

## Reevaluation of high standard levees along the Arakawa River as upland evacuation areas in the lowlands of Tokyo

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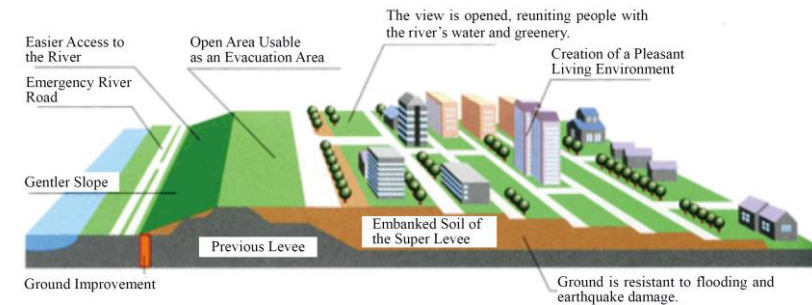
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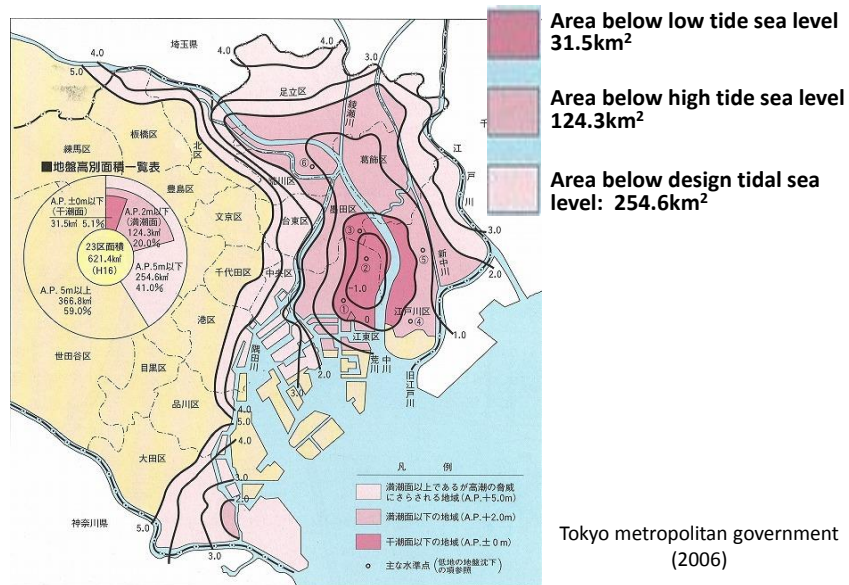
## Super Levee

- A super levee is a high standard river embankment with a broad width which can be used for urban land use.



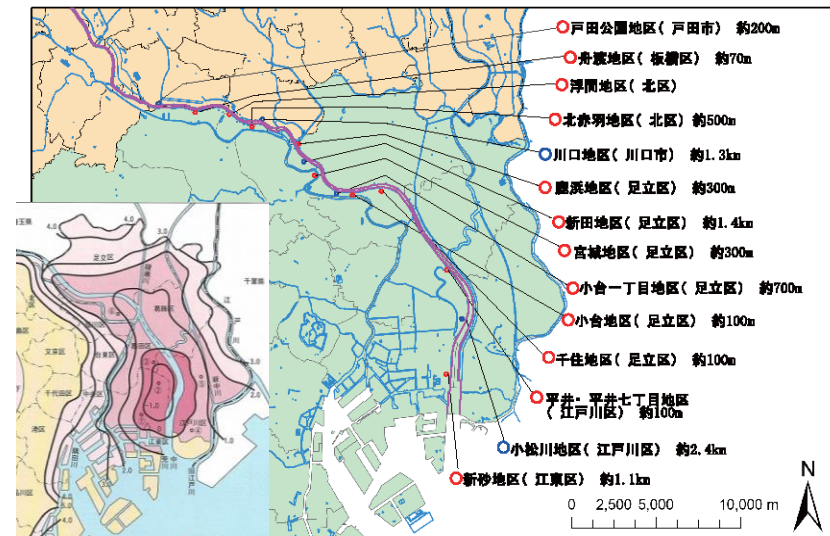
(Arakawa-Karyu River Office, 2013)

