The Grandstand at Leopardstown Racecourse, Dublin (Ireland)

Autor(en): **Bobrowski, J.**

Objekttyp: **Article**

Zeitschrift: **IABSE structures = Constructions AIPC = IVBH Bauwerke**

Band (Jahr): **4 (1980)**

Heft C-13: **Sports halls and stadia**

PDF erstellt am: **14.08.2024**

Persistenter Link: https://doi.org/10.5169/seals-16534

2. The Grandstand at Leopardstown Racecourse, Dublin (Ireland)

Owner: Leopardstown Club
Architect: Howard V. Lobb & Partners
Engineer: Jan Bobrowski and Partners
Contractor: Hugh O'Neill & Co Ltd
Precasting:
Ardglass Ltd – Riversdale Concrete Products – Roecrete Ltd – Wall Units Ltd
Completion date: 1971

The grandstand, situated in a magnificent rural setting, consists of two 4 storey buildings, one housing the Tote betting hall and facilities, the other being the grandstand itself. The latter is an H-framed structure with a cantilevered roof as shown in Figure 1a. The roof consists of precast prestressed components, each component being the full length shown on the drawing and 1.9 m in width. In cross-section each roof component is curved so that it approximates to a quarter of a circle in shape, with stiffening rib forming a spine along its centre, the circular shape being 63 mm in thickness as shown in Figure 1b. Figure 1b also shows the method of anchoring the cantilevers and stressing them transversely.

On the opposite elevation – which is equally important since it faces the paddock and parade ring – the betting hall building has viewing galleries carried on T-shaped white concrete components, and above this level, a colonnaded facade of precast white concrete frames 8.5 m in height, forming a series of arches along the top of the building with a recessed band of concrete with a ribbed surface halfway down. Principal dimensions and data for the Leopardstown grandstand are listed in the table.

An interesting innovation which has contributed to this good result is that to control tensile stresses due to temperature and so eliminate cracking which would mar the highly-polished surfaces, a limited amount of post-tensioning was introduced along the edges of the viewing balconies.

Attention should perhaps be drawn to the figures given in the table for the strengths specified for the lightweight concrete. Solite aggregate was used and a high level of strength was consistently achieved. Another interesting technique is the use of hanging cladding panels, consisting of precast, prestressed "planks". These panels contrast with cement-painted walling. The technique of using prestressed planking has been extended to permanent formwork and most of the beams cast in place in the grandstand have permanent shuttering similar in construction to the cladding panels. For both applications, the finish on the planks is of Galway marble aggregate with deeply-ground exposed surfaces. The same finish is used for the precast T-shaped columns and the frames of the colonnade.

(J. Bobrowski)

Leopardstown Grandstand

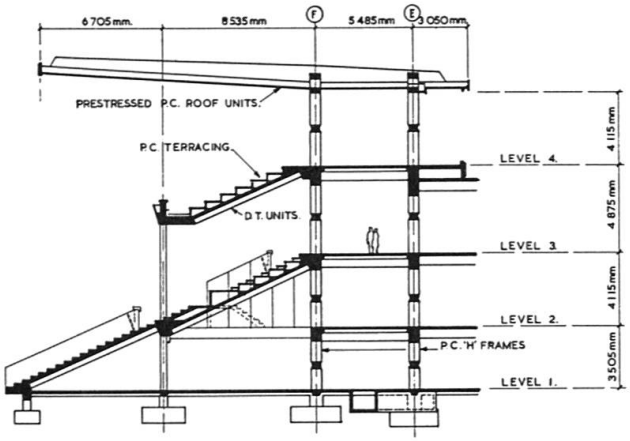


Fig. 1(a) Typical Cross Section

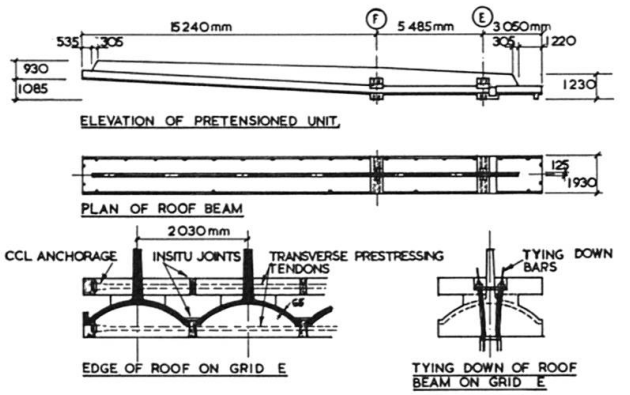
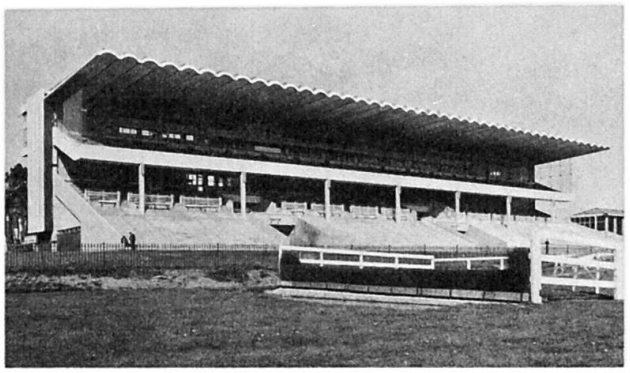


Fig. 1(b)



Leopardstown Grandstand

TABLE – Data for Leopardstown Grandstand

Overall size of structure	97.5 m×55 m
Floor area of stand	9,300 m²
Number of people accommodated:	
reserved enclosure	5,500
grandstand enclosure	3,000

Structure of stand

H-frames:	
centres	5.5 m
cross-section of columns	610×460 mm
cross-section of cross member	460×460 mm
28 day cube strength of concrete	52.2 N/mm²
Floors:	
Double tees:	
width	2.42 m
centre of ribs	1.21 m
typical depths	559 mm
corresponding spans	12.24 m
corresponding prestressing:	
Dyform strand	six 12.7 mm dia
28 day cube strength of concrete	63 N/mm²
Roof:	
length of cantilever	15.25 m
length of roof component	23.8 m
width of roof component	1.9 m
width of in situ joint between components	100 mm
depth of spine beam	530-925 mm
Concrete for roof components:	
density	1,873 kg/m³
aggregate: cement ratio	1.99
water: cement ratio	0.4
percentage of sharp sand in aggregate	39
type of coarse aggregate	Solite (expanded slate)
crushing strength:	
7 days	42 N/mm²
28 days	54.6 N/mm²
typical weight of one component	15.230 kg
typical prestressing of one component:	
Dyform	14 strands
Hanging cladding panels:	
width	1.22 m
thickness	63 mm
length	up to 15.5 m
prestressing	16×5 mm wire
Frames at rear elevation:	
number of frames	15
height	8.54 m
width	4.04 m
weight	10,680 kg
T-shaped columns beneath colonnade:	
maximum length	4.57 m
span	6.1 m