abaGRIGLIATI

Forging ideas since 1975

MANUAL PROFILES H58

Use and maintenance instructions

Rev.04 09/06/2023

USE AND MAINTENANCE INSTRUCTIONS

PROFILE H58 FIXING SYSTEMS

ABAGRIGLIATI profiles are used to create flooring in mezzanines, walkways, walkable surfaces in general and to build stair steps. The following are descriptions of different methods that can be used for installation on load-bearing structures.

STEP USE FOR STAIRS AND LANDINGS

Some models are referred to as STEPS because their configuration makes them ideal for this use; they are:
Mod. GF - ZB2 - STEP ZBC - GB2 – GXB – GXF - GLB

PRELIMINARY CONSIDERATIONS

- The standard application systems are valid exclusively for profiles with a length equal to an integer multiple of the cutting pitch: Mod. GF; ZB2; Step ZBC; GB2 = multiple of 50 mm (e.g. 1000; 1050; 1100 mm; ...); Mod. GXB; GXF; GLB = multiple of 60 mm (e.g. 900; 960; 1020 mm; ...);

- The staircase / structure must be sized in compliance with CURRENTLY APPLICABLE regulations;

- THE STABILITY of the staircase/structure must be guaranteed regardless of the step and its application;

- Sizing must take into account current laws and regulations in regard to safety and, in the case of systems, to the specifications of each sector of use;

- Installation must be carried out by skilled staff specialised in the assembly of structures and correctly trained in safety matters;

- Avoid fixing to a single head of the profiles for overhanging (bracket-type) support;

- Mechanical fastening using bolts must take place in compliance with the provisions of UNI EN 1090-2 chapter 12.5.1;

- Before and during assembly , the material must be handled with care to avoid dents and deformations;

- The material must be stored away from bad weather, humidity and polluting or aggressive agents;

A) STAIRS TREADS

For the application of STEP (tread) profiles to the load-bearing structure, ABAGRIGLIATI has three different systems available:

A1) PLATE STEP SUPPORTS thick. 5 mm WELDED:
System adopted in a standard configuration only for the GF model section 250; 300; 325

The support brackets are supplied welded to the profile, forming a finished step ready for installation.

The length of the profile matches the internal free span of the supporting structure.

- A1.1 Drill the matching holes in the load-bearing member of the staircase/structure as per diagram (A1.4);

- A1.2 Position the step by causing the holes in the step to match the holes in the structure and bolt down;

- A1.2.1 For steps with a length of up to 1450 mm: fix to the structure using 2 + 2 HEX HEAD BOLTS M10 CL. 8.8 of adequate length to tighten the head + the support profile thickness-wise. Tightening torque 40 Nm;

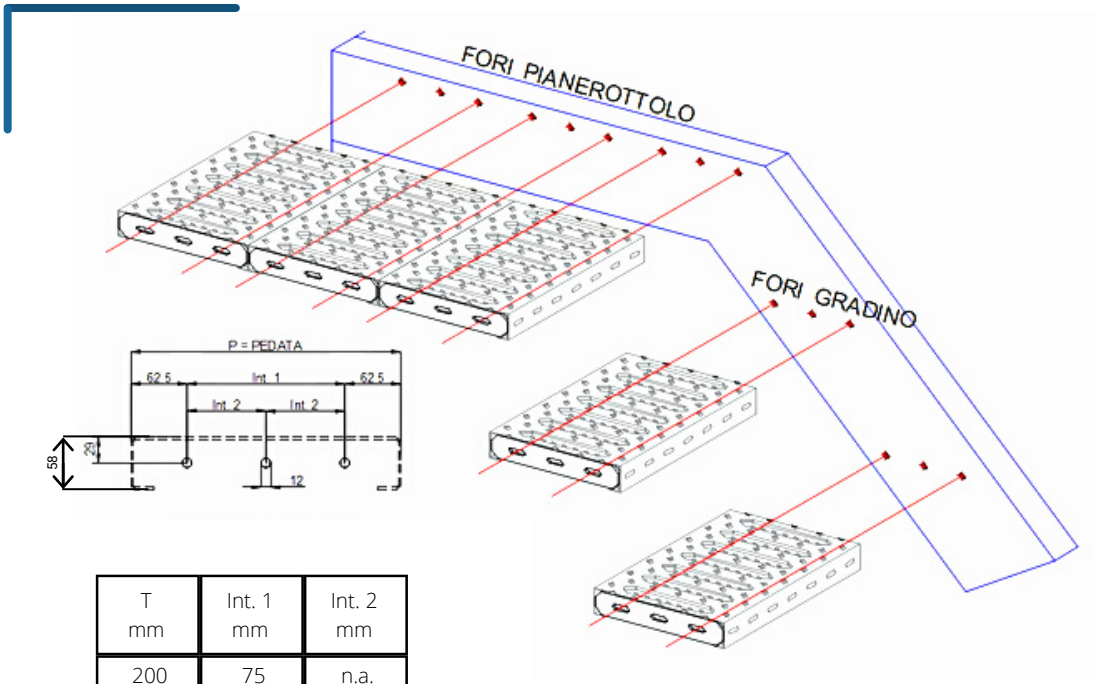
- A1.2.2 For steps with a length of 1500 mm up to 1800 mm: fixing to the structure using 3 + 3 HEX HEAD BOLTS M10 CL. 8.8 of adequate length to tighten the head + the support profile thickness-wise. Tightening torque 40 Nm;

- A1.2.3 For steps with a length of 2400 H83 mm: fixing to the structure using 3 + 3 HEX HEAD BOLTS M12 CL. 8.8 of adequate length to tighten the head + the support profile thickness-wise. Tightening torque 70 Nm;

- A1.2.4 Before tightening the bolts, check the correct alignment of the treads. Any overlap must be consistent;

- A1.3 Supply available with the following raw materials/finishes: S235JR, raw finish - S235JR, hot-dip galvanized finish UNI EN ISO 1461.