## Low-lying Areas in Tokyo

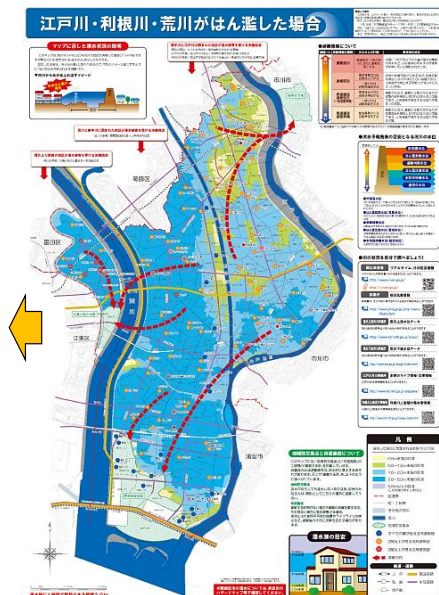


Tokyo metropolitan government  
(2006)

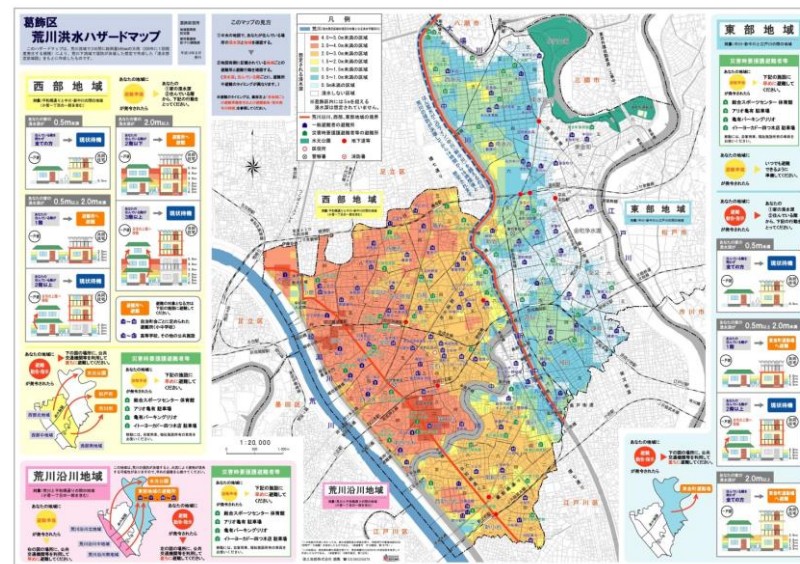
## Super levees along the lower reaches of the Arakawa River in Tokyo



Edogawa Ward:  
Flood Hazard Map



Katsushika Ward: Flood Hazard Map



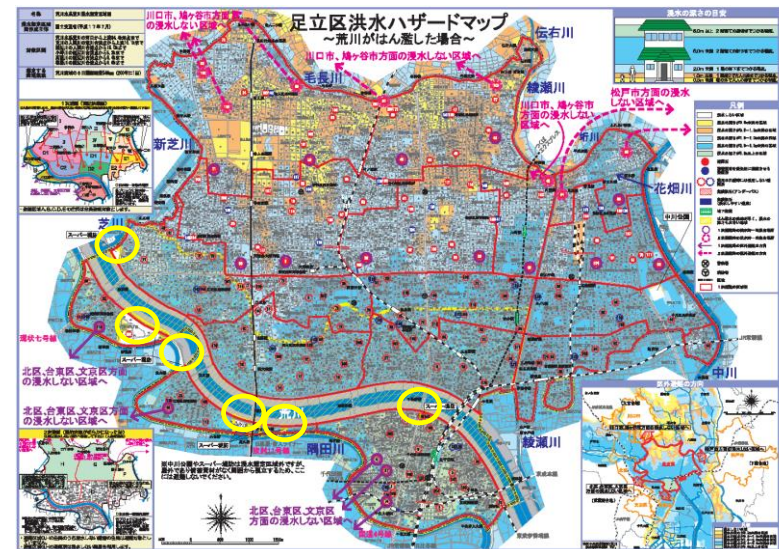


## Katsushika Ward: Flood Hazard Map

### Orientation of safety evacuation areas



## Adachi Ward: Flood Hazard Map



## Super Levees along the Arakawa River

No.	Super levee district	Main land use				Length (m)	Area (ha)	Mean width (m)	Filling completion year
		Dwelling house	Public park	Public facility other than park	Others				
1	Shinsuna			X	X	1,140	14.0	123	2004
2	Komatsugawa	X	X	X		2,380	23.3	98	in progress
3	Hirai	X				50	0.2	40	1997
4	Hirai 7-chome	X				100	1.3	130	2003
5	Senju	X		X		100	1.0	100	1999
6	Odai	X				100	0.4	40	1991
7	Odai 1-chome	X		X	X	360	6.8	189	2008
8	Miyagi		X			300	1.2	40	2001
9	Shinden	X		X	X	1,360	24.6	181	2012
10	Shikahama		X			300	3.4	113	1991
11	Kawaguchi			X	X	1,340	12.7	95	in progress
12	Kita-akabane			X		500	2.0	40	2003
13	Ukima			X		100	0.6	60	provisional completion
14	Funado			X		70	0.6	86	2006
15	Toda-koen		X			150	2.2	147	2008

