding

equipment																						equipment
arc welding equipment																						arc welding equipment
other welding equipment																						other welding equipment
kiln, caldron																						kiln, caldron
industrial dryer																						industrial dryer
other kiln, caldron																						other kiln, caldron
transmission																				1	1	transmission
electric power facilities						1			1							1					3	electric power facilities
other electrical equipment													1								1	other electrical equipment
human power cranes			2		1	1						1	1		1						7	human power cranes
human power																		1			1	human power hauling equipment
human power		1																			1	human power machine
hand tool		2	1	2	2		2	2	2	1	1		2	3		1		1	1		23	hand tool
ladder		2	5	4	2	1	3	1	1	2	2	3	1	2	1	3		3	1	1	38	ladder
slinging tool		2		2		3		2		1	1				1	2	1	1	2		18	slinging tool
other tools		1		2	3	3	2	1			1	1	1			1	2		2	2	22	other tools
other equipment,																						other equipment,

facilities		3	4	3	3	2	1		3	2	1	1	2	1			1	1		2	30	facilities
scaffolding		1	1		1		2		1	1	1			2	1			1			12	scaffolding
timbering																						timbering
stairs, landing stage		1	2	5	2	3	1	4	1	1	2	2	2	2	3	2		2	2	2	39	stairs, landing stage
opening					2					1				1				1			5	opening
roof, beam, haze, crossbeam, principal rafter		2		1	1					2	1						1				8	roof, beam, haze, crossbeam, principal rafter
working platform, boot board		1	3	2		1	1	3	3	1			2		1			1	3	2	24	working platform, boot board
passage		5	3	5	2	1	3	3	1	5	2	6	7	2	2	2	3	3	1	5	61	passage
building, establishment		5	3	3	5	2	1	1	1	4	2	1	2			3	1	5	3		42	building, establishment
other temporary buildings, establishments		4	4	3	1	2		1		1	1	3	2	2				1			25	other temporary buildings, establishments
explosive substance																						explosive substance
inflammable substance		1																1			2	inflammable substance
inflammable gas											2										2	inflammable gas
harmful substance																						harmful substance
radiation																						radiation
other hazards,																		1			1	other hazards, harmful substances

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metal material		3	8	6	2	3	5		3	1	1	2	2	1	2	3	7	1	1	2	53	metal material
lumber, bamboo		2	1			1		1						1	1			1			8	lumber, bamboo
stone, sand, substance		10	1	5	3	1	5	1	2	1	5		2	1	1			1	1		40	stone, sand, substance
other materials		1		2	1	1		1				1							1		8	other materials
load		1	1	1	1	2		1	1												8	load
machine/equipment as load		1												1							2	machine/equipment as load
natural ground,		2	2	1	2	4		1	2		1	1	1	1	1	1		2	1	2	25	natural ground,
standing tree					1	2		2	1		1				1					1	9	standing tree
water					1							1			1						3	water
abnormal environment												1									1	abnormal environment
high/cold temperature environment		1	1											1					1		4	high/cold temperature environment
other environments		3		2	2	1	2		1	4	2	2	2	1	1	1	1	2	2	2	31	other environments
other causal agent				1										1					1		3	other causal agent
no causal agent		2	4		3			2	2		2	2	3				1		2	5	28	no causal agent
unclassifiable		1																			1	unclassifiable
total		129	101	101	89	90	68	67	57	70	62	62	74	64	48	50	61	65	62	63	1,383	total

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	2	2					1	1						1	1	1							10	19 years old or less
20-29	8	22	9	10	4	8	6	5	6	2	4	3	2	3	3	1	2	5	2	2	4	3	4	118	20-29
30-39	12	14	17	22	10	9	18	16	10	12	8	9	10	7	4	7	6	6	3	2	9	6	9	226	30-39
40-49	32	25	28	18	22	16	16	15	17	10	11	9	15	17	12	11	13	8	8	17	12	9	11	352	40-49
50-59	39	44	45	43	40	35	35	32	30	26	27	12	18	19	20	26	13	10	12	16	14	16	12	584	50-59
60 years old or	29	30	28	24	25	27	26	20	26	18	17	24	25	16	22	28	29	19	25	24	26	28	27	563	60 years old or
more			20								.,	24												503	more
total	121	137	129	117	101	95	101	89	90	68	67	57	70	62	62	74	64	48	50	61	65	62	63	1,853	total

