



**Temporary Works  
forum**

Promoting best practice in  
the construction industry.

TW20.017 – 7th February 2020

## **TWf INFORMATION SHEET No. 9** **Temporary Works Equipment (TWE) - Design to Eurocodes**

### **1.0 Background**

1.1 This information sheet follows on from:

- (i) previously-published TWf Guidance, ‘The Use of European Standards for Temporary Works Design’ (TWf2014:01)<sup>1</sup>;
- (ii) a TWf Discussion Paper, ‘The permissible stress versus limit state debate’ (TW18.047);
- (iii) a TWf Debate, ‘Transcript of part of the TWf meeting held on 20.6.18 (TW18.119); and
- (iv) a Discussion Paper (TW19.056), twice issued for comment to members (11.6.19 and 9.12.19).

1.2 Suppliers of temporary works equipment generally only publish ‘service load’ capacities for their systems. They do not publish ‘characteristic resistances’ as defined in the product and structural design Eurocodes. In the UK, equipment is usually marked with a ‘safe working load’ (or ‘safe working pressure’).

1.3 There are two fundamental reasons for this:

- (a) using the material and load factors in the structural Eurocodes will often reduce the overall factor of safety (FoS) traditionally demanded for temporary works designs in the UK. An inexperienced designer may only check the Ultimate Limit State (ULS) against the characteristic resistance using these factors, potentially resulting in a dangerous design; and
- (b) the majority of temporary works is installed and managed by personnel who understand ‘service loads’. Characteristic resistances and limit state philosophy remains the domain of the designer. By stating the characteristic resistances there is a high risk that site personnel will assume this to be the service load.

1.4 This information sheet suggests a practical approach for temporary works design in the UK using TWE from reputable suppliers using their service load published data.

<sup>1</sup>

<https://www.twforum.org.uk/viewdocument/the-use-of-european-standards-for-t>



## 2.0 Recommendations

### 2.1 Temporary Works Equipment (TWE) Suppliers

2.1.1 TWE suppliers should provide:

- (a) service load data that has been validated against the relevant product Eurocode(s) with a minimum FoS of 1.65.

NOTE:

Where the design assisted by testing has been utilised to satisfy this requirement it should be clearly stated.

and

- (b) recommended one or more minimum multiples of these values to give an equivalent characteristic resistance that can safely be compared to a ULS load case generated using a structural Eurocode.

NOTE:

A minimum multiple of 1.50 is recommended.

ULS normally ranges between 1.35.SLS (Serviceability Limit State) and 1.50.SLS using a structural code.

### 2.2 Temporary Works Designers (TWDs)

2.2.1 TWDs should state clearly on all calculations and drawings whether a limit state or permissible stress design has been carried out.

### 2.3 Permanent Works Designers (PWDs)

2.3.1 With a limit state design, the PWD should ensure that the SLS load case is the main check on any TWE. If the ULS loads are  $>1.50.SLS$  then investigate why this is the case. Once satisfied, use this as the main check. This will ensure that the TWE design is always conservative with an unusual load case. To avoid confusion, provide any construction drawings with SLS loads only.

2.3.2 Provide SLS calculated deflections/settlements, etc. recognising that most temporary works failures are serviceability failures and that giving the site teams this information will help safely manage the works. This information should be provided on any drawings for the site team. Also, maximum allowable service loads should be stated so that site team know how conservative the design is.

## References

TWf2014:01, The use of European Standards for temporary works design  
PAS 8812:2016, Temporary works. Application of European Standards in design. Guide (BSI)