

Explanatory Text of the Urban Geological Map of the Northern Area of Chiba Prefecture

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(ABSTRACT)

The northern area of Chiba Prefecture is located between Tokyo Bay and the Edo-gawa and Tone rivers in the eastern part of the Tokyo metropolitan area, Kanto Plain, central Japan. Topographically, the area includes uplands, lowlands, and reclaimed lands. Geologically, the area is situated within the eastern part of the Kanto Sedimentary Basin filled with thick Cenozoic successions. They comprise the Lower to Middle Pleistocene Kazusa Group, Middle to Upper Pleistocene Shimosa Group, Upper Pleistocene terrace deposits and loam, Alluvium (post-LGM deposits), and reclamation and banking (man-made strata) (Fig. 1).

The Lower to Middle Pleistocene Kazusa Group consists of marine sediments in the eastern part of Chiba Prefecture where the group crops out, while its detailed lithofacies is unknown in the northwestern part. The boundary between this group and the overlying Shimosa Group is defined by the base of the Jizodo Formation corresponding to MIS 12.

The Middle to Upper Pleistocene Shimosa Group is divided into seven formations; Jizodo, Yabu, Kamiizumi, Kiyokawa, Yokota, Kioroshi, and Joso formations. Each of them is composed of the depositional cycle of fluvial and marine sediments formed under the influence of the sea-level fluctuations during MIS 12–5c.

The terrace deposits younger than the Shimosa Group (younger terrace deposits) distributes along the small valleys dissecting the upland area. They comprise fluvial muddy sand accumulated at MIS 5a or later. These terrace deposits and the Shimosa Group are covered with the Joso Clay and the Younger Kanto Loam which are generally composed of volcanic ash soil.

The Alluvium, called “Chuseki-so”, is the post-LGM (Last Glacial Maximum) deposits which distribute beneath the lowlands along the rivers and the coastal area of Tokyo Bay. It consists mainly of sand and mud formed in the fluvial to inner-bay environments, including thick incised-valley fills.

The shoreline of Tokyo Bay in the northern area of Chiba Prefecture was mostly reclaimed for industrial estates by sand and mud sediments dredged from the off shore. These man-made strata were severely liquefied due to their high water-content when the large earthquakes such as the 1987 East off Chiba Earthquake and the 2011 off the Pacific coast of Tohoku Earthquake occurred.

Chronostratigraphic division		Lithostratigraphic division		Tephra	MIS	Facies	Depositional environment					
Quaternary	Holocene	Reclamation and banking	Alluvium	Younger Kanto Loam	1	Reclamation and banking	Sand, mud	Reclamation				
		Sand bar, beach ridge, natural levee, marsh, and valley floor deposits				Sand bar and beach ridge deposits	Sand	Sand bar, beach ridge				
	Pleistocene	Upper	Younger terrace deposits	Shimoso Group	AT	2	Natural levee deposits	Sand	Natural levee			
			Joso Fm.		KIP		5a	Younger Kanto Loam	Volcanic ash soil	Terrestrial		
								Upper	Upper Kioroshi Fm.	Sand, interbedded sand and mud	Beach, lagoon, lacustrine	
			Lower		Lower Kioroshi Fm.		Mud, sandy mud	Bay, fluvial				
			Yokota Fm.		Yk3		6	5b	5c	Yokota Fm.	Muddy sand, sandy mud	Bay
										Gravelly sand, mud	Fluvial	
			Kiyokawa Formation		Ky3 (TB-8)		7a	7b	7c	Kiyokawa Fm.	(upper) Sand	Beach
										(middle) Muddy sand, sandy mud	Bay	
			Kamiizumi Formation		Km2 (TCu-1) Km1		7b	7c	7d	Kamiizumi Fm.	(lower) Gravelly sand, mud	Fluvial
										(upper) Sand	Beach	
			Yabu Formation		Yb5 Yb1 Yb0		7c	7d	7e	Yabu Fm.	(middle) Muddy sand, sandy mud	Bay
(lower) Gravelly sand, mud	Fluvial											
Jizodo Formation	J4 (TE-5a)	7d	7e	7f	Jizodo Fm.	(upper) Sand	Beach					
					(middle) Muddy sand, sandy mud	Bay						
Kazusa Group (undivided)	Kh6 Ks11	7e	7f	7g	Kazusa Group	(lower) Gravelly sand, mud	Fluvial					
					Sand, mud							

Fig. 1 Stratigraphic summary in the northern area of Chiba Prefecture.