Workers' number of workplace of fatal and non-fatal accidents in gravel digging 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	50	60	49	53	44	51	39	43	44	34	30	27	38	30	25	31	29	20	23	17	22	22	22	803	9 workers or less
10-29	54	58	58	44	40	32	49	38	33	30	31	25	28	24	25	40	31	23	27	36	35	36	33	830	10-29
30-49	13	14	16	16	13	8	9	4	13	4	5	5	4	5	9	2	4	5		7	8	4	5	173	30-49
50-99	3	5	5	4	4	4	4	3			1			2	2	1				1			3	42	50-99
100-299	1		1					1						1	1									5	100-299
300 workers or																									300 workers or
more																									more
total	121	137	129	117	101	95	101	89	90	68	67	57	70	62	62	74	64	48	50	61	65	62	63	1,853	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	11	10	18	6	13	11	3	8	8	5	12	3	7	5	4	4	6	3	4	5	9	5	6	166	January
February	7	16	9	8	14	11	9	11	12	8	1	3	5	9	6	5	6	5	1	5	5	9	4	169	February
March	8	5	13	11	10	6	5	7	8	5	4	7	8	7	6	7	8	4	5	6	4	7	5	156	March
April	7	15	10	8	6	11	11	7	8	9	5	6	8	7	4	9	3	2	6	4	2	6	4	158	April
May	10	12	6	7	8	4	8	8	5	7	6	6	2	4	6	5	9	2	3	3	3	6	4	134	May
June	15	10	10	16	4	6	11	9	8	5	8	4	11	2	7	7	4	2	5	8	3	3	7	165	June
July	16	16	12	6	9	9	12	9	13	5	8	7	7	5	3	7	5	8	4	4	10	4	11	190	July
August	9	12	8	9	12	6	8	10	8	6	4	5	3	3	4	6	6	3	2	5	5	5	1	140	August
September	14	9	13	11	6	12	7	8	6	3	5	3	5	2	5	6	4	3	6	3	4	4	4	143	September
October	9	12	7	6	6	8	9	3	5	6	7	6	2	4	6	6	2	5	2	10	6	6	6	139	October
November	8	11	14	14	9	6	9	9	5	4	3	3	5	7	5	8	4	6	9	4	7	3	6	159	November
December	7	9	9	15	4	5	9		4	5	4	4	7	7	6	4	7	5	3	4	7	4	5	134	December
total	121	137	129	117	101	95	101	89	90	68	67	57	70	62	62	74	64	48	50	61	65	62	63	1,853	total

Prefecture of fatal and non-fatal accidents in gravel digging 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	24	25	11		14		13	13	14	9	17	11	15	11	14	12	17	9	5	10	14	15	14	287	Hokkaido
Aomori	2	2	3		1		2	2	2	1	1	1	2	1		1	1			1	2			25	Aomori
lwate	3	1	3		3		1	1	3	1	2	1			1	2	2	1			1	2	1	29	lwate

Miyagi	1	1	4	2	3	3	1	1	2	1	1	1	1	3	6	1	2	3		1	1	39	Miyagi
Akita	2	4	3	3	2	6				2	1		1	2	1		1	2	2	1	1	34	Akita
Yamagata	5	7	5	2	2		2	1		1	2	3	2			2	1		1	2	1	39	Yamagata
Fukushima	3	2	1	1		4			1		1	1	3	3			4	3	2	3	1	33	Fukushima
Ibaraki	7	8	4	3	6	3	2	5	2	4	2	3	1	2	2	2	1		2	4	1	64	Ibaraki
Tochigi	3	4	4	3	6	2	5	5		3	2	2	4	2			1	1	1	2	2	52	Tochigi
Gunma	2	2	4	1	2			2	1	1	2	1	1			1	2	1				23	Gunma
Saitama	2	3		1	2		4			1	2	1					1	2			1	20	Saitama
Chiba	4	5	2	2	1	2	3	1	1	2	2	2	4	1	1	2	4	4	4	2		49	Chiba
Tokyo							1										1					2	Tokyo
Kanagawa	2	2	1	3	1	1		1		1	1			1		1		1		2	1	19	Kanagawa
Niigata	9	8	9	12	9	7	8	6	3	4	5	8	6	5	5	5	3	5	5	3	11	136	Niigata
Toyama	3	3	5	2	6	1		3	5	4	3	1	3	2	3	1	1	2	1	1	2	52	Toyama
Ishikawa			1	1					1		4	1			1	1	2		1	1		14	Ishikawa
Fukui	1	2		1							1	1	1	1	2	2	1			2		15	Fukui
Yamanashi	6	2	6	4	6	3	6	3		3		2	2	4	1		1	2		1	2	54	Yamanashi
Nagano	10	2	10	7	3	1	2	2	3	1	3	1	1	3			2	2	6	3	4	66	Nagano
Gifu	4	7	6	5	8	5	4	5	3	2	3	2		5	2	4	3	8	4	2	4	86	Gifu
Shizuoka	11	2	7	6	3	9	9	6	8	1	5	4	4	3	1	2	3	3	3	2	4	96	Shizuoka
Aichi	1	1	3		1	1	1		2	1	1	1	1	3		1	1			1	2	22	Aichi
Mie		9	6	7	3	2	4	3			2	2	3	4	3	2		4		3	2	59	Mie
Shiga	2		4	3		1				1	2				1							14	Shiga
Kyoto	1	1	3	3	2	1	1				1	1			2		2	1	1	1	1	22	Kyoto

