



A Deep Dive into Post-installed Anchor Solutions

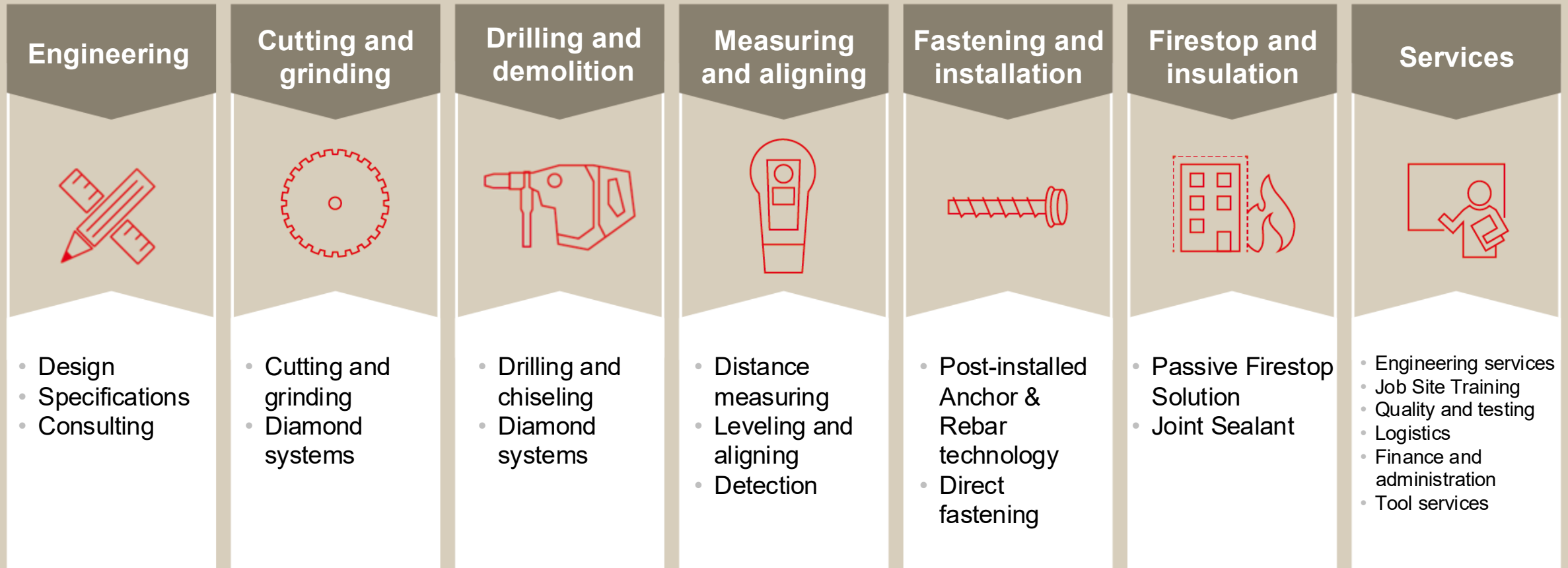
SPEC2„SITE



THIS IS HILTI



SYSTEM SOLUTIONS FOR THE CONSTRUCTION INDUSTRY

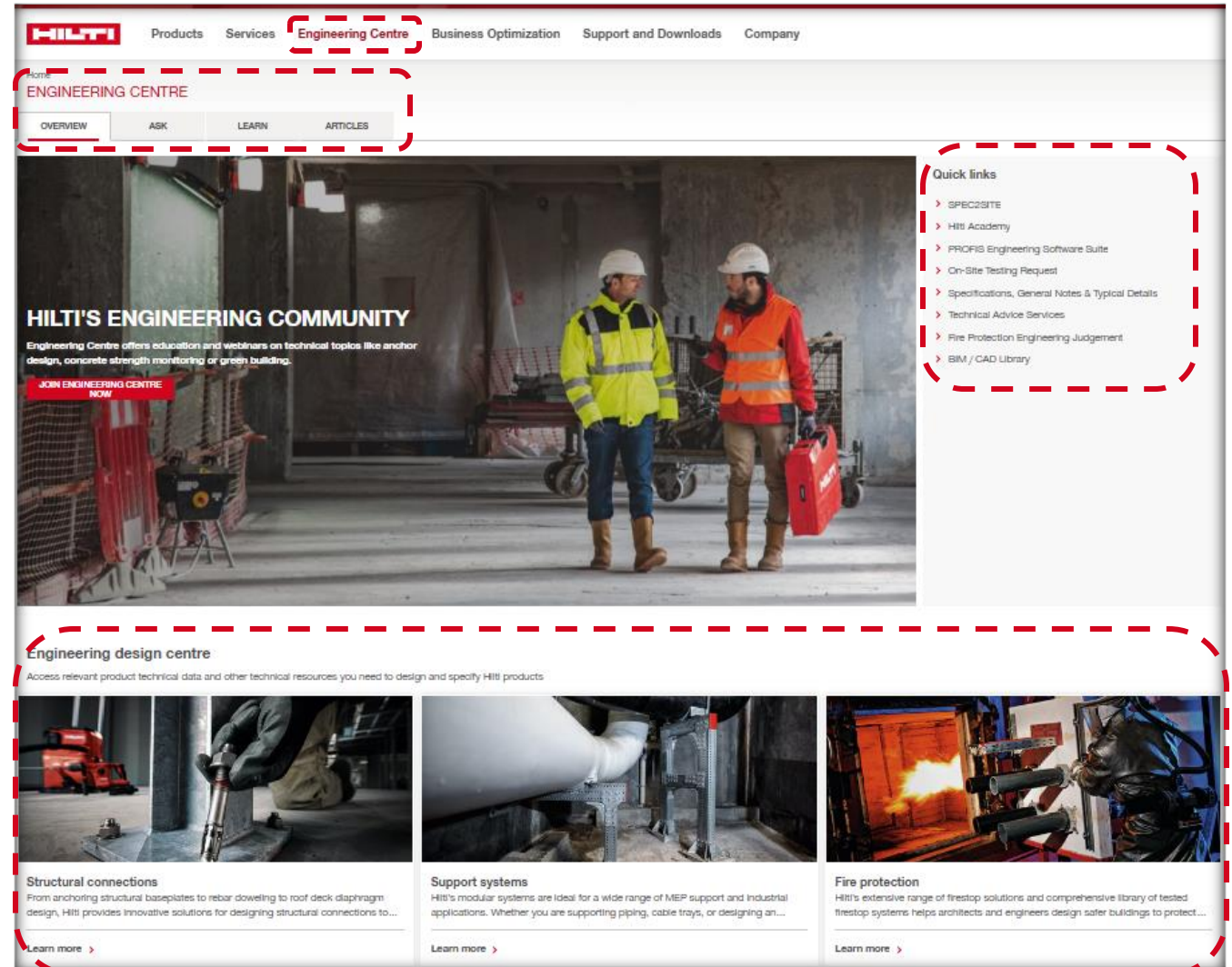


HILTI ENGINEERING CENTRE – ONE LOCATION FOR ALL YOUR DESIGN NEEDS

- Navigate seamlessly to anywhere from the Engineering Centre
- Educational and support resources are easy to locate – Ask, Learn, Articles
- Quick links feature the most used resources
- Design Centres are organized by your application needs – Anchor, Rebar, Façade, Fire Protection, Modular Supports
- And so much more!

Visit the new sites at:

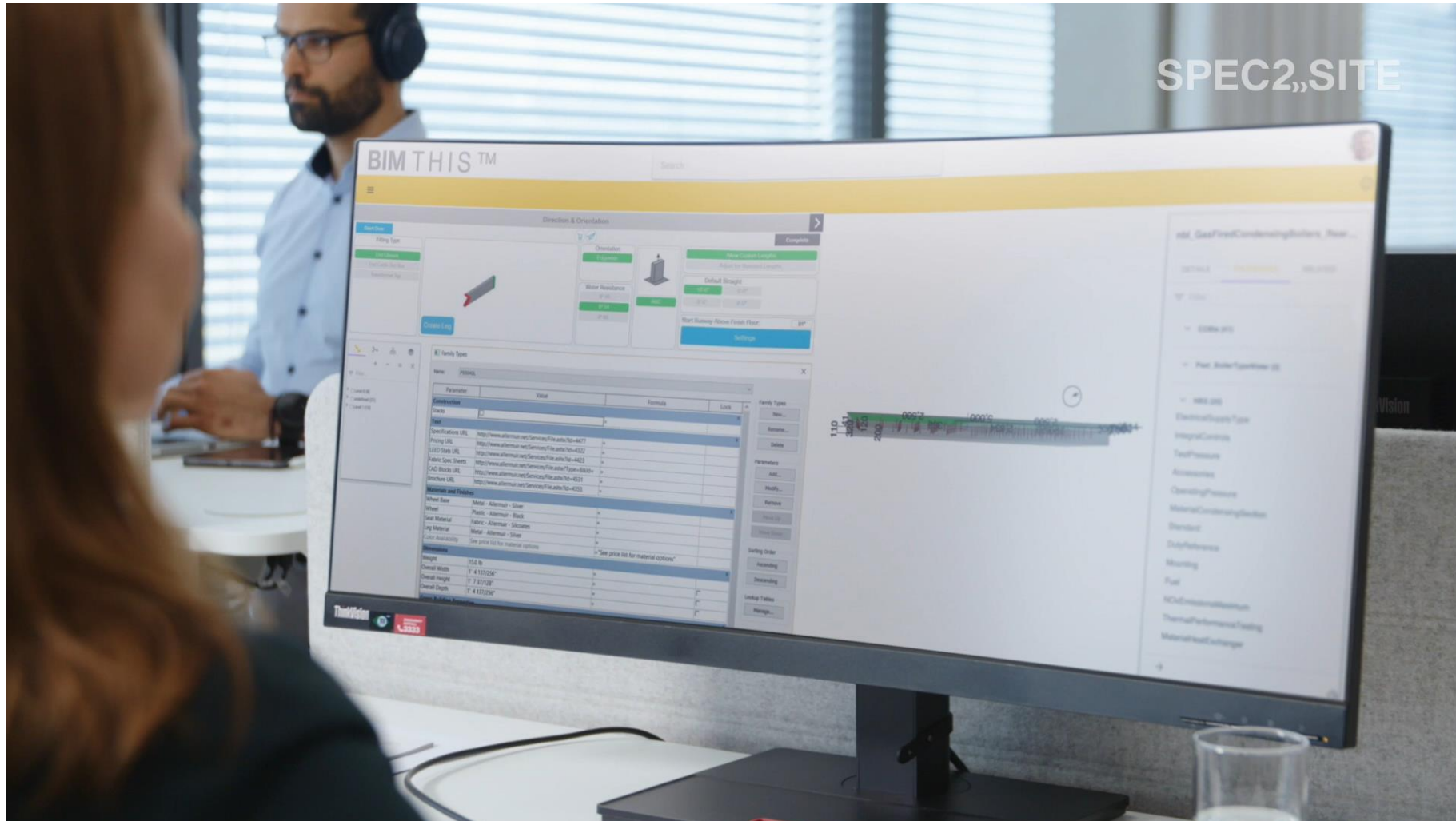
<https://www.hilti.com.my/engineering/>



AGENDA

- **Overview of SPEC2SITE**
- **Introduction to Post-Installed Anchor**
- **Deep Dive : Post-Installed Anchor Systems**
 - *Chemical Anchors*
 - *Mechanical Anchors*
- **Value Engineered Solution : Enabling VE with PROFIS Engineering**
- **Hilti Engineering Solution and Services – Translating Specs to the Jobsite**

WHY YOU SHOULD PARTNER WITH HILTI FOR YOUR STRUCTURAL CONNECTIONS?



Better Specs that are:

HIGHER PERFORMING

Our better anchoring solutions, meet a wide variety of application requirements

VALUE ENGINEERED

Our software enables optimized and code-compliant designs

MORE PEACE OF MIND

Our 'faster, simpler, and safer' systems, knowledge-sharing and jobsite presence help ensure you get what you spec

MORE SUSTAINABLE

Our solutions enable you to reduce material and quantify CO₂ savings in your designs

SPEC2„SITE

Better Site Practices that are:

FASTER

Our systems allow fewer and faster installation steps, delivering the lower total cost of ownership

SIMPLER

Our systems allow an intuitive and straight forward installation process, anyone can do it

SAFER

Our systems, knowledge sharing, and jobsite presence help ensure that you comply with the spec

MORE SUSTAINABLE

Our systems enable you to reduce waste and quantify CO₂ on your project

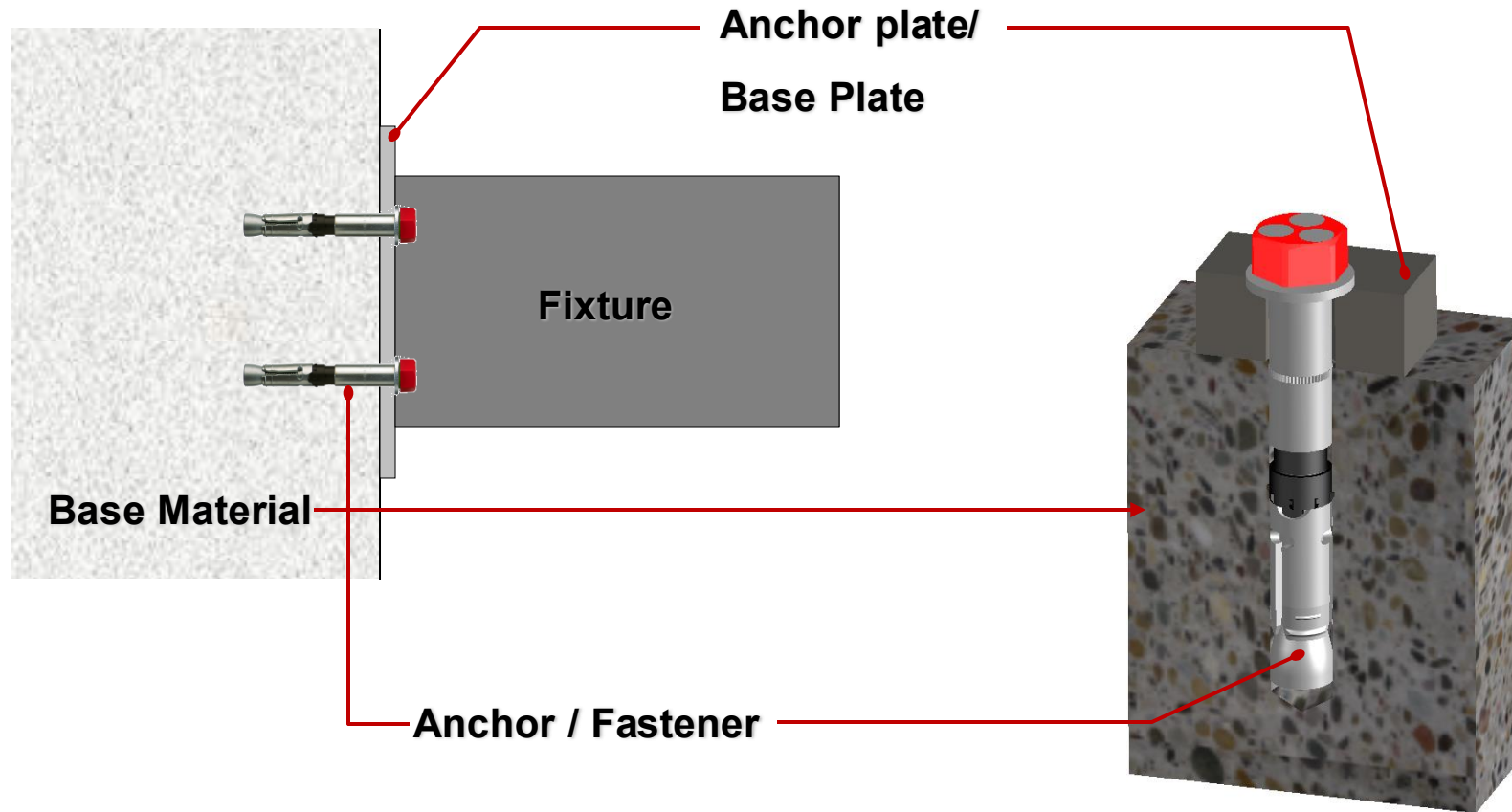


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WHAT IS A POST-INSTALLED ANCHOR?

- Component used to secure a fixture into a base material



COMMON APPLICATION AND ITS EXAMPLES



Architectural

Architectural element & envelop
Facade & curtain wall systems
Cladding systems
Balustrades & railing
Signage etc.



Structural

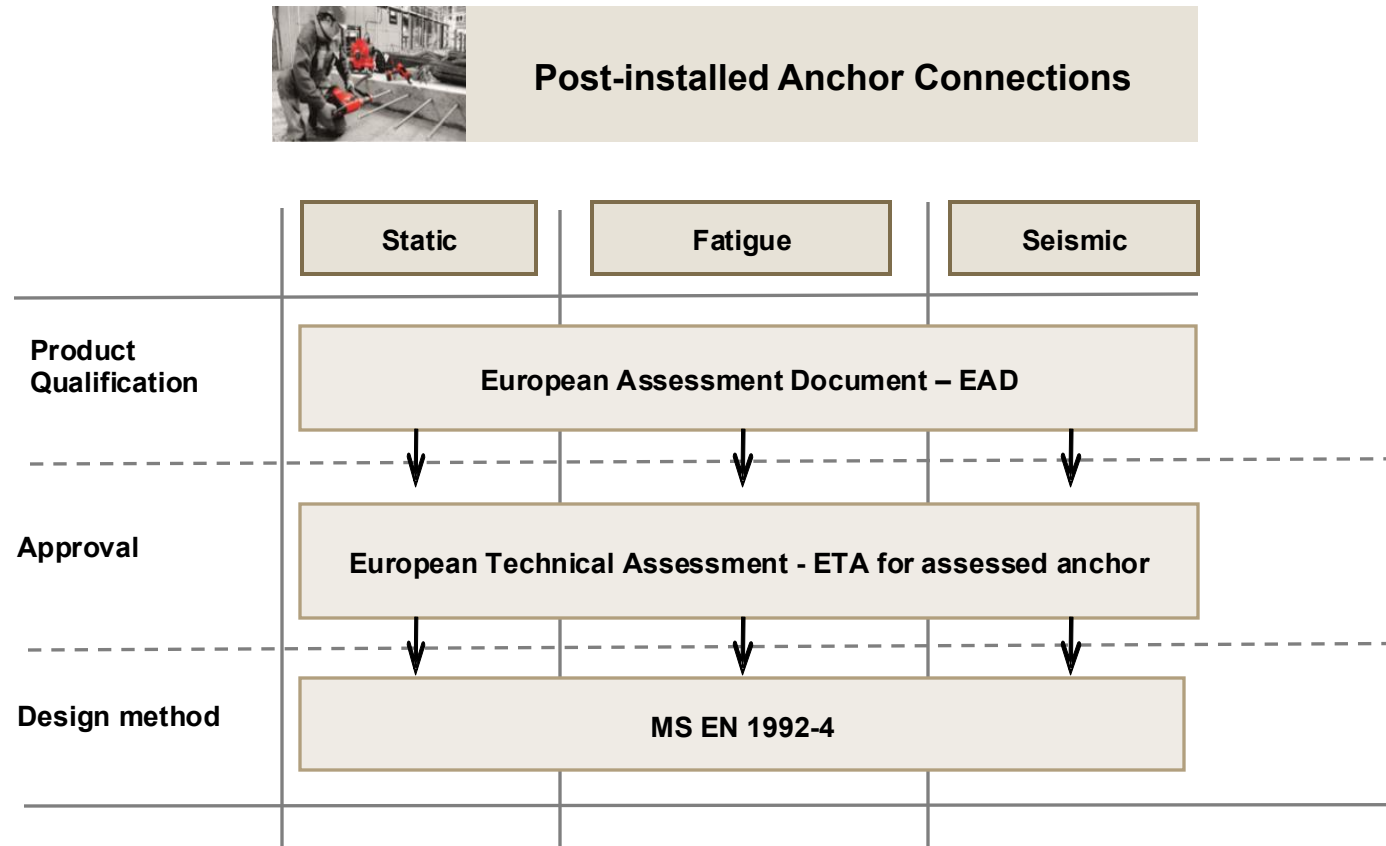
Structural baseplate
Non-structural baseplate
Steel beam & column fastening
Temporary structure (strut, catch
platforms) etc.



