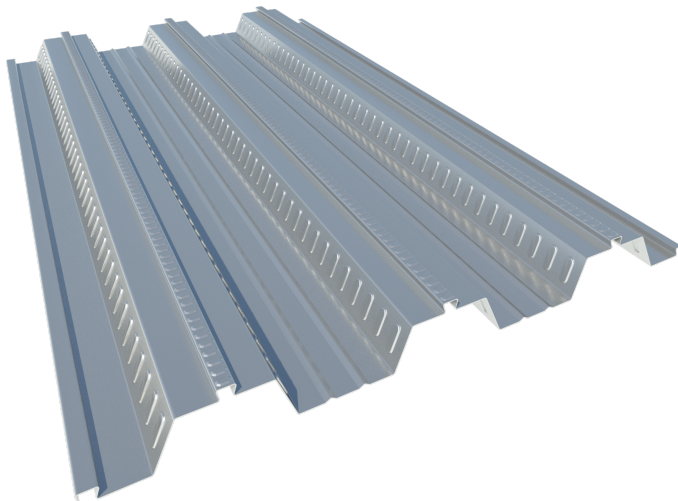


MT-76 COMPOSITE SLAB

COMPOSITE SLABS



RAW MATERIAL
Steel

FINISH
Galvanized

THICKNESSES mm (in.)
0.75 to 1.2
(0.029-0.047)

USEFUL WIDTH
880 mm (34.65 in.)

	THICKNESS mm (in.)			
	0.75 (0.029)	0.80 (0.031)	1.00 (0.039)	1.20 (0.047)
P (kg/m ²)	8.36	8.92	11.15	13.38
I (cm ⁴ /m)	75.58	89.00	111.10	133.00
W (cm ³ /m) - upper fiber	24.01	27.30	33.80	40.50
Ap (mm ² /m)	998.00	1135.30	1411.80	1694.10

P=profile weight per square meter I=profile inertia per linear meter W=resistant module profile per linear meter
Ap=useful section of steel per line



DESCRIPTION AND APPLICATION

The composite slab represents the most suitable construction solution for all those constructions where both the maximum technical and mechanical performance are required, as well as quick execution and guarantees. Thanks to its superior characteristics, it adapts to any building type (industrial, commercial, sports, residential). It has significant economic benefits, especially if taken into account at the beginning of the project: it involves a decrease in the average thickness of the slab, and therefore a reduction in weight that translates into a reduction in the resistant section of the structure (pillars, beams, foundations).

The foundation of composite slabs lies in the technology used to enhance the adhesion between the shaped steel sheet and the concrete. This technology is also called composite slab (or what is known as forjado colaborante in Spanish) because of the "collaboration" between the two materials that make up the slab, to cope with the stresses generated by the loads. The mechanical adhesion of the two components is performed through the indentations in the sloping flanks of the galvanized steel profile. Chemical adhesion alone would not be sufficient to ensure efficient bonding that actually works the composite slab as a mixed structure.

The characteristics of the MT-76 composite slab have been developed in collaboration with the Structures Group of the Continuum Mechanics Department of the School of Senior Engineers of Seville (Spain), within a framework of cooperation with AICIA (Andalusian Association for Research and Industrial Cooperation).

The experimental tests carried out comply with the requirements of the Eurocode 4 and Eurocode 3 standards, the only reference standards and mandatory standards at the European level.

The values published in the tables refer to the permissible static overload and the section of reinforcement at the negative bending moment in the case of intermediate supports. Tests to break the slabs of different typology have provided the characteristic parameters "m" and "k" that define the reference line of the MT-76 composite slab. This reference line provides the allowable overload data depending on the thickness of the sheet and the thickness of the floor slab.

After obtaining these values, following the testing procedures described in EC4, they have been verified by means of the mandatory verification tests.

GEOMETRIC SPECIFICATIONS

APPLIED STANDARDS

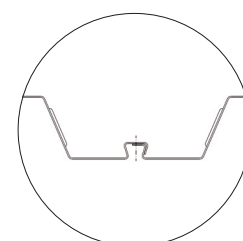
Geometric Specifications				
Characteristic	Value	Units	Tolerance / Standard	
Profile thickness (h)	75.8 (2.98)	mm (in.)	±1.5	EN 1090
Wave pitch	293	mm	+4/-1	EN 1090
Width of the ridge and valley	164/129	mm	+4/-1	EN 1090
Useful width (w)	880 (34.65)	mm (in.)	[±0.1 * h] and ≤15	EN 1090
Protruding surface of core depth	3.5	mm	-0.5/+1	EN 1090
Length [l]	1600 (62.99) to 14,000 (551.18)	mm (in.)	+20/-5	EN 1090
Height / Width stiffener	15/23	mm	-0.5 to +1/ +0.1	EN 1090
Execution class	EXC2			EN 1090

Features of the Profile				
Characteristic	Value	Units	Tolerance / Standard	
Deviation from straightness	≤ to the tolerance	mm	±2/mL (max.10)	EN 1090
Deviation from quadrature	≤ to the tolerance	mm	≤ 0.005 w	EN 1090
Deviation of the side overlap	≤ to the tolerance	mm	±2 s/500 mm	EN 1090
Sheet thickness	0.75 (0.029) to 1.2 (0.047)	mm (in.)		EN 10143
Type of steel	S220GD to S350GD			EN 10346
Emission of cadmium and compounds	COMPLIES - No emissions			EN 1090
Radioactivity emission	COMPLIES - No emissions			EN 1090
Behavior against fire	Broof [t1]			RD 110/2008
Durability	Hot-dip galvanized			EN 10346
Fire resistance	Class A1			EN 13501-1
Load bearing capacity	See load tables			EN 1993 - EC3 and EC

Ref. Standard	Description
EN 508-1	Products for sheet metal roofing and cladding. Specify for self-supporting steel sheet products. Part 1: steel.
EN 10143	Sheets and strips of steel with continuous metal coating by hot dipping. Dimensional and shape tolerances.
EN 10346	Flat steel products, continuous coated by hot dipping. Technical supply conditions.
EN 1090-2	Completion of steel and aluminum structures. Part 2: Technical requirements for steel structures.
EN 1090-4	Completion of steel and aluminum structures. Part 4: Technical requirements for cold-formed structural elements and steel structures for roof, ceiling, flooring and wall applications.



SECTION PROFILE



OVERLAP DETAIL

MT-76 - LAYOUT 1 OPENING - 2 SUPPORTS STATIC OVERLOADS (daN/m²) THICKNESS 0.75 mm

		H (cm)															
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SPAN (m)	2.00	1340	1537	1733	1929	2126	2322	2518	2714	2911	3059	3191	3321	3448	3573	3696	3816
	2.20	1126	1291	1455	1620	1785	1950	2115	2280	2445	2610	2775	2540	2683	2827	2970	3113
	2.40	961	1102	1243	1383	1524	1665	1806	1634	1753	1872	1991	2110	2230	2349	2468	2587
	2.60	802	938	1074	971	1071	1171	1272	1372	1472	1572	1673	1773	1873	1973	2074	2174
	2.80	670	652	737	822	907	992	1077	1162	1247	1333	1418	1503	1588	1673	1758	1843
	3.00	482	555	628	701	773	846	919	992	1065	1137	1210	1283	1356	1429	1501	1574
	3.20	413	476	538	601	663	726	789	851	914	976	1039	1102	1164	1227	1289	1352
	3.40	355	409	463	517	571	625	679	734	788	842	896	950	1004	1058	1112	1166
	3.60	306	353	400	446	493	540	587	634	681	728	775	822	869	916	962	1009
	3.80	264	305	345	386	427	468	509	549	590	631	672	712	753	794	835	876
	4.00	228	263	299	334	370	405	441	476	512	547	583	618	654	689	725	760
	4.20	182	227	258	289	320	351	382	413	444	475	506	537	568	598	629	660
	4.40	135	196	223	250	277	304	331	358	385	411	438	465	492	519	546	573
	4.60	96	156	192	215	239	262	286	309	332	356	379	403	426	449	473	496
	4.80	63	113	164	185	205	225	246	266	286	306	327	347	367	388	408	428
	5.00	35	76	130	158	175	193	210	228	245	263	280	298	315	333	350	368

