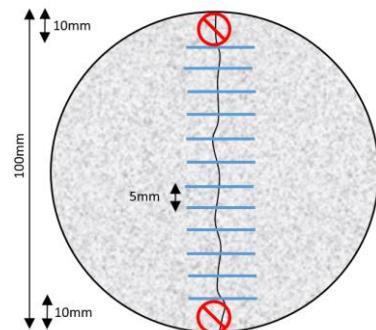


1 **SUPPLEMENTARY MATERIALS**

2 Bacteria-based self-healing concrete exposed to frost salt scaling

3 **Vanessa Giaretton Cappellessos, Tim Van Mullem, Elke Gruyaert, Kim Van Tittelboom, Nele De Belie**

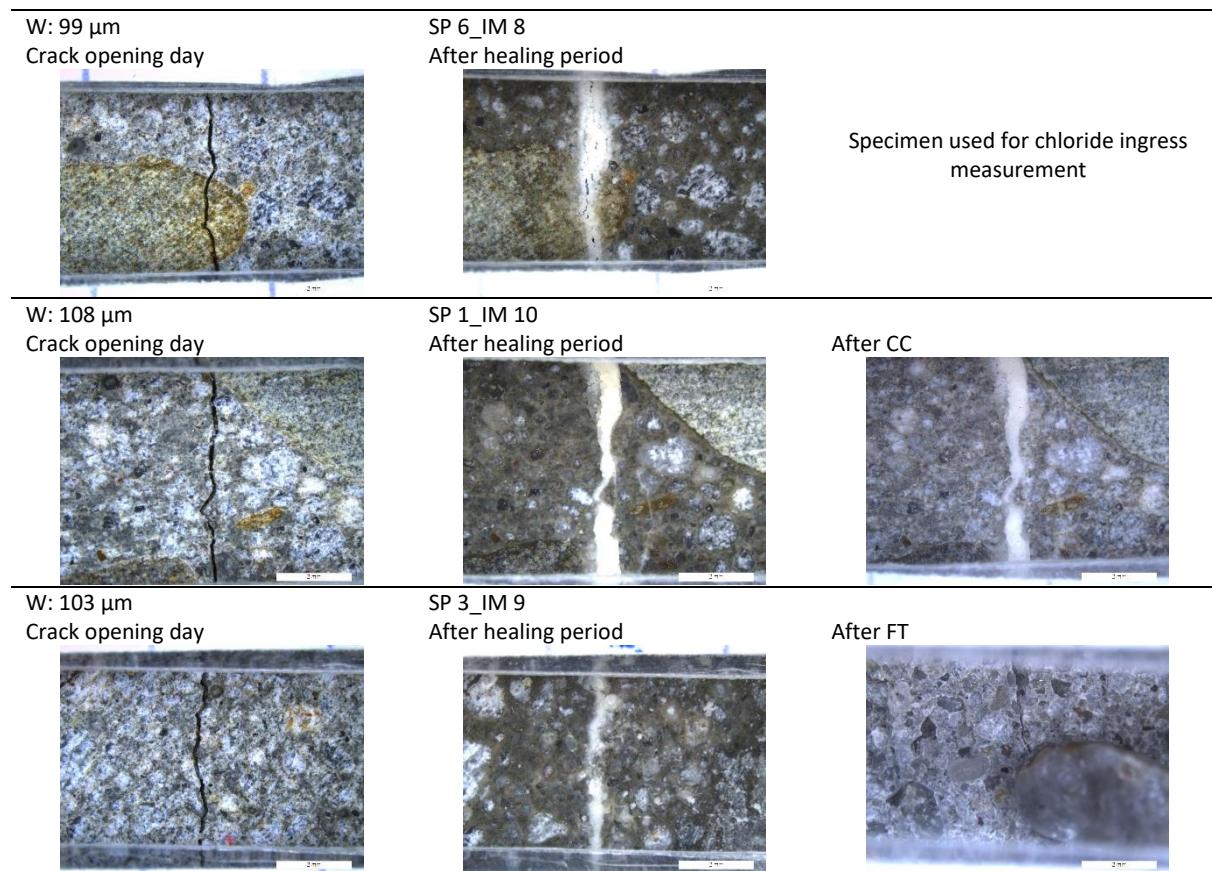
4 **1. Crack width measurement**



5

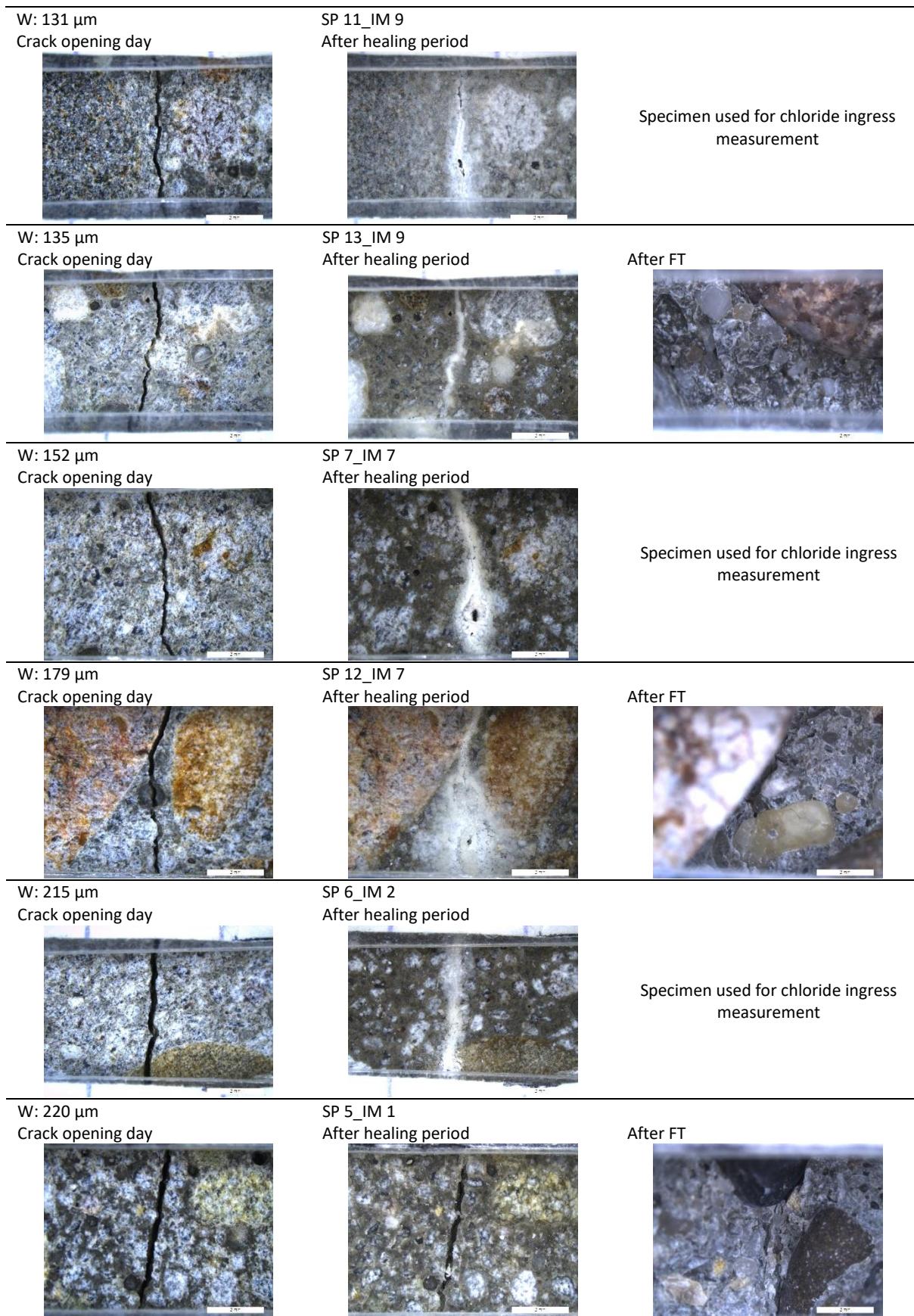
6 *Figure S1: Definition of areas measured on the crack in the surface in contact with de-icing salts to obtain the average crack*
7 *width*

