30.07.2017 Rev. 2

GRP PLATFORM AND WALKWAYS SYSTEMS

COMPOSITE SOLUTION

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1. USES AND CHARACTERISTICS

The FRP walkways are built by assembling fiberglass and polyester resin pultruded profiles and gratings; they assure several advantages compared to the normal metal ones:

a. High resistance to chemical and atmospheric aggressions
b. High mechanical/weight ratio
c. Long-lasting
d. Lightness
e. Dimensional stability
f. High dielectric properties
g. No maintenance
h. Easy to install

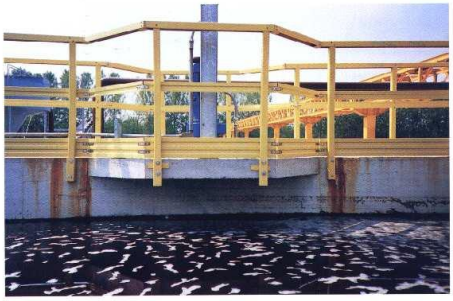
Structures are designed and built accordingly to the **BS 2782, Hong Kong Wind Code, BS 476 Part 6, BS 476 Part 7 Standards**

2. EMPLOYMENT FIELDS

DURADECK(R) AND DURARAIL (R)'s walkways can be installed in any plant, but they are mainly used in **corrosive environments** where their characteristics are emphasized, in those plants where conventional materials are not long-lasting or need continuous varnishing or protection with high maintenance costs and in any case safety in the working environment is not guaranteed.

The industries that use DURADECK(R) AND DURARAIL (R)'s walkways are:

- **Sewerage Treatment Plants (DSD / WSD)**
- **Chemical Industries**
- **Galvanic plants**
- **Mineral industries**
- **Textile industries**
- **Food industries**
- **Electric stations**
- **Electric distribution cabins**
- **Oil plants**
- **Tanneries**
- **Water treatment plants**
- **Marine field**
- **Paper factories**



3. MATERIALS

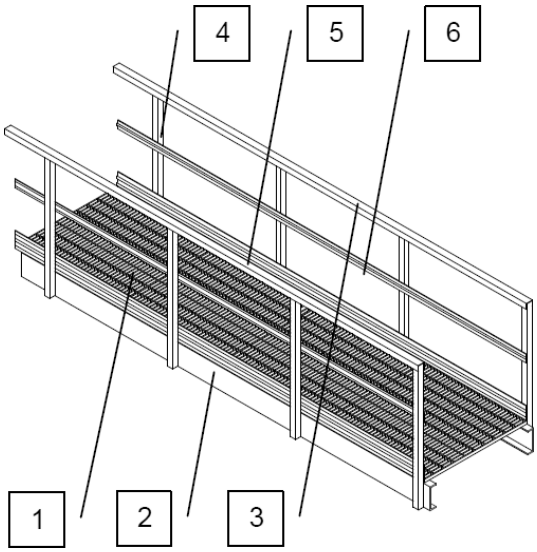
3.1 WALKWAY

Self-bearing structures
These structures are built with C and/or I profiles fixed together with secondary beams of the same type, which are chosen accordingly to the specific load request. In any case, the minimum considered load capacity is 2kN/m² (distributed load) accordingly to the UNI EN ISO 14122-2 norm. The junctions are made with stainless steel plates and bolts & nuts as described below.

Walking surface
The floor is built with a choice of FRP gratings accordingly to the required load. In any case the minimum considered load capacity is 1,5 kN (concentrated load) accordingly to the UNI EN ISO 14122-2 norm. Shall the structure be subject to the UNI EN ISO 14122-2 norm, the walking surface must fulfill the following conditions:

- If there is an occasional transit of people underneath the walkway, the floor grating must have a maximum opening that does not allow a 35 DuraDeck(R) and DuraRail (R) diameter ball to fall through (grating type SCH38/30);
- If the walkway is placed over working areas, the floor grating must have a maximum opening that does not allow a 20 DuraDeck(R) and DuraRail (R) diameter ball to fall through (grating type SCH52/30).

Handrail system
The handrails are built by assembling the profiles described in table 3.3 with cupronickel rivets. The stanchions are placed approximately every 120 cm (max 130 cm) and are fixed to the structural profiles with two bolts.



