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

1. **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;
2. EUROPEAN TECHNICAL APPROVAL **(ETA-11/0374) FOR HSA** FOR DESIGN OF **UNCRACKED** **CONCRETE** CONDITION AND STATIC LOADS
3. EUROPEAN TECHNICAL APPROVAL **(ETA-21/0878) FOR HST4** FOR DESIGN OF **CRACKED** **CONCRETE** CONDITION **OR/AND SEISMIC LOADS**
4. EUROPEAN TECHNICAL APPROVAL **(ETA-19/0601) FOR HY200-R V3 WITH HAS ROD** FOR DESIGN OF **CRACKED** **CONCRETE** CONDITION **OR/AND SEISMIC LOADS**
5. EUROPEAN TECHNICAL APPROVAL **(ETA-23/0277) FOR HY200-R V3 OR RE500 V4 WITH HAS-U A4** FOR DESIGN UNDER **FATIGUE CYCLIC LOADING**
6. EUROPEAN TECHNICAL APPROVAL **(ETA-20/0867) FOR HUS4** DESIGN OF **CRACKED CONCRETE** CONDITION **OR IN STEEL FIBRE REINFORCED CONCRETE (SFRC)**
7. 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)**
8. CHARACTERISTIC RESISTANCE FOR CRACK AND/OR UNCRACK CONCRETE AND DISPLACEMENT
9. **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.
10. 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.
11. 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.
12. FOR CONDITION WHERE ANCHORS ARE EXPOSED DIRECTLY TO WEATHER, **316 STAINLESS STEEL OR EQUIVALENT** GRADE SHALL BE ADOPTED WITH APPROVAL FROM THE CONSULTANT.
13. 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”**
14. TO ENSURE FAST AND RELIABLE INSTALLATION WITH AUTOMATIC HOLES CLEANING, **SAFESET** SYSTEM IS TO BE USED.
15. 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.
16. 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 CONCTRACTOR SHALL ARRANGE FOR A MANUFACTURER’S REPRESENTATIVE TO PROVIDE **ONSITE INSTALLATION TRAINING** FOR POST-INSTALLED ANCHOR AND THE **TRAINING RECORD** MUST SUBMIT FOR APPROVAL.
17. CONTRACTOR IS ADVISED TO IDENTIFY OR TO LOCATE THE POSITION OF EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURE PRIOR TO POST-INSTALLING ANCHORS. EXISTING BARS SHALL BE LOCATED USING **HILTI FERROSCAN PS300** OR X-RAY OR CHIPPING OR OTHER MEANS.
18. **ON-SITE PULL OUT TESTING** SHALL BE CARRY OUT IN ACCORDANCE TO **BRITISH STANDARD 8539 Clause 9 AND ANNEX B.3 OR OTHER CLAUSES** ACCORDINGLY. ON-SITE PULL OUT TEST LOAD SHOULD FOLLOW **DESIGN LOAD** UNLESS OTHERWISE SPECIFIED.

**Annex B.3.** 🡪 PROOF TEST LOAD FACTOR = 1.5, ≥ 2.5% OF ALL ANCHORS OF THE TOTAL NUMBER OF ANCHORS INSTALLED ON A JOB; MINIMUM 3 ANCHORS OF THE SAME TYPE INSTALLED ON SAME BASE MATERIAL, ETC

**Clause 9** 🡪 PROOF TESTING, TO VALIDATE THE QUALITY OF INSTALLATION, MIGHT NOT BE NECESSARY IF APPROVED ANCHORS ARE INSTALLED BY TRAINED OPERATIVES WORKING UNDER SUPERVISION. IF THIS CONDITION IS NOT SATISFIED THEN PROOF TESTING MIGHT BE REQUIRED.

1. ANY ASSISTIVE TOOLS THAT CAN BE USED TO SUPPLEMENT/ SUPPORT BS8539 CLAUSE 9 (E.G. **HILTI ADAPTIVE TORQUE MODULE** AND **HILTI SAFESET SYSTEM**) CAN BE ADOPTED FOR CONSIDERATION OF MEETING BS8539 CLAUSE 9 EXEMPTION.
2. POST-INSTALLED ANCHOR APPLICATIONS SHALL INCLUDE BUT NOT LIMITED TO THE FOLLOWING EXAMPLES AS SHOWN IN THE DIAGRAMME:



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

1. **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;
2. EUROPEAN TECHNICAL APPROVAL **(ETA-19/0160) FOR HIT-HY270 WITH HAS-U**
3. EUROPEAN TECHNICAL APPROVAL **(ETA-07/0219) FOR FRAME ANCHOR HRD**
4. 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.
5. 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.
6. FOR CONDITION WHERE ANCHORS ARE EXPOSED TO WEATHER, **316 STAINLESS STEEL OR EQUIVALENT** GRADE SHALL BE ADOPTED WITH APPROVAL FROM THE CONSULTANT.
7. CONTRACTOR MUST FOLLOW APPROVED METHOD FOR THE INSTALATION. METHOD STATEMENT MUST SUBMIT FOR APPROVAL BEFORE COMMENCEMENT OF WORK.
8. 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.
9. 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 CONCTRACTOR SHALL ARRANGE FOR A MANUFACTURER’S REPRESENTATIVE TO PROVIDE **ONSITE INSTALLATION TRAINING** FOR POST-INSTALLED ANCHOR AND THE **TRAINING RECORD** MUST SUBMIT FOR APPROVAL.
10. **ON-SITE PULL OUT TESTING** SHALL BE CARRY OUT IN ACCORDANCE TO **BRITISH STANDARD 8539 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.