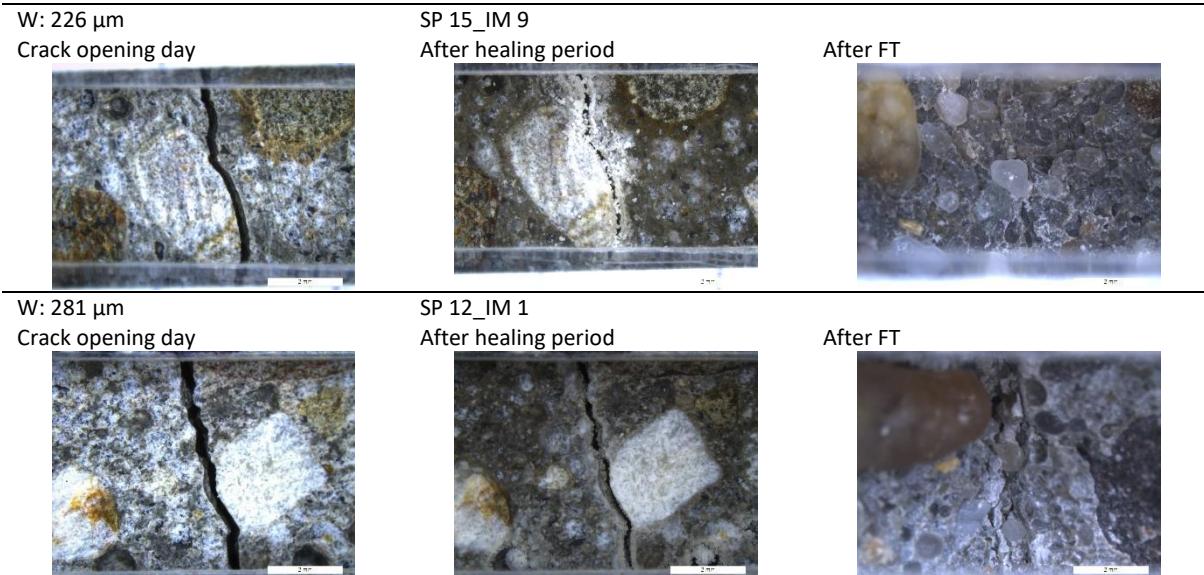
8 **2. Microscopic images**



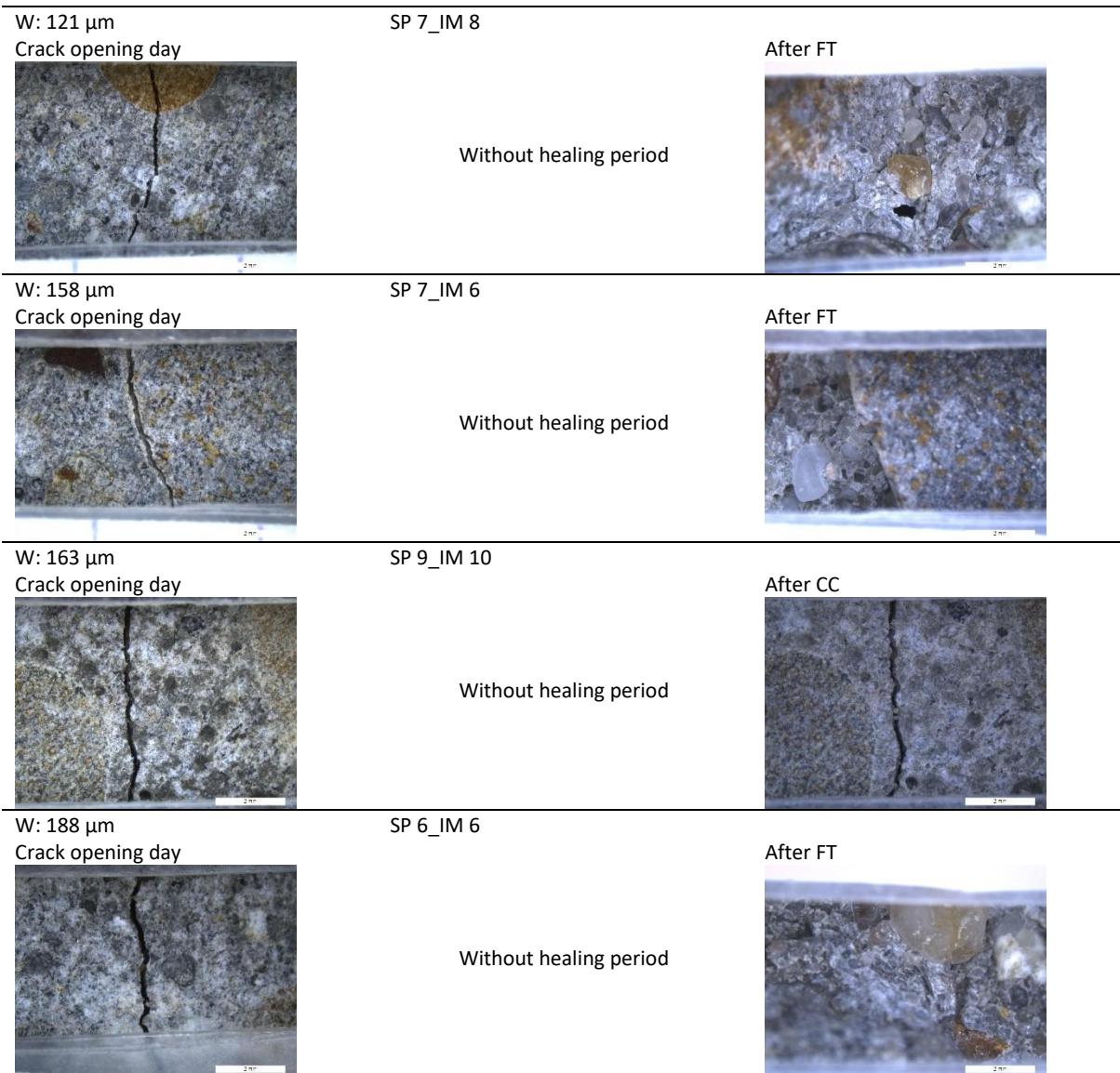
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13
14 *Figure S2. Microscopic images of reference samples subjected to healing cycles (REF H) and then either to freezing
and thawing (FT) or standard climate conditions (CC) (SP: specimen, IM: image, W: crack width in mm)*



