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Nippon Steel Corporation
Nippon Steel Trading Co., Ltd.

“Straight Web-type Sheet Piling Cell Construction Method” Adopted for
a Major Infrastructure Project Overseas
- Hong Kong Boundary Crossing Facilities (“HKBCF”) Connecting Hong Kong,
Zhuhai, and Macao -

For the revetment structure of an artificial island project in Hong Kong, it has been decided that “Sheet Piling Cell Construction Method”, using “Straight Web-type Sheet Piles”—the sales expansion of which has been promoted by Nippon Steel Corporation (President: Shoji Muneoka; hereinafter “Nippon Steel”), will be used (about 100,000 tons of our “Straight Web-type Sheet Piles” will be used).

For the determinants leading to this adoption, the following may be cited:

- (1) The “Sheet Piling Cell Construction Method” using Straight Web-type Sheet Piles, which, from the early stages of the basic design for this project, have been proposed to the project owner and the consultant by Nippon Steel and Nippon Steel Trading Co., Ltd. (President: Tetsuo Imakubo; hereinafter “Nippon Steel Trading”), is an ecological method suitable for the execution zone inhibited by white dolphins, a rare species of marine life.**
- (2) In this construction site adjoining Hong Kong International Airport, this method can clear the severe height restrictions.**
- (3) Nippon Steel’s Straight Web-type Sheet Piles, with their available lengths, the interlocking strengths, and other specifications, as well as with Nippon Steel’s “integrated support, from manufacture and design through to execution and delivery,” backed up by long experience with similar projects undertaken in many parts of the world, have been highly evaluated by the project owner, the consultant, and the general contractor.**

This massive use of 100,000 tons of Straight Web-type Sheet Piles for a single project is the biggest ever in size (compared with the Kisarazu artificial island of the Tokyo Trans Bay Highway, which used about 20,000 tons of Straight Web-type Sheet Piles).

Outline of the project

Of the main project of the 40-km road construction connecting Hong Kong and Macao, this HKBCF project will build an artificial island, for locating the entry & exit control office, on the east side of Hong Kong International Airport.

The HKBCF project owner is the government of the Hong Kong Special Administrative Region, and construction is being executed by China Harbour Engineering Company Limited (“CHEC”), a subsidiary for the overseas business of China Communications Construction, a leading Chinese general contractor; meanwhile, Nippon Steel and Nippon Steel Trading are to supply the entire requirement of 100,000 tons of Straight Web-type Sheet Piles for this project.

The HKBCF project, officially inaugurated at the site on December 14 in the presence of the chief executive (Mr. Donald Tsang), is scheduled for completion in 50 months.

The HKBCF, 6.14 km in total circumference, requires 134 cylindrical cellular structures for the revetment construction. The Straight Web-type Sheet Piles for this project are going to be manufactured at Nippon Steel’s Yawata Works (Kitakyushu City, Fukuoka Prefecture) and delivered over a period of one year from January 2012.

Outline and features of the sheet piling cell construction method

The sheet piling cell construction method forms a cylindrical cell about 30 m in diameter by interlocking individual piles in cylindrical form and, carrying the cell to the installation site, driving them into the required depth, then filling the inside of the cell with earth and sand, etc. The Straight Web-type Sheet Piles are used for revetment construction to sustain reclaimed embankment.

Because cylindrical cells are pre-manufactured at a site not or only slightly affected by sea waves, and then driven in at the site, this method permits execution within a short period of time. This method also eliminates the need for soil improvement work, ordinarily necessary for traditional masonry work and concrete caissons, etc. Such features make this method suitable for a region demanding ecological consideration, such as in this area.

Features of Nippon Steel’s Straight Web-type Sheet Piles

This product, compared with other similar products, offers the following advantages.

- 1. Manufacturable lengths of 38 m**
 - Even for a project involving deep-water construction along with the general extensiveness of such an operation, it is possible to substantially shorten the construction term by minimizing the vertical jointing places of the Straight Web-type Sheet Piles.**
- 2. Maximum interlock strength of 5,880 KN/m**
 - The high tensile strength of the interlocking of the Straight Web-type**

Sheet Piles increases the reliability of the cellular structure, while also permitting large diameters.

- **Large diameters and the resulting increased stability of cells make it possible to shorten the length of penetration into the seabed and to reduce the weight of the steel used.**

3. Maximum angle of deviation for an interlocking swing of 10

- **The large angle of the interlocking deviation provides the ease and smoothness of both the interlocking and driving of piles.**

Based on our long engineering experience and delivery records associated with this method in Japan, Nippon Steel is expanding steel solution activities and integrating development, manufacturing, quality, technology, and sales. In construction markets overseas providing a good outlook for major-scale infrastructure improvement projects, mainly in developing nations and resource-producing countries, we aim to contribute to the improvement of social capital in each country through the promotion and expansion of the sale of our Straight Web-type Sheet Piles.

【The scene of ground-breaking ceremony on December 14】







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