Osaka	2						1	1				2				1		1				8	Osaka
Hyogo	2	4	4		1	1	1		3	1		1	1	1			1		3	3	1	28	Hyogo
Nara		1				1										1						3	Nara
Wakayama		3	2	1			2		1		1	1	2	1	1	3	1	1	1	2	1	24	Wakayama
Tottori																							Tottori
Shimane		2	1	1													1					5	Shimane
Okayama	1	2	2		2		2					1		1								11	Okayama
Hiroshima		2	1	2	1	1		1	1		1			1	1							12	Hiroshima
Yamaguchi		2	2		1							1		1	1				1			9	Yamaguchi
Tokushima		5	2	2	1	2	2				1	1	1	1			1	1	2	1	2	25	Tokushima
Kagawa						2																2	Kagawa
Ehime		1			1	1	1	1	1	1	1	1	1	1					1	1		13	Ehime
Kochi	2	1					1					1		1				1	1			8	Kochi
Fukuoka	1	3	5	1		1		1	2	1			1	2	2	1			1			22	Fukuoka
Saga	1																					1	Saga
Nagasaki																							Nagasaki
Kumamoto	1	4	2	1	1	3	1	4	5	3	1	2		1	2	3	1	1	4	1		41	Kumamoto
Oita	1	1	2	2	3	3	1	3		1	1		1	2	3	2	1	1				28	Oita
Miyazaki	1	2	1	1	3	5	4	2	1	4		1	2	2	3		2				2	36	Miyazaki
Kagoshima	1	1			4	1	2		1		1								1			12	Kagoshima
Okinawa					1																1	2	Okinawa
total	121	137	129	101	101	89	90	68	67	57	70	62	62	74	64	48	50	61	65	62	63	1,641	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)

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Fatal accidents in gravel digging in Japan in 1999-2021

gravel digging industry Code No.020202

Type of fatal accidents in gravel digging 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	2		4			4	1	2	1		1		3			1	1		2				1	23	fall from height
falling to same level															1									1	falling to same
laming to same level																									level
crash																									crash
struck by flying or							1															1		2	struck by flying
falling object																									or falling object
collapse	2		1		1	1		1			1			1				1	1		1			11	collapse
crashed by				1					1			1										1		4	crashed by
caught in/hotwoon		2	1		1	1	1		1	2		1	1	1	1	3					1		2	20	caught
caught in/between		٥				'										, 							_		in/between
cut																									cut

						_		_			_					-		1		_	_		_	-	
injury to the sole of																									injury to the sole
the foot																									of the foot
drown		1			1	1		1							1	1		1						7	drown
contact to high/low-																									contact to
temperature																	1							1	high/low-
temperature																									temperature
contact to harmful																									contact to
substance																									harmful
Substance																									substance
electric shock																									electric shock
explosion														1										1	explosion
burst																									burst
fire																									fire
traffic accident (public																									traffic accident
road)					I																			5	(public road)
t																									traffic accident
traffic accident (others)																									(others)
reaction to																									reaction to
motion/improper																									motion/improper
motion																									motion
others																									others
unclassifiable																									unclassifiable
total	4	4	6	2	4	7	3	4	4	2	2	2	4	3	3	5	3	2	3		3	2	3	75	total

