BESA
BUILDING ENGINEERING SERVICES ASSOCIATION

Good Practice Guide for

Supports and Fixings

Will Pitt
Chair BESA Technical Committee

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How has the industry historically operated….

We use channel and threaded rod

We fix to steelwork and purlins

We mix and match products

Site teams left to come up with the solution

What does this mean?

- We don’t know what the applied load is
- We don’t fully understand the application
- We rarely seek approval from the structural engineer
- We cannot prove that the selected supports and fixings systems are fit for purpose

……But why is any of that a problem?

The need for change

Getting supports and fixings wrong can be catastrophic.....

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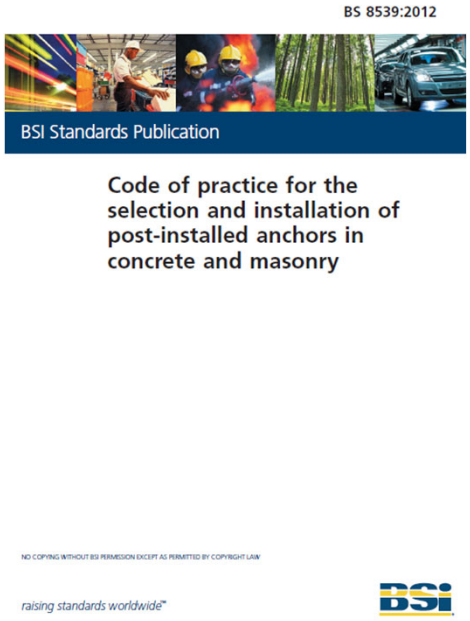
The need for change

