Sendai Mediatheque, Sendai, Japan
Toyo Ito & Associates, January 2001

Type of project:
The Mediatheque is a civic building in the heart of Sendai, whose purpose is to fill the need for technological creativity. The functional program calls for a library, galleries for exhibitions, and multimedia spaces. Additional program includes a cafeteria, theater, meeting rooms, and an entrance hall. It serves as a hybrid building because it replaces 3 previous buildings, and because of its ever changing program.

Summary of design concepts:
The building criteria called for maximum flexibility throughout the project both in plan and in section. The design is simplified into three main elements, floor plates, columns, and an exterior skin. Ito designed the floor plates as an open plan to allow for changes in use. The building is supported by reticular truss-like tubular columns that appear to sway in section through the building giving the character of ocean seaweed. In addition to the buildings’ structure, the columns also house services such as stairs, elevators, mechanical equipment, and natural light shafts. The floor-to-floor heights vary according to the specific use of the floor. Ito’s aim was to design a building as transparent as possible, and a free from constraints. The elevations are reflective to fit into its urban context, and transparent to be as open as possible. At night the building becomes as lantern viewable from many angles.

Bibliography:
Pollock, Naomi R., Architectural Record, May 2001 p.191-201
Toyo Ito – Blurring Architecture, Suerrorant-Ludwig-Museum, 1999 p.130-33, 101-103
http://www.arch.columbia.edu/Students/Spring99/Stoltz.gary/cad.html
http://www.um.u-tokyo.ac.jp/publish_db/1997VA/english/virtual/01.html

Relationship of tubes and plates

Site Plan
Building Plans

The floor plates of the Sendai Mediatheque were designed to be as thin as possible to give the appearance of thin square sheets suspended like a mobile at varying heights. The overall building had to appear to be lightweight and fragile. Each floor plate composed of steel plates sandwiching steel beams that radiate from the columns rather than an orthogonal rhythm. The buildings functions are separated by the floors, whitewall each floor to be specifically designed for each function. The design of the floor’s interior was delegated to different designers form a kaleidoscope of floors characterized by different colors, forms, and materials. In general, services are placed at the rear forth building, along the north façade, while the south end is left completely open to allow views into the building from the street. The gallery floors can be arranged around full height partition walls, movable walls on tracks, and completely open areas.

Fifth Floor gallery
Sections - Elevations

In contrast to the diversity of the floor plans, the building is tied together in section by the reticular tubular columns that run through the core building. The columns are the most distinguishable element of the building, and that is due to the uncommon nature of them. Not only are the columns visible, they are glorified in the building, which differs from most open plan buildings. But what makes the columns stand out is how they are not even linear. They appear to sway in elevation with little concern for holding up the building. The loose appearance of the columns and the differing floor-to-floor heights strengthens the concept of floating plates among seaweed in an aquarium.

The elevations main concern is not close itself off from the city, but to embrace it. The completely transparent south façade is intended to allow interaction between the outside city and the inside. At night, the glass almost vanishes, and the interior of the building is visible from all elevations.
Dialogue of Elements

The Mediatheque is a typical building in the sense that it is not program driven, and therefore can accommodate any and all programmatic conditions that might arise. The building’s three basic architectural elements (plates, columns, and skin) work harmoniously together due to the simplicity of the scheme. Rarely do buildings articulate the basic elements through the building, and from floor to floor. Mediatheque emphasizes the reticular tube columns, and although they differ in size and length, they are consistent through the building. Each tube is only one story high, and connects to the floor plates and the tube above.

Toyo Ito plays with the scale of the tubes by using them both as structural columns, and for circulation within them. They do not seem overbearing because they are only one story in height. Although the tubes are generally hollow, they form a void that the user may interact with. The buildings open plan limit any solid/void relationships. Although the building is a solid box, the transparency of the elevations give the appearance of completely void.

Relationship of columns through floors

Diagram of three basic elements

Diagram of vertical circulation

Appearance of invisible (void) building
Sustainability/ Daylight/ Ventilation

The Sendai Mediatheque’s design is very energy effective and prefabrication of materials lowered the cost of construction. The skin of the exterior elevation is either double paned or shaded glass, limiting heat gain. Photovoltaic panels on the roof supplement energy costs.

The building receives plenty of daylight from the exterior transparent skin, and from the reticular tubes that have computerized rotating mirrors on top to reflect sunlight down the tubes transforming them into pillars of light. The main south façade is free from louvers and mullions, and is a double paned with ventilation to reduce heat gain. The other façades reflect the use of the floor by means of transparent glass, opaque glass, and solid metal panels.

Service spaces contained within tubes and against north facade

The service program spaces such as restrooms, offices, and storage are placed against the back north side of the building. This leaves the south faced completely wall free, just transparent glass. The skin of the north facade is stainless steel panels. The east and west facades are panelled with glass, opaque glass, and steel.

Diagram of exterior skin and sunlight

Picture showing relationship of interior & skin

The HVAC systems are located in the basement and on the roof which use the tubes for the flow of energy throughout the building. The skin also acts as a mechanical system which is left open during the summer to allow it to “breathe.” During the winter, it is closed off to act as an insulated air space. Open windows provide natural ventilation to the building floors and offices. The reticular tubes serve two functions by carrying the mechanical ducts through the building and by pulling the natural air from top to bottom like a wind catcher. Although public buildings require air-conditioning systems, Mediatheque uses the system very little due to natural ventilation.