天津大学新校区综合体育馆，天津，中国
Gymnasium of New Campus of Tianjin University, Tianjin, China, 2015

建筑设计：李兴钢，张音玄，闫昱，梁旭/中国建筑设计院有限公司
Architects: LI Xinggang, ZHANG Yinxuan, YAN Yu, LIANG Xu/China Architecture Design Group

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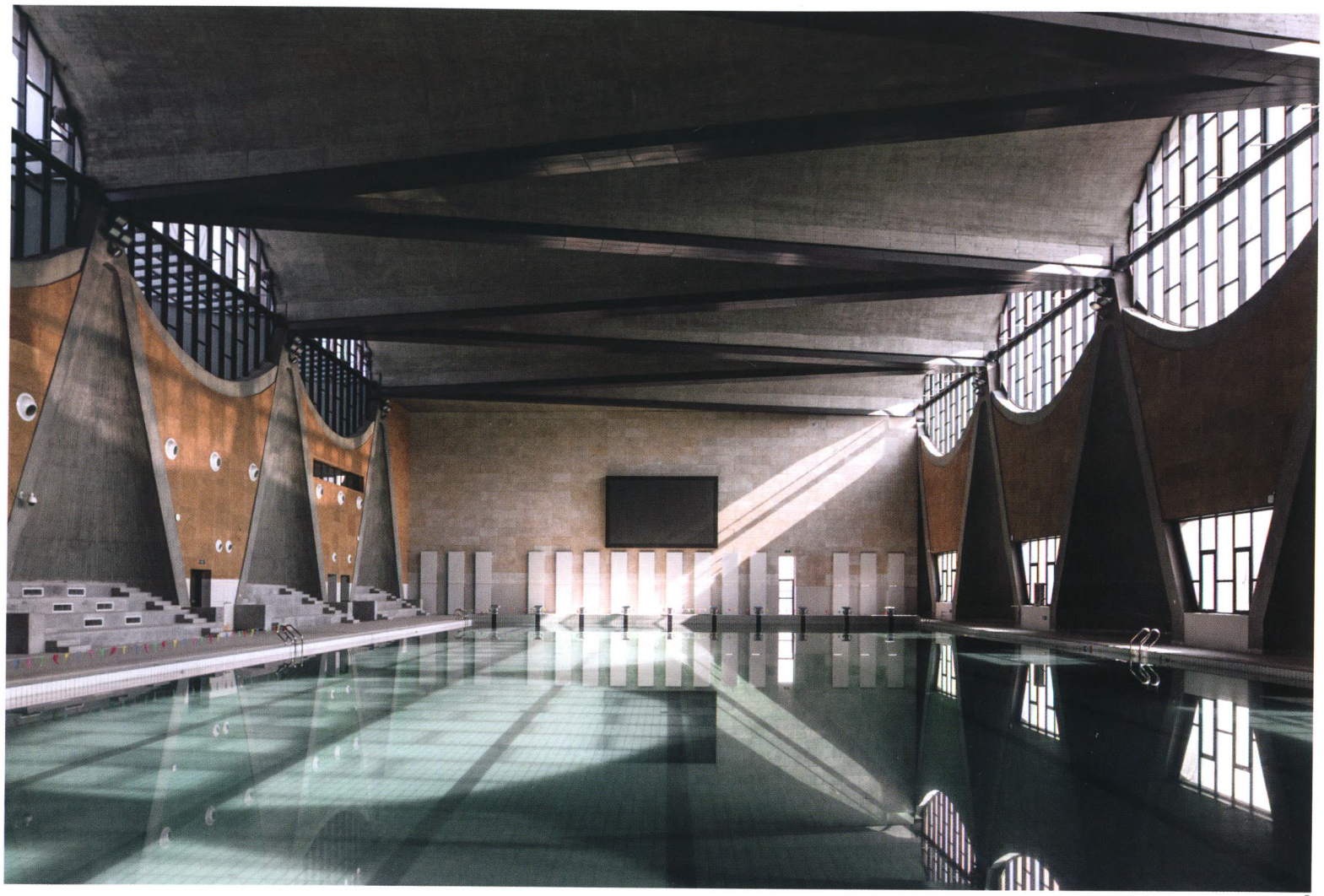
天津大学新校区综合体育馆位于校前区北侧，建筑主体包含室内体育活动中心和游泳馆两大部分，以一条跨街的大型缓拱形廊桥将两者的公共空间串通为一个整体，并形成一个环抱的入口广场，沟通建筑东西和南北。各类室内运动场地依其对平面尺寸、净空高度及使用方式（专用或兼用）的不同要求，紧凑排列，并以线性公共空间（公共大厅、缓拱廊桥和游泳馆门厅）叠加、串联为一个整体，不但增强了整个室内空间的开放性和运动氛围，而且天然造就了错落多样的建筑檐口高度，以及高效而舒展的平面布局。室内体育中心的公共大厅屋面采用了波浪形渐变的直纹曲面形屋面（空心密肋屋盖结构），其东侧长达 140m 的室内跑道，不仅为大厅带来凸显屋面形状的自然光线和向远处延伸的外部景观，而且那些奔跑于架高跑道上的人，也成为可由室内外空间中欣赏的独特风景，张扬建筑的运动主题。运动场地空间的屋顶和外墙，使用了一系列直纹曲面、筒拱及锥形曲面的钢筋混凝土结构，带来大跨度空间和高侧窗采光，在内明露木模混凝土筑造肌理，在外形成沉静而多变的建筑轮廓。达到建筑结构、空间与形式完美统一的结果，具有一种“建构”之美和空间“诗意”。为此，建筑师在结构设计和施工、工法、精度控制等方面进行了大量主导性工作。建筑外部材料主要采用清水混凝土饰面，结合具有天津大学老校区建筑特色的深棕红色页岩砖拼贴饰面；室内各运动空间除露明本色混凝土肌理（墙柱和屋顶）及白色涂料（墙面和吊顶）的部位外，还采用了具有吸音功能的本色木丝板材墙面和结合了空调、风道、风口的本色欧松板材固定座椅，以增加空间的温暖感和舒适性。□