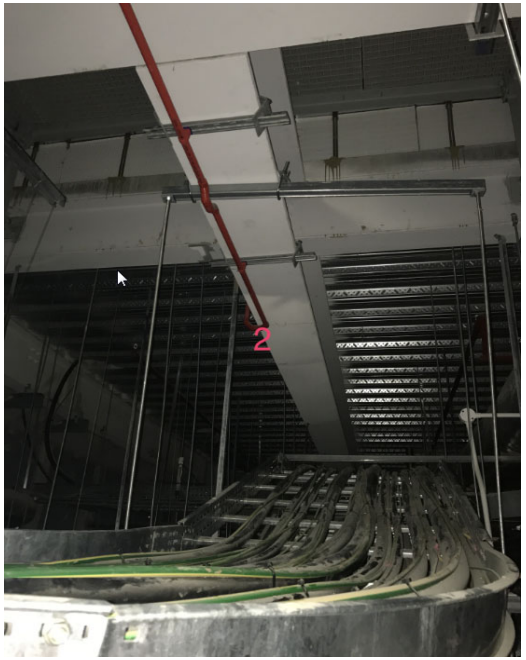


Cost & Reputation

BS 8539:2012

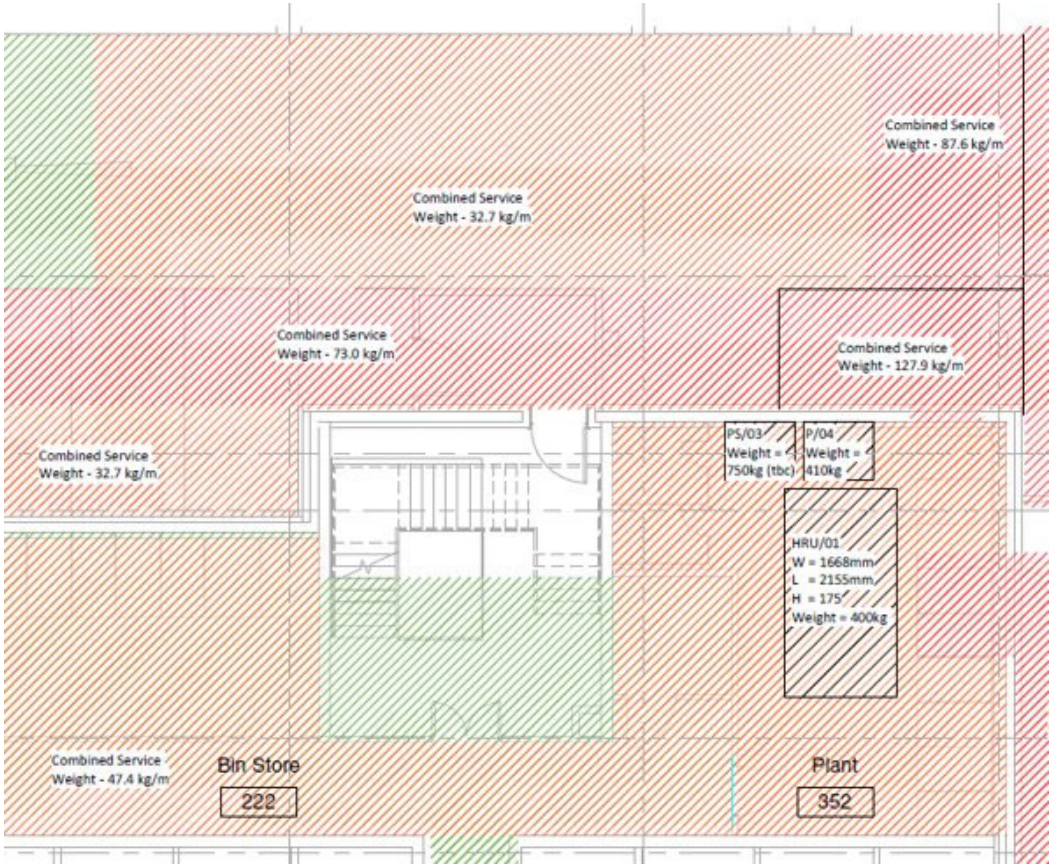
Due Diligence

Common problems



Design

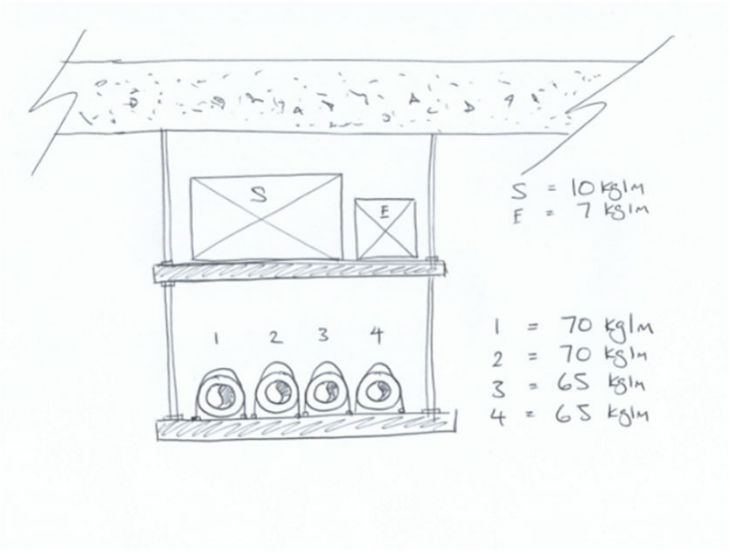
Suspended services