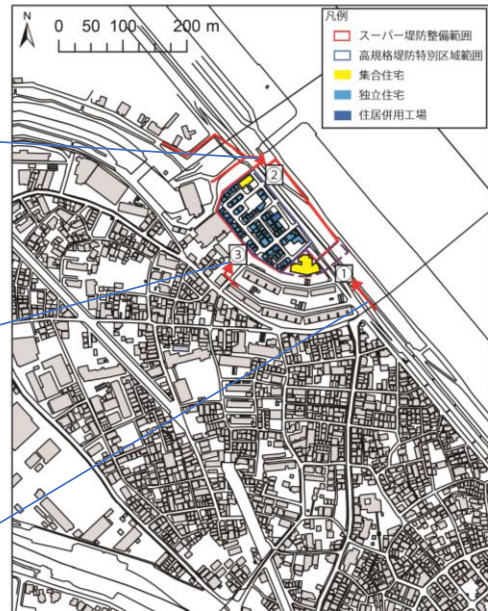
as of March 2014

## Public facilities and others on the super levee

No.	District	Public facilities other than park	Others
1	Shinsuna	Water station, Water treatment plant Electric power transmission facility	Heavy machinery leasing company
2	Komatsugawa	Junior high school, Pumping station	
5	Senju	Community (Lifelong learning) centre	
7	Odai 1-chome	New transportation system station Station square	Mass retailer, Electrical retailer, Automobile retailer
9	Shinden	Elementary school, Junior high school Sewerage facility, Fire fighting center	Superstore
11	Kawaguchi	Elementary school, Junior high school Kindergarten	Temple, Driving school
12	Kita-akabane	Disaster prevention station (stockpile warehouse for food and materials)	
13	Ukima	Open space (provisional completion)	
14	Funado	Recycling facility	