- Diagram A1.4



T mm	Int. 1 mm	Int. 2 mm
200	75	n.a.
250	125	n.a.
300	175	87.5
325	200	100

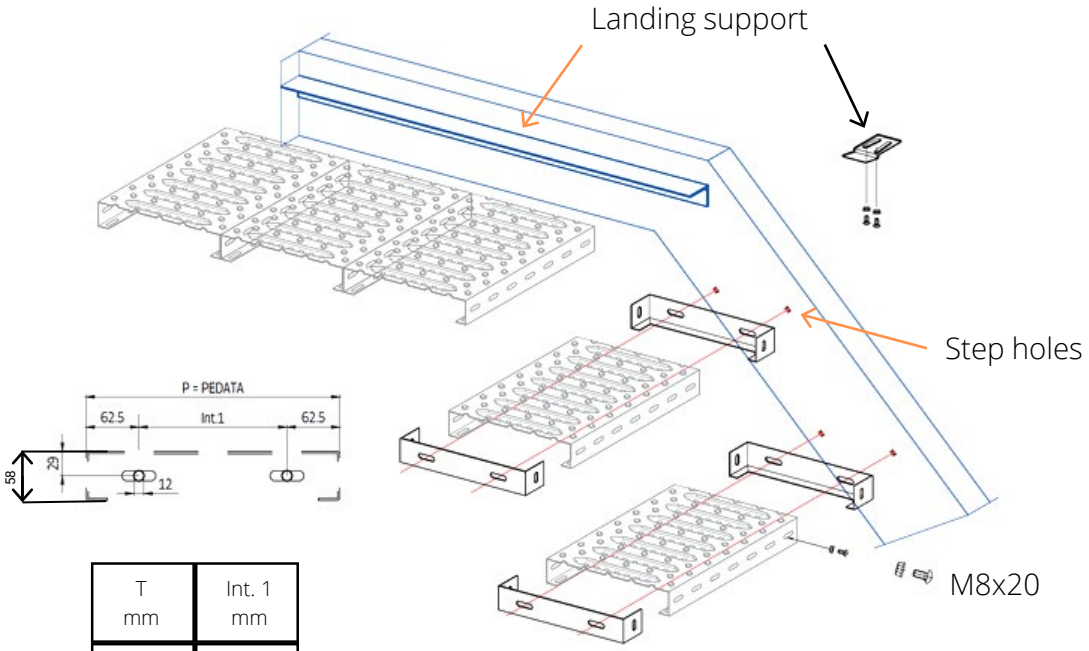
A2) EXTERNAL STEP SUPPORTS

EXTERNAL STEP SUPPORTS are brackets that are supplied on request as loose items separately from the profile. 2 supports per step are required.

The profile length + 6 mm matches the internal free span of the load bearing structure.

- A2.1 Drill the matching holes in the load-bearing member of the staircase/structure as per diagram (A2.7);
- A2.2 Fix the step supports to the structure using 2 + 2 HEX HEAD BOLTS M10 CL. 8.8 of adequate length to tighten the head + the support profile thickness-wise. Tightening torque 40 Nm;
- A2.3 Place the step on top of the supports and fix it to the matching slots with 2 + 2 BH M8x20 screws + F nut. Tightening torque 23 Nm;
- A2.4 Solution suitable for profiles with a maximum length of 1500 mm;
- A2.5 Supply available with the following raw materials/finishes: S235JR, raw finish - S235JR, hot-dip galvanized finish UNI EN ISO 1461; S250GD+Z200 Sendzimir galvanized;
- A2.6 EXTERNAL TYPE STEP SUPPORTS cannot be used to support a landing. We recommend using a support angle bar and blocking the profiles from below using OPEN BEAM ANCHOR BRACKETS, without using any other accessories (see § B1).