Mechanical, Electrical & Plumbing (MEP)

Overhead services fastening
Machineries fastening
Piping & ducting
Services support system etc.

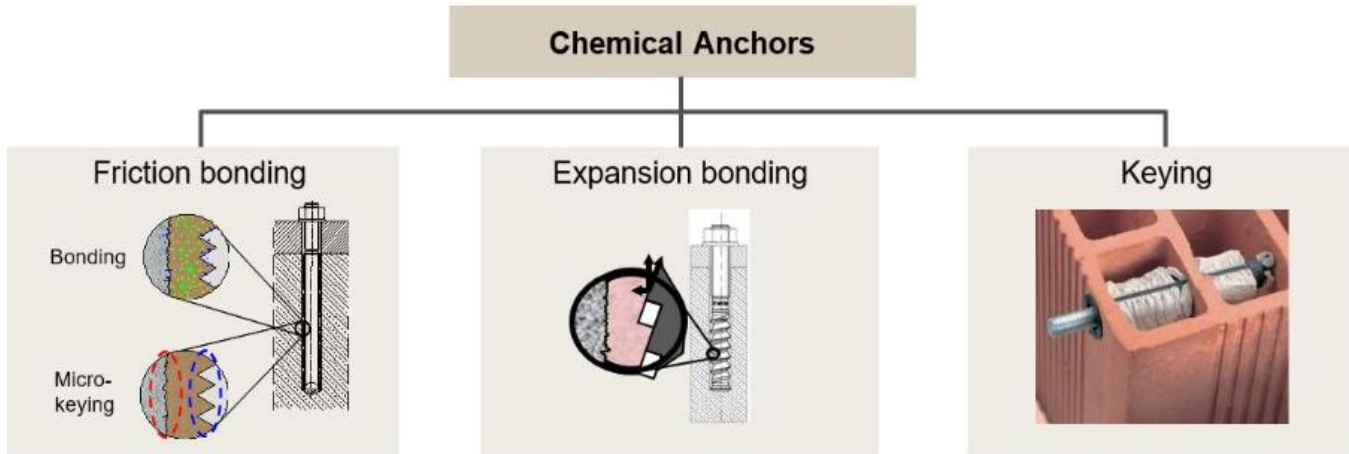
EUROPEAN REGULATORY FRAMEWORK FOR POST-INSTALLED ANCHORS



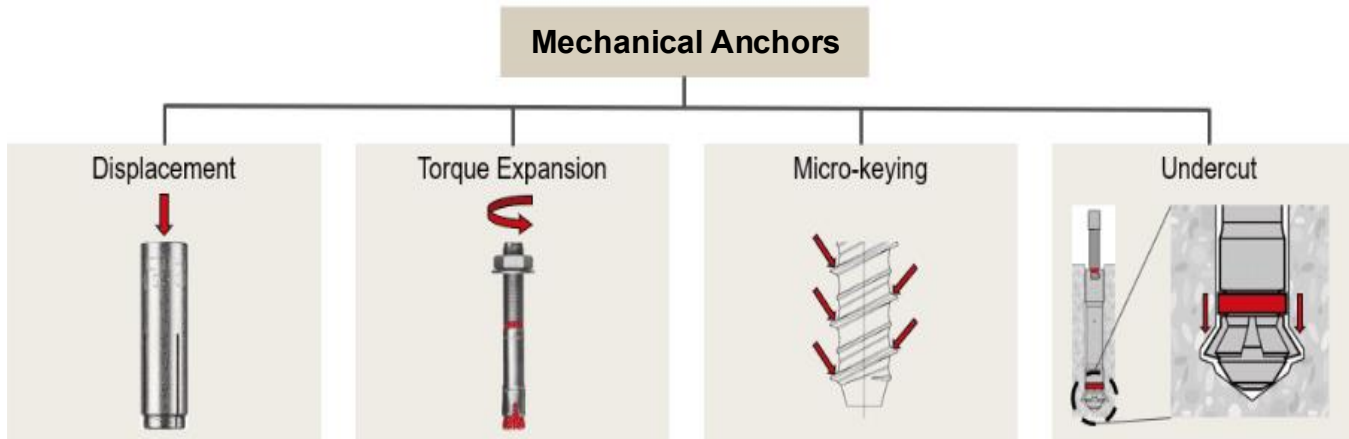
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HOW IT WORKS: BENEFITS & LIMITATIONS



- + Lower spacing and edge distance
- + Flexibility on embedment depth
- No immediate loading
- Sensitive to cleaning and temperature



- + Immediate loading
- + Less sensitive to external conditions
- + Simpler installation
- Less flexibility on embedment depth
- Higher spacing and edge distance

The choice of anchor type strongly depends on the design criteria and specific project requirements

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CHEMICAL ANCHORING SYSTEMS CONSIST OF AN ADHESIVE, AN ANCHOR ELEMENT, AND ACCESSORIES

Adhesives

Injectable adhesives



Capsule systems



Elements

Anchor rods



Specialty Element



Accessories

Dispenser



Mesh sleeves



Cleaning and installation accessories



Disclaimer: Products shown are part of our portfolio and may not represent the full range available. For the complete product offering, please visit www.hilti.com.my

CHEMICAL ANCHOR AND ITS COMMON APPLICATIONS

Product Portfolio

Application conditions

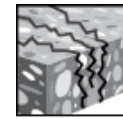
Concrete



Masonry



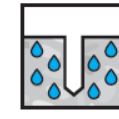
Base
Materials



Cracked
Concrete

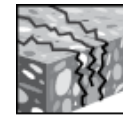


Uncracked
Concrete



Wet
Concrete

Base
Materials



Cracked
Concrete

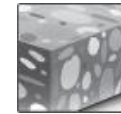


Uncracked
Concrete

Base
Materials

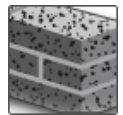


Cracked
Concrete

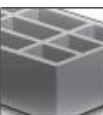


Uncracked
Concrete

Base
Materials

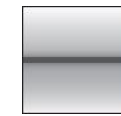


Solid
Masonry



Hollow
Masonry

Loading
Conditions



Static &
Quasi Static



Seismic
C1 & C2



Fire**

Loading
Conditions



Static &
Quasi Static



Seismic
C1 & C2



Fire**

Loading
Conditions



Static &
Quasi Static



Seismic
C1 & C2



Fire**

Loading
Conditions



Static &
Quasi Static

Disclaimer: Products shown are part of our portfolio and may not represent the full range available. For the complete product offering, please visit www.hilti.com.my. For detailed performance and application information, please refer to the relevant ETA document for each product.

** Access to on-demand session for [Designing Post-installed Bonded Anchors in Concrete under Fire Condition as per TR082](#) here

THE HILTI HDE CORDLESS AUTOMATIC DISPENSER PROVIDES ACCURATE DOSING AND REDUCES WASTE

At Hilti we believe simplifying chemical anchor installation helps **prevent waste** to save our customers money. The Hilti **HDE automatic dispenser** is simply the most productive chemical anchor dispenser available, and the same dispenser is used for the full portfolio of Hilti adhesives.