Hirai and Hirai 7-chome district



Hirai 7-chome district





Hirai district

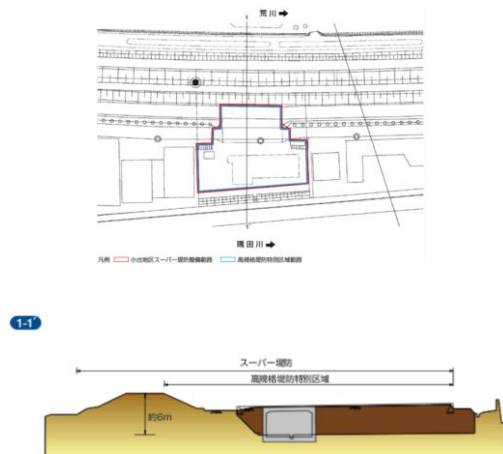


Odai district

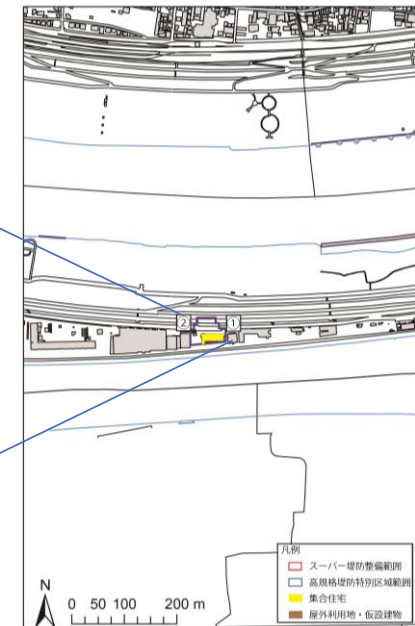




## Odai district



## Odai district



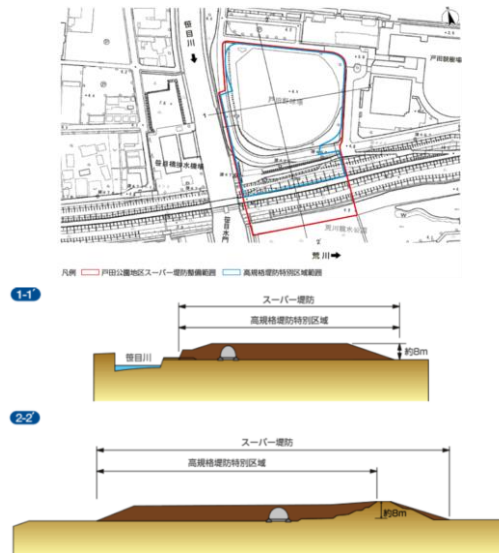
Odai district



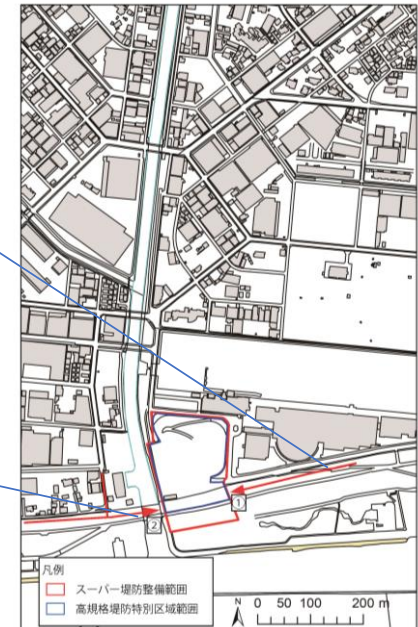
Toda-koen district



## Toda-koen district



## Toda-koen district





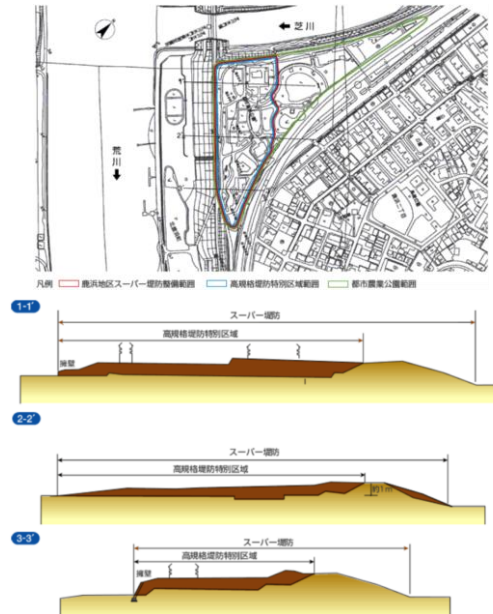
Toda-koen district



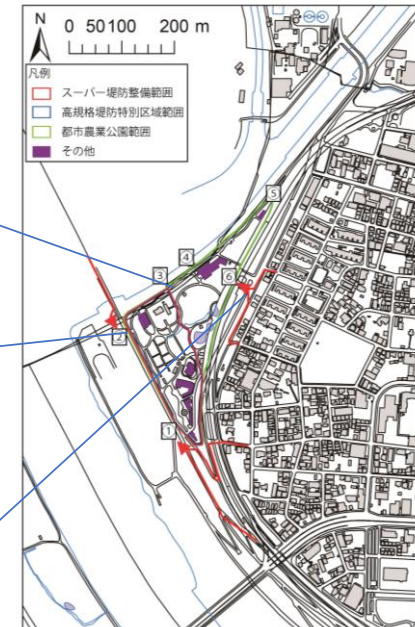
Shikahama district



## Shikahama district



## Shikahama district



Shikahama district



Senju district





Senju district



Senju district



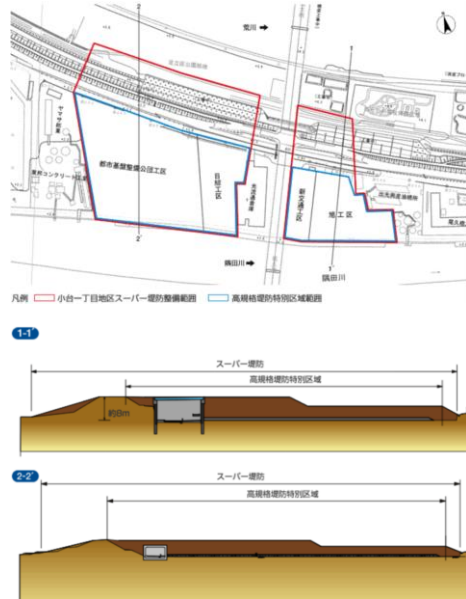
Senju district



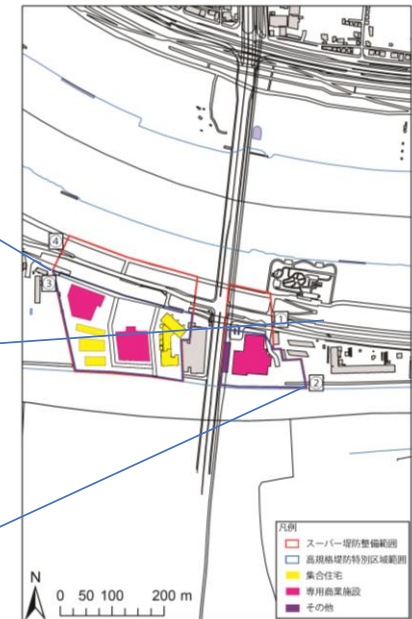
Odai 1-chome district



## Odai 1-chome district



## Odai 1-chome district





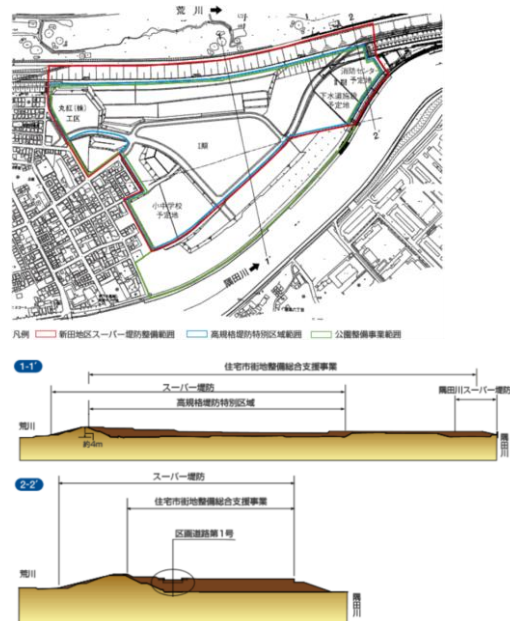
Odai 1-chome district



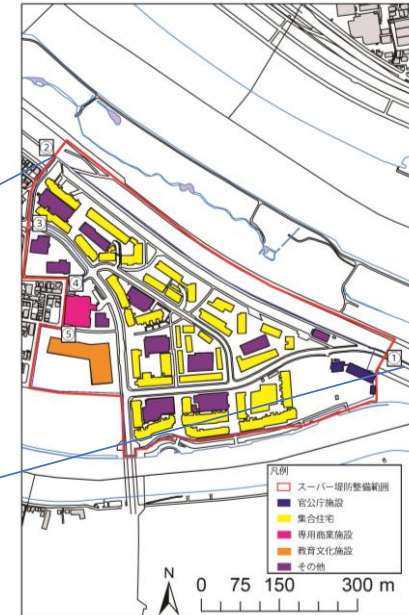
Shinden district



## Shinden district



## Shinden district



## Shinden district



Possible ratio for evacuation spaces of a total land or floor area based on land or building use

Land or building use	Ratio of total land or floor area for evacuees
Land use	
Park, Sports ground	70%
Unused land	40%
Community road	40%
Building use	
School, Community center	40%
Administrative facility	20%
Other public facility	0%
Commercial building	20%
Office building	5%
