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8. Architectural Features of Station Buildings

General

In design of the station buildings for Shinkansen, the 3-S concept was aimed at; that is, Standard, Smart and Simple. The harmony between the standardization for all the stations of the Shinkansen and the individuality of each station based on its locality has been pursued especially in the planning of stations for the Tohoku line and the Joetsu line. As an example, Sendai Station will be explained here.

Outline of plan

The platforms for trains are situated on the top floor of the station building of four stories and a basement. In order to secure a maximum effective space, the steel-frame-concrete composite structure was adopted, as explained in Chapter 7.

Photo 1 and Fig. 1 show the front view and the cross section, respectively. The concourse is situated on the second floor and the part of the third floor above the concourse is eliminated, in order to present a spacious atmosphere (see Photo 2). The structure is so arranged that all the passengers may be led to the concourse both from the station plaza and from the platforms by stairs and escalators. The passengers entering here from the pedestrian deck of the station plaza have a broad view over the concourse for the conventional lines, the ticket gates, the ticket windows, the ticket vending machines, the tourist center, the information center, the free passage, the entrance of the station building and so on. Also they can enjoy a view of the civic center of Sendai City through the front glass screen.

A large pedestrian deck (8300 m²) was provided because the space in front of the station was not sufficiently large and it was considered to be desirable to separate the plane for pedestrians from the plane for automobiles. A parking area with a capacity for 300 cars is situated on the roof of the building.

A huge shopping center (13000 m², 190 shops) was developed in the basement of the station building and on the former freight yard adjacent to the station.

External Wall Panels

For the purpose of shortening the construction period, minimizing the work above the tracks in operation, increasing the constructional accuracy, and securing better durability, mainly precast concrete panels and partly glass-reinforced concrete panels were used as external walls. Prior to application of the station building, vibration tests were carried out to determine the structural behaviour of the panel and its details for the fixture.

Abatement of Noise and Vibration due to Train Passage

The bedrooms for engineers and conductors on shift-work being situated under the viaducts, it was important that they, together with the offices, be insulated against the noise caused by trains passing on the viaducts and by general traffic in the neighbourhood. To this end, the offices are surrounded by sound barriers and in addition the ceilings and floors of the bedrooms are suspended on rubber pieces. No bedrooms are located on the third floor, as this floor is the most likely to be subject to vibration and noise due to train passage.

Facilities for Physically Handicapped Persons

Toilets for persons in wheelchairs, indented floor plates for alarm and conduct, double hand-rails in the over-bridges and the stair-cases and hand-rails in the toilets are examples of facilities for physically handicapped persons (see Photo 4). It is also planned to prepare a braille points information board. These are, however, already standard facilities in J.N.R.

Disaster Prevention Facilities

Various facilities and systems are provided for prevention of disasters such as fire and earthquake damage.



Photo 1 Front view of Sendai station

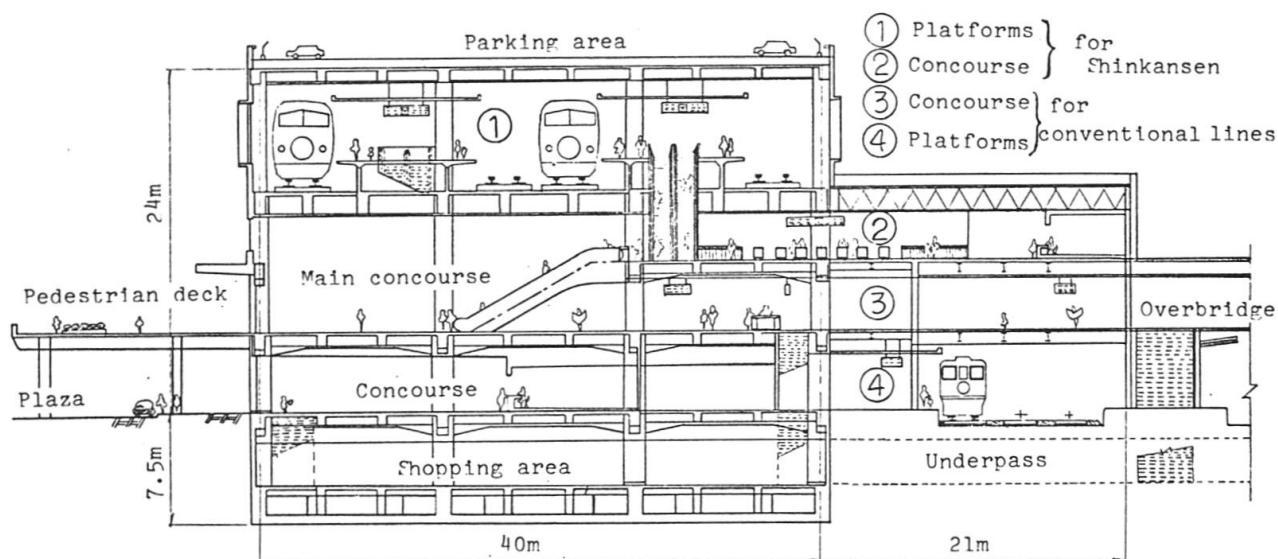


Fig. 1 Cross section of Sendai station



Photo 2 Main concourse

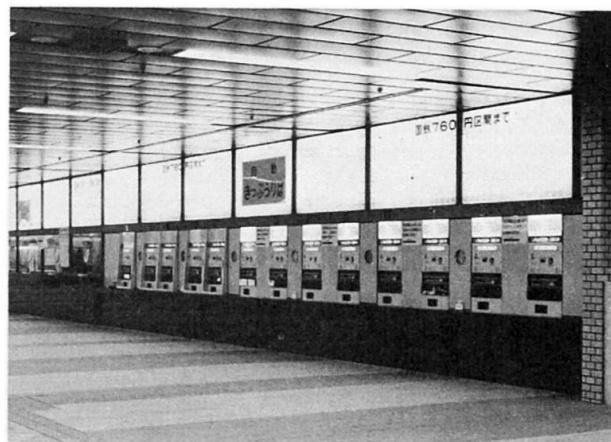


Photo 3 Ticket vending machines

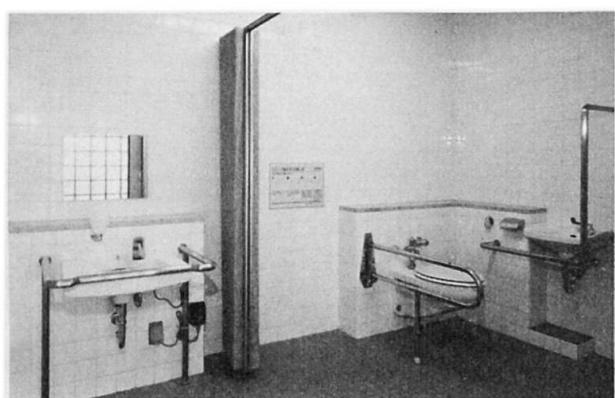


Photo 4 Facilities for physically handicapped persons



Photo 5 Control center for station building