项目信息/Credits and Data

客户/Client: 天津大学/Tianjin University
主创建筑师/Principal Architects: 李兴钢，张音玄/LI Xinggang, ZHANG Yinxuan
设计团队/Project Team: 闫昱，易灵洁，梁旭/YAN Yu, YI Lingjie, LIANG Xu
建筑面积/Floor Area: 75,000m^2
设计时间/Design Period: 2012.06-2013.06
建成时间/Completion Time: 2015.11
摄影/Photos: 孙海霆，张广源，李兴钢/SUN Haiting, ZHANG Guangyuan, LI Xinggang

1 屋顶鸟瞰/Aerial view of the roof



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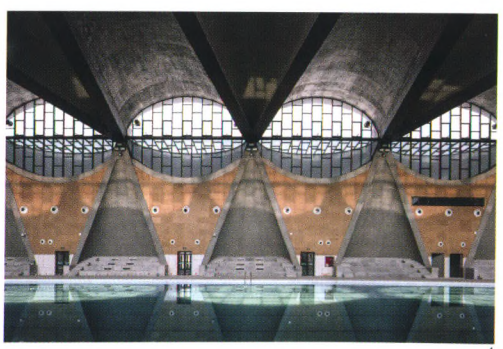

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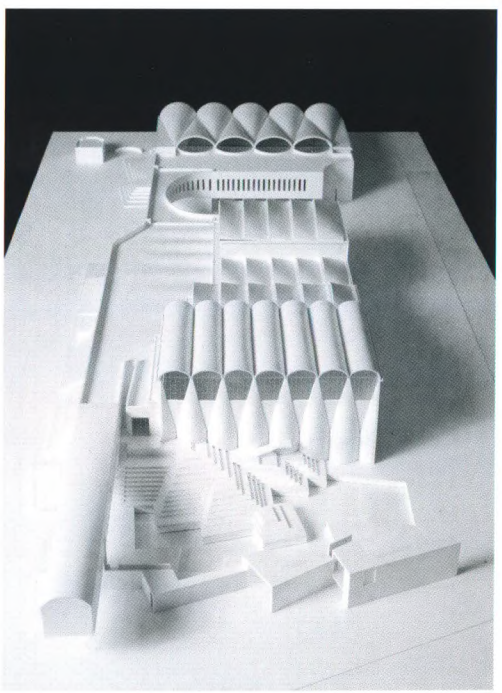
2 游泳馆室内/Natatorium interior
3 游泳馆锥筒及屋顶结构细部/Detail of the conical and roof structure of the natatorium
4 游泳馆室内/Natatorium interior
5 体育馆公共大厅/Lobby hall of the gymnasium