Design

Roof plant

Specification



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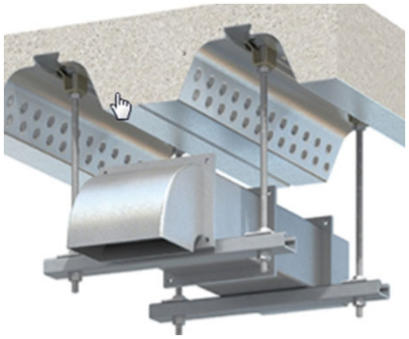
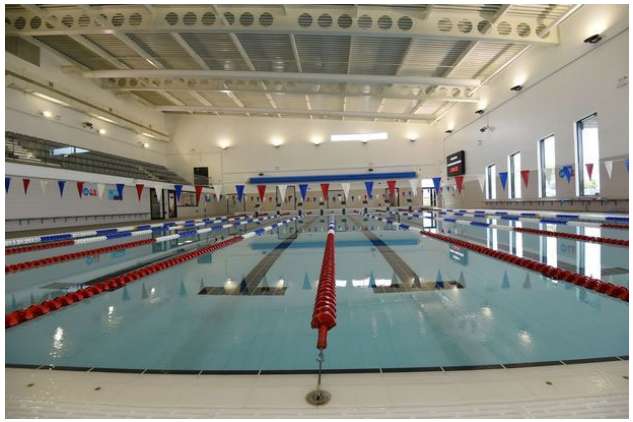
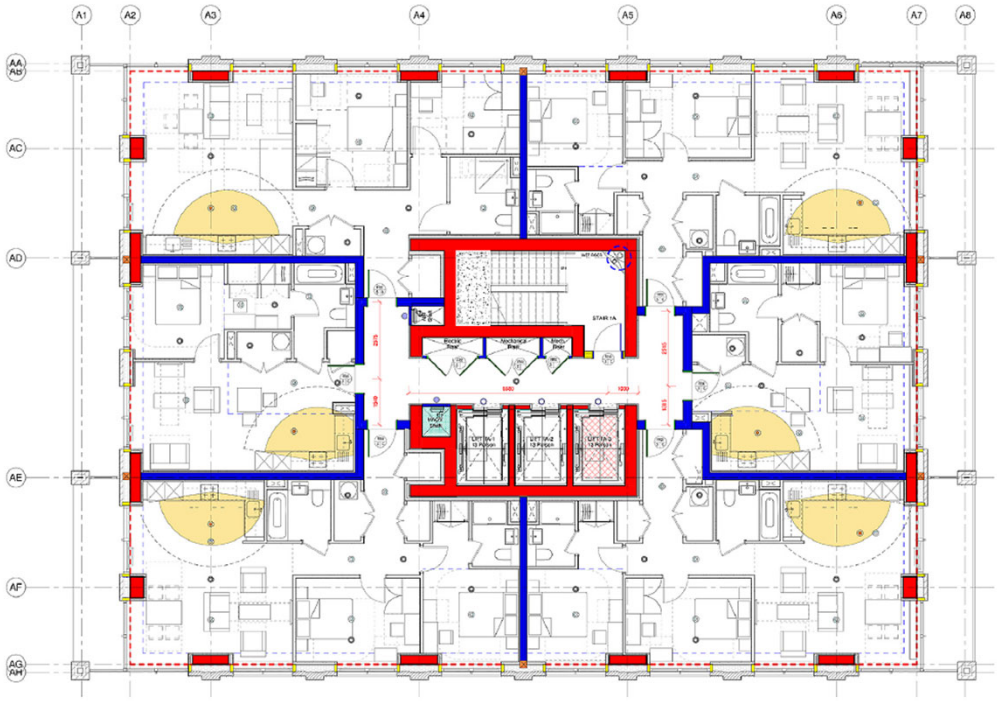