MT-76 - LAYOUT 2 OPENINGS - 3 SUPPORTS STATIC OVERLOADS (daN/m²) THICKNESS 0.75 mm

		H (cm)															
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SPAN (m)	2.00	1373	1492	1609	1725	1838	1949	2059	2167	2272	2376	2477	2577	2675	2770	2864	2955
	2.20	1233	1340	1445	1548	1649	1748	1846	1941	2035	2127	2218	2306	2393	2478	2561	2643
	2.40	1170	1213	1307	1400	1491	1580	1668	1754	1838	1921	2002	2081	2159	2235	2309	2382
	2.60	1019	1105	1191	1275	1357	1438	1517	1595	1671	1745	1819	1890	1960	2029	2094	2161
	2.80	934	1013	1091	1167	1242	1316	1388	1458	1528	1595	1662	1727	1790	1852	1913	1972
	3.00	859	934	1005	1074	1143	1210	1276	1340	1403	1465	1526	1585	1643	1699	1754	1808
	3.20	766	864	786	876	967	1058	1148	1237	1295	1351	1407	1461	1514	1565	1616	1665
	3.40	689	606	686	765	844	924	1003	1082	1162	1241	1302	1351	1400	1447	1494	1538
	3.60	462	531	601	671	741	810	880	950	1020	1089	1159	1229	1299	1342	1385	1426
	3.80	406	467	529	590	652	714	775	837	898	960	1021	1083	1145	1206	1268	1325
	4.00	358	412	467	521	576	630	685	739	794	848	903	957	1012	1067	1121	1176
	4.20	316	364	413	461	510	558	607	655	703	752	800	849	897	945	994	1042
	4.40	280	323	366	409	452	495	538	581	624	667	710	753	797	840	883	926
	4.60	248	286	324	363	401	439	478	516	555	593	631	670	708	747	785	823
	4.80	219	253	288	322	356	390	425	459	493	527	562	596	630	665	698	733
	5.00	194	225	255	286	316	347	377	408	438	469	499	530	560	591	622	652

MT-76 - LAYOUT 3 OPENINGS - 4 SUPPORTS STATIC OVERLOADS (daN/m²) THICKNESS 0.75 mm

		H (cm)															
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SPAN (m)	2.00	1437	1562	1685	1806	1925	2042	2157	2270	2381	2490	2596	2701	2803	2904	3002	3099
	2.20	1291	1403	1513	1621	1728	1832	1935	2035	2134	2231	2326	2419	2510	2600	2687	2773
	2.40	1170	1271	1370	1467	1563	1657	1749	1840	1928	2015	2101	2184	2266	2346	2425	2501
	2.60	1040	1159	1249	1337	1424	1509	1592	1674	1754	1833	1910	1986	2059	2132	2202	2272
	2.80	911	1044	1145	1225	1304	1382	1458	1532	1605	1677	1747	1815	1882	1948	2012	2075
	3.00	805	923	1041	1129	1201	1125	1222	1318	1414	1511	1605	1668	1729	1789	1847	1904
	3.20	718	824	724	808	891	975	1058	1142	1226	1309	1393	1477	1560	1644	1702	1755
	3.40	646	557	630	703	776	849	922	995	1068	1141	1214	1287	1360	1433	1506	1579
	3.60	423	487	551	615	679	743	807	871	935	999	1063	1127	1191	1255	1319	1383
	3.80	370	427	483	539	596	652	709	765	821	878	934	990	1047	1103	1159	1216
	4.00	325	375	425	475	524	574	624	674	723	773	823	873	922	972	1022	1072
	4.20	286	330	374	418	462	506	550	594	638	682	727	771	815	859	903	947
	4.40	252	291	330	369	408	447	486	525	564	603	643	681	720	759	799	838
	4.60	222	257	291	326	361	395	430	464	499	534	568	603	638	672	707	742
	4.80	195	226	257	288	318	349	380	411	441	472	503	534	564	595	626	657
	5.00	172	199	226	254	281	308	335	363	390	418	445	472	499	526	554	581

 HA-25 - fck=25N/mm² - Sheet - fy=220N/mm² - Sag L/250 - 0% coef. negative redistribution

 For other values, contact the **Technical Department** to evaluate the most optimal solution in each case and receive personalized advice.

HIANSA S.A. is not responsible for the effects caused by the breach of the conditions expressed in all points of these technical specifications.

 Shore up center of the opening

MT-76 - LAYOUT 1 OPENING - 2 SUPPORTS
STATIC OVERLOADS (daN/m²)
THICKNESS 0.8 mm

		H (cm)													
SPAN (m)		12	13	14	15	16	17	18	19	20	21	22	23	24	25
	2.00	1829	2037	2244	2451	2659	2826	2738	2924	3110	3296	3481	3611	3733	3853
	2.20	1535	1709	1634	1787	1939	2092	2244	2396	2549	2701	2854	3006	3159	3311
	2.40	1104	1231	1358	1484	1611	1738	1865	1992	2119	2246	2372	2499	2626	2753
	2.60	927	1034	1140	1247	1354	1461	1568	1674	1781	1888	1995	2101	2208	2315
	2.80	785	876	967	1057	1148	1239	1330	1420	1511	1602	1693	1783	1874	1965
	3.00	670	748	825	903	981	1058	1136	1214	1291	1369	1447	1524	1602	1680
	3.20	575	642	709	776	843	909	976	1043	1110	1177	1244	1311	1378	1445
	3.40	496	553	611	669	727	785	843	901	959	1017	1075	1133	1191	1248
	3.60	428	479	529	579	630	680	730	781	831	881	932	982	1032	1083
	3.80	330	415	459	503	547	590	634	678	722	766	810	853	897	941
	4.00	250	360	399	437	475	513	552	590	628	666	705	743	781	819
	4.20	185	282	346	380	413	446	480	513	547	580	614	647	680	714
	4.40	131	212	300	330	359	388	417	446	476	505	534	563	592	622
	4.60	86	154	239	286	311	337	362	388	413	439	464	490	515	540
	4.80	48	105	177	247	269	291	313	336	358	380	402	424	447	469
	5.00	16	64	125	200	232	251	270	289	309	328	347	367	386	405
	5.20														
	5.40														
	5.60														
	5.80														
	6.00														