Hilti Volume Calculator to Prevents Waste



- Estimate required volume of chemical adhesive in accordance to anchor size and embedment depth
- Prevent wastage to save your cost

Download it today via :

[Hilti Volume Calculator - Google Play Store](#)

[Hilti Volume Calculator - Apps Store](#)

One Automatic Dispenser for All



[HDE 500-22 Cordless adhesive dispenser - Dispensers - Hilti Malaysia](#)

SPEC2„SITE

INSTALLATION VIDEO : HIT-RE500 V4 CHEMICAL ANCHOR



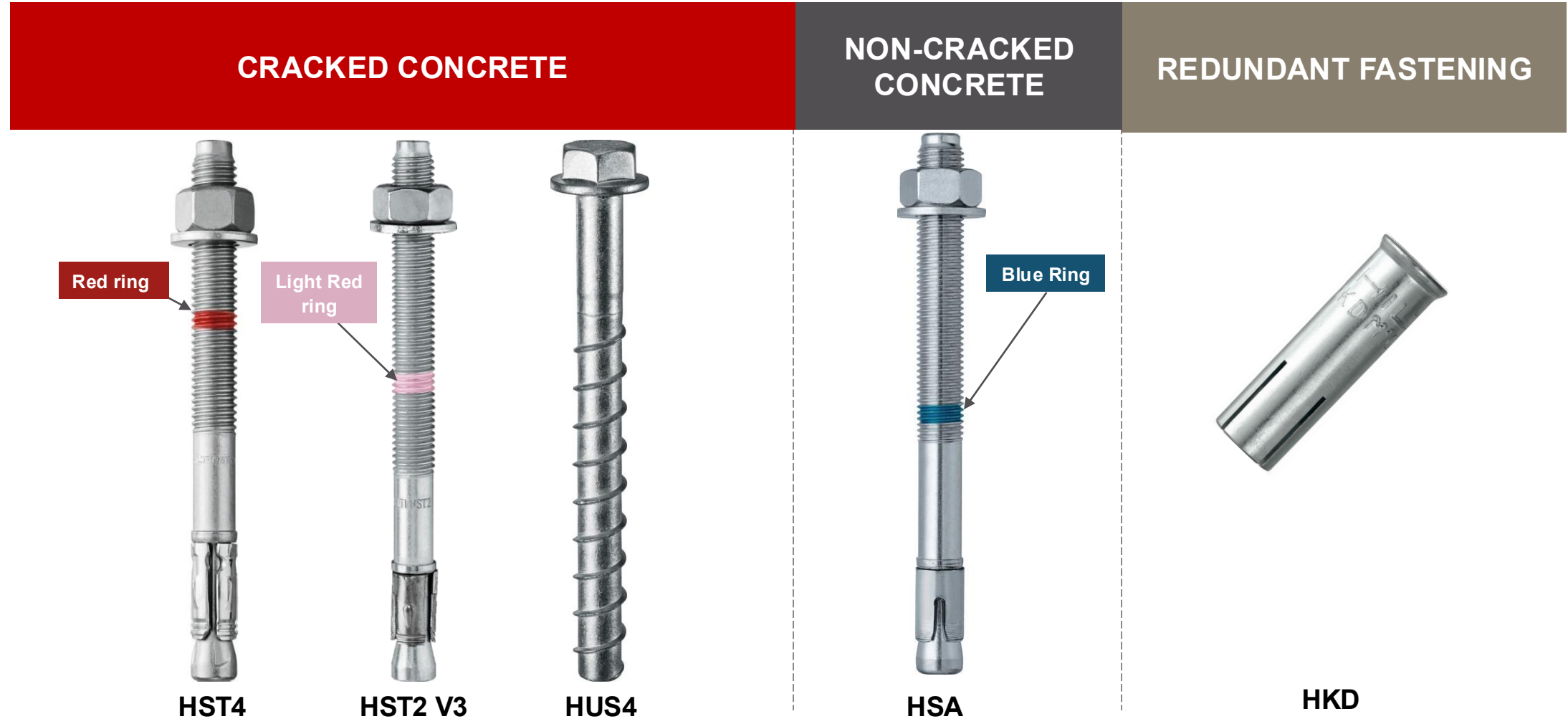
Source : <https://www.youtube.com/watch?v=yx65XDC1cOg>

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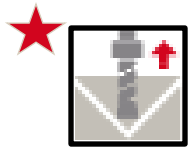
COMMON MECHANICAL ANCHORS ITS APPLICATION

Access to article : [Cracked Concrete Consideration in Design of Post-installed Anchor](#)



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HST4: THE ONLY STUD ANCHOR WITH THE SAME CONCRETE CONE CAPACITY OF A CAST-IN ANCHOR



Disclaimer: For detailed performance and application information, please refer to the relevant ETA document for each product.

HST4: our *highest* performing
Hilti stud anchor

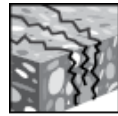


The HST4 offers the **greatest Value Engineering opportunities** by delivering reduced diameters & lengths, reduced baseplate dimensions by utilizing the **highest performance**

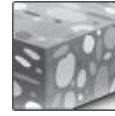
Article : [HILTI HST4: Performance That Matches Cast-In Headed Fasteners](#)

Application conditions

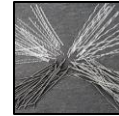
Base Materials



Cracked Concrete

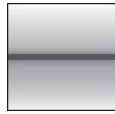


Uncracked Concrete



Fibre Reinforced Concrete

Loading Conditions



Static &
Quasi Static



Seismic
C1 & C2



Fire

Carbon Steel, galvanized, $\geq 5\mu\text{m}$
A4 Stainless steel

- ✓ European Technical Assessment (ETA)
- ✓ Non-cleaning installation
- ✓ Adaptive Torque (AT) Module

Key Applications

- Structural Baseplate
- Non-structural Baseplate
- Façade
- MEP Fastening
- Industrial



HST4: THE ONLY STUD ANCHOR WITH THE SAME CONCRETE CONE CAPACITY OF A CAST-IN ANCHOR



According to the EN1992-4, the characteristic resistance of a group of fasteners in case of concrete cone failure is obtained by:

$$N_{Rk,c} = N_{Rk,c}^0 \cdot \frac{A_{c,N}}{A_{c,N}^0} \cdot \psi_{s,N} \cdot \psi_{re,N} \cdot \psi_{ec,N} \cdot \psi_{M,N}$$

These coefficients account for concrete cone interference in group of anchors (spacing), proximity to slab edge (edge distance), presence of dense reinforcement, load eccentricities, compression forces between fixture and concrete

Characteristic resistance of one anchor in an infinite slab

$$N_{Rk,c}^0 = k_1 \cdot \sqrt{f_{ck}} \cdot h_{ef}^{1,5}$$

f_{ck} = concrete nominal characteristic compressive cylinder strength

h_{ef} = Effective embedment depth



k₁ factor for cast-in and post-installed fasteners by EN1992-4.

	Cast-in (EN1992-4)	Post-installed (EN1992-4)	HST4 M10-M16	HST4 M8 & M20	HST2 V3 M8 to M10
Cracked concrete	8.9	7.7	8.9	7.7	7.7
Uncracked concrete	12.7	11.0	12.7	11.0	11.0

HST4: the 1st stud anchor in the market with the same concrete cone resistance as a cast-in headed fastener for M10 to M16 diameters.
 At equivalent embedment depths, HST4 has 16% larger resistance to concrete cone failure than any other stud anchor in the market

HST2 V3: HIGH PERFORMANCE WEDGE ANCHOR FOR CRACKED CONCRETE APPLICATION

Disclaimer: For detailed performance and application information, please refer to the relevant ETA document for each product.

HST2 V3

Light Red ring



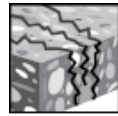
HST2 V3
Carbon Steel

HST2-F V3
Hot-dip
Galvanized

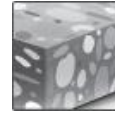
HST2-R V3
Stainless Steel

Application conditions

Base Materials



Cracked
Concrete



Uncracked
Concrete

Loading Conditions



Static &
Quasi Static



Seismic
C1 & C2



Fire

Carbon Steel, Hot-dip galvanized, Stainless steel

- ✓ European Technical Assessment (ETA)
- ✓ Non-cleaning installation
- ✓ Adaptive Torque (AT) Module

Key Applications

- Structural Baseplate
- Non-structural Baseplate
- Façade
- Catch platform
- MEP Fastening, Industrial etc.



HUS4 – HIGH PERFORMING SCREW ANCHOR WHICH IS REMOVABLE, ADJUSTABLE AND REUSABLE*

Disclaimer: For detailed performance and application information, please refer to the relevant ETA document for each product.

HUS4 Screw Anchor



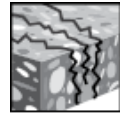
HUS4-H



Check Gauge for HUS Screw Anchor Reusability Test

Application conditions

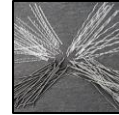
Base Materials



Cracked Concrete



Uncracked Concrete

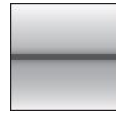


Fibre-Reinforced Concrete



Hollow Core Slab**

Loading Conditions



Static & Quasi Static



Seismic C1 & C2



Fire

Carbon Steel, zinc plated, multilayer coating, A4 Stainless steel

- ✓ European Technical Assessment (ETA)
- ✓ Non-cleaning installation
- ✓ Reusable, adjustable, removable
- ✓ Hexagonal, Countersunk, Threaded head

Key Applications

- Catch platforms, structural baseplate
- Temporary fastenings
- Formwork, propping systems, protection barriers
- MEP fastening / Hollow core slab

***Reusable** in concrete under static and quasi-static loading for temporary fastening. The wear of HUS4 anchor has to be checked with corresponding check gauge before reused

****Application in HCS** is approved for certain type and size of HUS anchor by referring to its relevant ETA



HSA – WEDGE ANCHOR FOR STATIC APPLICATION IN UNCRACKED CONCRETE

Disclaimer: For detailed performance and application information, please refer to the relevant ETA document for each product.