The Gymnasium of New Campus of Tianjin University is located in the north of the front zone of the campus. The main buildings include an indoor sports center and a natatorium. The public spaces of these two buildings are linked by a large arch bridge which encloses an entrance plaza and connects the entire building. According to the respective requirements towards the plan dimension, headroom, and usage (dedicated or multi-purpose), multiple indoor sports fields are compactly organized and connected by the linear public spaces (the public hall, the arch bridge, and the lobby of swimming pool). This design strategy not only largely enhances the openness and sports atmosphere of the interior spaces but also creates diverse eave heights with an efficient and easy-going layout. The design mainly focuses on how to logically organize and repeat the basic unit of the form and structure so as to generate specific function, light environment, and atmosphere within each space. The public hall of the indoor sports center adopts a ruled curve surface roof of a gradient wave-shape (hollow ribbed roof structure), with the 140-meter-long overhead indoor track, which forms a great light environment and infinite landscape. The exercisers who are running on the overhead track naturally become a part of the landscape, showing the spirit of sports. The roof and the exterior walls of the sports space use a series of reinforced concrete structure of ruled curve surfaces, barrel arch and conical surface, providing large span space and high side window lighting, achieving the perfect unity of the building's structure, space and form, as well as accessing the beauty of "tectonic" and the "poetic" of space. Consequently, the architects have played a leading role in the structural design, construction, engineering, precision control and other aspects. The main material of the facade are bare concrete and red-brown colored bricks which is the iconic architecture material of the old Tianjin University campus. The interior space of the gymnasium, except for the usage of bare concrete (for columns and roofs) and white coating (for walls and ceilings), contains sound absorption wood panel and OSB board of natural color for seat fixture and air-condition, air-pipes and wind pots in order to enhance the warmth and comfort of the space.□



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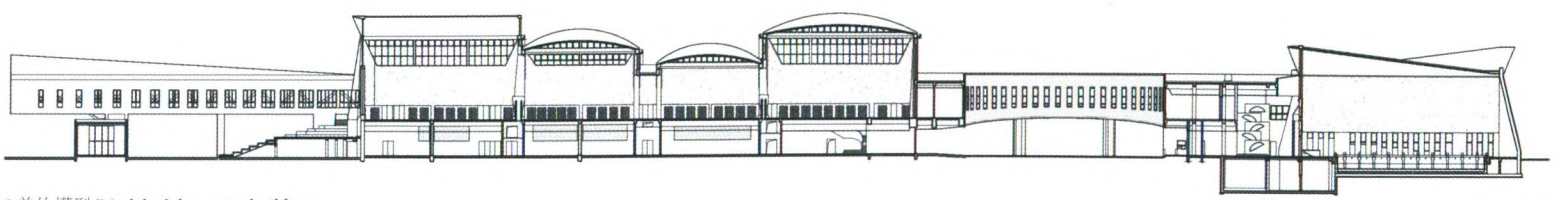

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6 总体模型/Model of the entire building
7 自西向东看体育馆室内直纹曲面屋顶/Watching interior ruled roof curve surfaces of the gymnasium from west to east
8 立面/Elevation

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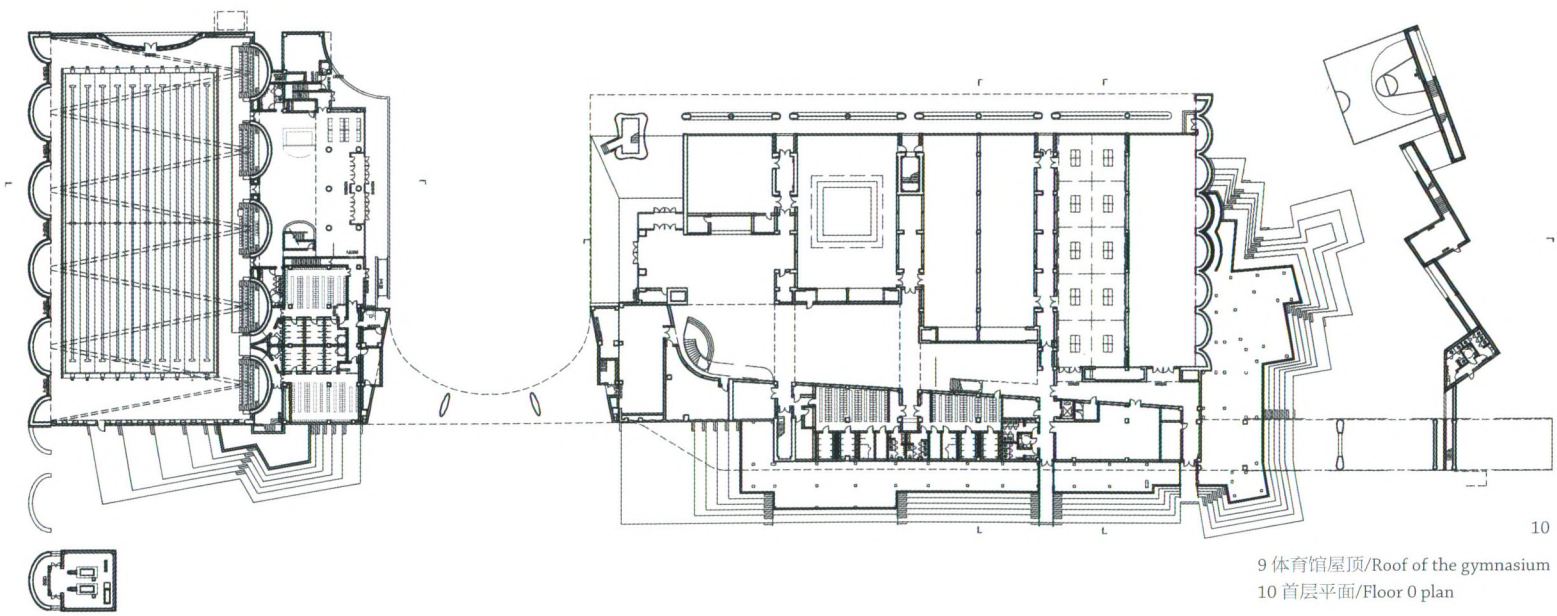