Causal (L) 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 (L)
machine	2		3		1	3		1	2	1	1		2			4						1	2	23	machine
crane, conveying machine		3		2	1	1	1		2	1		1	1	1	1	1	1		2		2		1	22	crane, conveying machine
other equipment		1	1		1																			3	other equipment
temporary buildings, establishments						1	2						1	1	1		1		1						temporary buildings, establishments
substance, material	1		1		1			1				1		1				1				1		8	substance, material
load																									load
environment	1		1			2		2			1				1		1	1			1			11	environment
others																									others
total	4	4	6	2	4	7	3	4	4	2	2	2	4	3	3	5	3	2	3		3	2	3	75	total

Causal agents (middle) of fatal accidents in gravel digging 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	2010	2020	2021	total	Causal (M)
Causai (iii) agents	1999	2000	2001	2002	2003	2004	2003	2000	2007	2000	2009	2010	2011	2012	2013	2014	2013	2010	2017	2010	2019	2020	2021		agents

engine																							engine
power transmission mechanism																							power transmission mechanism
woodworking machine																							woodworking machine
construction machine	1		2			3		1	2	1	1		2			3				1	1	18	construction machine
metal manufacturing machine																							metal manufacturing machine
general machine	1		1		1											1					1	5	general machine
mobile silviculture machine																							mobile silviculture machine
crane				1																		1	crane
conveying machine		3		1		1	1		2	1		1	1	1	1	1	1	2	2		1	20	conveying machine
vehicle					1																	1	vehicle
pressure vessel																							pressure vessel
chemical facilities																							chemical facilities
welding equipment																							welding equipment

			-	 				 									 		 	
kiln, caldron																				kiln, caldron
electric equipment																				electric equipment
human power machine,																				human power
tools																				machine, tools
tools																				tools
other equipments,																				other
facilities		1	1	1															3	equipments,
																				facilities
temporary buildings,																				temporary
establishments					1	2					1	1	1	1		1			8	buildings,
																				establishments
hazards, harmful																				hazards,
substances												1							1	harmful
																				substances
materials 1	1		1	1			1			1					1			1	7	materials
load																				load
natural environment 1	1		1		2		2		1				1	1	1		1		11	natural
																				environment
other causal agent																				other causal
other edusar agent																				agent
no causal agent																				no causal
																				agent
unclassifiable																				unclassifiable

total	4	4	6	2	4	7	3	4	4	2	2	2	4	3	3	5	3	2	3		3	2	3	75	total	
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Causal agents (small) of fatal accidents in gravel digging 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																									power transmission
mechanism																									mechanism
circular sawing																									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		2		1	1	1	1		1		2			1		10	transporting or
loading machine																	loading machine
excavating machine	1			2		1		1	1		1				1	8	excavating machine
foundation work																	foundation work
machine																	machine
hardening machine																	hardening machine
demolition machine																	demolition machine
vehicle for high lift																	vehicle for high lift
work																	work
other construction																	other construction
machines																	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				1						1				1	4	mixer, grinder
roll machine (except																roll machine (except
printingroll																printingroll
machine)																machine)
injection molding																injection molding
machine																machine
food manufacturing																food manufacturing
machine																machine
printing machine																printing machine
industrial robot																industrial robot
other general		_														other general
power machines															I	power machines
felling machine																felling machine
mobile logging																mobile logging
machine																machine
skyline yarding																skyline yarding
machine																machine
other mobile																other mobile
silviculture machine																silviculture machine
crane																crane
mobile crane			1												1	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		1			1	1			1			1	1		1	1	8	truck
forklift						1											1	forklift
railway equipment																		railway equipment
conveyor	3			1			1	1		1	1			1	1		10	conveyor
loader																		loader
straddle carrier																		straddle carrier
rough terrain hauler														1			1	rough terrain hauler
other powered																		other powered
conveying machines																		conveying machines
cars, bus,			1														1	cars, bus,
motorcycle																	1	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																slinging tool
other tools																other tools
other equipment,	1	1	1												3	other equipment,
scaffolding																scaffolding
timbering																timbering
stairs, landing stage																stairs, landing stage
opening				1							1				2	opening
roof, beam, haze, crossbeam, principal rafter																roof, beam, haze, crossbeam, principal rafter
working platform, boot board					1					1					2	working platform, boot board
passage																passage
building, establishment								1	1			1			3	building, establishment
other temporary buildings, establishments					1										1	other temporary buildings, establishments
explosive substance																explosive substance
inflammable substance																inflammable substance