HSA Uncracked Concrete Anchor

Blue Ring



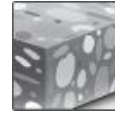
HSA
Carbon Steel
Zinc plated

HSA-F
Hot-dip
Galvanised

HSA-R
Stainless Steel

Application conditions

Base
Materials



Uncracked
Concrete

Loading
Conditions



Static &
Quasi Static



Fire

Carbon Steel, Zinc Plated, Hot-Dip Galvanised,
A2 Stainless Steel, A4 Stainless steel

- ✓ European Technical Assessment (ETA)
- ✓ Adaptive Torque (AT) Module

Key Applications

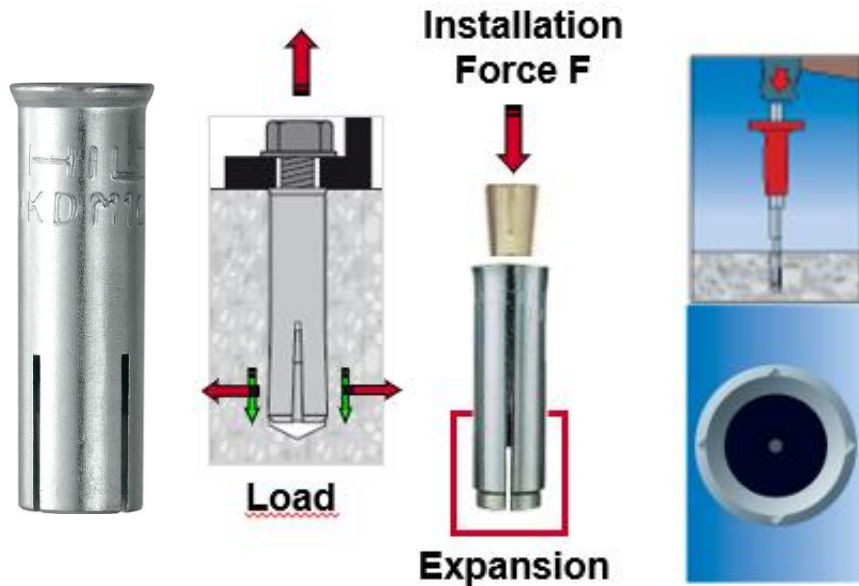
- Fastening in uncracked concrete
- Handrails & Balustrades
- Guard rails



HKD – HIGH PERFORMANCE DROP-IN ANCHOR FOR MEDIUM DUTY LOADS APPLICATIONS

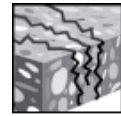
Disclaimer: For detailed performance and application information, please refer to the relevant ETA document for each product.

HKD DROP-IN ANCHOR



Application conditions

Base Materials



Cracked Concrete (Redundant)



Uncracked Concrete (Redundant)

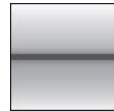


Pre-stressed Hollow core slab (Redundant)



Uncracked Concrete (Single Anchor)

Loading Conditions



Static & Quasi Static



Fire (Redundant)

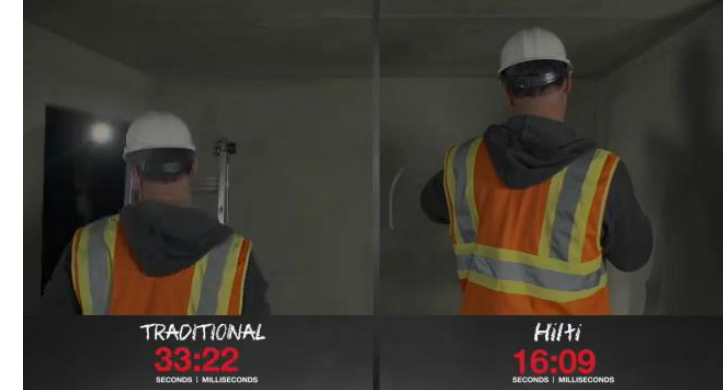
Carbon Steel, galvanized, $\geq 5\mu\text{m}$
A4 Stainless steel

- ✓ European Technical Assessment (ETA)
- ✓ Installation with Setting Tool



Key Applications

- Medium duty loads with threaded rods
- Suspension systems for MEP fastening (Pipes, Ducting, Services etc.)

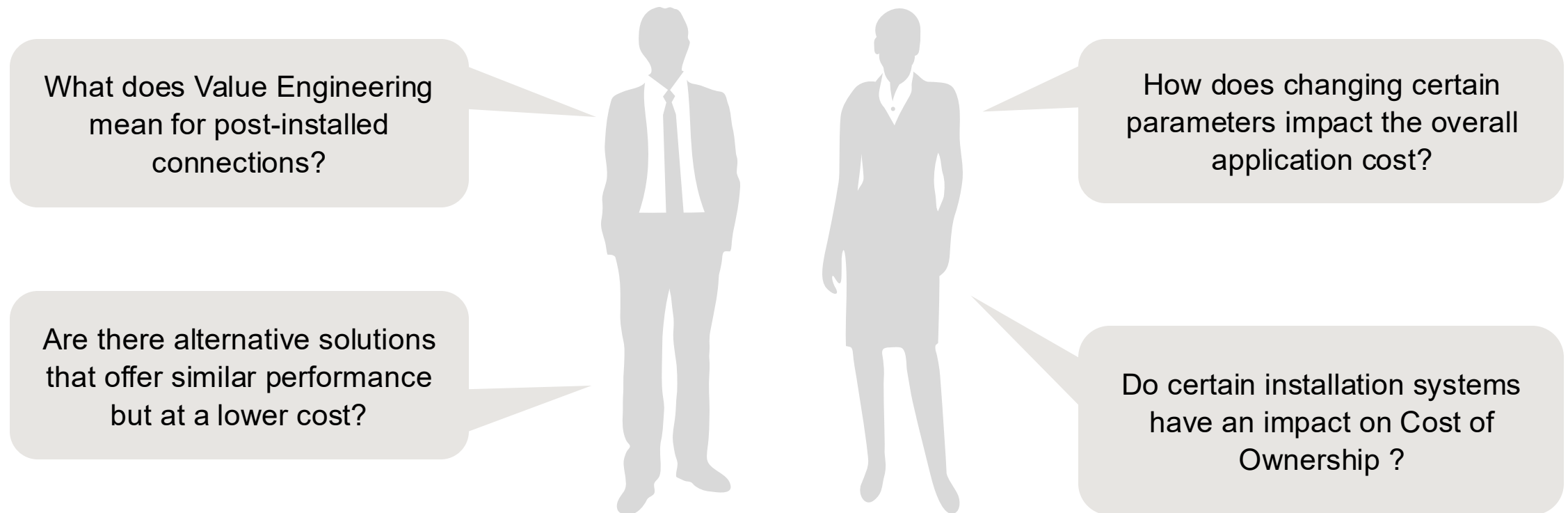


<https://www.youtube.com/watch?v=PtDGm4jZI4w>

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HOW CAN I MAKE MY SPECS VALUE ENGINEERED?



AT HILTI, WE KNOW THAT VALUE ENGINEERING IS IMPORTANT FOR DESIGNERS, CONTRACTORS & OWNERS

Lower material cost



Lower workflow cost



Value for Money

Shorter anchors, smaller diameter anchors, smaller baseplates

Fewer steps (no cleaning), quicker installation (setting tools, AT torquing)

Improved cost to performance ratio, Lower Cost of Ownership

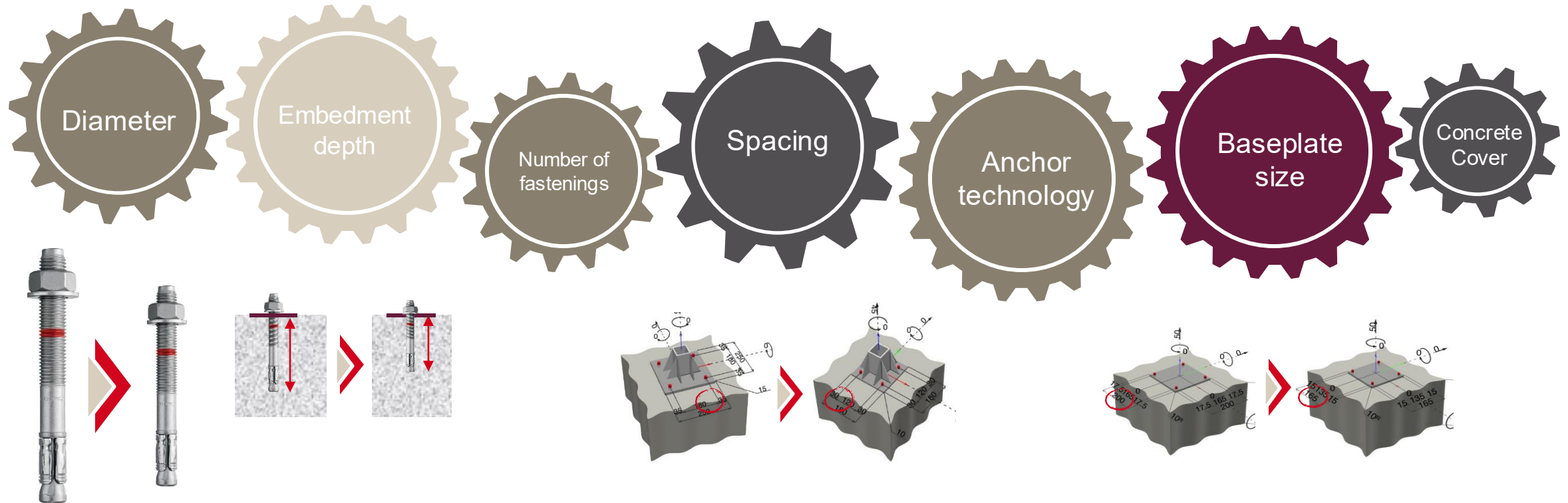


If Engineers solve this equation with Hilti, their design can be optimized and **Value Engineered**

Value Engineering your structural connections with Hilti enables you to **translate lower material and workflow costs into tangible savings on the jobsite, in the design office, and over the lifetime of the structure.**

WHAT ARE SOME PARAMETERS THAT I CAN CONSIDER TO OPTIMIZE MY DESIGN AND **LOWER MATERIAL COST**?