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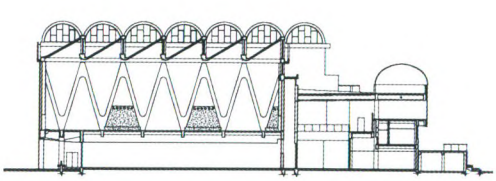
9 体育馆屋顶/Roof of the gymnasium
10 首层平面/Floor 0 plan

评委评语

该项目最突出的技术特点是它的空间结构。设计从建筑的功能和使用出发，大跨度混凝土拱券屋盖的结构造型有效地满足了其下方公共体育活动对于大尺度无柱空间的需求。建筑师对于结构构件和构造节点的处理颇费匠心，最终结构整体呈现出一种清晰的“重力传递”的可读性。所有这些技术层面的努力，最终物化为一处感人的空间场所，光、材料、声音，塑造出丰富而诗意的空间感知。这一点得到了这次技术进步奖评委的高度认可——技术的运用并非是简单的罗列堆砌，它的终极意义是为人的生活服务的，是指向文化的。□

Jury Statement

The most prominent technical feature of the project is its spatial structure. Designed with regard to function and usage, the large-span undulating concrete roof effectively spans across the public sportsground underneath that requires a large-scale column-free space. The architects paid close attention to structural components and joinery, and the final structure conveys a clear message of load bearing. All these technical efforts give shape to a space that stirs up emotions; here, light, material, and sound create a rich and poetic perception of space. This was highly praised by the judges of the Technological Innovation Award – the use of technology is not confined to the mere accumulation of technological measures; rather, its ultimate goal is to build better lives for the people and create culture.□



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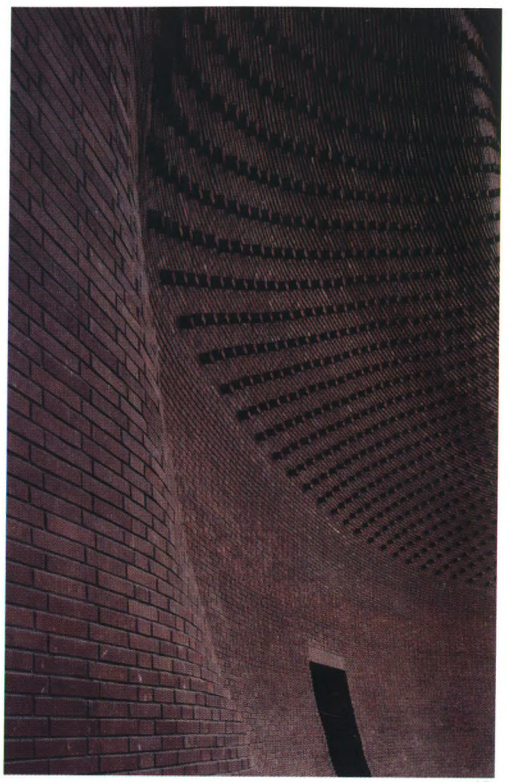

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11 剖面/Section
12 通往室外的楼梯/View of the stair to the outdoor
13 西立面砖墙细部/Detail of the brick wall on west façade
14 西南侧半鸟瞰/Aerial view from southwest