1. Walking surface
- FRP Grating type "SCH38/30"
- FRP Grating type "SCH52/30"

(different grating types can be used if required)

2. Structure
- FRP C 152x42x9.5mm

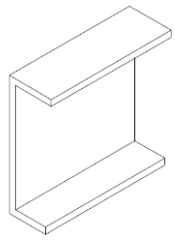
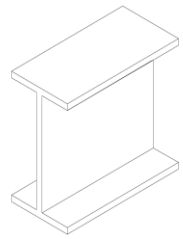
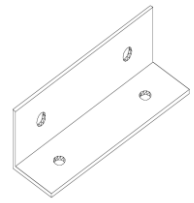
3. Handrail
- FRP Square profile 50x50x5mm

4. Stanchion
- FRP Square profile 50x50x5mm

5. Toe-plate
- FRP FLAT SHAPED profile 200mm x 3mm

Accessories
Stainless steel bolt & nuts and clamps.
Cu-Ni alloy rivets.

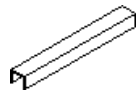
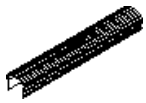
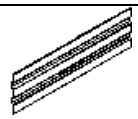
3.2 STRUCTURE PROFILES SHEET

PROFILES	DESCRIPTION	DIMENSIONS (DuraDeck(R) and DuraRail (R))	BAR LENGTH (m)	WEIGHT (Kg/m)	COLOR
	C PROFILE TYPE IN FRP	300x100x15 200x60x10 150x45x8	6	12,5 5,3 3,2	Yellow/grey
	IPE PROFILE TYPE IN FRP	200x100x10 152X42X9.5	6	6,5 4,1	Yellow/grey
	S.S. ANGULAR	50x50x5 50x50x6 75x75x5	6		

Accessories

- M10 SS 304 or above screws
- M10 SS 304 or above nuts and washers

3.3 HANDRAIL SYSTEM PROFILES SHEET

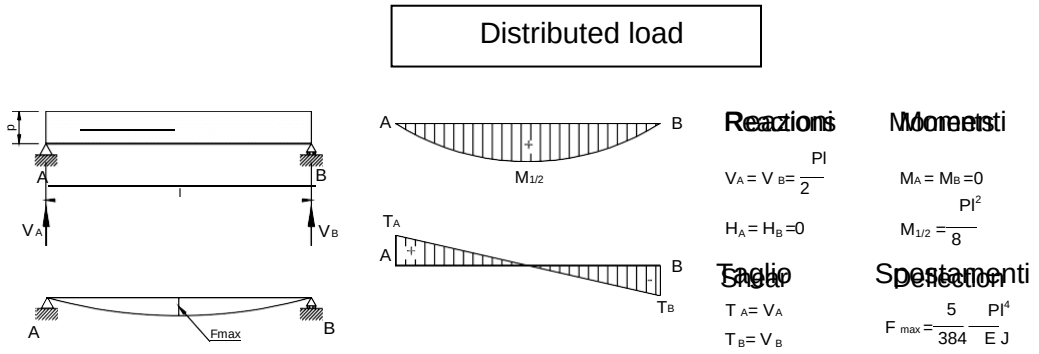
PROFILES	DESCRIPTION	DIMENSIONS (DuraDeck(R) and DuraRail (R))	BAR LENGTH (m)	WEIGHT (Kg/m)	COLOR
HORIZONTAL PROFILES					
	Handrail	50x50x5	6	1.27	Yellow/grey
	Ergonomic handrail	50x60x5	6	1.24	Yellow/grey
	Kneerail	shaped 55x5	6	0.50	Yellow/grey
	Tubular kneerail	Ø 26x19	6	0.50	Yellow/grey
	Toe-plate	shaped 2x100x5	6	1.35	Yellow/grey
VERTICAL PROFILES					
	Rod	square 50x50x5	1,00 – 1,33 or 6	1.53	Yellow/grey

Accessories

- M10 screws
- M10 nuts and washers
- M4x 16 Cu-Ni alloyrivets
- PA reinforcement
- Adjustable junctions for handrail
- Adjustable junctions for tubular kneerail

4. INSTRUCTIONS FOR DESIGN ENGINEER

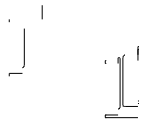
The design of the walkway is determined by the calculation of the maximum span, which corresponds to the most restraining of the two conditions: maximum action on main profiles ($\sigma \leq \sigma_{adm.}$) or the maximum deflection ($f \leq 1/200$ span), as shown in the table below. Walkway is considered as a simply supported beam (isostatic structure) uniformly loaded.