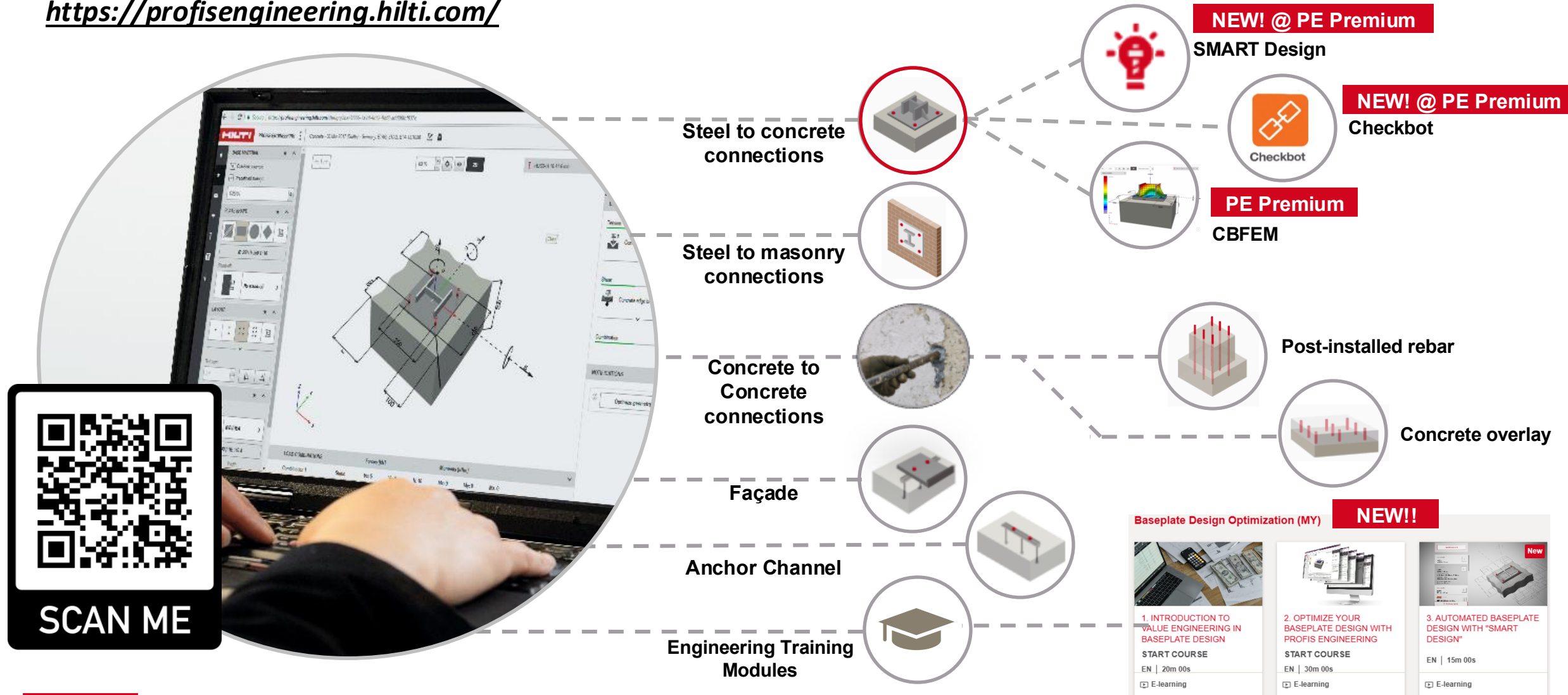
Levers to drive value



PROFIS ENGINEERING: ALL IN ONE CLOUD BASE SOLUTION

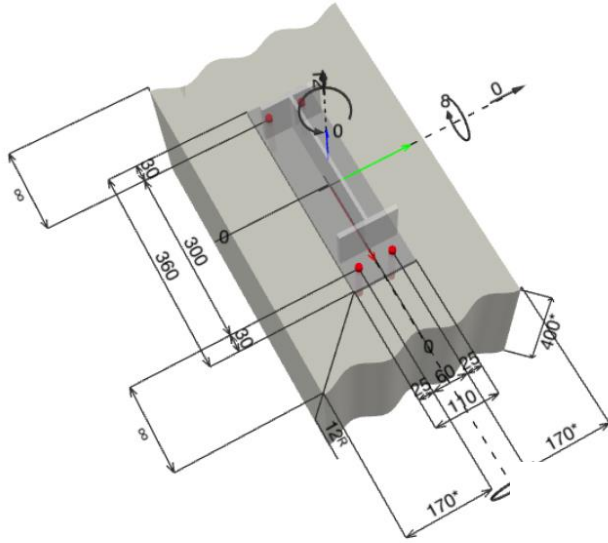
Design Your Post-Installed Connections and Generate Comprehensive Reports in a Single Click!

<https://profisengineering.hilti.com/>



PROFIS DEMO - EXAMPLES OF THE DAY

Anchoring to Concrete



I Beam Profile : UKB 254x102x25

Base Material : Cracked concrete

Concrete Grade : C30/37

RC Column Size : 400x400

Preferred solution : HILTI HST4 / HIT-RE 500 V4 + HAS 8.8

Reaction Loading Combination 1 : 40kN Shear + 8kNm Bending Moment

Reaction Loading Combination 2 : 30kN Shear + 12kNm Bending Moment

Reaction Loading Combination 3 : 20kN Shear + 20kNm Bending Moment



**PROFIS
ENGINEERING**



ANCHOR DESIGN	
Tension	
Steel	49%
Concrete breakout	88%
Pullout	70%
Splitting	0%
Shear	
Steel	34%
Concrete edge breakout	30%
Pryout	21%
Combination	
Steel	35%
Concrete	97%

HILTI

Hilti PROFIS Engineering 3.1.14

REPORT

www.hilti.com/content/hilti/CP/XX/en/non-transaction/light-pages/malaysia.html

Company:

Address:

Phone / Fax:

Design:

Fastening point:

Concrete - Apr 28, 2025 (5)

Page:

Specifier:

E-Mail:

Date:

28/04/2025

Specifier's comments:

1 Input data

Anchor type and diameter:

HST4 M12

Return period (service life in years):

50

Item number:

2320066 HST4 M12x135 5-79

Specification text:

Hilti HST4 stud anchor with 95 mm embedment, M12, Steel galvanized, installation per ETA-21/0878.

Effective embedment depth:

$h_{e, req} = 95.0 \text{ mm}$ ($h_{e, req} = -$ mm), $h_{e, max} = 104.0 \text{ mm}$

Material:

Carbon Steel

Evaluation Service Report:

ETA-21/0878

Issued / Valid:

31/10/2024 / -

Proof:

Design Method MS EN 1992-4, Mechanical

Stand-off installation:

$s_{cr} = 0.0 \text{ mm}$ (no stand-off); $t = 12.0 \text{ mm}$

Anchor plate^{*)}:

$l_a \times l_t \times t = 360.0 \text{ mm} \times 110.0 \text{ mm} \times 12.0 \text{ mm}$; (Recommended plate thickness: not calculated)

Profile:

Advance UKB, 254 x 102 x 25; (L x W x T x FT) = 257.2 mm x 101.9 mm x 6.0 mm x 8.4 mm

Base material:

cracked concrete, C30/37, $f_{ct, 90^\circ} = 30.00 \text{ N/mm}^2$; $h = 400.0 \text{ mm}$, partial material safety factor $\gamma_c = 1.500$

Installation:

Hammer drilled hole, installation condition: Dry

Reinforcement:

no reinforcement or reinforcement spacing $\geq 150 \text{ mm}$ (any ϕ) or $\geq 100 \text{ mm}$ ($\phi \leq 10 \text{ mm}$)

no longitudinal edge reinforcement

*) - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [mm] & Loading [kN, kNm]

Input data and results must be checked for conformity with the existing conditions and for plausibility!

PROFIS Engineering (c) 2003-2025 Hilti AG, FL-9404 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

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SPECIFICATION TEXT

Hilti HST4 stud anchor with 95 mm embedment, M12, Steel galvanized, installation per ETA-21/0878,

Close

Copy to clipboard

AGENDA

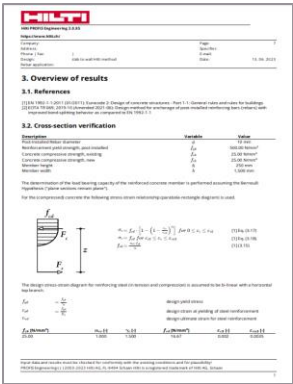
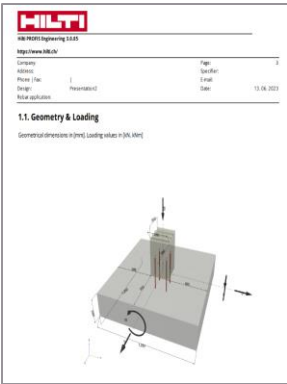
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 - *Mechanical Anchors*
- **Value Engineered Solution : Enabling VE with PROFIS Engineering**
- **Hilti Engineering Solution and Services – Translating Specs to the Jobsite**

HOW DOES HILTI HELP TRANSLATE A SPEC FROM PROFIS ENGINEERING TO THE JOBSITE?