MT-76 - LAYOUT 2 OPENINGS - 3 SUPPORTS
STATIC OVERLOADS (daN/m²)
THICKNESS 0.8 mm

		H (cm)													
		12	13	14	15	16	17	18	19	20	21	22	23	24	25
SPAN (m)	2.00	1642	1757	1870	1981	2091	2198	2303	2407	2508	2607	2705	2800	2894	2985
	2.20	1474	1576	1677	1777	1874	1970	2063	2155	2246	2334	2421	2505	2588	2669
	2.40	1334	1426	1517	1606	1694	1779	1864	1946	2027	2106	2184	2260	2334	2406
	2.60	1215	1299	1381	1462	1541	1618	1694	1769	1842	1913	1983	2052	2119	2184
	2.80	1114	1190	1265	1338	1410	1480	1549	1617	1683	1748	1811	1873	1934	1993
	3.00	962	1073	1164	1231	1296	1361	1424	1485	1546	1605	1663	1719	1774	1828
	3.20	835	932	1028	1124	1197	1256	1314	1370	1426	1480	1532	1584	1634	1683
	3.40	729	814	898	983	1067	1151	1217	1269	1319	1369	1417	1465	1511	1556
	3.60	640	714	789	863	937	1011	1086	1160	1225	1271	1315	1359	1401	1442
	3.80	564	629	695	761	826	892	958	1023	1089	1154	1220	1264	1303	1341
	4.00	498	556	614	673	731	789	847	905	964	1022	1080	1138	1196	1249
	4.20	441	493	545	596	648	700	752	803	855	907	959	1010	1062	1114
	4.40	391	438	484	530	576	622	668	714	760	806	853	899	945	991
	4.60	348	389	430	471	512	554	595	636	677	718	759	801	842	883
	4.80	309	346	383	419	456	493	530	567	603	640	677	714	750	787
	5.00	275	308	340	373	406	439	472	505	538	571	604	637	669	702
	5.20	244	273	303	332	362	391	420	450	479	509	538	568	597	626
	5.40	205	243	269	295	322	348	374	400	427	453	479	506	532	558
	5.60	146	215	239	262	286	309	332	356	379	403	426	450	473	497
	5.80	97	169	211	232	253	274	295	316	337	358	378	399	420	441
6.00	56	115	186	205	223	242	260	279	298	316	335	354	372	391	

MT-76 - LAYOUT 3 OPENINGS - 4 SUPPORTS
STATIC OVERLOADS (daN/m²)
THICKNESS 0.8 mm

		H (cm)													
SPAN (m)		12	13	14	15	16	17	18	19	20	21	22	23	24	25
	2.00	1719	1840	1958	2075	2190	2303	2413	2522	2628	2733	2835	2935	3034	3130
	2.20	1544	1652	1758	1862	1964	2065	2163	2260	2355	2448	2539	2628	2716	2801
	2.40	1398	1495	1590	1684	1776	1867	1955	2042	2127	2211	2292	2372	2450	2527
	2.60	1274	1363	1449	1534	1617	1699	1779	1857	1934	2010	2083	2156	2226	2295
	2.80	1169	1249	1328	1405	1481	1555	1628	1699	1769	1838	1905	1970	2034	2096
	3.00	889	991	1094	1196	1299	1401	1497	1562	1626	1688	1749	1809	1867	1924
	3.20	770	859	948	1037	1126	1215	1304	1393	1482	1558	1614	1668	1722	1774
	3.40	671	749	826	904	982	1060	1138	1215	1293	1371	1449	1527	1593	1641
	3.60	587	655	724	792	860	929	997	1065	1133	1202	1270	1338	1407	1475
	3.80	516	576	636	696	756	817	877	937	997	1057	1117	1178	1238	1298
	4.00	454	507	560	614	667	720	773	827	880	933	986	1039	1093	1146
	4.20	401	448	495	542	589	637	684	731	778	825	872	920	967	1014
	4.40	354	396	438	480	522	564	605	647	689	731	773	815	857	899
	4.60	313	350	388	425	462	499	537	574	611	648	686	723	760	797
	4.80	277	310	343	376	409	443	476	509	542	575	608	641	675	708
	5.00	234	274	304	333	363	392	422	451	481	510	540	569	599	628
	5.20	167	242	268	295	321	347	373	399	426	452	478	504	531	557
	5.40	111	187	237	260	283	307	330	353	376	400	423	446	470	493
	5.60	65	128	205	229	249	270	291	311	332	353	373	394	415	435
	5.80	27	78	142	201	219	237	255	274	292	310	328	347	365	383
	6.00		36	89	155	191	207	223	239	255	272	288	304	320	336

 HA-25 - fck=25N/mm² - Sheet - fy=220N/mm² - Sag L/250 - 0% coef. negative redistribution

 For other values, contact the **Technical Department** to evaluate the most optimal solution in each case and receive personalized advice.

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 Shore up center of the opening

MT-76 - LAYOUT 1 OPENING - 2 SUPPORTS
STATIC OVERLOADS (daN/m²)
THICKNESS 1.0 mm

		H (cm)													
SPAN (m)		12	13	14	15	16	17	18	19	20	21	22	23	24	25
	2.00	2212	2416	2562	2706	2847	2986	3122	3256	3387	3516	3642	3766	3887	4006
	2.20	1851	2061	2271	2435	2562	2686	2808	2927	3045	3160	3273	3383	3491	3597
	2.40	1575	1754	1932	2111	1996	2153	2310	2467	2625	2782	2939	3064	3162	3257
	2.60	1358	1284	1416	1549	1682	1814	1947	2079	2212	2345	2477	2610	2742	2875
	2.80	978	1091	1204	1317	1430	1543	1656	1769	1882	1995	2108	2221	2334	2447
	3.00	838	935	1032	1129	1226	1323	1420	1517	1615	1712	1809	1906	2003	2100
	3.20	722	806	890	974	1058	1142	1226	1310	1394	1478	1562	1646	1730	1814
	3.40	626	699	772	845	918	991	1064	1137	1210	1283	1356	1429	1502	1575
	3.60	501	608	672	736	800	863	927	991	1055	1119	1182	1246	1310	1374
	3.80	392	531	587	643	699	755	811	867	923	978	1034	1090	1146	1202
	4.00	303	430	514	563	612	661	711	760	809	858	907	956	1006	1055
	4.20	230	336	451	494	537	581	624	667	711	754	797	840	884	927
	4.40	170	259	369	434	472	510	548	587	625	663	701	739	778	816
	4.60	120	195	288	381	414	448	482	516	549	583	617	651	684	718
	4.80	78	141	220	317	364	394	423	453	483	513	542	572	602	632
	5.00	42	96	163	245	319	345	371	398	424	450	476	503	529	555
	5.20														
	5.40														
	5.60														
	5.80														
	6.00														

MT-76 - LAYOUT 2 OPENINGS - 3 SUPPORTS
STATIC OVERLOADS (daN/m²)
THICKNESS 1.0 mm

		H (cm)													
SPAN (m)		12	13	14	15	16	17	18	19	20	21	22	23	24	25
	2.00	1772	1887	2000	2110	2219	2326	2430	2533	2634	2732	2829	2924	3016	3107
	2.20	1592	1695	1795	1894	1990	2085	2179	2270	2360	2447	2533	2617	2700	2780
	2.40	1442	1534	1625	1713	1800	1885	1969	2051	2131	2210	2287	2362	2436	2508
	2.60	1315	1399	1480	1560	1639	1716	1792	1866	1938	2009	2078	2146	2213	2277
	2.80	1207	1282	1357	1429	1501	1571	1639	1707	1772	1837	1900	1961	2021	2080
	3.00	1112	1182	1249	1316	1381	1445	1508	1569	1629	1687	1745	1801	1855	1909
	3.20	1030	1093	1156	1217	1277	1335	1392	1448	1503	1557	1609	1660	1710	1759
	3.40	904	1008	1073	1129	1184	1238	1291	1342	1392	1442	1490	1536	1582	1627
	3.60	795	888	980	1051	1102	1152	1200	1248	1294	1339	1383	1426	1468	1509
	3.80	703	785	866	948	1028	1074	1119	1163	1206	1248	1288	1328	1366	1404
	4.00	623	696	769	842	914	987	1046	1087	1127	1165	1203	1239	1275	1309
	4.20	555	620	685	750	814	879	944	1009	1055	1090	1125	1159	1192	1224
	4.40	495	553	611	669	727	785	844	902	960	1018	1055	1086	1116	1146
	4.60	442	494	546	599	651	703	755	807	859	912	964	1016	1048	1075
	4.80	396	442	489	536	583	630	677	724	771	818	864	911	958	1005
	5.00	354	396	439	481	523	565	607	650	692	734	776	818	861	903
	5.20	317	355	393	431	470	508	546	584	622	660	698	736	774	812
	5.40	253	319	353	387	421	456	490	524	559	593	627	661	696	730
	5.60	188	282	316	347	378	409	440	471	502	533	564	595	625	656
	5.80	133	211	283	311	339	367	395	423	451	478	506	534	562	590
	6.00	87	152	234	279	304	329	354	379	404	429	454	479	504	529