- Diagram A2.7



T mm	Int. 1 mm
200	75
250	125
300	175
325	200

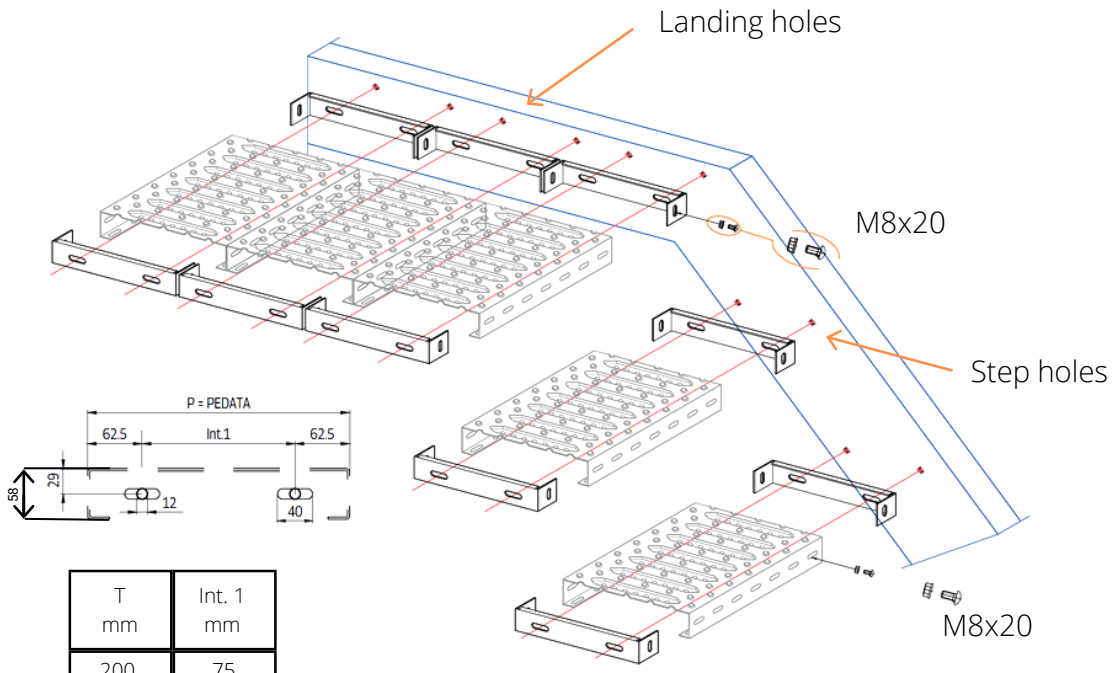
A3) (INTERNAL) REINFORCED STEP SUPPORTS

REINFORCED STEP SUPPORTS are brackets that are supplied on request as loose items separately from the profile. 2 supports per step are required

The length of the profile matches the internal free span of the supporting structure.

- A3.1 Drill the matching holes in the load-bearing member of the staircase/structure as per diagram (A3.7);
- A3.2 Fix the step supports on the profile heads in line with the matching slots with 2 + 2 BH M8x20 screws + F nut. Tightening torque 23 Nm. In this way a complete step is formed;
- A3.3 Fixing to the structure using 2 + 2 HEX HEAD BOLTS M10 CL. 8.8 of adequate length to tighten the head + the support profile thickness-wise. Tightening torque 40 Nm;
- A3.4 Solution suitable for profiles with a maximum length of 1500 mm;
- A3.5 Supply available with the following raw materials: S235JR, raw finish - S235JR, hot-dip galvanized finish UNI EN ISO 1461; S250GD+Z200 Sendzimir galvanized; AISI 304 stainless steel; S355J0WP Corten steel;
- A3.6 REINFORCED STEP SUPPORTS can be used to support a landing. Using them for this purpose is however rather time consuming. We recommend using a support angle bar and blocking the profiles from below using OPEN BEAM ANCHOR BRACKETS, without using any other accessories, as shown in diagram A2.7 (see § B2 and B3).

- Diagram A3.7



T mm	Int. 1 mm
200	75
250	125
300	175
325	200

A4) ALTERNATIVE SYSTEMS

Any alternative fixing systems may only be used if evaluated and approved by a qualified technician .

B) LANDINGS

To build landings, several standard profiles of suitable length are positioned side by side until the required width is reached; if necessary, profiles with different cross-sections can be used.
(E.g. landing measuring 1200x2700 mm: consisting of no. 4 300x2700 profiles.)
It is advisable to lay the landing profiles parallel to the treads of the inlet ramp, to ensure a homogeneous traffic flow.

For the application of LANDING profiles to the load-bearing structure, ABAGRIGLIATI has three different methods available:

B1) PLATE STEP SUPPORTS thick. 5 mm WELDED:
See Diagram A1.4

These supports are supplied welded to the profile, forming a finished step ready for installation.

The length of the profile matches the internal free span of the supporting structure.

- B1.1 Drill a number of matching holes in the load-bearing structure of the staircase/structure at the same level, as per diagram A1.4, for the application of multiple adjacent profiles;

- B1.2 Then carry out the installation as per point A1.2 and subsequent ones;

- B1.3 Supply available with the following raw materials/finishes: S235JR, raw finish - S235JR, hot-dip galvanized finish UNI EN ISO 1461;

B2) (INTERNAL) REINFORCED STEP SUPPORTS

See Diagram A3.7

2 individual supports are provided for each step.

The length of the profile matches the internal free span of the supporting structure.

- B2.1 Drill a number of matching holes in the load-bearing structure of the staircase/structure at the same level, as per diagram A3.6, for the application of multiple adjacent profiles;
- B2.2 Insert the step supports inside the profiles near the edges, without fixing them with bolts (they will slide inside the profile);
- B2.3 Fixing the supports to the structure using 2 + 2 HEX HEAD BOLTS M10 CL. 8.8 of adequate length to tighten the head + the support profile thickness-wise. Tightening torque 40 Nm;
- B2.4 Fix the step supports on the profile heads in line with the matching slots with 2 + 2 BH M8x20 screws + F nut. Use the same bolt to tighten two adjacent profiles thickness-wise throughout. Tightening torque 23 Nm;
- B2.5 Join adjacent profiles together with a BH M8x20 screw + F nut, in the centre of the span, through the slotted holes provided on the 58 mm edge. Tightening torque 23 Nm;
- B2.6 Solution suitable for profiles with a maximum length of 1500 mm;
- B2.7 Supply available with the following raw materials/finishes: S235JR, raw finish - S235JR, hot-dip galvanized finish UNI EN ISO 1461; S250GD+Z200 Sendzimir galvanized; AISI 304 stainless steel; S355J0WP Corten steel.