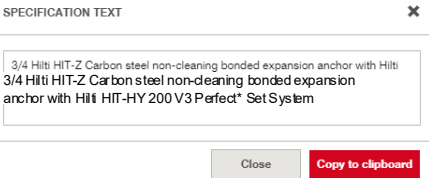
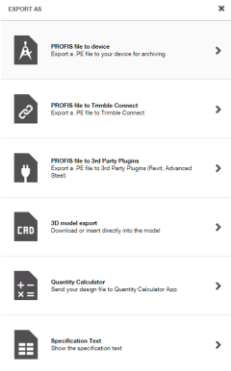
Fast and compliant designs with easy-to-use PROFIS Engineering

- Optimize your design in a few clicks
- Report provides a clear representation of the application
- Full Transparency on Design Method



Designs easily transferred to specs and drawings

- Recommended and customizable specification text
- Detail export in BIM/CAD
- Quantity Calculator to create Bill of Materials (BOM)



Onsite support, product submittals, and simplified installation

- Field team members provide onsite training and support
- Installation systems that are faster, simpler, and safer



HILTI ENGINEERING SOLUTION AND SERVICES

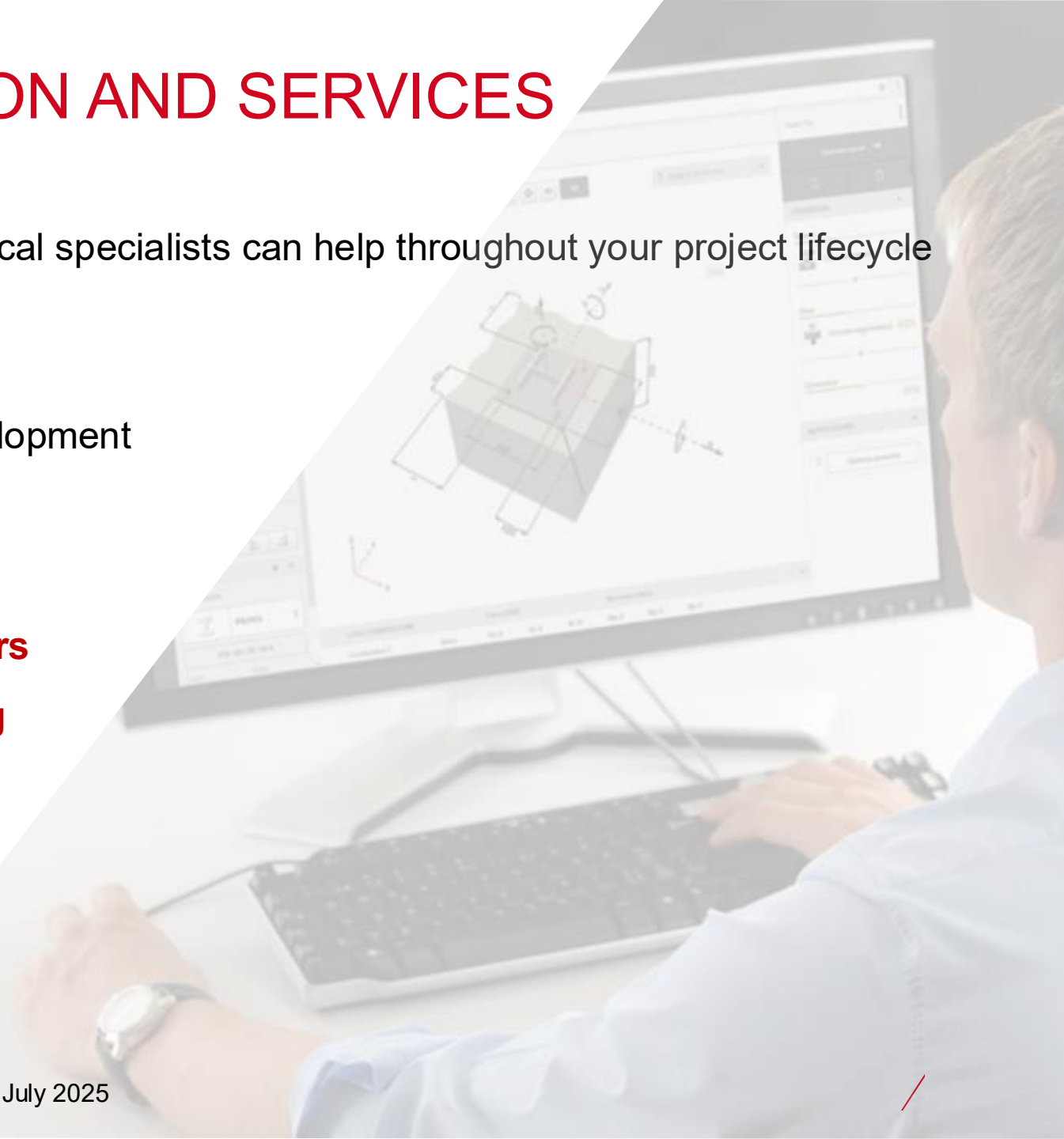
Our experienced certified Hilti engineers and technical specialists can help throughout your project lifecycle from design to installation to building management.

SPEC

SITE

- HILTI solutions **consultation services**
- **Specification text & General Notes** development
- **Bill of Quantity (BoQ) preparation**
- **Consumption calculations & estimation**
- **Technical supports & Technical Seminars**
- **Jobsite support and installation training**
- **On-site testing**

SPEC**2**»SITE



GENERAL NOTES & MASTER SPECIFICATION LIBRARY

Access to General Notes & Master Spec Library: [Specifications, General Notes and CAD Details - Hilti Malaysia](#)

Anchoring to Concrete

General notes for Post-Installed Anchors (Anchoring to Concrete)

- POST-INSTALLED ANCHOR CONNECTIONS TO CONCRETE SHALL BE DESIGNED AS PER EC2-4 FOR STATIC/QUASI STATIC LOADS/ SEISMIC LOADS USING PRODUCTS WITH EUROPEAN TECHNICAL ASSESSMENT REPORT (ETA) WITH ASSUMED WORKING LIFE OF THE ANCHOR OF MINIMUM 50 YEARS. THE EXPANSION ANCHORS SHALL TESTED UNDER;
 - EUROPEAN TECHNICAL APPROVAL (ETA-11/0374) FOR HSA FOR DESIGN OF UNCRACKED CONCRETE CONDITION AND STATIC LOADS
 - EUROPEAN TECHNICAL APPROVAL (ETA-21/0878) FOR HST4 FOR DESIGN OF CRACKED CONCRETE CONDITION OR/AND SEISMIC LOADS
 - EUROPEAN TECHNICAL APPROVAL (ETA-19/0601) FOR HY200-R V3 WITH HAS ROD FOR DESIGN OF CRACKED CONCRETE CONDITION OR/AND SEISMIC LOADS
 - EUROPEAN TECHNICAL APPROVAL (ETA-23/0277) FOR HY200-R V3 OR RE500 V4 WITH HAS-U A4 FOR DESIGN UNDER FATIGUE CYCLIC LOADING
 - EUROPEAN TECHNICAL APPROVAL (ETA-20/0867) FOR HUS4 DESIGN OF CRACKED CONCRETE CONDITION OR IN STEEL FIBRE REINFORCED CONCRETE (SFRC)
 - EUROPEAN TECHNICAL APPROVAL (ETA-19/0556) FOR HSL4 FOR DESIGN OF CRACKED CONCRETE CONDITION WITH FIRE CONSIDERATIONS OR/AND SEISMIC LOAD OR/AND FATIGUE (ETA-19/0858)
 - CHARACTERISTIC RESISTANCE FOR CRACK AND/OR UNCRACK CONCRETE AND DISPLACEMENT
- THE CONDITION OF CONCRETE FOR ITS SERVICE LIFE IS ASSUMED TO BE CRACKED AS PER EC2-4, UNLESS DETERMINED AND PROVEN OTHERWISE. ANCHORS SUITABLE FOR CRACKED CONCRETE CONDITION, I.E. HST4, HST2V3, HUS4, HSL4 OR HY200V3 WITH HAS ROD SHALL BE USED UNLESS PROVEN CONCRETE IS UNCRACKED.
- ANCHOR CAPACITY USED IN DESIGN SHALL BE BASED ON THE EUROPEAN TECHNICAL ASSESSMENT (ETA) AND DETAILED CALCULATIONS AS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD. SUBSTITUTION REQUESTS FOR ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO USE. CONTRACTOR SHALL PROVIDE CALCULATIONS DEMONSTRATING THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE PERFORMANCE VALUES OF THE SPECIFIED PRODUCT. SUBSTITUTIONS WILL BE EVALUATED BY THEIR HAVING AN ETA SHOWING COMPLIANCE WITH THE RELEVANT REQUIREMENTS.
- FOR CONDITION WHERE ANCHORS ARE ENCLOSED OR POSSIBLE TO EXPOSE TO WEATHER, HOT-DIP GALVANIZED OR 304 STAINLESS STEEL ANCHORS SHALL BE ADOPTED WITH APPROVAL FROM THE CONSULTANT.
- FOR CONDITION WHERE ANCHORS ARE EXPOSED DIRECTLY TO WEATHER, 316 STAINLESS STEEL OR EQUIVALENT GRADE SHALL BE ADOPTED WITH APPROVAL FROM THE CONSULTANT.
- CONTRACTOR MUST FOLLOW APPROVED METHOD FOR THE INSTALLATION. METHOD STATEMENT MUST SUBMIT FOR APPROVAL BEFORE COMMENCEMENT OF WORK. ANCHOR MUST BE SET USING A CALIBRATED TORQUE WRENCH ACCORDING TO THE INSTALLATION TORQUE MOMENT OUTLINED IN THE ETA, OR ALTERNATIVELY, USING MACHINE TORQUEING, "AT MODULE"
- TO ENSURE FAST AND RELIABLE INSTALLATION WITH AUTOMATIC HOLES CLEANING, SAFESIT SYSTEM IS TO BE USED.
- ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWING OR/AND AS PER REQUIREMENT STATED IN ETA.
- POST-INSTALLED ANCHOR INSTALLATION SHALL BE PERFORMED BY PERSONNEL TRAINED TO INSTALL THE SYSTEM PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII), AS INCLUDED IN THE MATERIAL PACKAGING. THE CONTRACTOR SHALL ARRANGE FOR