MT-76 - LAYOUT 3 OPENINGS - 4 SUPPORTS
STATIC OVERLOADS (daN/m²)
THICKNESS 1.0 mm

		H (cm)													
SPAN (m)		12	13	14	15	16	17	18	19	20	21	22	23	24	25
	2.00	1855	1975	2093	2210	2324	2436	2546	2653	2759	2863	2965	3064	3162	3257
	2.20	1667	1775	1880	1984	2086	2186	2283	2380	2474	2566	2656	2745	2832	2916
	2.40	1511	1608	1703	1796	1887	1977	2065	2151	2236	2319	2400	2479	2557	2633
	2.60	1379	1466	1552	1637	1720	1801	1880	1958	2035	2109	2183	2254	2324	2393
	2.80	1266	1345	1424	1500	1576	1650	1722	1793	1862	1930	1996	2061	2125	2187
	3.00	1167	1240	1312	1382	1451	1518	1585	1649	1713	1775	1835	1894	1952	2009
	3.20	1081	1148	1176	1279	1342	1404	1464	1524	1582	1639	1694	1748	1801	1852
	3.40	834	931	1028	1124	1221	1303	1358	1413	1466	1518	1569	1619	1668	1715
	3.60	733	818	903	988	1073	1158	1243	1315	1364	1412	1459	1504	1549	1592
	3.80	646	721	797	872	947	1022	1098	1173	1248	1316	1360	1402	1443	1483
	4.00	572	638	705	772	839	906	973	1039	1106	1173	1240	1307	1347	1384
	4.20	507	567	626	686	745	805	864	924	983	1043	1102	1162	1221	1281
	4.40	451	504	557	610	663	717	770	823	876	929	982	1036	1089	1142
	4.60	401	449	497	544	592	639	687	734	782	829	877	925	972	1020
	4.80	352	400	443	486	528	571	613	656	699	741	784	827	869	912
	5.00	285	357	396	434	472	510	548	587	625	663	701	739	778	816
	5.20	210	311	353	387	422	456	490	525	559	593	628	662	696	730
	5.40	148	232	315	346	377	408	438	469	500	531	561	592	623	654
	5.60	97	166	251	309	336	364	391	419	447	474	502	530	557	585
	5.80	54	111	181	269	300	324	349	374	399	423	448	473	498	522
	6.00	18	64	123	196	266	289	311	333	355	377	399	422	444	466

 HA-25 - fck=25N/mm² - Sheet - fy=220N/mm² - Sag L/250 - 0% coef. negative redistribution

 For other values, contact the **Technical Department** to evaluate the most optimal solution in each case and receive personalized advice.

HIANSA S.A. is not responsible for the effects caused by the breach of the conditions expressed in all points of these technical specifications.

 Shore up center of the opening

MT-76 - LAYOUT 1 OPENING - 2 SUPPORTS

 STATIC OVERLOADS (daN/m²)

THICKNESS 1.2 mm

		H (cm)													
SPAN (m)		12	13	14	15	16	17	18	19	20	21	22	23	24	25
	2.00	2430	2578	2723	2866	3006	3144	3279	3412	3542	3670	3795	3918	4038	4156
	2.20	2171	2323	2453	2580	2706	2829	2950	3069	3185	3299	3411	3521	3628	3733
	2.40	1844	2053	2227	2342	2456	2567	2676	2783	2888	2991	3092	3190	3287	3381
	2.60	1588	1768	1948	2128	2244	2331	2489	2636	2730	2821	2910	2998	3084	3169
	2.80	1383	1540	1645	1716	1781	1851	1987	2122	2258	2393	2529	2664	2750	2828
	3.00	1008	1125	1241	1358	1475	1591	1708	1825	1942	2058	2175	2292	2408	2525
	3.20	872	973	1074	1175	1276	1378	1479	1580	1681	1782	1883	1985	2086	2187
	3.40	690	846	934	1023	1111	1199	1288	1376	1464	1552	1641	1729	1817	1905
	3.60	545	739	817	894	972	1049	1126	1204	1281	1359	1436	1513	1591	1668
	3.80	428	591	717	785	853	921	989	1057	1126	1194	1262	1330	1398	1466
	4.00	334	470	631	691	751	811	872	932	992	1052	1112	1173	1233	1293
	4.20	257	371	511	610	663	716	770	823	876	930	983	1036	1090	1143
	4.40	193	289	408	539	586	634	681	728	776	823	870	918	965	1012
	4.60	140	221	322	444	519	561	603	645	687	729	771	814	856	898
	4.80	95	164	250	354	460	497	535	572	609	647	684	722	759	797
	5.00	57	115	189	278	386	440	474	507	540	574	607	640	674	707
	5.20	15	61	120	194	282	387	419	449	479	508	538	568	597	627
	5.40														
	5.60														
	5.80														
	6.00														

MT-76 - LAYOUT 2 OPENINGS - 3 SUPPORTS

 STATIC OVERLOADS (daN/m²)

THICKNESS 1.2 mm

		H (cm)													
SPAN (m)		12	13	14	15	16	17	18	19	20	21	22	23	24	25
	2.00	1902	2016	2128	2238	2346	2451	2555	2657	2757	2855	2951	3045	3137	3227
	2.20	1710	1812	1912	2009	2105	2200	2292	2383	2472	2559	2644	2727	2809	2889
	2.40	1550	1642	1731	1819	1905	1990	2073	2154	2234	2312	2388	2463	2536	2607
	2.60	1415	1498	1579	1658	1736	1812	1887	1961	2033	2103	2172	2239	2305	2369
	2.80	1299	1374	1448	1520	1591	1660	1728	1795	1860	1924	1986	2047	2107	2165
	3.00	1198	1267	1334	1400	1465	1528	1590	1651	1711	1769	1825	1881	1935	1988
	3.20	1110	1173	1235	1296	1355	1413	1470	1525	1580	1633	1685	1735	1785	1833
	3.40	1033	1091	1148	1203	1258	1311	1363	1414	1464	1513	1561	1607	1652	1696
	3.60	964	1017	1070	1121	1172	1221	1269	1316	1362	1407	1450	1493	1534	1575
	3.80	844	942	1000	1048	1094	1140	1184	1228	1270	1311	1351	1391	1429	1466
	4.00	751	838	925	982	1025	1067	1108	1148	1187	1225	1263	1299	1334	1368
	4.20	670	748	826	905	962	1001	1039	1076	1113	1148	1182	1216	1248	1280
	4.40	599	670	740	810	881	941	976	1011	1045	1077	1109	1140	1170	1199
	4.60	538	601	664	728	791	854	917	951	983	1013	1042	1071	1099	1126
	4.80	483	540	597	655	712	769	826	883	926	954	981	1008	1034	1058
	5.00	435	487	538	590	641	693	745	796	848	899	925	950	973	996
	5.20	365	439	485	532	579	625	672	719	766	812	859	896	918	939
	5.40	281	396	438	480	523	565	607	650	692	734	777	819	861	886
	5.60	211	313	395	434	472	511	549	587	626	664	703	741	779	818
	5.80	153	238	344	392	427	461	496	531	566	601	636	670	705	740
	6.00	104	175	264	354	385	417	449	480	512	543	575	607	638	670