B3) LAYING OF PROFILES (WITHOUT STEP SUPPORTS) AND FIXING WITH ANCHORS. Recommended method: faster and cheaper

See Diagram A2.7 - Diagram C1.8 - Diagram C1.9

This solution does not involve the supply of step supports, but requires the creation of an adequate lay-on support for the profiles, which must be fixed from below using different types of anchoring systems for mezzanine floors.

2 individual anchor brackets are supplied for each profile. The brackets will be sized according to the type of support/beam.
The length of the profile matches the internal free span of the supporting structure.

- B3.1 Weld an angle bar of suitable size and thickness inside the supporting structure for the ABAGRIGLIATI profile to lay on. The support point must be lowered by 58 mm compared to the finished surface of the landing (diagram A2.7);

- B.3.1.1 Alternatively, it is possible to use the profiles forming the load-bearing structure as a support surface; they must be at the correct height, i.e. -58 mm with respect to the finished walking surface height;

- B3.2 Lay the profiles over the support surfaces. In the case of long landings that span over the space of several ramps, it is advisable to create several support beams on the same level and lay whole profiles without breaks, to ensure flooring continuity;

- B3.3 Fix the profiles to the structure using anchoring brackets to be defined and sized according to the type of beam/supports: Open beam anchor; OMEGA or ZL type beam anchor; Anchor for tubular beam (hxb section). Apply the brackets using BH M8x20 screws + F nut. Tightening torque 23 Nm;

- B3.3.1 In the case of support profiles made with IPE/HEA model angle bars or beams, pressure anchors can be used, in this case it is necessary to know the thickness of the wing to be tightened; for this option the absence of activities likely to transmit vibrations must be ensured;

- B3.4 Join adjacent profiles together with a BH M8x20 screw + F nut, in the centre of the span, through the slotted holes provided on the 58 mm edge. Tightening torque 23 Nm;

- B3.5 There are no length limits; the distance between supports must be evaluated according to the required load bearing capacity;

- B3.6 Supply available with the following raw materials/finishes: S235JR, raw finish - S235JR, hot-dip galvanized finish UNI EN ISO 1461; S250GD+Z200 Sendzimir galvanized; AISI 304 stainless steel;

FLOORING USE

FLOORS FOR MEZZANINES, WALKWAYS IN GENERAL, LOADING PLATFORMS, WALKABLE SURFACES

The ABAGRIGLIATI profiles can be used to create different types of walkable/pedestrian flooring.

Their use and application depend on several variables:

- Type of structure such as: mezzanine floors in general, lofts, walkways, machine on-board platforms, loading surfaces etc.;
- Intended use as: storage warehouses, picking warehouses, roofing maintenance walkways, cycle/pedestrian paths, vehicle flatbeds, agricultural machinery, technological (agricultural, chemical, food) systems, silos etc.;
- Environmental conditions: humidity, pollutants, cold temperatures, abrasives etc.;
- Dimensions: from small single platforms to large mezzanine surfaces;
- Type of support profiles: IPE, HEA, UNP beams, tubular, angular profiles etc.;

Due to the many existing variables, it is not possible to identify a single fixing method, but a number of accessories are made available that can make anchoring to the support beams easier.

The different installation options on load-bearing structures are described below.

PRELIMINARY CONSIDERATIONS

- Our standard application systems are suitable for profiles with a length equal to an integer multiple of the cutting pitch; this applies in particular to head-to-head joints, large surfaces, or platforms with head fixings: pitch cutting makes it easy to successfully install the different standard accessories;
- The structures must be sized in compliance with current regulations;

- The stability of the structures must be guaranteed regardless of the type of profiles and the method used for their fixing;

- Sizing must take into account current laws and regulations regarding construction and safety and be carried out in accordance with industry specifications for systems and/or machinery;

- Installation must be carried out by personnel specialised in the assembly of structures and correctly trained in safety matters;

- Avoid fixing to a single head of the profiles for overhanging (bracket-type) support;

- Before and during assembly, the material must be handled with care to avoid dents and deformations;

- The material must be stored away from bad weather, humidity and polluting or aggressive agents.

C) FLOORING OF MEZZANINES AND WALKWAYS

Flooring composed of multiple side-by-side profiles. The profiles are placed on top of the structure providing continuous support which can also be multiple point support.

C1) GENERAL INSTALLATION REQUIREMENTS REGARDLESS OF THE TYPE OF BEAM

- C1.1 Prepare the load-bearing structure by checking that the support beams are accurately levelled and squared as required by the technical project documentation;

- C1.2 Begin installing an ABAGRIGLIATI profile, by ensuring correct alignment with the load-bearing structure;

- C1.3 Lay a second parallel profile, join it to the previous one using Button Head bolts M8X20 in at least 2 points centrally in the support spans. Tightening torque 23 Nm;

- C1.4 Now fix the first anchors to secure the first profiles as per diagram C1.8 or C1.9 depending on the type of beam. Before fixing the anchor between two profiles, fix the union bolts between the load-bearing edges of adjacent profiles;

- C1.4.1 In the case of structures subject to vibrations or pallet truck traffic, anchors fixed with bolts should be preferred; opt for pressure anchors on perfectly rigid structures only.

