Welcome
Irish Branch IIRSM
Oct 2018
Agenda:

15.00 – 15.15 – Welcome & Introduction
15.15 – 15.45 – Presentation: The Design & Installation of Anchors
15.45 – 16.00 – Refreshment & Networking
16.00 – 17.00 – AGM
The Design & Installation of Anchors

Overview:

– Anchors are commonly used in construction.
– Their main uses are to attach steel to concrete and to attach mechanical & electrical systems to concrete structures (threaded bar).
– “Safety Critical Anchors”.
The Design & Installation of Anchors

Objective:

– Understand the term “Safety Critical”.
– Know when to apply the Code of Practice and how to manage.
– Identify common installation issues on site.
Safety Critical:

• CoP for the Design and Installation of Anchors.
• HSA CoP Definition;
  — “Safety Critical Situation” - means circumstances where the failure of such connections would cause risk of human injury or death”
Role of the Designer:

- Decides an anchor is required.
- Completes a design risk assessment to determine if it is a Safety Critical Situation.
- Gathers all necessary information to design the anchor, using form FM-01 (Appendix A) or a drawing to communicate the requirements.
- If the anchor manufacturer/supplier is assisting in the design, the designer must approve the design.
- If designing the anchor, completes form FM-02 (Appendix A).
Role of the Anchor Manufacturer / Supplier:

**Anchor Manufacturer/Supplier**

- Provides information on available/suitable anchors.
- Assists in the design of the anchor if requested and if competent to undertake the design.
- Advises on alternative anchors.
- If designing the anchor, completes form FM-02 (Appendix A) and sends this or a computer printout to the designer for approval.
Role of the Anchor Installer:

Anchor Installer

- Purchases the correct anchor.
- Installs the anchor in accordance with the manufacturer’s instructions.
- If there are installation problems on site, then discusses these with the contractor and anchor designer.
- Supervises installation and completes form FM-03 (Appendix A).
Role of the Contractor:

The contractor should ensure that the specified anchor is procured and that the anchor installer is trained for the correct installation of that anchor type. In addition the contractor should ensure that the installer is working under competent supervision.
The Design & Installation of Anchors

• The three most commonly used anchors are, Through Bolts, Drop in Anchors and Chemical Anchors.

• Screw Anchors are now being used in temporary situations such as propping.
Torque – Controlled Expansion Anchor (Through Bolt) :
Torque – Controlled Expansion Anchor (Drop in):

[Image of a controlled expansion anchor and related tools]
Bonded Anchor (Chemical Anchors):
Screw Anchor (Reusable) :
What will fail first?

What will fail first, the concrete base material or the anchor?
Pull out test, anchor failure.
Pull out test, concrete failure.
Common errors (HSA CoP):

- Use of a drill bit with the wrong diameter.
- Use of a wrong drilling system, for example in case of undercut anchors.
- Use of wrong setting tools, for example not using a torque wrench for torque controlled expansion anchors.
- Failure to clean the hole, if cleaning is required by the manufacturer.
- Installation of the anchor such that the fixture cannot be installed without significant manipulations, for example anchor is not flush with the concrete surface in cases where required.
- Hammering in an anchor that should be installed by rotation, for example anchor rod for a bonded anchor.
Common errors:

- Using a different bolt than designed. (Change management.)
- Grouting / shimming not included in design.
- Assuming more anchors provides extra strength.
- Anchors not fitted at 90 degrees
- Anchors striking rebar and missing anchors.
Note on Scaffolding ties:

• If in concrete, follow the CoP for the Design and Installation of Anchors.
• Must have a safe working capacity of at least 6.25kN.
• Testing should be carried out on all projects (between 1.2 and 1.5 times the required load).
• Minimum 3 anchors and at least 5%.
In summary:

• Safety Critical Anchors require design, selection and installation using FM1, FM2 and FM3 forms.
• Training and supervision is required to ensure anchors are installed correctly.
• Installers must have the correct tools for the job!
Questions