MT-76 - LAYOUT 3 OPENINGS - 4 SUPPORTS

 STATIC OVERLOADS (daN/m²)

THICKNESS 1.2 mm

		H (cm)													
SPAN (m)		12	13	14	15	16	17	18	19	20	21	22	23	24	25
	2.00	1990	2110	2227	2342	2456	2567	2676	2783	2888	2991	3092	3190	3287	3381
	2.20	1790	1897	2002	2105	2206	2305	2402	2497	2591	2682	2772	2860	2945	3030
	2.40	1624	1720	1814	1906	1997	2086	2173	2259	2343	2425	2505	2584	2661	2736
	2.60	1483	1570	1655	1739	1821	1901	1980	2057	2133	2207	2280	2351	2420	2488
	2.80	1362	1441	1519	1595	1669	1743	1814	1885	1954	2021	2087	2151	2214	2275
	3.00	1257	1329	1400	1470	1538	1605	1671	1735	1798	1859	1919	1978	2035	2091
	3.20	1165	1232	1297	1361	1424	1485	1545	1604	1662	1718	1773	1826	1879	1930
	3.40	1084	1146	1206	1265	1323	1379	1434	1488	1541	1593	1643	1692	1740	1787
	3.60	1013	982	1044	1104	1162	1219	1274	1328	1381	1434	1482	1528	1574	1618
	3.80	778	869	959	1050	1140	1200	1248	1294	1339	1383	1426	1467	1508	1547
	4.00	691	771	852	932	1013	1094	1168	1211	1253	1293	1333	1372	1409	1446
	4.20	615	687	759	831	903	975	1047	1119	1175	1213	1249	1285	1320	1353
	4.40	549	613	678	743	807	872	936	1001	1065	1130	1173	1206	1238	1270
	4.60	471	549	607	665	723	781	839	897	955	1013	1071	1129	1164	1193
	4.80	386	492	544	596	649	701	753	805	857	910	962	1014	1066	1118
	5.00	315	442	489	536	583	630	677	724	771	818	865	912	959	1006
	5.20	235	344	437	482	524	566	609	651	694	736	779	821	864	906
	5.40	170	260	371	433	471	510	548	586	625	663	702	740	778	817
	5.60	115	190	282	389	424	459	493	528	563	597	632	667	701	736
	5.80	70	131	209	303	381	413	444	475	507	538	569	601	632	663
	6.00	31	82	147	226	322	371	399	428	456	484	512	541	569	597

 HA-25 - fck=25N/mm² - Sheet - fy=220N/mm² - Sag L/250 - 0% coef. negative redistribution

 For other values, contact the **Technical Department** to evaluate the most optimal solution in each case and receive personalized advice.

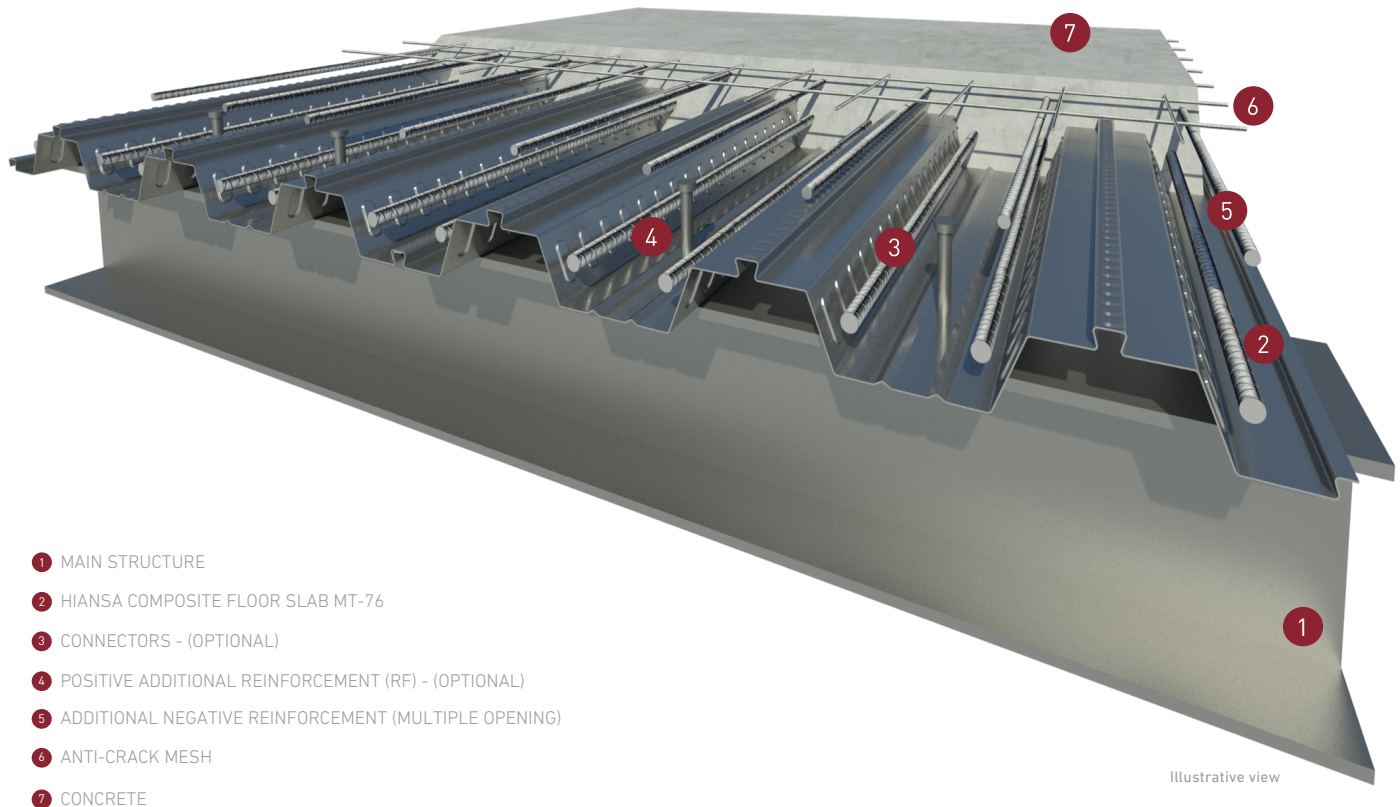
HIANSA S.A. is not responsible for the effects caused by the breach of the conditions expressed in all points of these technical specifications.