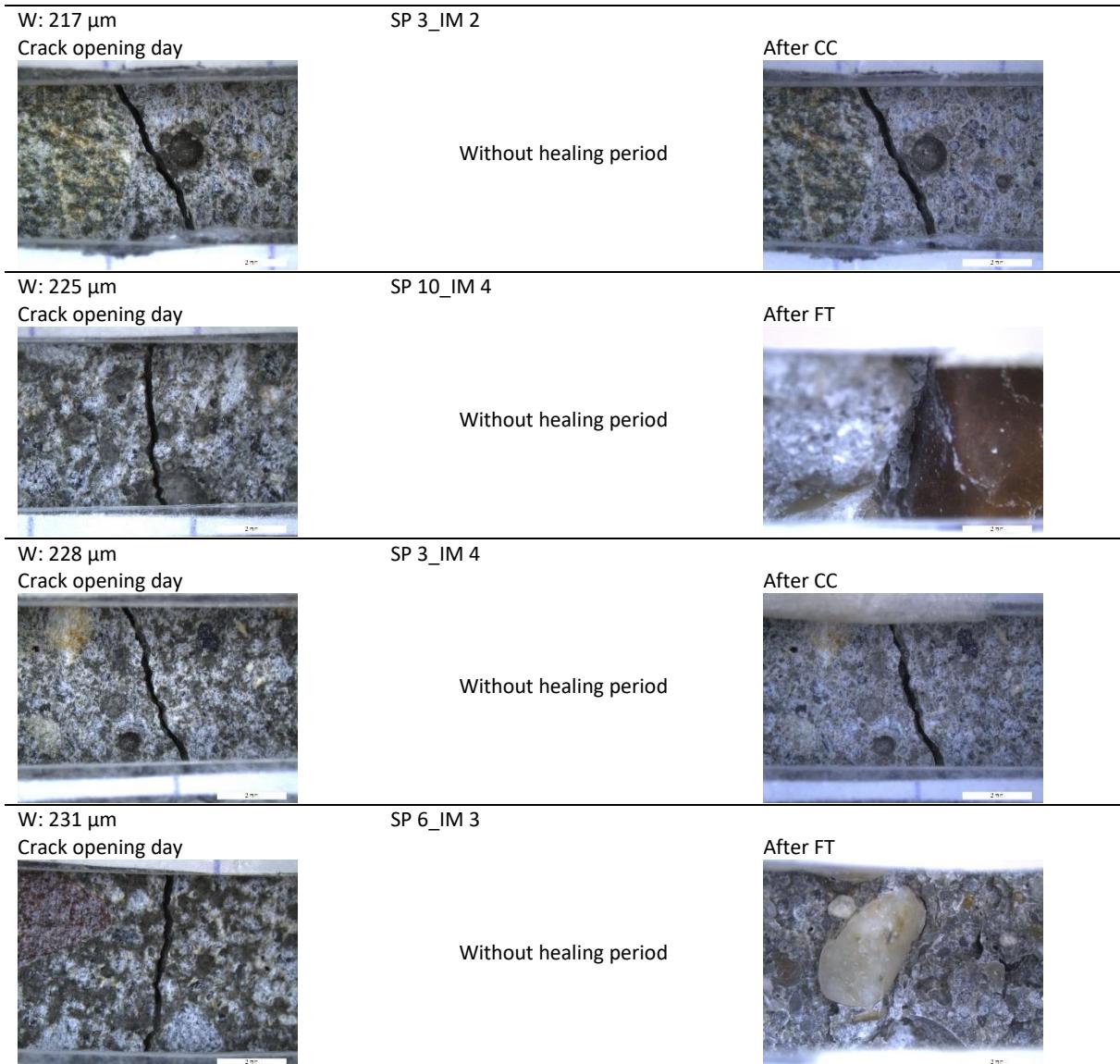
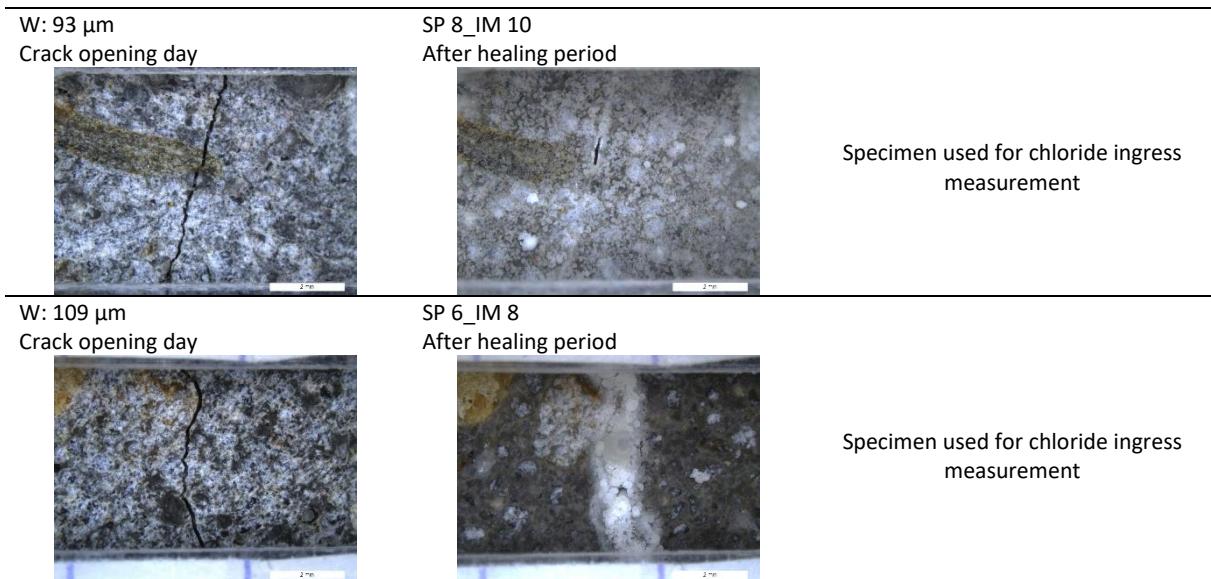