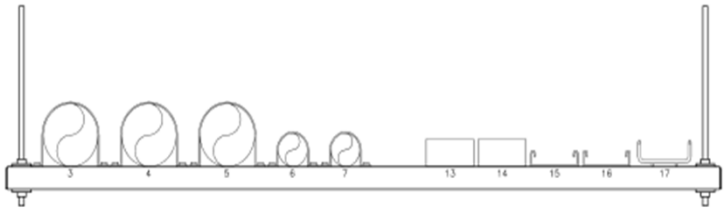
Base material fixing suitability



Environment

Specification

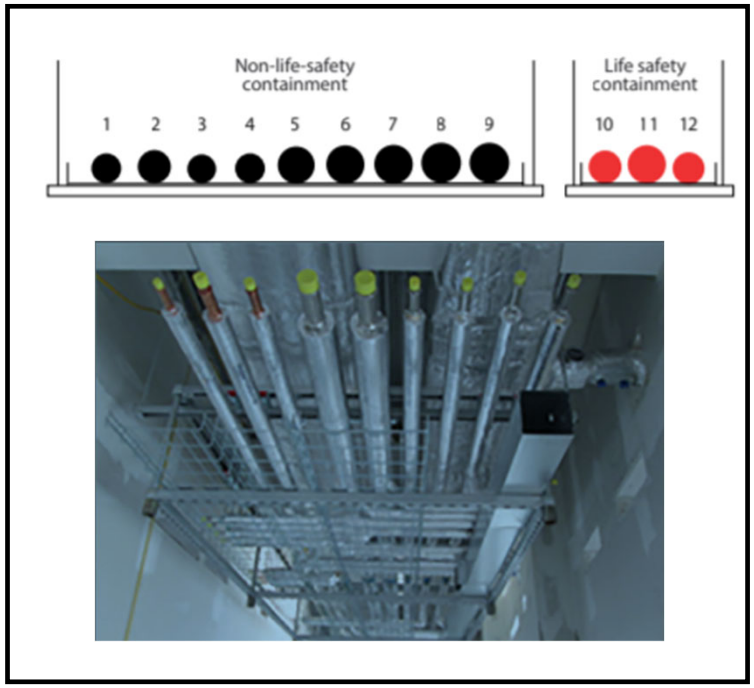




Fire Rating

Specification

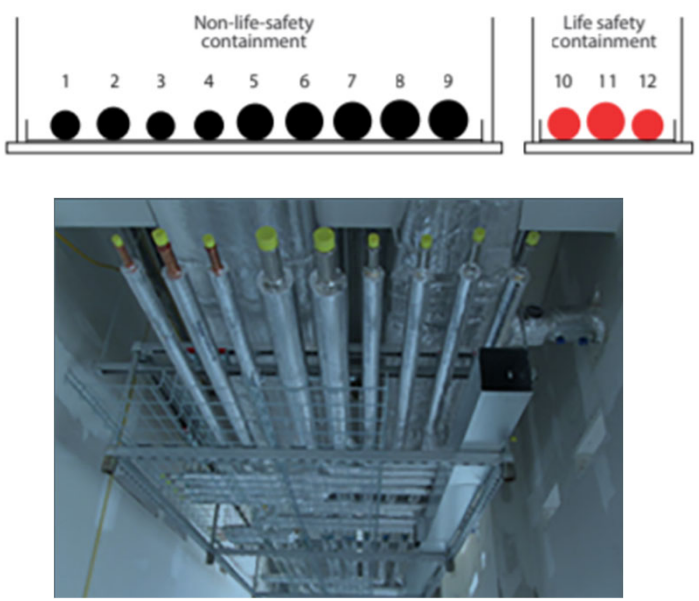
Fire Rating



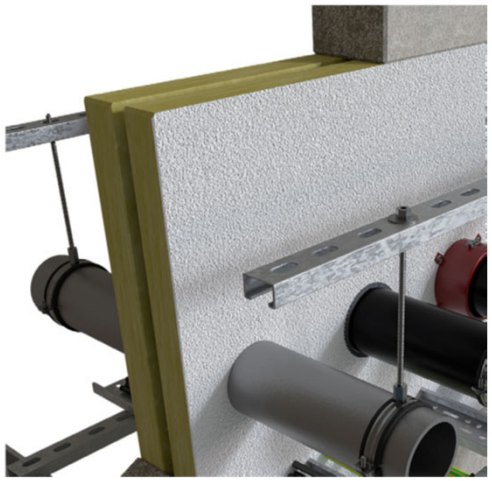
Power supplies to life safety systems

Specification

Fire Rating



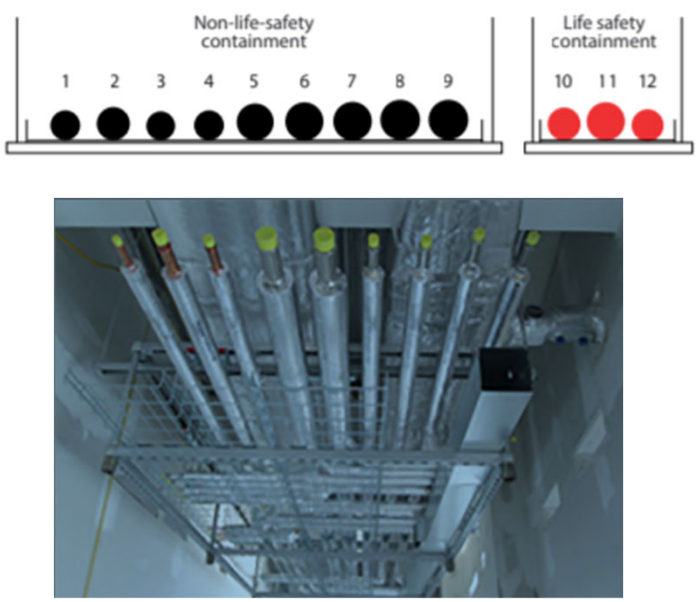
Power supplies to life safety systems



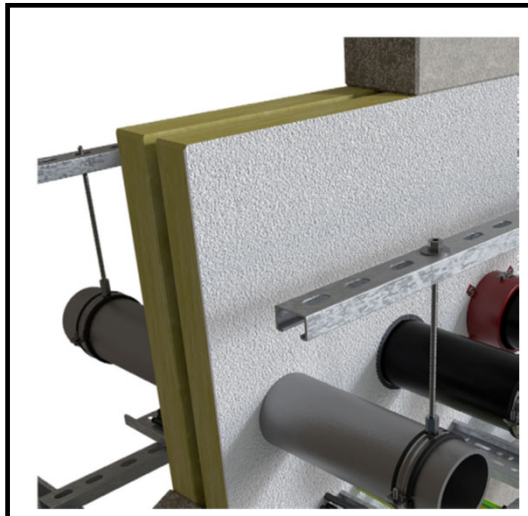
Supports either side of a penetration seal

Specification

Fire Rating



Power supplies to life safety systems