inflammable gas									1							1	inflammable gas
harmful substance																	harmful substance
radiation																	radiation
other hazards,																	other hazards,
harmful substances																	harmful substances
metal material	1															1	metal material
lumber, bamboo								1								1	lumber, bamboo
stone, sand,		1	1		1							1			1	5	stone, sand,
substance		1	'		I										Ľ)	substance
other materials																	other materials
load																	load
machine/equipment																	machine/equipment
as load																	as load
natural ground,	1	1		1	1		1							1		6	natural ground,
rock	'	<u> </u>			ľ		'							<u> </u>			rock
standing tree																	standing tree
water				1	1					1		1				4	water
abnormal																	abnormal
environment																	environment
high/cold																	high/cold
temperature											1					1	temperature
environment																	environment
other environments																	other environments
other causal agent																	other causal agent

no causal agent																								no causal agent
unclassifiable																								unclassifiable
total	4	4	6	2	4	7	3	4	4	2	2	2	4	3	3	5	3	2	3	3	2	3	75	total

Workers age of fatal accidents in gravel digging 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																									19 years old or less
20-29					1									1										2	20-29
30-39		1	1			2	1				1										1			7	30-39
40-49	1	2		2	2					1			1	1			1						1	12	40-49
50-59	2	1	2			2	1	3	4	1		1				2	1	2						22	50-59
60 years old or more	1		3		1	3	1	1			1	1	3	1	3	3	1		3		2	2	2	32	60 years old or more
total	4	4	6	2	4	7	3	4	4	2	2	2	4	3	3	5	3	2	3		3	2	3	75	total

Workers' number of workplace of fatal accidents in gravel digging 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	1	2	1	1	1	5		1	2			2	3	2	2	3	1	2	2		1	1		33	9 workers or less
10-29	2	2	3	1	1	2	3	2	1	2	2		1		1	2	2		1		2	1	1	32	10-29
30-49	1		2		2				1					1									1	8	30-49
50-99								1															1	2	50-99
		$\overline{}$		\Box				\Box	\Box				\Box						\Box	$\overline{}$				i	

100-299																								100-299
300 workers or																								300 workers or
more																								more
total	4	4	6	2	4	7	3	4	4	2	2	2	4	3	3	5	3	2	3	3	2	3	75	total

Month of fatal accidents in gravel digging 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	2				1		2			1				1								1	10	January
February		1	2		1		1								1				1		1			8	February
March																2	1							3	March
April					1	1	1							1			1		1			1		7	April
May						1				1		1												3	May
June	1								1				1	1				1					1	6	June
July					1			1	2				1			1					1			7	July
August				2		1				1			1				1							6	August
September			2			2	1		1				1											7	September
October								1				1			1	1					1			5	October
November	1	1	1		1	1										1		1	1			1	1	10	November
December			1								1			1										3	December
total	4	4	6	2	4	7	3	4	4	2	2	2	4	3	3	5	3	2	3		3	2	3	75	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	2		3	1	1	1		1		1			3		1	1		1	1			1	1	19	Hokkaido
Aomori																									Aomori
lwate																									lwate
Miyagi											1													1	Miyagi
Akita	1							1																2	Akita
Yamagata		1	1											1										3	Yamagata
Fukushima							1																	1	Fukushim
Ibaraki		1										1												2	lbaraki
Tochigi	1														1									2	Tochigi
Gunma																									Gunma
Saitama																									Saitama
Chiba		2				1						1			1	1			1		1			8	Chiba
Tokyo																									Tokyo
Kanagawa					1													1						2	Kanagawa
Niigata			1		2			1	2				1											7	Niigata
Toyama																									Toyama
Ishikawa																			1					1	Ishikawa
Fukui						1																		1	Fukui
Yamanashi			1																				1	2	Yamanasl
Nagano				1												1								2	Nagano
Gifu									1															1	Gifu

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

Miyazaki						1			1							1							3	Miyazaki
Kagoshima								1															1	Kagoshima
Okinawa																								Okinawa
total	4	4	6	2	4	7	3	4	4	2	2	2	4	3	3	5	3	2	3	3	2	3	75	total

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

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