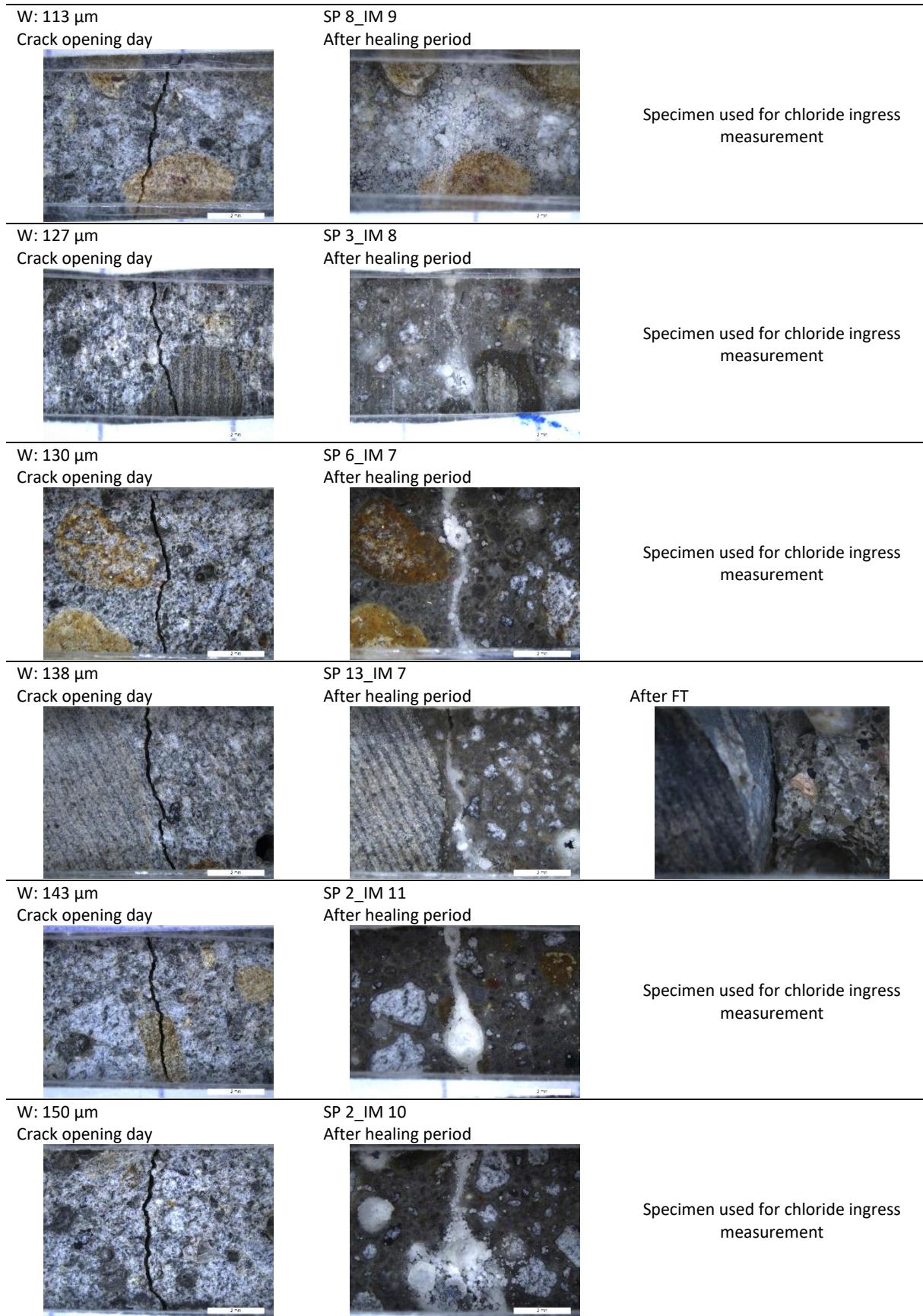