Supports either side of penetration seals

Designated fire escape routes

Specification

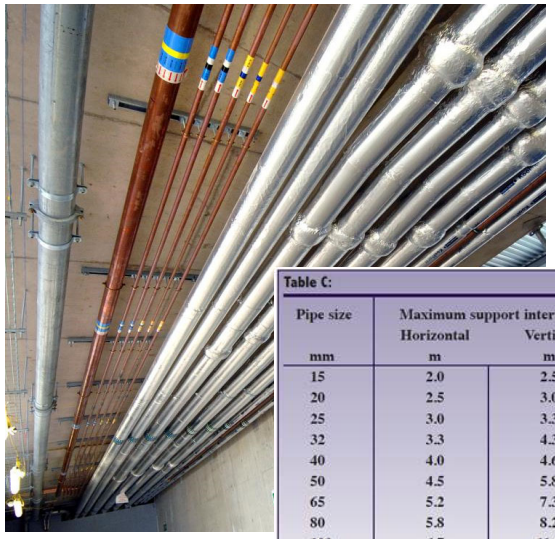
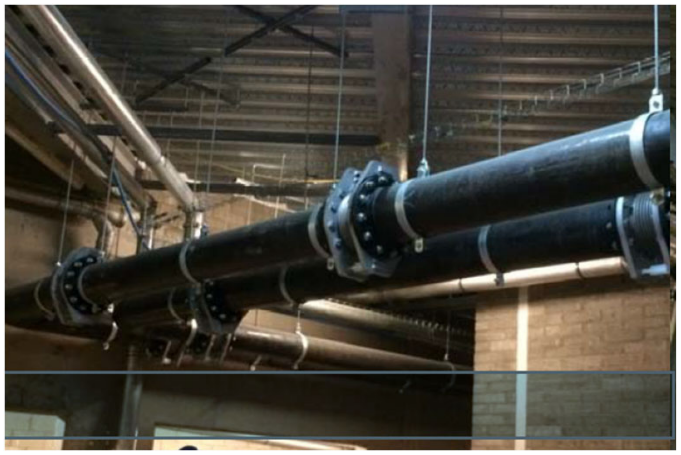


Table C:

Pipe size	Maximum support interval	
	Horizontal	Vertical
mm	m	m
15	2.0	2.5
20	2.5	3.0
25	3.0	3.3
32	3.3	4.3
40	4.0	4.6
50	4.5	5.8
65	5.2	7.3
80	5.8	8.2
100	6.7	11.0
125	7.0	12.0
150	8.0	12.0
200	9.5	14.0
250	10.5	18.0

Support Spacing



Thermal expansion

ETA

CE

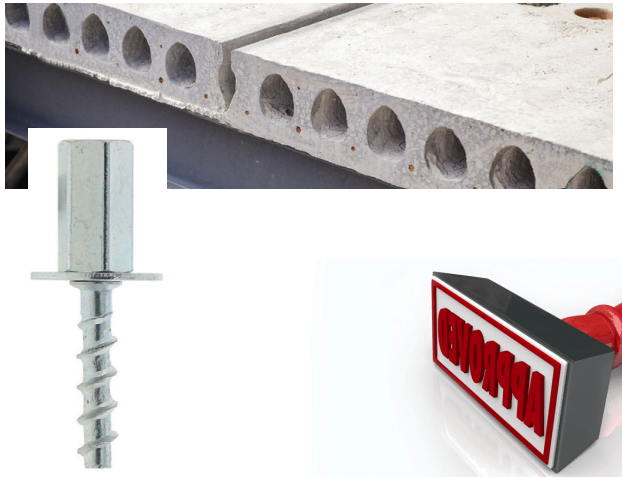
Europ. Techn. Bewertung
European Technical Assessment