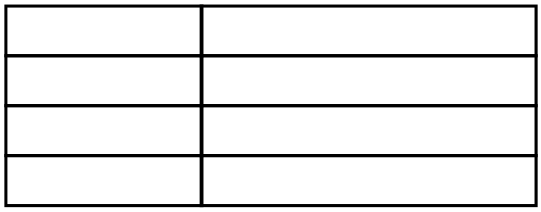
- C1.5 Continue installing as per the layout.

- C1.6 Recommendations for layout design:

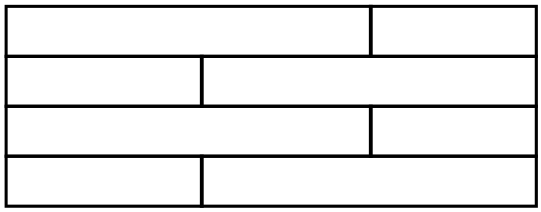
- Always provide profile head-to-head junction points over load-bearing beams;
- "Comb-like" laying is preferable, i.e. ensure that the head-to-head joints are not in line but alternate, to ensure that a continuous edge is available for use, even with limited support length on the beam; the recommended support length must be at least 40 mm. See diagram C1.7;
- For butt joints, the use of REINFORCED JOINTS is recommended, in particular for blind profiles. In any case, flat joints should always be installed on edges facing out to an empty space. See diagram C1.10;

- C1.7 During assembly operations, do not overload the profiles beyond their design capacity (e.g. placing a pack of profiles to be assembled within a limited area) and avoid truck traffic or anything else not specified by design.

