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## **Auditorium of Rome: glulam roof structures: design and erection**



# Auditorium of Rome

Glulam roof structures: design and erection

In the very heart of Rome the "Citta' della musica" has finally been completed; After three years 3 halls-auditoriums- , 2700-1200 and 750 , so named after the total seats capacity, the majestic construction by Italian maestro Arch. Renzo Piano is now fully available to the international shows.

The following presentation-mainly pictures taken during construction- is aimed to show the design and erection process which has been carried out under my direction on behalf of KAUFMANN HOLZ AG of Austria.

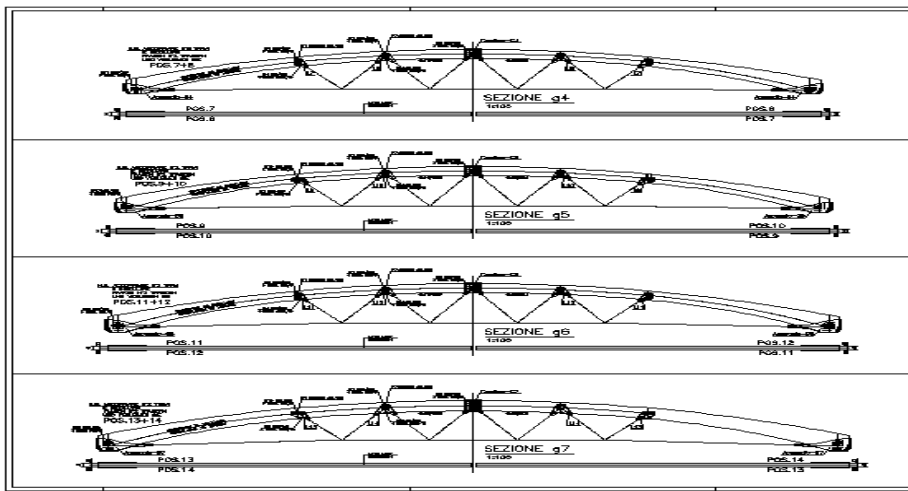
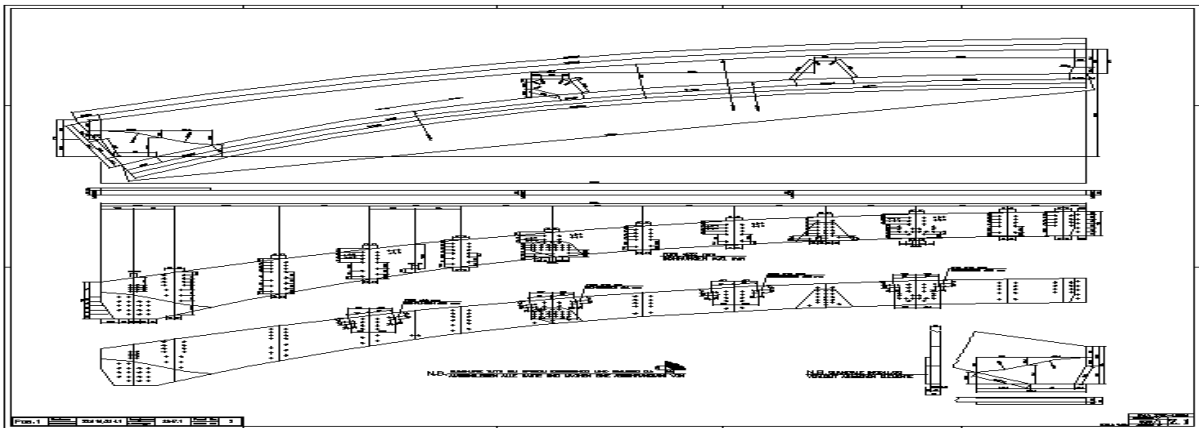


Total time for erection has been six months:

1500 mc GLULAM,  
1.000.000 kg steel  
9000 sqm of panels



Sample of production drawings



Nr. Seiten 1a					DISTINTA LAMELLARE-LEIMHOLZLISTE					Kaufmann Holz AG			Standard-Abrechnungsmaß				
Cliente		IMPREGILO		Auftrag Nr: 538_1 Lotto1					Consegna								
Kunde		SALA 2700/1		Kostenstelle:					Lieferung			08/07/2001					
Pos	Tipo	Colla	BS	Qualität	Descrizione	Pezzi	b	h1	h	h2	L (m.)	L1	M3/Pezzo	E/ges. M3	b	h	E/ges. M3
Typ	Leim				Beschreibung	Stück	(cm)		(cm)			(m.)	M3/Stück		(cm)	(cm)	
1	Z1	D	14	N	ARCO CAPRIATA	2	22,0		110,0	214,1	22,471		6,9068	13,8136			
2	Z2	D	14	N	ARCO CAPRIATA	2	22,0		110,0	214,1	22,471		6,9068	13,8136			
3	Z3	D	14	N	ARCO CAPRIATA	2	22,0		110,0	211,9	23,108		7,1422	14,2844			
4	Z4	D	14	N	ARCO CAPRIATA	2	22,0		110,0	211,9	23,108		7,1422	14,2844			
5	Z5	D	14	N	ARCO CAPRIATA	2	22,0		110,0	213,0	23,783		7,3424	14,6848			
6	Z6	D	14	N	ARCO CAPRIATA	2	22,0		110,0	213,0	23,783		7,3424	14,6848			
7	Z7	D	14	N	ARCO CAPRIATA	2	22,0		110,0	212,6	24,442		7,6083	15,2166			
8	Z8	D	14	N	ARCO CAPRIATA	2	22,0		110,0	212,6	24,442		7,6083	15,2166			
9	Z9	D	14	N	ARCO CAPRIATA	2	22,0		110,0	215,2	25,149		7,6487	15,2974			
10	Z10	D	14	N	ARCO CAPRIATA	2	22,0		110,0	215,2	25,149		7,6487	15,2974			
11	Z11	D	14	N	ARCO CAPRIATA	2	22,0		110,0	231,3	25,921		8,1981	16,3962			
12	Z12	D	14	N	ARCO CAPRIATA	2	22,0		110,0	231,3	25,921		8,1981	16,3962			
13	Z13	D	14	N	ARCO CAPRIATA	2	22,0		130,0	227,3	26,525		9,2451	18,4902			
14	Z14	D	14	N	ARCO CAPRIATA	2	22,0		130,0	227,3	26,525		9,2451	18,4902			
37	Z37	D	14	N	ARCARECCIO	1	22,0		60,0		5,230		0,6904	0,6904			
38	Z38	D	14	N	ARCARECCIO	1	22,0		60,0		5,230		0,6904	0,6904			
39	Z39	D	14	N	ARCARECCIO	1	22,0		60,0		5,229		0,6902	0,6902			
40	Z40	D	14	N	ARCARECCIO	1	22,0		60,0		5,229		0,6902	0,6902			
41	Z41	D	14	N	ARCARECCIO	1	22,0		60,0		4,664		0,6156	0,6156			
42	Z42	D	14	N	ARCARECCIO	1	22,0		48,0		3,856		0,4072	0,4072			
43	Z43	D	14	N	ARCARECCIO	1	22,0		60,0		3,128		0,4129	0,4129			
44	Z44	D	14	N	ARCARECCIO	1	22,0		48,0		2,322		0,2452	0,2452			
45	Z45	D	14	N	ARCARECCIO	1	22,0		60,0		1,595		0,2105	0,2105			
46	Z46	D	14	N	ARCARECCIO	1	22,0		48,0		1,157		0,1222	0,1222			
47	Z47	D	14	N	ARCARECCIO	1	22,0		60,0		5,230		0,6904	0,6904			
48	Z48	D	14	N	ARCARECCIO	1	22,0		60,0		5,230		0,6904	0,6904			
49	Z49	D	14	N	ARCARECCIO	1	22,0		60,0		5,229		0,6902	0,6902			



Unloading half-arches : max tot weight: kg. 14.700 hall 2700 type G10-G11.



Storing area of steel and glulam materials



End connections of steel members of main trusses



Steel parts to be inserted on ground before erection

Detail of lower hinge ;  
each weighing kg. 3300  
(hall 2700)



Top hinge: kg. 1080 (hall 2700)



Connecting steel parts: hinges, steel chords, windbracing, ...



in order to assemble the whole truss a temporary tower has been used: the total weight of half truss being kg. 27000 (beam G11)