Approvals

Structural Engineer Sign-off

The following information should be contained in the technical submission:

- Point loads
- Fixings into concrete
- Fixings into bison beams and hollow core slabs
- Fixings to purlins and steel beams
- Fixings to decking and composite metal floor systems



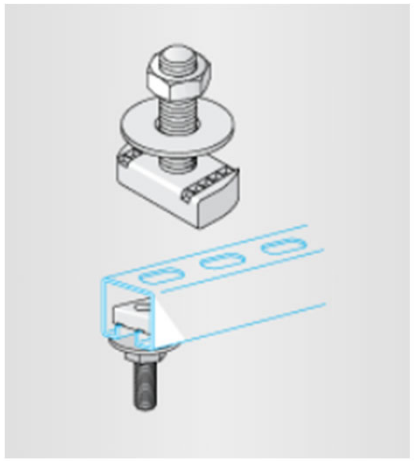
Installation - competence

✓ Installer training completed at start of project

✓ Concrete anchors installed by trained individuals working under supervision of CFA certified supervisors (or similar)

Installation – torque settings

Many of the supports and fixings systems used in building services are required to be torqued to a correct setting as specified by the manufacturer.



Testing

There are only 2 types of fixing test used and these are:

1. PROOF TEST
2. PRELIMINARY TEST

- The terms ‘pull test’ should no longer be used as it is too vague and is generally misunderstood.

Testing

A PROOF TEST is used to validate the quality of the installation.

They are not necessary if:

- ETA fixings are used
- Fixings into concrete are specified based on the application
- Fixings are installed by trained operatives working under supervision

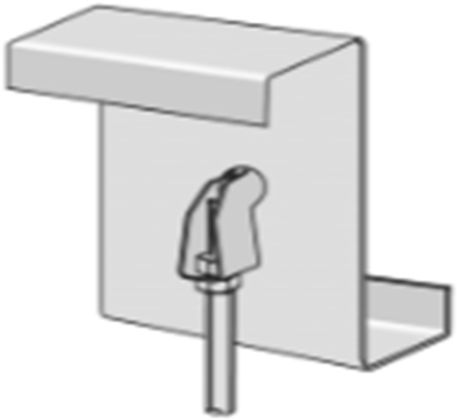
Testing

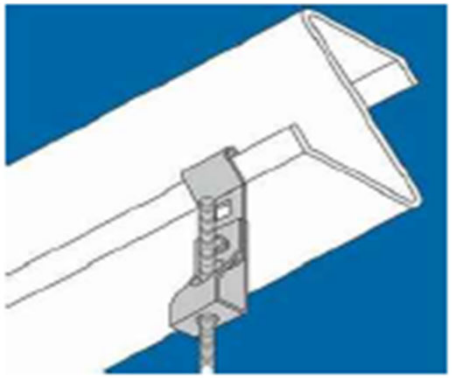
A PRELIMINARY TEST is used to determine the allowable resistance.

It is only required for:

- Refurbishments
- Where the concrete / substrate performance is unknown
- Where the performance of the fixing in the substrate is unknown.

