# Wakkanai North Seawall
# A Collaboration of HIRAO Toshio and TSUCHIYA Minoru

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Wakkanai is an important port facing Sakhalin across the Souya Straits. The 427m section of the North Seawall is commonly known as the "North Seawall Dome" with its overhang, making it a unique seawall. This dome was constructed in 1936 and fulfilled an important role in the pre-war era along with the pier built for the Karafuto seaway. In the post-war era, it has been serving as the northernmost gateway for the ferry between Rishiri / Rebun and for the regular ferry service between Japan-Russia, which resumed in 1995. The square where passengers and cargo traveled across the Karafuto seaway in the pre-war era now bustles with local events and tourists stride about. Motorcycle tourist groups headed for the northernmost land use the dome as a campground as well. The dome is currently recognized among people as an eloquent symbol of Wakkanai's history and culture, playing a new role as a first-class tourist attraction.

Looking back from its birth to present, it is truly a blessed public works facility. At the same time, it arouses a strong sense of duty in civil engineer to provide public facilities such as this, which make a substantial contribution to the region. Here, we will reflect on the origin of the dome and the engineers involved, while reflecting on the role of modern civil engineers.

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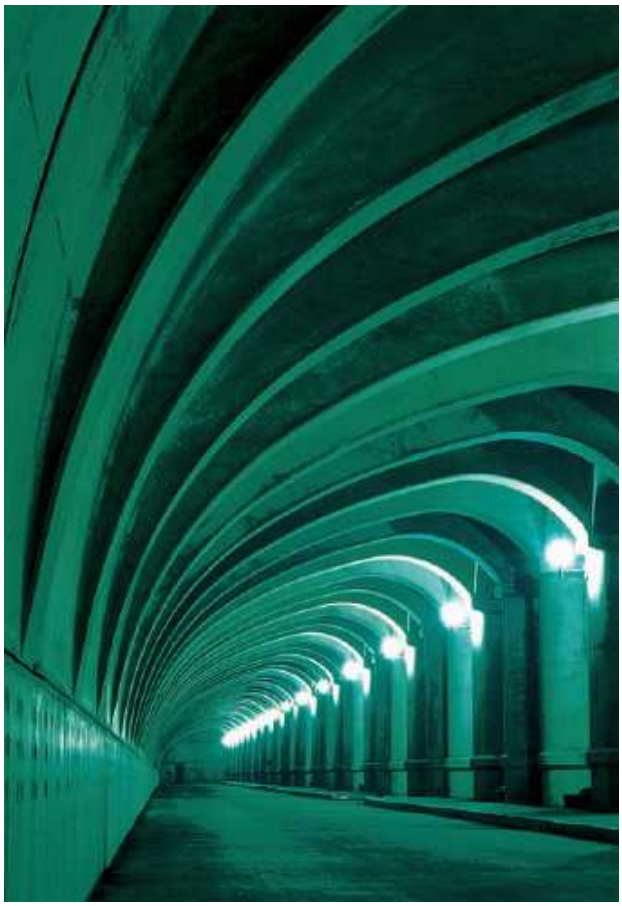
Most of the public documents state that TSUCHIYA Minoru (1904-1997), a 26 year-old assistant engineer at the Wakkanai Harbor Construction Office, designed the facility. How did such a young engineer accomplish such an achievement? Why did it take such a form? When TSUCHIYA was 91 years old (January 1995), the author had a chance to hear the specifics directly from him.



Picture 1 The nightscape inside the dome. The beams seem sucked into the wall.

TSUCHIYA was part of the first class to graduate from Hokkaido University. He took up his post at Wakkanai in October of 1928 with a 6-month delay due to sickness and was put in charge of constructing the pier's caisson. One month later, he was to have a fateful encounter with HIRAO Toshio. HIRAO graduated from the University of Tokyo in

1916 and received tutelage from ITO Chouemon at the Otaru Harbor Construction Office associated with HIROI Isamu. He was then given orders to double as the Director-General of the Wakkanai Harbor Construction Office while serving as the Director-General of Abashiri Harbor Construction Office.

HIRAO had TSUCHIYA survey waves that crossed over the parapet wall and the corrosion rate of wooden piles cast in the ocean. The wooden piles were vermiculated. Also, Wakkanai's characteristic strong winds and high waves surpassed the ability of parapets that were upright by +727.2 cm high. HIRAO took the survey results and decided to construct a canopy on the seawall and use concrete piles. In January of 1931, he ordered TSUCHIYA to design the seawall in 2 months. However, HIRAO drew a design in freehand and indicated a dome structure for the canopy. HIRAO judged the overall scale from the wave overtopping observations.