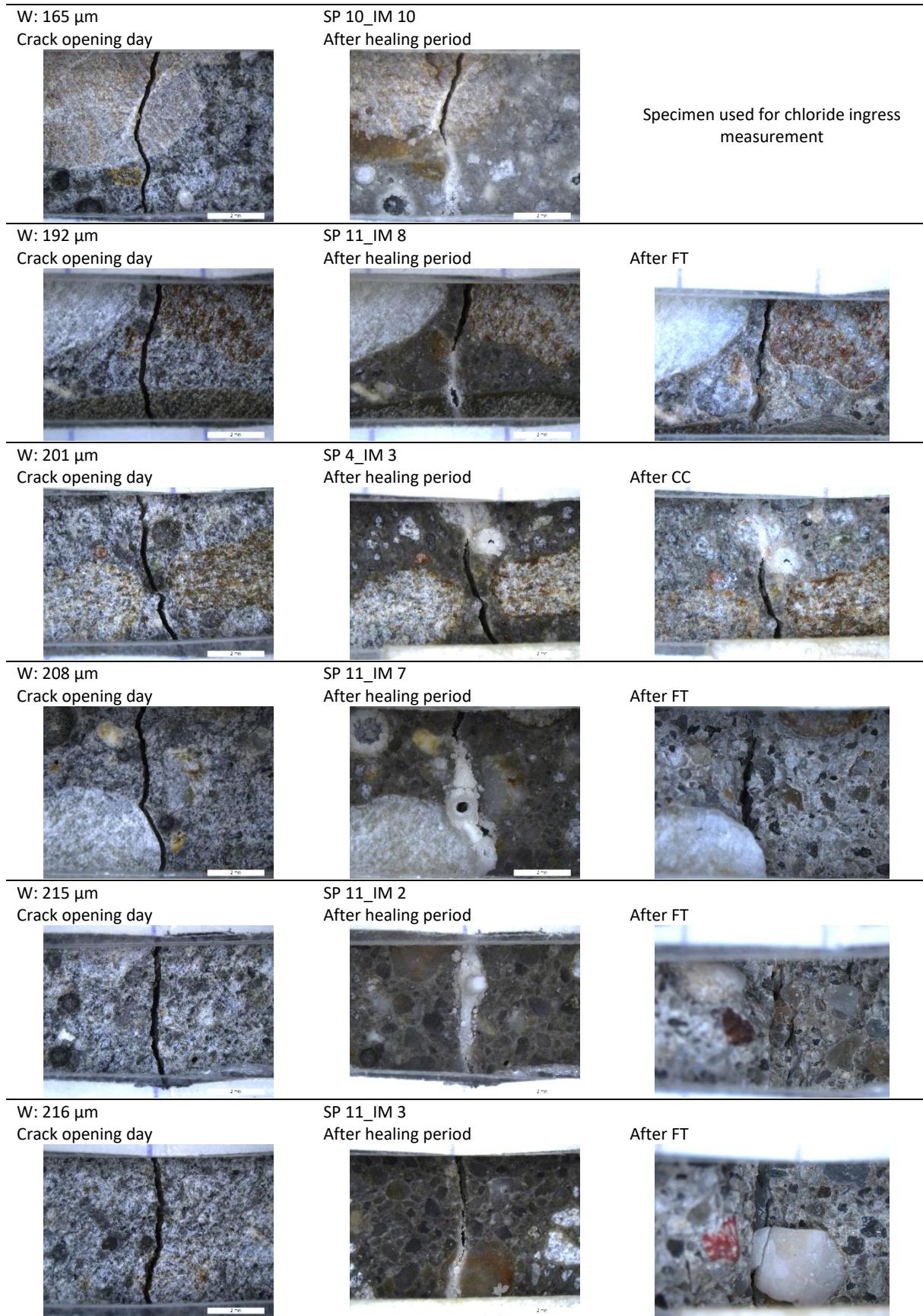
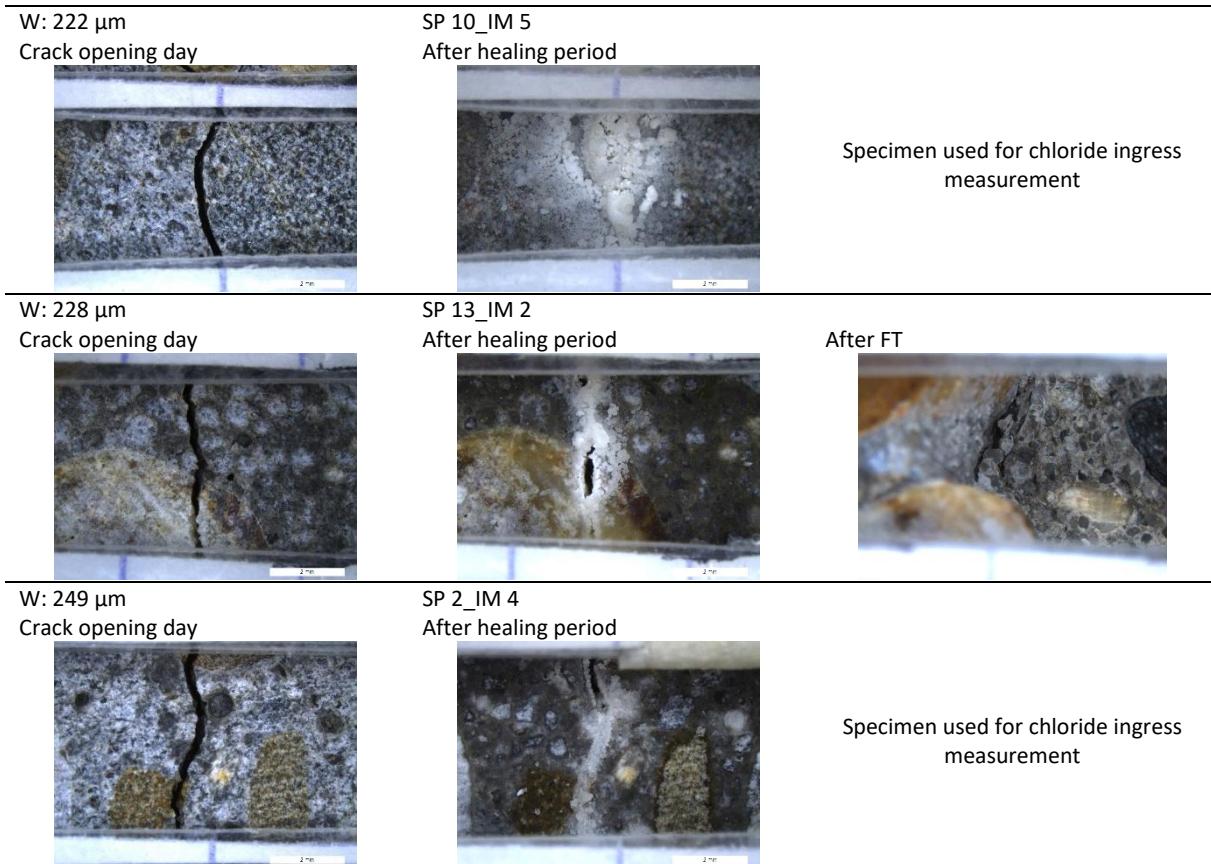