Anchoring to Masonry

General notes for Post-Installed Anchors (Anchoring to Masonry)

- POST-INSTALLED ANCHOR CONNECTIONS TO MASONRY SHALL BE DESIGNED AS PER ETAG NO. 020 AND TR054 BY ADOPTION OF ANCHOR PRODUCTS WITH EUROPEAN TECHNICAL ASSESSMENT REPORT (ETA) WITH ASSUMED WORKING LIFE OF THE ANCHOR OF MINIMUM 50 YEARS. THE ANCHORS SHALL BE TESTED UNDER;
 - EUROPEAN TECHNICAL APPROVAL (ETA-19/0160) FOR HIT-HY270 WITH HAS-U
 - EUROPEAN TECHNICAL APPROVAL (ETA-07/0219) FOR FRAME ANCHOR HRD
- ANCHOR CAPACITY USED IN DESIGN SHALL BE BASED ON THE EUROPEAN TECHNICAL ASSESSMENT (ETA) AND DETAILED CALCULATIONS AS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD. SUBSTITUTION REQUESTS FOR ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO USE. CONTRACTOR SHALL PROVIDE CALCULATIONS DEMONSTRATING THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE PERFORMANCE VALUES OF THE SPECIFIED PRODUCT. SUBSTITUTIONS WILL BE EVALUATED BY THEIR HAVING AN ETA SHOWING COMPLIANCE WITH THE RELEVANT REQUIREMENTS.
- FOR CONDITION WHERE ANCHORS ARE ENCLOSED OR POSSIBLE TO EXPOSE TO WEATHER, HOT-DIP GALVANIZED OR 304 STAINLESS STEEL ANCHORS SHALL BE ADOPTED WITH APPROVAL FROM THE CONSULTANT.
- FOR CONDITION WHERE ANCHORS ARE EXPOSED TO WEATHER, 316 STAINLESS STEEL OR EQUIVALENT GRADE SHALL BE ADOPTED WITH APPROVAL FROM THE CONSULTANT.
- CONTRACTOR MUST FOLLOW APPROVED METHOD FOR THE INSTALLATION. METHOD STATEMENT MUST SUBMIT FOR APPROVAL BEFORE COMMENCEMENT OF WORK.
- ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF MASONRY. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS OR/AND AS PER REQUIREMENT STATED IN ETA.
- POST-INSTALLED ANCHOR INSTALLATION SHALL BE PERFORMED BY PERSONNEL TRAINED TO INSTALL THE SYSTEM PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII), AS INCLUDED IN THE MATERIAL PACKAGING. THE CONTRACTOR SHALL ARRANGE FOR A MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR POST-INSTALLED ANCHOR AND THE TRAINING RECORD MUST SUBMIT FOR APPROVAL.
- ON-SITE PULL OUT TESTING SHALL BE CARRY OUT IN ACCORDANCE TO BRITISH STANDARD BS59 9.3 AND ANNEX B . ON-SITE PULL OUT TEST LOAD SHOULD FOLLOW DESIGN LOAD UNLESS OTHERWISE SPECIFIED.

B.2.1 (ON-SITE TESTS TO DETERMINE ALLOWABLE RESISTANCE) → THESE TESTS ARE NOT REQUIRED FOR ANCHORS CONFORMING TO ETAGS FOR USE IN CONCRETE, AS THE DESIGN RESISTANCE IS READILY DETERMINED FROM THE APPROVAL DOCUMENT; HOWEVER, THEY MIGHT BE NEEDED FOR ANCHORS TO BE USED IN MASONRY IN CONDITIONS OUTLINED IN B.2.2 AND B.2.3. IN THE PROCEDURES OUTLINED IN B.2.2, THE METHOD USED FOR ANCHORS CONFORMING TO ETAGS WILL INITIALLY DETERMINE THE CHARACTERISTIC RESISTANCE FROM WHICH THE DESIGN RESISTANCE AND ALLOWABLE RESISTANCE CAN BE DERIVED, WHILE THE METHOD FOR ANCHORS NOT CONFORMING TO ETAGS (SEE B.2.3) WILL DETERMINE THE ALLOWABLE RESISTANCE DIRECTLY.

Anchoring to Hollow Core Slab

GENERAL NOTES FOR POST-INSTALLED ANCHORING TO HOLLOW CORE SLAB

- POST-INSTALLED ANCHORING TO HOLLOW CORE SLAB SHALL BE DESIGNED AS PER MS EN 1992-4 FOR STATIC/QUASI STATIC LOADS. ALL PRODUCTS USED SHALL HAVE EUROPEAN TECHNICAL ASSESSMENT (ETA) IN ACCORDANCE WITH THE RELEVANT VERIFICATION AND ASSESSMENT DOCUMENTS INCLUDING AN ASSUMED MINIMUM 50-YEAR WORKING LIFE OF THE ANCHOR AS DETAILED BELOW:

TYPE OF FASTENING	TYPE OF ANCHOR	ETA APPROVAL	ASSESSMENT DOCUMENT(S)
LIGHT DUTY	HILTI HRD	ETA 07/0219	EUROPEAN TECHNICAL APPROVAL GUIDELINE (ETAG) 020
MEDIUM DUTY	HILTI HKD	ETA 06/0047	- EUROPEAN ASSESSMENT DOCUMENT (EAD) 330747
	HILTI HUS3-H/II/A/P/C	ETA 10/0005	- TECHNICAL REPORT (CEN/TR) 17079
	HILTI HUS4-HR/CR		

- THE STRUCTURAL SYSTEM MUST HAVE SUFFICIENT RESISTANCE TO TRANSFER THE LOAD FROM ONE FASTENER TO NEIGHBOURING FASTENERS SHOULD EXCESSIVE SLIPPAGE OR FAILURE OF ANY ONE ANCHOR OCCURS. SERVICEABILITY AND ULTIMATE LIMIT STATE OF THE SYSTEM SHOULD NOT BE EXCEEDED SIGNIFICANTLY DUE TO THE LOAD TRANSFER.

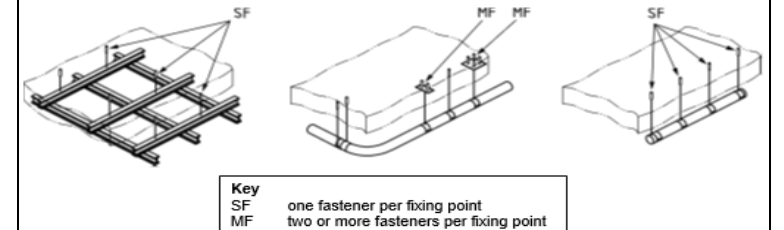


FIGURE 1 – STATICALLY INDETERMINATE NON-STRUCTURAL SYSTEMS WITH ONE OR MORE FASTENERS PER FIXING POINT - EXAMPLES

- RECOMMENDED VALUES FOR REDUNDANT FASTENING DESIGN (LIMITING DESIGN ACTION, $F_{t,Rd}$, NUMBER OF FIXING POINTS, n_f , AND NUMBER OF FASTENERS PER FIXING POINT n_p) ARE TO BE REFERRED TO THE TABLES 1, 2 AND 3 PROVIDED IN THE FOLLOWING PAGES.
- RECOMMENDED LOADS USED IN DESIGN SHALL BE BASED ON THE TECHNICAL DATA PUBLISHED BY HILTI OR SUCH OTHER METHOD AS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD. SUBSTITUTION REQUESTS FOR ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO USE. CONTRACTOR SHALL PROVIDE ALL RELEVANT RECORDS THAT HAVE BEEN SEALED BY ANOTHER LICENSED ENGINEER DEMONSTRATING THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF MEETING THE PERFORMANCE OF THE SPECIFIED PRODUCT. SUBSTITUTIONS WILL BE EVALUATED BY THEIR HAVING AN ETA SHOWING COMPLIANCE WITH THE RELEVANT BUILDING CODE, LOAD RESISTANCE, INSTALLATION CATEGORY, AND AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS.
- INSTALL POST-INSTALLED ANCHOR PER THE MANUFACTURER PRINTED INSTALLATION INSTRUCTIONS (MPII), AS INCLUDED IN THE ANCHOR PACKAGING OR TECHNICAL DATA SHEET.

THANK YOU!