TSUCHIYA was perplexed. It was an unprecedented form that no one experienced and there was nobody to consult. However, there were two fortuitous inspirations. The first was that he studied concrete arch bridges for his graduation paper and studied arch bridge designs and German texts. Another was the course material on Greco-Roman architecture he kept from the architecture course he took as an undergraduate (at that time, architecture at Hokkaido University was taught by FUKUOKA Goichi, the Prefecture's Director of Architecture). TSUCHIYA mustered confidence and approached the design. This background explains the ancient Roman influence of the dome exterior but the gradual merging of the arch rib into the wall surface and the design of the splash guard to block wave breaks indicate his extraordinary efforts. "Fortunately, I was fearless regarding the design. Of course, the formwork caused headaches later on. If I had matured into a professional harbor engineer, I probably wouldn't have chosen such a grand design." This is TSUCHIYA's own reflection.

There were two designers. In other words, the basic concept and technical backbone was laid down by HIRAO and the detailed design was handled by TSUCHIYA. HIRAO did not make any demands on the unique form proposed by TSUCHIYA and approved it. HIRAO then made rounds at the Ministry of Interior to persuade the adoption of this design. During these activities, HIRAO did not claim the design as his own despite being deeply involved in the design as the person in charge. In his twilight years, TSUCHIYA was concerned that he was the sole person credited, explaining, "It is really a joint effort of HIRAO and I. If it wasn't for Mr. HIRAO, I wouldn't have been so bold." It is

Photo-2 A view of the dome from the pier

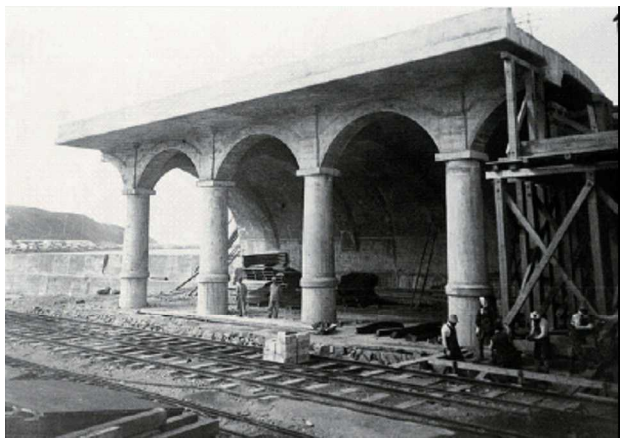


Photo-3 1931, the first block's form work removal. The splashguard was not yet installed. (Credit: TSUCHIYA Minoru) (unit: mm)

interesting to note that TSUCHIYA was not aware that a canopied seawall was so uncommon. HIRAO never praised him so he did not know how his design was regarded. To TSUCHIYA, HIRAO was a very fearsome figure since he was 12 years his senior. However, HIRAO took TSUCHIYA with him when he returned to his basic duties at Hakodate and also invited TSUCHIYA as his assistant when he was put in charge by the Navy for the harbor construction of Hainan Island, so the two were professionally close. HIRAO held TSUCHIYA in high regard and TSUCHIYA deeply admired HIRAO for his willingness to take the initiative in challenging new construction methods. This dome is a monument made by the synergy of their knowledge before embarking on their long relationship as master and pupil. The author would like to respect TSUCHIYA's wishes and note that it was a "collaborative work."

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Incidentally, the dome was not always a tourist spot. According to TSUCHIYA, the Mainichi Daily published an article about the dome and TSUCHIYA in 1964 and this served as the turning point for the dome to be featured in tourist guidebooks and magazines. Afterwards, another big opportunity came in 1976. The inside of the dome was used as storage site for coal but it was heavily wasted from salt damage and was scheduled for demolition. However, since this structure was ingrained as a symbol of Wakkanai city, the citizens heavily lobbied for a faithful restoration to its original form. The restoration was completed in 1980.

As shown, superiorly designed infrastructure that continuously contributes to regional economic activities influences the regional identity little by little and plays a role in cultural formation. The dome met such levels and was therefore renewed and passed on. This is an example of a fortunate civil engineering facility that not only satisfied function but also helped express the regional culture.

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Now, how can public facilities that make regional contributions such as this be provided? Simply providing facilities that prioritize economy and only satisfy functionality will make it hard for facilities of this caliber to emerge. Even TSUCHIYA did not create similar forms after gaining experience as an engineer. The dome was given birth by an experienced HIRAO's visionary perception, leadership and action.

Currently, public works are viewed critically by citizens, but they are not asking for "cheaper construction." Rather, they are protesting against the "waste of taxes." Essentially, civil engineering is a field that is deeply involved in the formation of a region's environment and culture through the provision of infrastructure. Being drowned out in the deafening cry for cheap and cheaper seems like a neglect of duty on the part of civil engineers.

I admire HIRAO Toshio. I want to be a leader like him. This is the author's story of the Wakkanai North Seawall.