Figure S3. Microscopic images of reference samples subjected directly to freezing and thawing (FT) or standard climate conditions (CC) (REF U) (SP: specimen, IM: image, W: crack width in mm)



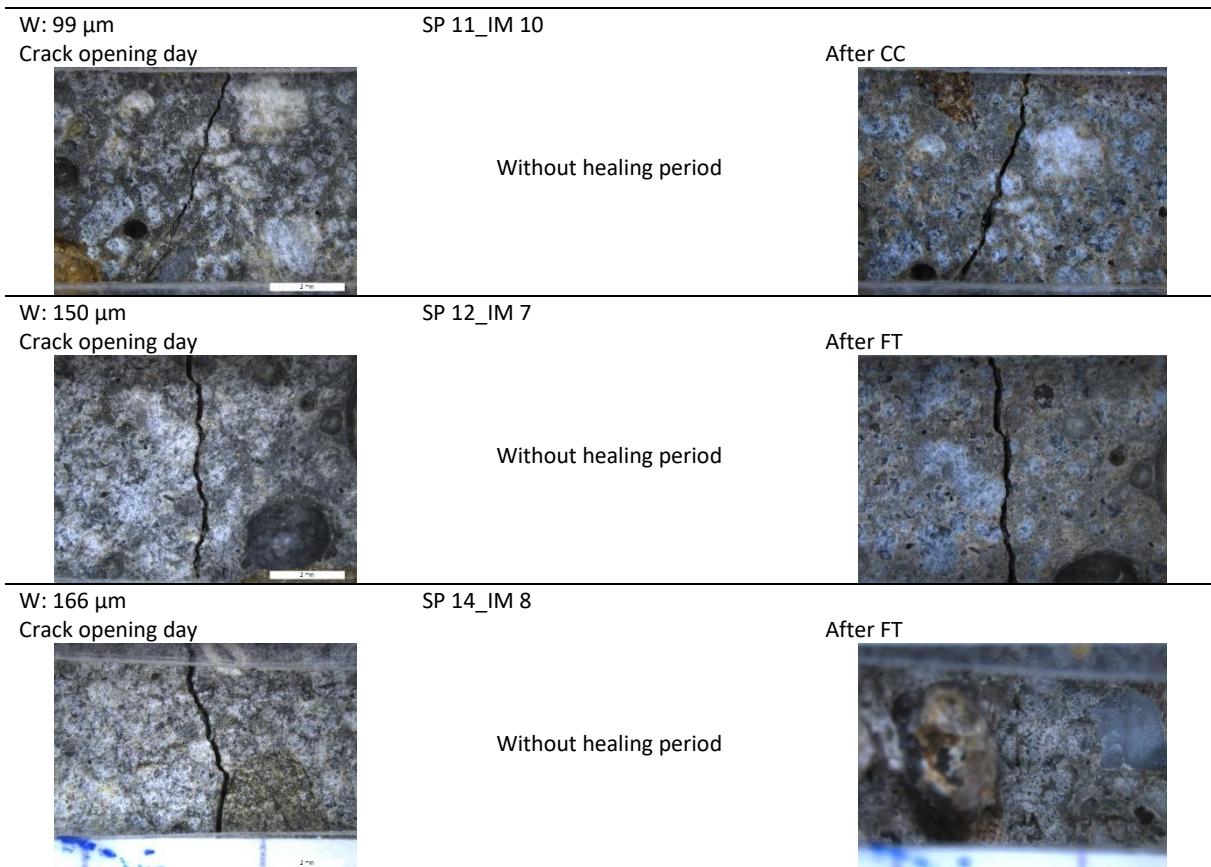




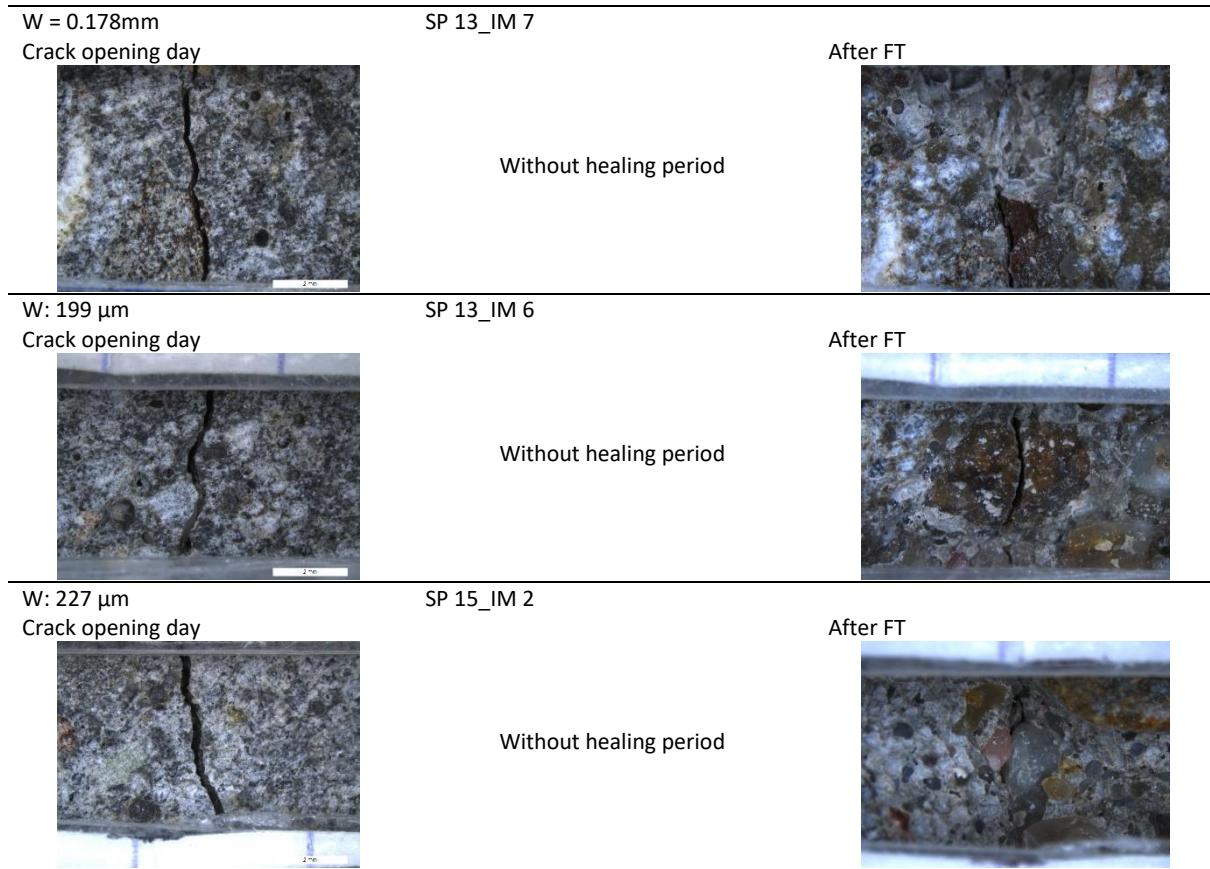


23
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Figure S4. Microscopic images of bacterial samples subjected to healing cycles (BAC H) and then either to freezing and thawing (FT) or standard climate conditions (CC) (SP: specimen, IM: image, W: crack width in mm)