- Diagram C1.7

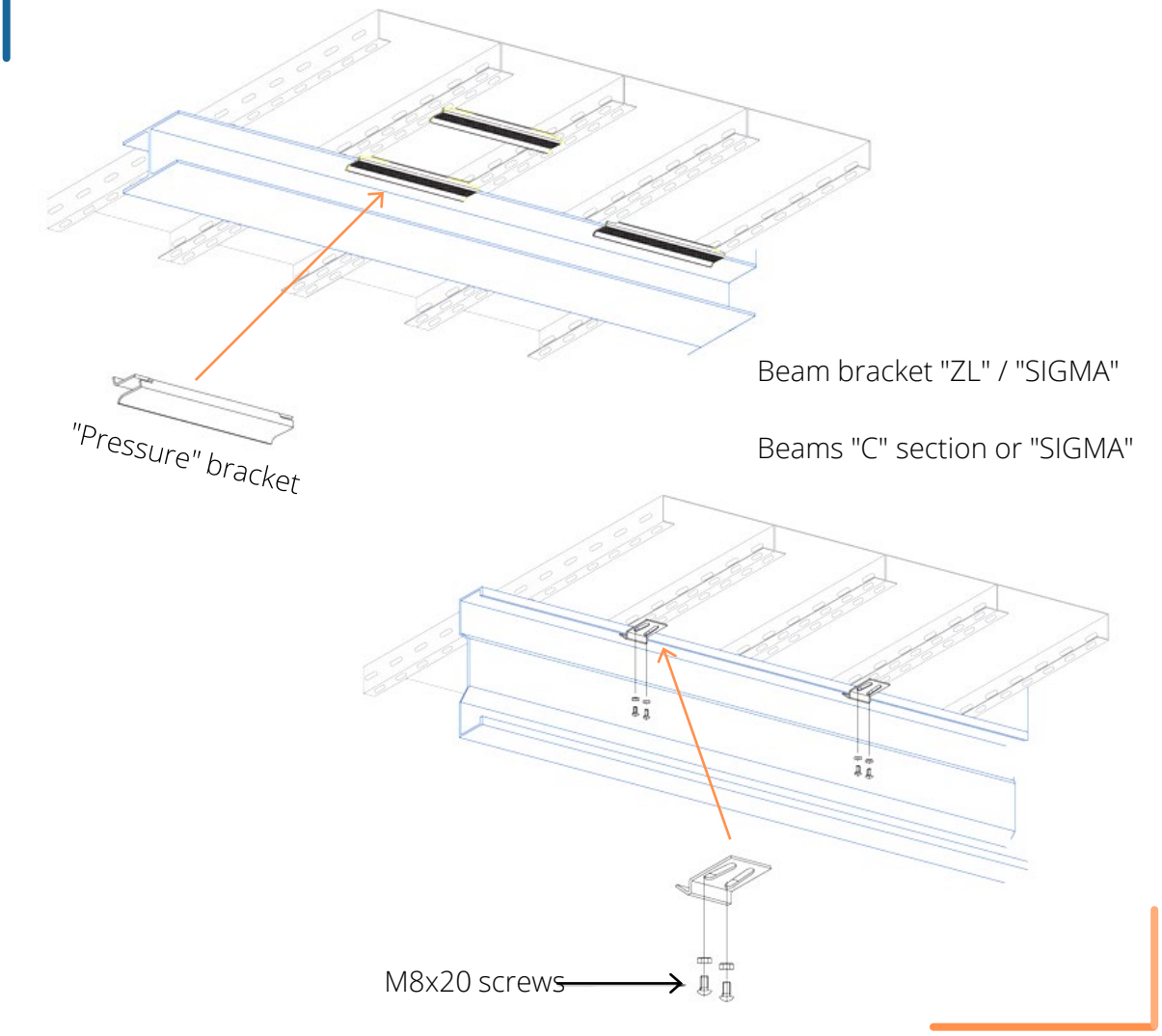


Installation with aligned joints

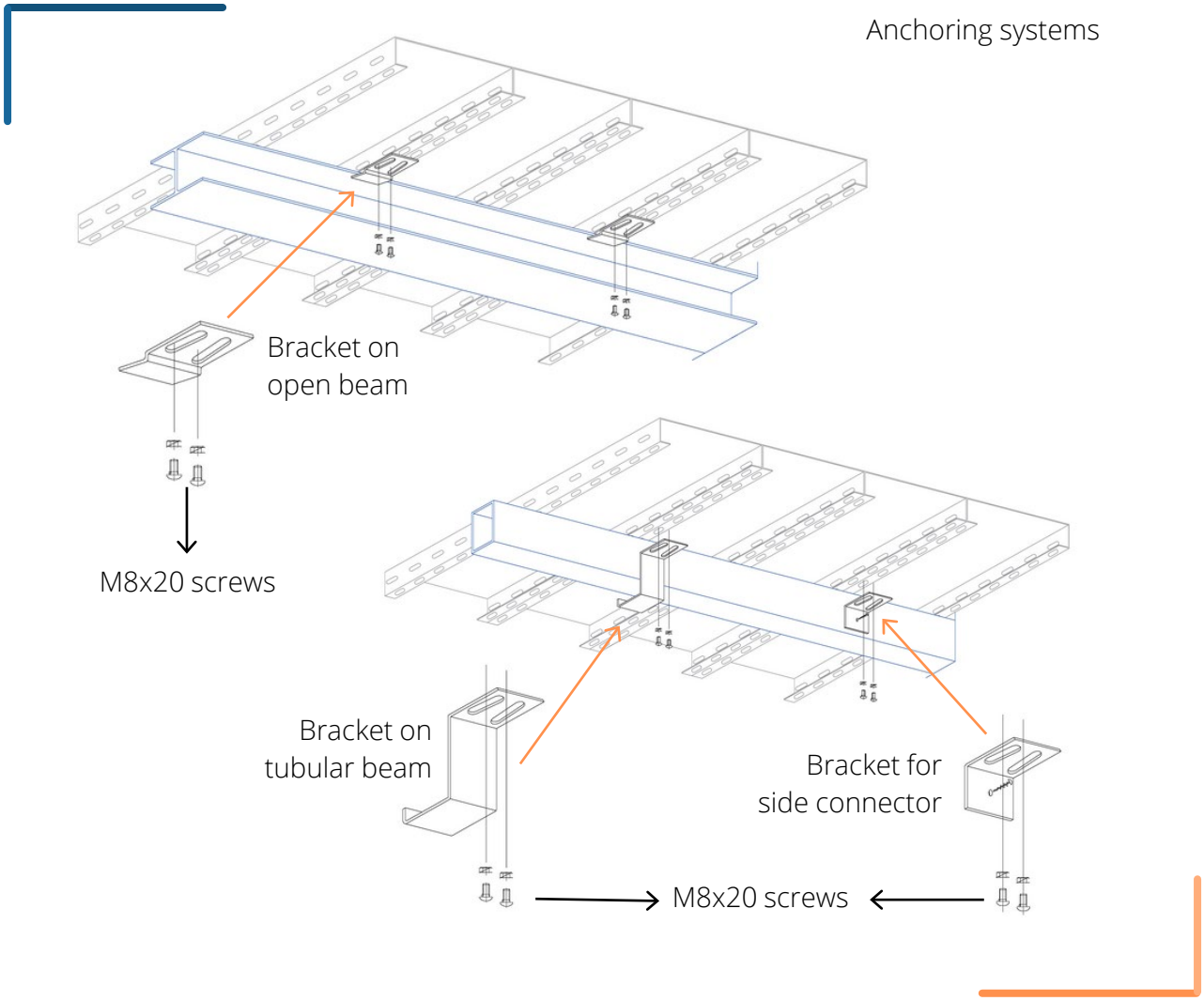


Laying with staggered "comb" joints

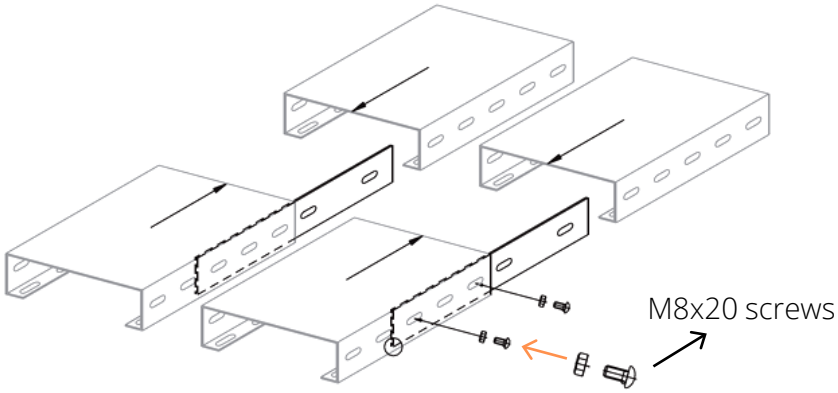
- Diagram C1.8

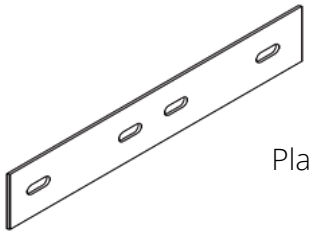

Beam bracket "ZL" / "SIGMA"
Beams "C" section or "SIGMA"
"Pressure" bracket
M8x20 screws

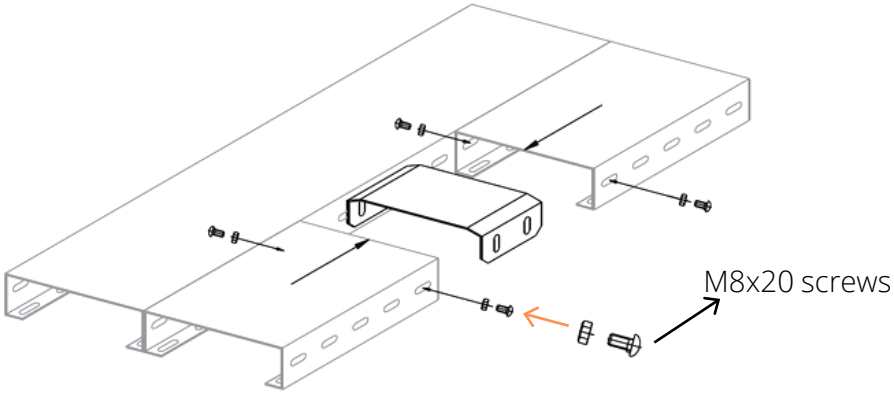
- Diagram C1.9

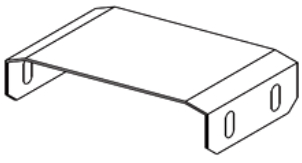

Anchoring systems
Bracket on
open beam
M8x20 screws
Bracket on
tubular beam
Bracket for
side connector
M8x20 screws

- Diagram C1.10









C2) ANCHOR TABLE ORDERED BY SECTION CONSIDERING THE MAIN TYPES OF BEAM

This table shows the quantities of anchors and bolts recommended for correct assembly.

ABAGRIGLIATI Profile section	BEAM TYPE	ANCHOR TYPE	No. of ANCHORS	No. of BH Bolts M8X16 for profile anchoring and joining
b x h	Model/Designation	Description/code	pcs/m2 (average)	pcs/m2 (average)
125x58 150x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Open Beam) H 3-12 3HNAS008MZ(H)	5	18
125x58 150x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Pressure) Th. xx (th. Wing) 3HNAH125HZ	5	8
125x58 150x58	IPE 400/450 HEA 280/340 HEB 180/220 L Th. 13-16	Anchor Open beam H 13-16 3HNAS013MZ(H)	5	18
125x58 150x58	TUBE h x b	Anch. Tubular beam h x b	5	18

ABAGRIGLIATI Profile section	BEAM TYPE	ANCHOR TYPE	No. of ANCHORS	No. of BH Bolts M8X16 for profile anchoring and joining