Warehouse, Station	5%
Other industrial building	5%
Apartment building	5% (excluding its residents)
Detached house	0% (excluding its residents)



### Possible evacuation spaces and evacuees on the super levee

Super levee district	Type of super levee	Total upland area of super levee (ha)	Total area for possible evacuation spaces (ha)	Ratio for possible evacuation spaces on the total upland area	Total number of possible evacuees (thousand)
Hirai and Hirai 7-chome	High rise apartment and detached houses	1.82	0.66	36.3%	3.3
Odai	High rise apartment	0.29	0.29	100.0%	1.4
Shikahama	Park	2.28	2.13	93.4%	10.6
Toda-koen	Park	2.90	2.03	70.0%	14.5
Senju	Mixed-use	0.27	0.93	344.4%	4.7
Odai 1-chome	Mixed-use	7.74	6.30	81.4%	31.5
Shinden	Mixed-use	22.62	20.32	89.8%	101.6
Komatsugawa	Mixed-use	28.23	25.86	91.6%	129.3

### Number of possible evacuation routes and evaluation of accessibility

Super levee district	Total upland area of super levee (ha)	Total number of possible evacuees (thousand)	Number of possible evacuation routes	Number of routes based on accessibility rank			
				a very good	b ~ good	c ~ not good	d ~ bad
Hirai and Hirai 7-chome	1.82	3.3	3	1	1	1	-
Odai	0.29	1.4	2	-	1	1	-
Shikahama	2.28	10.6	6	1	1	1	3
Toda-koen	2.90	14.5	2	-	1	1	-
Senju	0.27	4.7	2	-	1	1	-
Odai 1-chome	7.74	31.5	4	-	2	2	-
Shinden	22.62	101.6	5	-	3	2	-
Komatsugawa	28.23	129.3	9	1	5	3	-

**Thank you for your attention.**