 Shore up center of the opening

MT-76 COMPOSITE SLAB

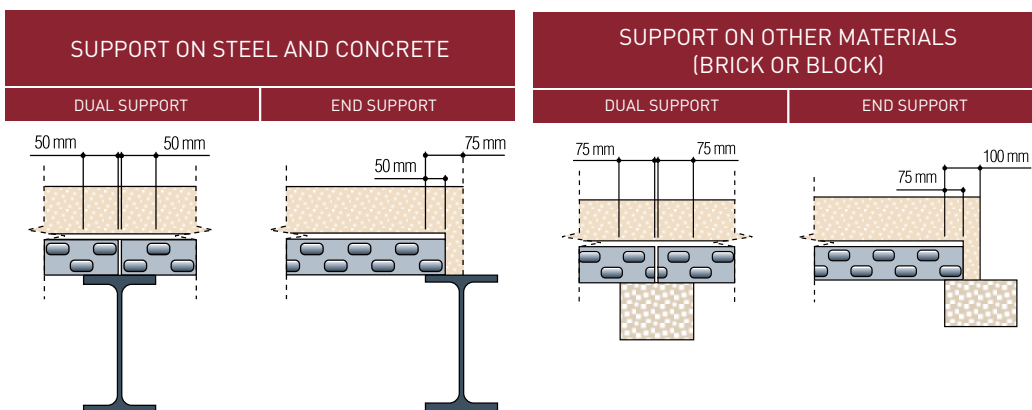
COMPOSITE SLABS

TYPE DETAILS

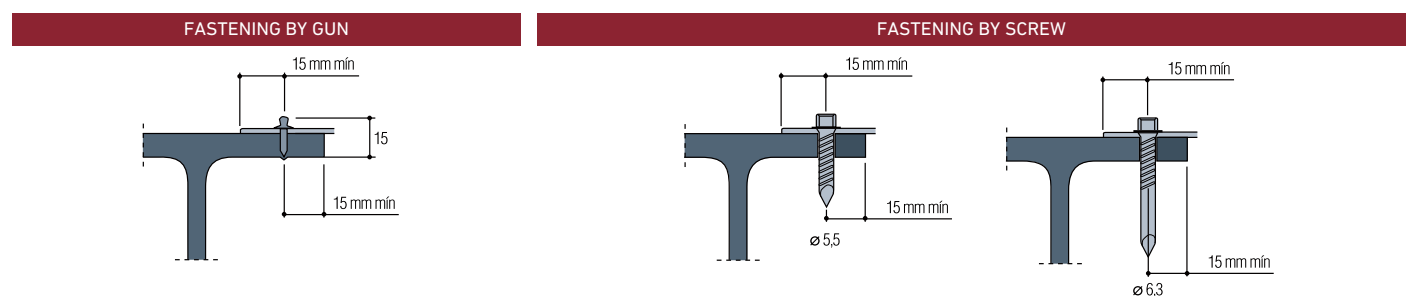


Section type MT-76 composite slab, in which all the reinforcements that can be placed according to the calculation requirements set by the Designer are indicated. Even connectors that are welded or bolted will be necessary when the slab is required to work integrally with the supporting metal beam.

CONDITION OF SUPPORT OF THE SHEETS ON BEAMS



The attachment of the slab to the structure will be by screw, nail or welding, at the discretion of the Designer and always respecting the minimum measurements indicated for each case in the attached figures. It is recommended to attach each sheet one at a time and check at the end that they are all secured.



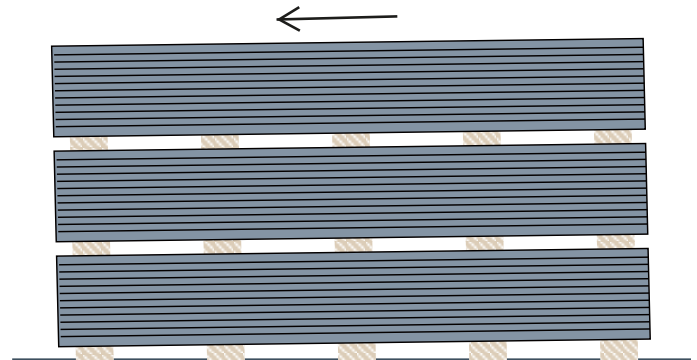
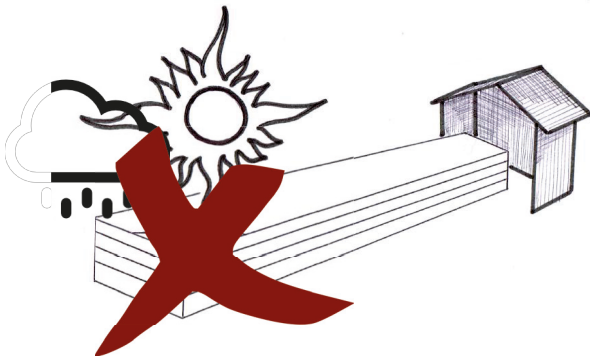
MT-76 COMPOSITE SLAB

COMPOSITE SLABS

STOCKING OF MATERIAL

In order to avoid the action of wind, humidity, condensation and rain, it is recommended that the galvanized steel material be stored in covered, ventilated areas and in an atmosphere that is as dry as possible.

In case of outdoor storage, the packages must be isolated from the ground by means of blocks of different height in order to obtain a slope that favors the evacuation of the water. They must also be covered with tarpaulins or plastics ensuring proper ventilation to avoid the concentration of water or excessive humidity that can cause white oxide to appear that only affects the aesthetics of the material without reducing its resistant properties.



Elevation view

STRUTTING THE SLAB

Strutting the slab is understood as the placement of intermediate supports to temporarily reduce the distance between supports during the pouring and setting phases of concrete. Once the sheets have been secured, where necessary, a strut will be placed in the middle of the section. In case of needing two struts (large section of free span) the struts will be placed at $1/3$ and $2/3$ of the free span of the section. The sketch illustrates the correct way to place a strut.

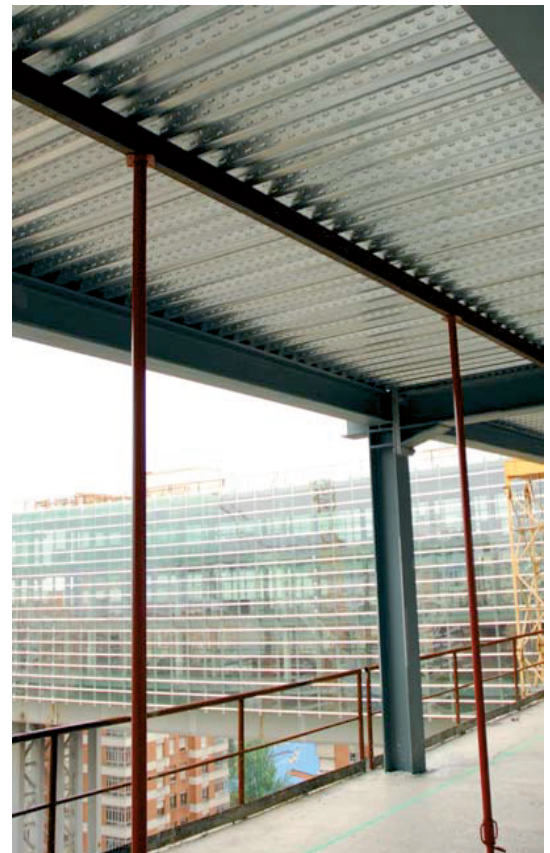
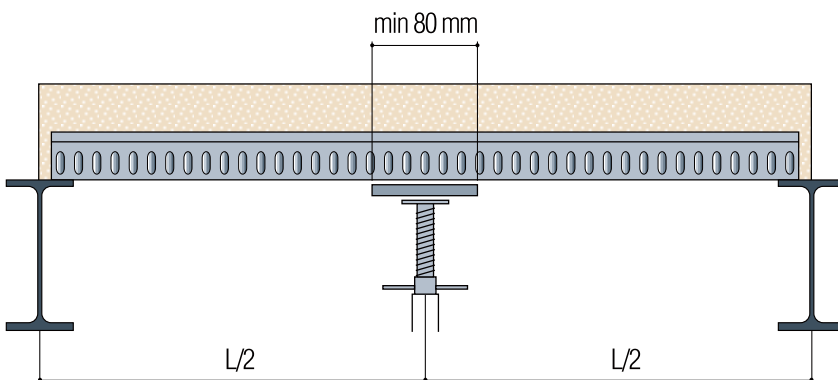


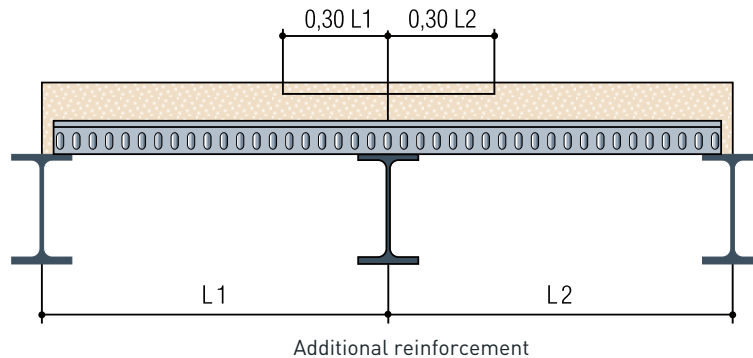
Image of temporary strutting

MT-76 COMPOSITE SLAB

COMPOSITE SLABS

NEGATIVE REINFORCEMENT

When the designed slab is continuous, that is, it has intermediate supports, negative bending moments occur on these. It is then necessary to place this type of reinforcement, at a depth of 25 mm with respect to the upper face of the slab. The corrugated bars must be of sufficient length to cover one third of the span of each of the adjacent openings, as shown in the attached sketch. The minimum section of reinforcement required withstand these negative bending moments is detailed in the corresponding calculations.