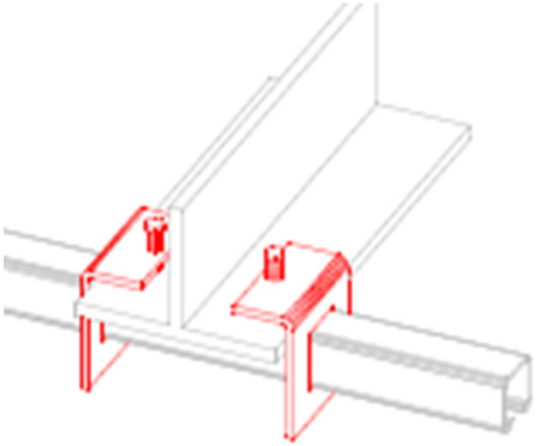
A few examples of good and bad practice

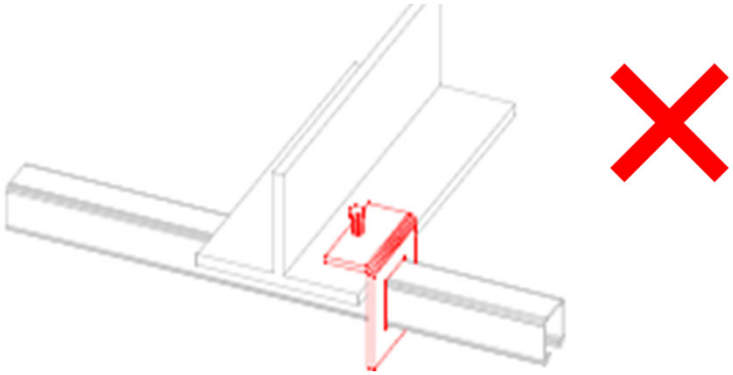




Fixings to purlins

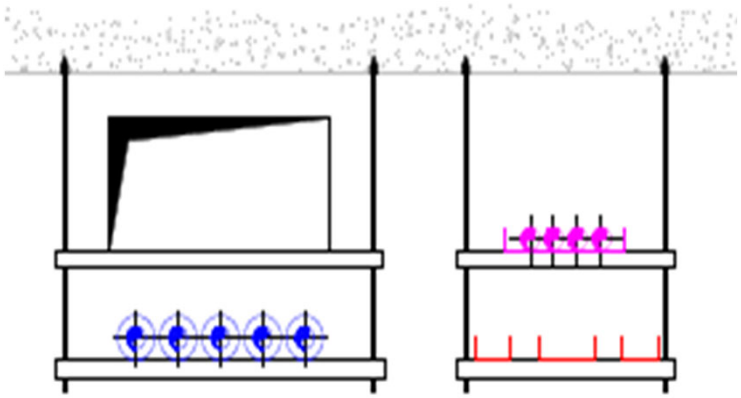
A few examples of good and bad practice

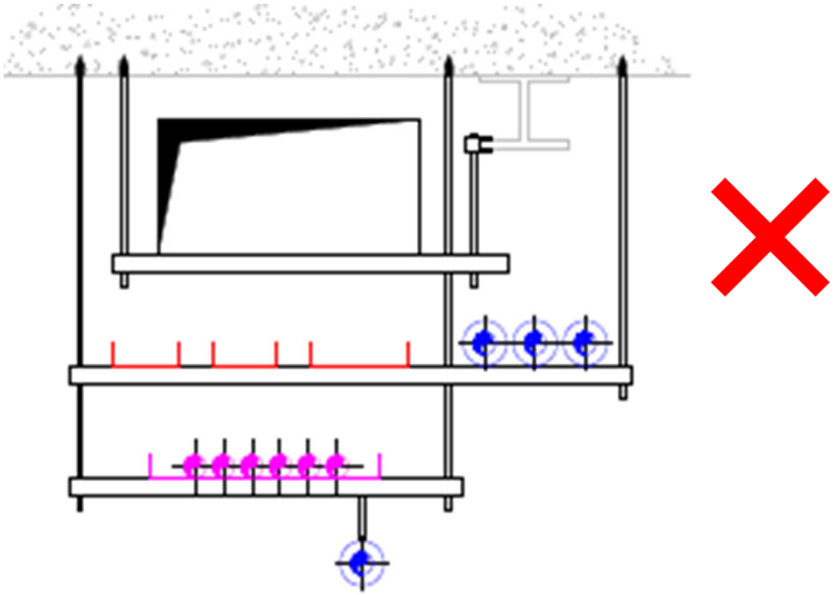




Window brackets

A few examples of good and bad practice





Overloading of fixings

Recap / summary

ESTABLISH WEIGHT

Of suspended & roof mounted MEP services

COLLABORATE

With structural engineer & builder and obtain approvals

SELECT PRODUCTS

Based on weight, application & environment

PROVIDE DETAILS

Show bracket details on drawings

TRAIN OPERATIVES

On best practice installation techniques

INSTALL

Using correct tools and follow manufacturers instructions (torque)

TEST FIXING

Proof or Preliminary testing (BS 8539)

IN CONCLUSION

Supports & Fixings are not commodity items. They need to be designed and engineered from the outset and not left to those carrying out the install to come up with solutions.

Where to find it?

www.thebesa.com/knowledge

Questions

Q&A