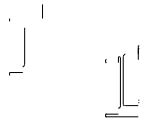


UNIFORMELY DISTRIBUTED LOAD 200 kg/m² WIDTH of the WALKWAY 100 cm						
PROFILE	**DIMENSIONS DuraDeck(R) and DuraRail (R)**	**A_v cm²**	**E daN/cm²**	**J_x cm⁴**	**W_x cm³**	**MAX SPAN cm**
	300x100x15	45	230000	8549	570	830
	200x60x10	20	230000	1570	157	480
	150x45x8	12	230000	524	70	340
	90x35x8	7,2	230000	121	27	200

UNIFORMELY DISTRIBUTED LOAD 400 kg/m² WIDTH of the WALKWAY 100 cm						
PROFILE	**DIMENSIONS DuraDeck(R) and DuraRail (R)**	**A_v cm²**	**E daN/cm²**	**J_x cm⁴**	**W_x cm³**	**MAX SPAN cm**
	300x100x15	45	230000	8549	570	680
	200x60x10	20	230000	1570	157	390
	150x45x8	12	230000	524	70	270
	90x35x8	7,2	230000	121	27	165

UNIFORMELY DISTRIBUTED LOAD 600 kg/m² WIDTH of the WALKWAY 100 cm						
PROFILE	**DIMENSIONS DuraDeck(R) and DuraRail (R)**	**A_v cm²**	**E daN/cm²**	**J_x cm⁴**	**W_x cm³**	**MAX SPAN cm**
	300x100x15	45	230000	8549	570	600
	200x60x10	20	230000	1570	157	340
	150x45x8	12	230000	524	70	240
	90x35x8	7,2	230000	121	27	145

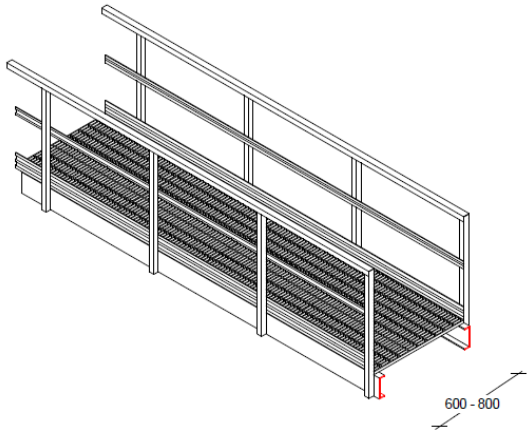
UNIFORMELY DISTRIBUTED LOAD 200 kg/m² WIDTH of the WALKWAY 100 cm						
PROFILE	**DIMENSIONS DuraDeck(R) and DuraRail (R)**	**A_{v_2} cm²**	**E daN/cm²**	**J_{x_4} cm⁴**	**W_{x_3} cm³**	**MAX SPAN cm**
	200x100x10	20	230000	2293	229	550
	150x75x8	12	230000	766	102	385

UNIFORMELY DISTRIBUTED LOAD 400 kg/m² WIDTH of the WALKWAY 100 cm						
PROFILE	**DIMENSIONS DuraDeck(R) and DuraRail (R)**	**A_{v_2} cm²**	**E daN/cm²**	**J_{x_4} cm⁴**	**W_{x_3} cm³**	**MAX SPAN cm**
	200x100x10	20	230000	2293	229	445
	150x75x8	12	230000	766	102	310

UNIFORMELY DISTRIBUTED LOAD 600 kg/m² WIDTH of the WALKWAY 100 cm						
PROFILE	**DIMENSIONS DuraDeck(R) and DuraRail (R)**	**A_{v_2} cm²**	**E daN/cm²**	**J_{x_4} cm⁴**	**W_{x_3} cm³**	**MAX SPAN cm**
	200x100x10	20	230000	2293	229	390
	150x75x8	12	230000	766	102	270

- Accordingly to EN 547 and EN 547-3 values, unless exceptional circumstances, the free minimum height over the walkways and the passage corridors must be of 2100 DuraDeck(R) and DuraRail (R).

- Unless exceptional circumstances the free width of a passage corridor must be al least 600 DuraDeck(R) and DuraRail (R) but preferably 800 DuraDeck(R) and DuraRail (R). Shall the passage corridor be used for the passage of more than one person at a time, width increases to 1000 DuraDeck(R) and DuraRail (R).



5. ASSEMBLING INSTRUCTIONS

5.1 FIXING THE GRATING TO THEWALKWAY

The gratings are cut on size and are fixed to the structure with stainless steel standard fixing clamps and screws.

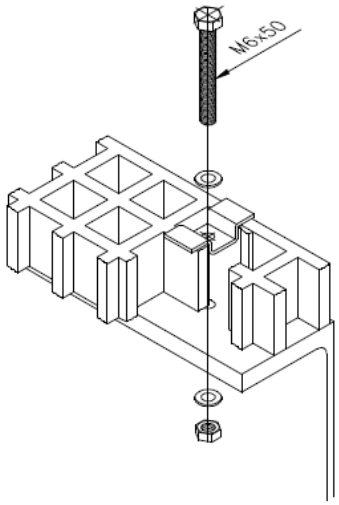


Fig. 1

5.2 HANDRAIL SYSTEM ASSEMBLING

Usually the handrail system is supplied pre-assembled; some parts may be disassembled for transport necessities. The fixing of the handrail system to the walkway is made as shown in the drawings Fig. 2. and Fig. 3. The structure is already drilled for the assembling. All the accessories are included.