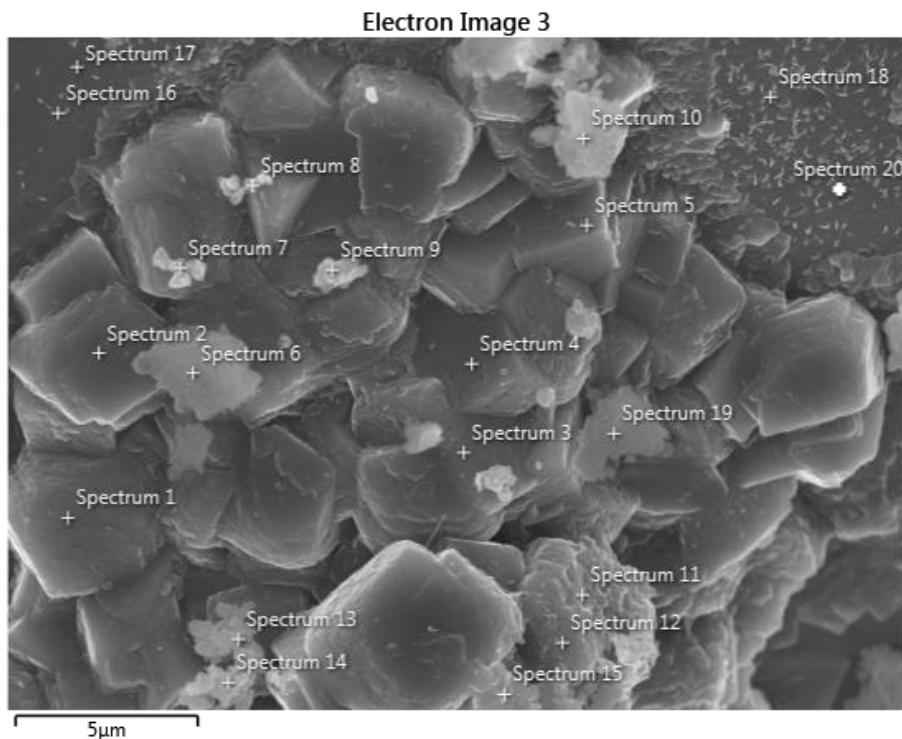


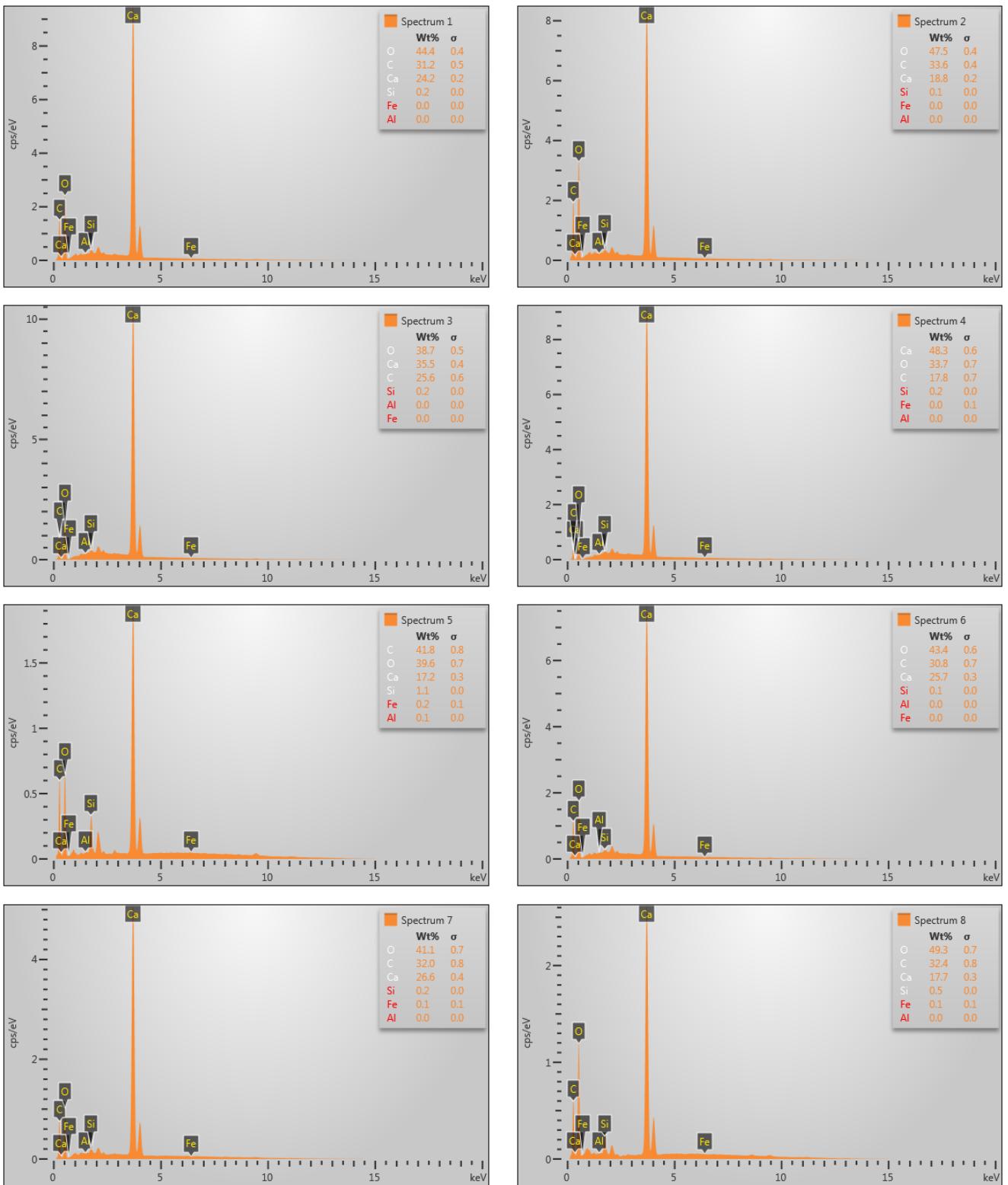