Two half beams, before erection



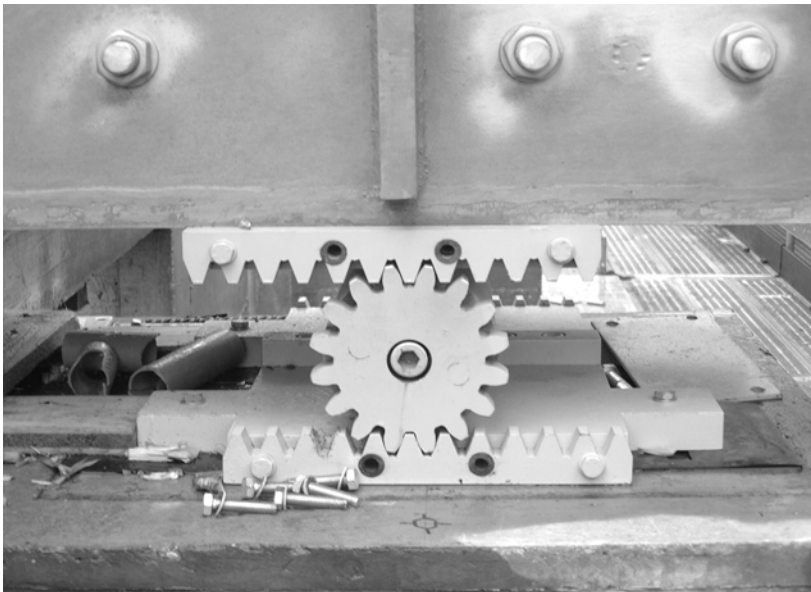
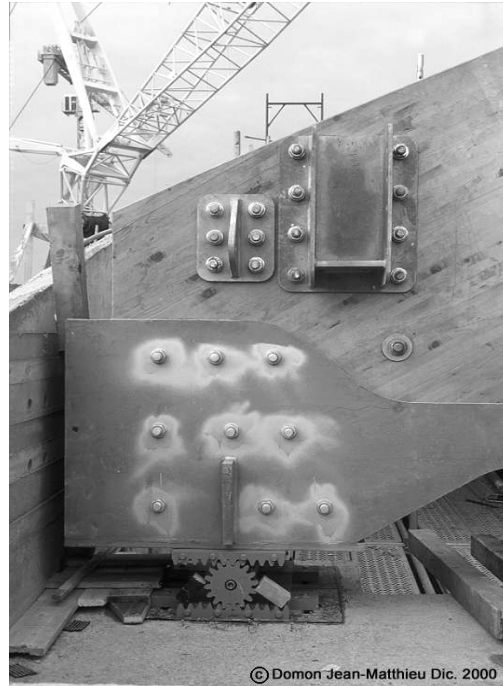
Assembling the twin traction rods: diameter 100mm (hall 2700)

The towers used to assemble the truss can be adjusted with hydraulic jigs (not showed)



(hall 1200)

The lower hinge (slide) is temporarily stopped during erection

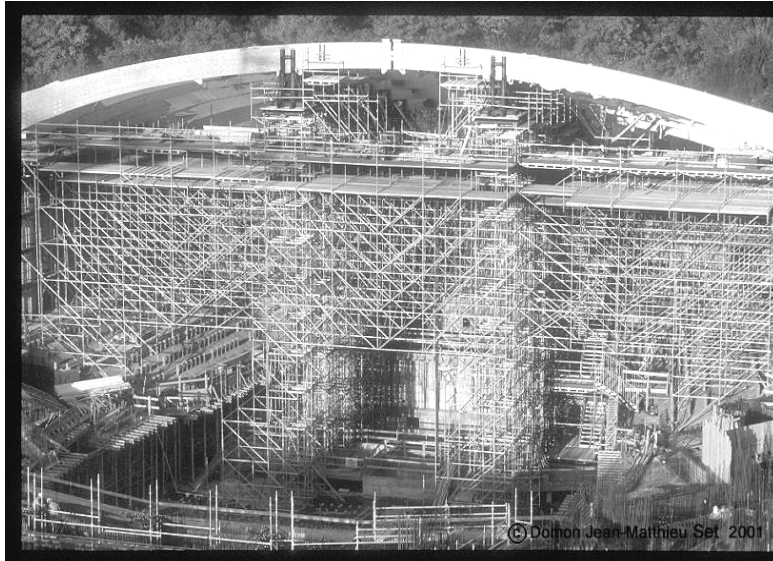




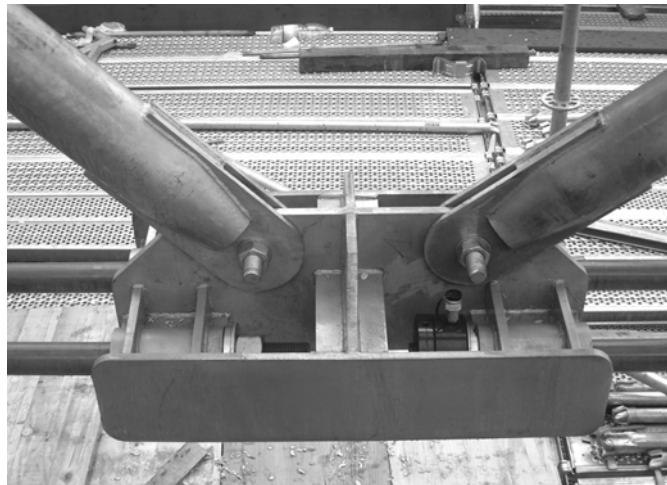
Top hinge



The 18 trusses of hall 2700 are lifted with a 400 TONS crane



Scaffolding itself is a powerful structure !



The connection of tension rods can be adjusted with a Freyssinet hydraulic muff



Glulam Wind bracing

Side construction has made of curved arches supported by stel tubes

250 mc glulam e 150.000 kg steel

Siding is made of 3D curved panels K1 MULTIPLAN 5 layers in larch mm 60.