b x h	Model/Designation	Description/code	pcs/m2 (average)	pcs/m2 (average)
200x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Open Beam) H 3-12 3HNAS008MZ(H)	4	13
200x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Pressure) Th. xx (th. Wing) 3HNAH125HZ	4	5
200x58	IPE 400/450 HEA 280/340 HEB 180/220 L Th. 13-16	Anchor Open beam H 13-16 3HNAS013MZ(H)	4	13
200x58	TUBE h x b	Anch. Tubular beam h x b	4	13
250x58 300x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Open Beam) H 3-12 3HNAS008MZ(H)	3	10
250x58 300x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Pressure) Th. xx (th. Wing) 3HNAH125HZ	3	4

ABAGRIGLIATI Profile section	BEAM TYPE	ANCHOR TYPE	No. of ANCHORS	No. of BH Bolts M8X16 for profile anchoring and joining
b x h	Model/Designation	Description/code	pcs/m2 (average)	pcs/m2 (average)
250x58 300x58	IPE 400/450 HEA 280/340 HEB 180/220 L Th. 13-16	Anchor Open beam H 13-16 3HNAS013MZ(H)	3	10
250x58 300x58	TUBE h x b	Anch. Tubular beam h x b	3	10
350x58 400x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Open Beam) H 3-12 3HNAS008MZ(H)	2	6
350x58 400x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Pressure) Th. xx (th. Wing) 3HNAH125HZ	2	2
350x58 400x58	IPE 400/450 HEA 280/340 HEB 180/220 L Th. 13-16	Anchor Open beam H 13-16 3HNAS013MZ(H)	2	6
350x58 400x58	TUBE h x b	Anch. Tubular beam h x b	2	6