ANTI-CRACK MESH

Its main mission is to cope with the retraction efforts generated by the drying of concrete, avoiding its cracking. It also contributes to the distribution of small point loads acting on the slab. It must be placed at a depth of 20 mm with respect to the upper face of the slab, covering its entire surface.

ANTI-CRACKING MESH IN SLAB COMPRESSION LAYER (mm)

			H (cm)																
Mesh	MT-76		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
		200x200x4	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	
		200x200x5	-	-	-	-	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	
		200x200x6	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓

OWN WEIGHT AND VOLUME OF CONCRETE

VALUES OF OWN WEIGHT OF THE COMPOSITE SLAB [kN/ m2]

		H (cm)																
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Profile	MT-76 e=0.75 mm	-	-	2.28	2.52	2.76	3	3.24	3.48	3.72	3.96	4.2	4.44	4.68	4.92	5.16	5.4	
	MT-76 e=0.8 mm	-	-	2.28	2.52	2.76	3	3.24	3.48	3.72	3.96	4.2	4.44	4.68	4.92	5.16	5.4	
	MT-76 e=1.0 mm	-	-	2.3	2.54	2.78	3.02	3.26	3.5	3.74	3.98	4.22	4.46	4.7	4.94	5.18	5.42	
	MT-76 e=1.2 mm	-	-	2.33	2.57	2.8	3.04	3.28	3.52	3.76	4	4.24	4.48	4.72	4.96	5.2	5.44	

VOLUME OF CONCRETE PER UNIT AREA [m3/m2]

H (cm)																		
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Profile	MT-76 e=0.75 mm	-	-	0.092	0.102	0.112	0.122	0.132	0.142	0.152	0.162	0.172	0.182	0.192	0.202	0.212	0.222	
	MT-76 e=0.8 mm	-	-	0.092	0.102	0.112	0.122	0.132	0.142	0.152	0.162	0.172	0.182	0.192	0.202	0.212	0.222	
	MT-76 e=1.0 mm	-	-	0.092	0.102	0.112	0.122	0.132	0.142	0.152	0.162	0.172	0.182	0.192	0.202	0.212	0.222	
	MT-76 e=1.2 mm	-	-	0.092	0.102	0.112	0.122	0.132	0.142	0.152	0.162	0.172	0.182	0.192	0.202	0.212	0.222	

BEHAVIOR AGAINST FIRE

The R factor is the load bearing capacity of a composite slab in a fire situation. According to Eurocode 4 Part 1.2, for this type of solution it will be 30 minutes (R-30). This data does not need any verification, as long as the calculation of the composite slab has been made in accordance with the specifications of Eurocode 4 Part 1.1.

If the project requires a fire resistance of more than 30 minutes (R-30), the designer can opt for different solutions:

- Incorporate a fire protection system on the underside of the slab. One option is to create a continuous coating of homogeneous thickness with mortars or paints or incorporate false ceilings of plasterboard or other materials (taking special care to ensure watertightness of the joints between elements).
- Incorporate traction reinforcements into the slab. This increases the bearing capacity of the slab in a fire situation (criterion R), but not the thermal insulation capacity (I). The thermal insulation capacity continues to depend on the effective thickness of the slab and the additional protection provided by the underside of the steel profile (*).

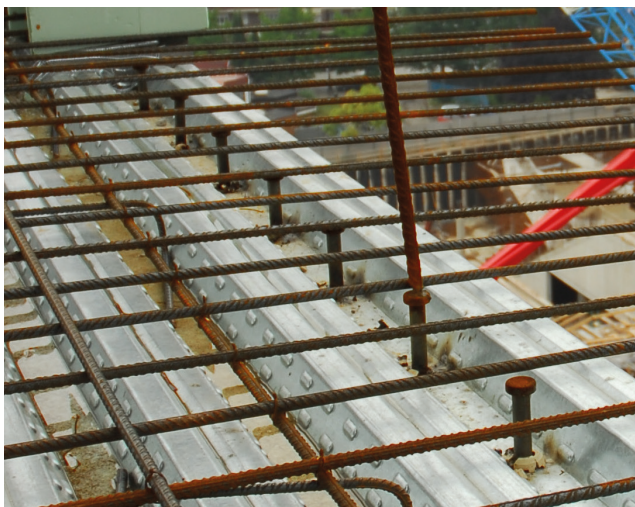
(*) Contact our Technical Department for cases in which an R factor greater than 30 minutes is required, in order to evaluate the most optimal solution in each case and receive personalized advice.

CONNECTORS - MIXED BEAM SOLUTION CONNECTED TO STRUCTURE

It is important to note that the connectors do not influence the actual strength of the composite slab. That is, the fact of having connectors, does not make the slab more resistant than when they are not used.

In this constructive solution, the profile for composite slab is attached to the metal structure by means of the connectors. The slab becomes part of the same load-bearing structure of the building, ceasing to be a monolithic element whose weight is supported by the beams and pillars on which it rests. It functions as a compression layer of the resistant section, which in this way sees its strength properties noticeably increased. This allows considering in the calculations, the sum of the resistant sections of the metal beam and the slab. The decision about the type of structure to be adopted and the corresponding calculation are the responsibility of the Designer.

These connectors may be welded through the slab sheet to the support structure or mechanically fixed by pneumatic gun and flashing or the like.



Soldered connectors



Mechanically fixed connectors

RECOMMENDATIONS FOR ASSEMBLY

Pouring of the concrete:

The concreting on the corrugated sheets will be carried out by traditional methods: pumps and pipes or cupola. Any oil, dirt, remaining greasiness from the manufacturing process or harmful substance, present on the upper face of the profile, must be removed before starting the pouring phase of the concrete. To achieve the final properties of the slab specified in the project, utmost care must be taken in this phase, avoiding excessive deformation of the slab, segregation of the aggregate or loss of slurry. The concrete will be poured as far as possible on the support beams of the slab, from the minimum possible height. It is necessary to use a concrete outlet pipe equipped with a handle that allows easy and practical handling, since in no case will the concrete be poured from a height greater than 30 cm. It is necessary to avoid any accumulation of material, and distribute it longitudinally to the ribs of the steel profile, from the beams to the spans. The forklift circulation will be carried out on 30 mm thick planks placed on the mesh, making sure that no more than three operators coincide in the same area of the slab at the same time.

To ensure the proper functioning of the slab, a satisfactory compaction must be made around the connectors, the reinforcements and on the relief of the sheet. It is not necessary to vibrate the concrete. In case of grout losses with the consequent appearance of stains on the lower part of the profile, it is advisable to clean with a simple stream of water before the drying.

Opening of holes in the slabs:

Generally, in the works it is necessary to provide apertures for the installations to pass through and downspouts through the slab. In this case, the apertures must be made prior to concreting, using expanded polystyrene blocks or any other type of formwork. When the side of the aperture is larger than a wave, it will be necessary to reinforce the perimeter of the aperture longitudinally and transversely at the structural level.