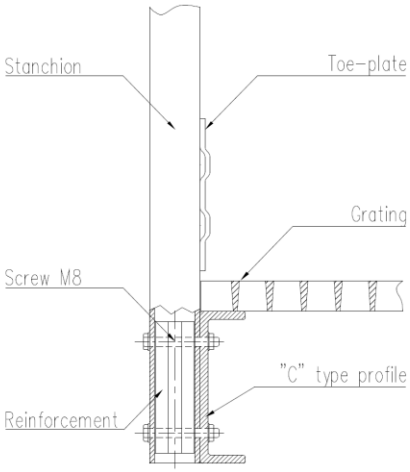


Fig. 2

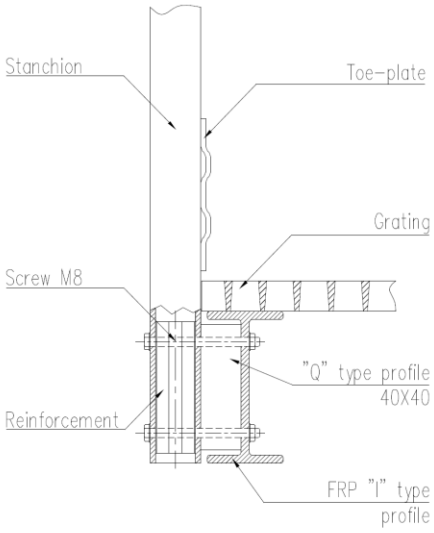


Fig. 3

5.3 FASTENING A WALKWAY TO A WALL WITH ANCHORS BOLTS

When the structure is assembled, it could be fixed to the wall with minimum M8 dimensions anchor bolts (**not included in the supply**).

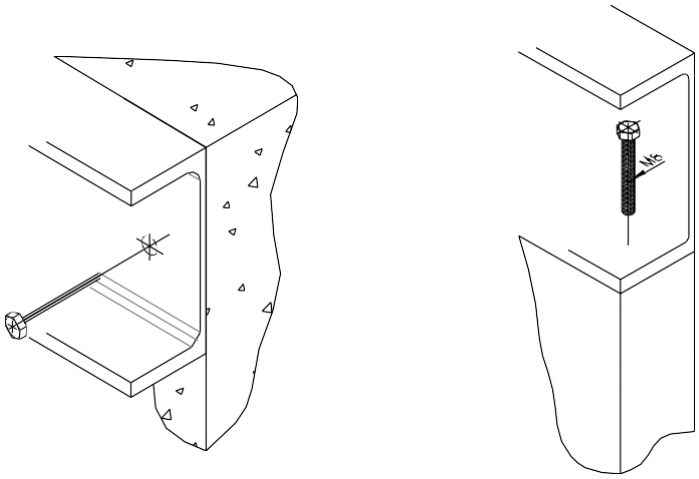
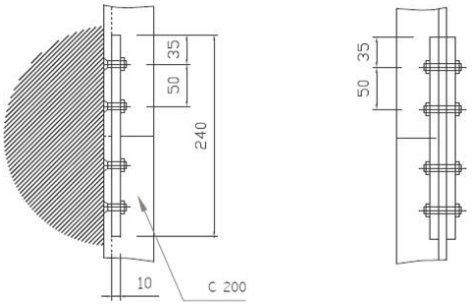


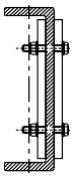
Fig. 4

5.4 JUNCTION BETWEEN WALKWAYS

The junction between walkways could be made by using FRP or Stainless steel connecting plates (fig.5), or just by drilling the support C profiles (fig.6).
The connecting screws and the nuts are type M10.

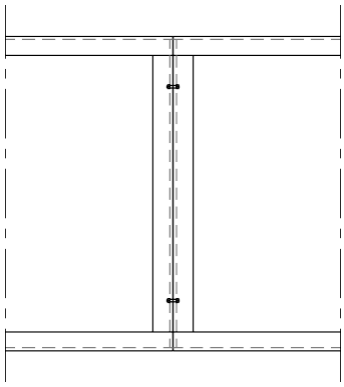


Top view

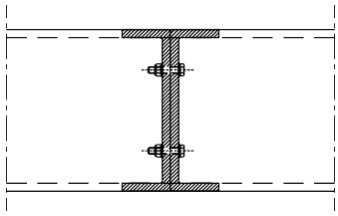


Front view

Fig. 5 Connection between walkways with plates



Top view



Front view

Fig. 6 Walkway junctions with secondary beams