ABAGRIGLIATI Profile section	BEAM TYPE	ANCHOR TYPE	No. of ANCHORS	No. of BH Bolts M8X16 for profile anchoring and joining
b x h	Model/Designation	Description/code	pcs/m2 (average)	pcs/m2 (average)
500x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Open Beam) H 3-12 3HNAS008MZ(H)	1	4
500x58	IPE 80/360 HEA 100/260 HEB 100/160 L Th. 3-12	Anchor (Pressure) Th. xx (th. Wing) 3HNAH125HZ	1	2
500x58	IPE 400/450 HEA 280/340 HEB 180/220 L Th. 13-16	Anchor Open beam H 13-16 3HNAS013MZ(H)	1	4
500x58	TUBE h x b	Anch. Tubular beam h x b	1	4

- C2.1 The profiles should be joined centrally in the span (between the load-bearing beams); in the case of support spans exceeding 1.50 metres, join the profiles with 2 bolts placed 1/3 of the way along the span; in case of spans longer than 2.50 metres, join the profiles with 3 bolts placed 1/4 of the way along the span.

- C2.2 The number of anchors is provided for guidance only and may vary depending on:

- the number/distance between supports: as the distance between supports increases, the number of anchors decreases, but adjacent profiles still need to be joined at multiple points.
- Critical uses for truck traffic (if compatible with the type of profile), support of machinery, inclined ramps and other challenging applications.

In any case, it will be the designer's responsibility to identify increased fixing requirements.

- C3 Once installation is complete, check:

- that there aren't any profiles with irregular and discontinuous support (no gaps between profile and beams).
- absence of dangerous hollow spaces (holes) in the floor: any gaps created to accommodate systems or stairs must in any case be covered or protected with suitable means or materials to prevent accidental falls.
- absence of stumbling blocks of any nature - regardless of the cause that generated them.
- absence of sharp edges in areas accessible with hands.
- absence of residual material (brackets/bolts/tools) which could cause tripping or slipping; also check inside the profiles and above the beams as any blunt objects left there might fall even long after installation.

D) MAINTENANCE

Like in any structure, the conditions of the various elements and their fixings should be constantly monitored.

The required checks to be carried out ANNUALLY are:

D1) PRESENCE OF DEFORMATIONS AND/OR DAMAGED PARTS

Part	State	Action
Mechanical damage		
Profile/step surface	Minor surface deformations without breaking points. Intact load-bearing edge. No points presenting tripping or cutting risks	Report to the safety manager as they must take action to check for any failure points and start the procedures for any required replacement.
Profile/step surface	Surface deformations with breaking points that can present a tripping hazard. Intact load-bearing edge.	Immediately report to the safety manager who must immediately close the passage or isolate the access point. Start replacement procedures.
Profile/step edge	Dents/deformations on the edge. Since this is the load-bearing part of the profile, even minimal deformations cannot be tolerated.	Immediately report to the safety manager who must immediately close access to the passage. Start replacement procedures.

Part	State	Action
<u>Mechanical damage</u>		
Step Support (stairs only)	Dents/deformations of the support. Since this is the load-bearing part even minimal deformations cannot be tolerated.	Immediately report to the safety manager who must immediately close access to the passage. Start replacement procedures.
Anchoring	Loose bracket (does not put pressure on the beam).	Immediately report to the safety manager who must check whether clearance is due to loosening of the bolts or to a deformation of the bracket.
Anchor point (element of the load-bearing structure)	Minor dents near the anchoring point.	Report to the safety manager as they must take action to check for any failure points and start the procedures for any required closing of the passage of replacement/repairing of damaged parts.
Anchor point (element of the load-bearing structure)	Major dents near the anchoring point.	Immediately report to the safety manager who must immediately close access to the passage. Start replacement procedures.

Part	State	Action
Oxidation In highly aggressive environments or in the presence of inadequate cutting operations, oxidation of the material may occur in some points of the profiles or accessories.		
Profile/brackets/bolts	Initial oxidation not significantly affecting the material; load-bearing edge intact.	Report to the safety manager as they must take action to check for any failure points and check whether replacement is needed.
Profile/brackets/bolts	Full-blown oxidation with obvious weaker points, damaged parts, in particular on the walkable surface or on the load-bearing edge only.	Report to the safety manager as they must take action to check for any failure points and start the procedures for any required replacement

State	Action
Bolts Bolts are the items used to connect the profiles to the structure; therefore, it is important that they are always in perfect condition.	
Loose bolts.	Immediately restore the initial installation conditions, evaluating whether simple tightening is sufficient or replacement is necessary.

D2) RECORDS

An inspection log should be set up in the form of a checklist which helps record the performed checks and increase their effectiveness.

This document is drawn up to guide and facilitate design and installation operations of ABAGRIGLIATI profiles.

However, any checks regarding the suitability, effectiveness and compatibility of the profiles for each intended use and their application shall be the responsibility of the designer and installer.

ABAGRIGLIATI reserves the right to introduce changes in its products and documentation without notice.

ABAGRIGLIATI SRL
Massanzago (PD) ITALY

Abagrigliati s.r.l. Unipersonale
via dell'Artigianato 10
35010 Massanzago, Padova - Italy
R.E.A. PD 349397
P.IVA e C.F. IT03940180288
Cap. Soc. € 50.000 i.v.

Tel. +39 049 5797535
Fax +39 049 5797860
www.abagrigliati.it
info@abagrigliati.it
abagrigliati@pec.it