In general, it can be said that:

- Apertures up to 300 mm on the side do not require reinforcement.
- Apertures with sides between 300 and 700 mm in length require reinforcement bars.
- The apertures with a side greater than 700 mm in length require the placement of auxiliary support structures. To make these apertures, the metal profile will be cut as long as the concrete is cured. It is important not to drill the slab with percussive equipment once it is set, since vibrations can affect the collaboration between the steel sheet and the concrete, generating a loss of adhesion and therefore of load bearing capacity.

Type of trims:

To expedite the construction of a composite slab and optimize the completion time, Hiansa S.A. has created exclusive galvanized steel finishes. These are pieces that, even without being essential, are very useful, since they replace certain formwork operations that would otherwise be done in a more artisanal way and approximatively in the construction:

- Trim for edge of slab (R1).
- Trim for brace (R2).
- Trim for shifting direction of slab (R3)



Trim for edge of
slabs (R1) – LINEAR



Trim for brace
(R2) - SINGLE-POINT



Trim for shifting
direction of slab
(R3) – LINEAR

CALCULATION CONSIDERATIONS

Calculation hypotheses:

- The results contained in the static overload tables, obtained according to the procedure established by the EC4 and EC3 Regulations, are based on the following calculation hypotheses:
- The loads acting on the slab are distributed and predominantly static.
- The spans of the slab are located in the direction of the ribs of the sheet.
- For the study of the slabs in the service phase, elastic analysis is used; for the flexural strength test, plastic theory is considered.
- The results of the tables refer to a composite slab without connectors; that is, they do not describe the behavior of the mixed beam solution.
- The concrete considered in the calculation is an HA-25 (*).
- The yield strength considered in the calculation of the steel of the MT-76 profile is 220 MPa (*), and the partial safety coefficient for Ultimate Limit States of the steel of the profile is 1.10.
- The calculation model used considers the following limit states: in the execution phase, bending represents the ultimate limit state, and deformation represents the service limit state. In the service phase, the ultimate limit states are represented by the bending, the shear forces, the vertical shears, while the ultimate limit state is the deformation.
- Deflection criterion when the ribbed steel sheet acts as a formwork: $f \leq l/250$ or $f \leq 20 \text{ mm} (*)$, with L = clear span between supports. In the calculation of these deformations, the weight of the sheet and fresh concrete are considered, but the setting loads are not considered, since they are temporary.
- Deflection criterion in the service phase: $f \leq l/250 (*)$ in any case referred to in the tables.
- Coefficients of increase of the loads used in the calculations:
 - Coefficient of increase of own weight: 1.35.
 - Coefficient of increase of permanent loads: 1.35.
 - Coefficient of increase of use loads: 1.50.
- The values of the "Service Load Tables for Profile MT-76" have been calculated in accordance with the specifications of EC4 part 1.1 in the construction phase of the slab, and as a mixed slab in the service phase thereof. The tables refer to a generic type of slab defined in the previous points. The project calculator is responsible for calculating the floor slab according to the specifics of the loads involved, the materials used and others specific to each project. The static overload values contained in the tables are the maximum allowable overload values in service, where the loads represent the sum of the permanent loads and the overloads of use acting on the slab. The weight of the composite slab itself has already been taken into account in the calculations.

[*] For other values, contact the Technical Department to evaluate the most optimal solution in each case and receive personalized advice.

MT-76 COMPOSITE SLAB

COMPOSITE SLABS

CALCULATION CONSIDERATIONS

Interpretation of the different shadings in the allowable overload tables: diversity of theoretical approach by insertion of the strut (during the setting of the slab).

The user of the overload tables of the composite slab with MT-76 profile might be surprised to see how, at a certain point, by increasing the thickness of the concrete slab by 1 cm, the allowable overload drops significantly. This jump in the values corresponds to entering into the shoring area, shaded in pink of the tables. This is due to the different theoretical approach that sustains the study and verification of an unshored structure and a shored structure (as set out in Eurocode 4 and Eurocode 3). An unsupported steel sheet, in the phase of setting the floor slab, is deformed proportionally to the weight of the concrete poured.

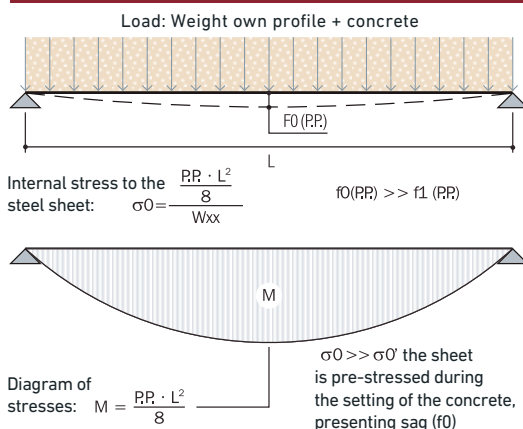
Once set, the slab presents sagging (f_0) and the sheet has an internal tension corresponding to its deformation.

When this slab is loaded with weight (load Q evenly distributed), the maximum value of bending moment (corresponding to load Q) will be recorded in the center of the opening. It is time to check the slab at the various stresses present (bending moment, shear stress, bond stress): in almost all cases the slab will break by reaching the maximum bond stress moment. It is fair to say that the load that has determined the slippage between the concrete and the steel sheet is equal to the sum of the slab's own weight and the applied load Q .

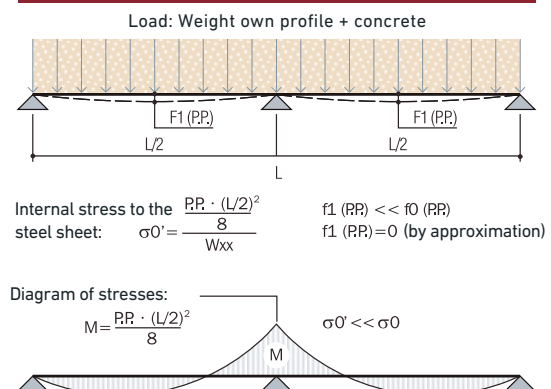
In the shored structures, the intermediate strut divides the free span between supports in two, and the sag (f_0') that is registered is significantly lower than the sag f_0 (registered by the same unshored slab). By approximation it can be said that the sag f_0' is equal to 0. During the setting of the concrete, the sheet does not present tension, it being the strut that supports the weight of the poured concrete. Once the concrete has been set, removing the strut and applying a Q load to the structure, the slab is checked for all the stresses present. Once again the collapse occurs by reaching the Ultimate Limit State at bond stress: in this case, the load Q determines the breakage of the slab. In the tables of admissible overload it is not permissible to add the weight of the slab itself to the value recorded during the test to break the slab.

In summary, in an unshored structure, it is permissible to add the own weight of the slab to the overload value of registered use, because the structure had already assumed this load (the own weight) before setting: the sag f_0 represents the deformation corresponding to the internal stress of the sheet generated by the pouring of the concrete.

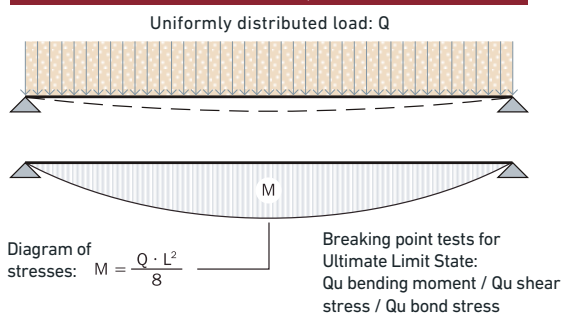
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