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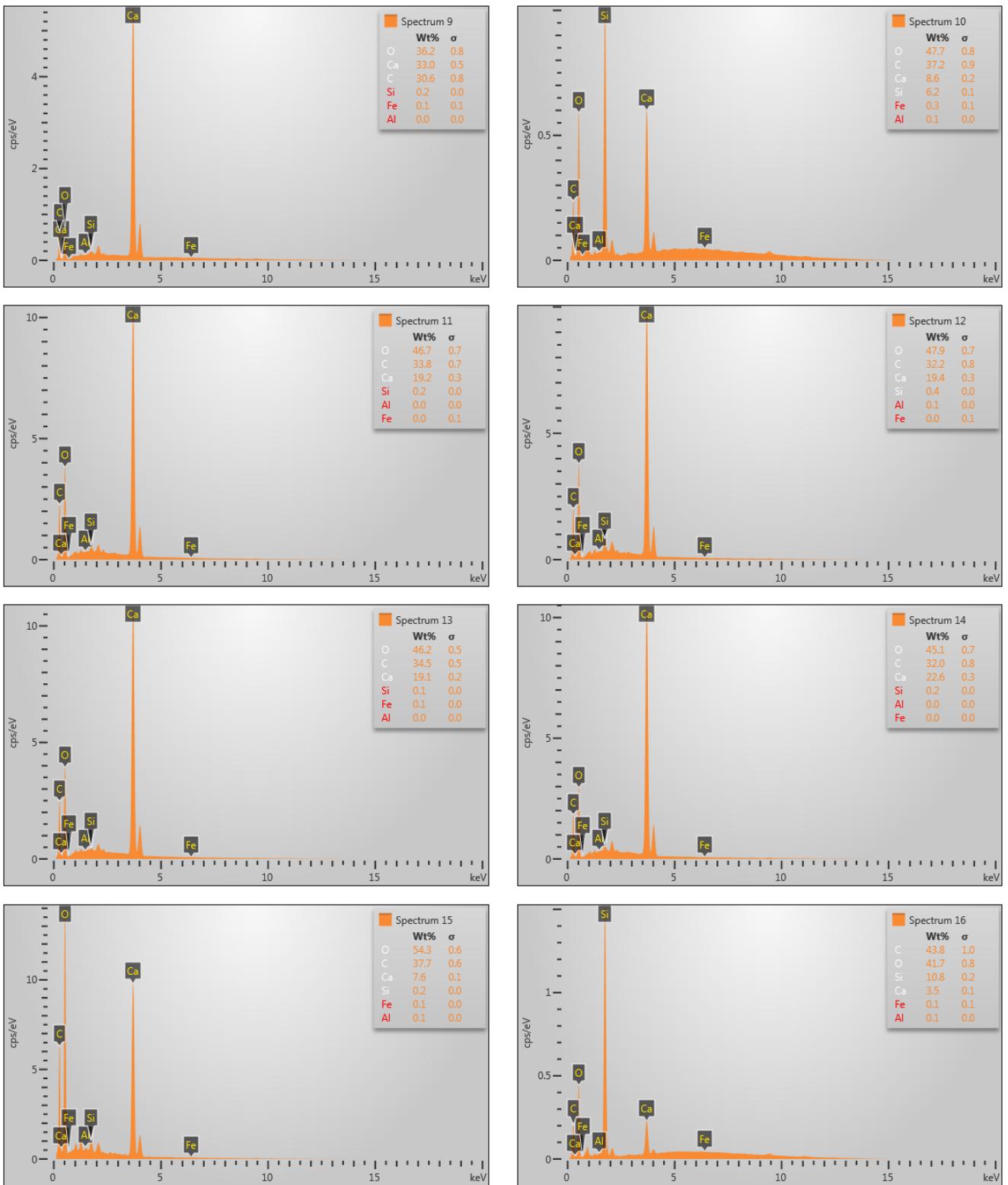


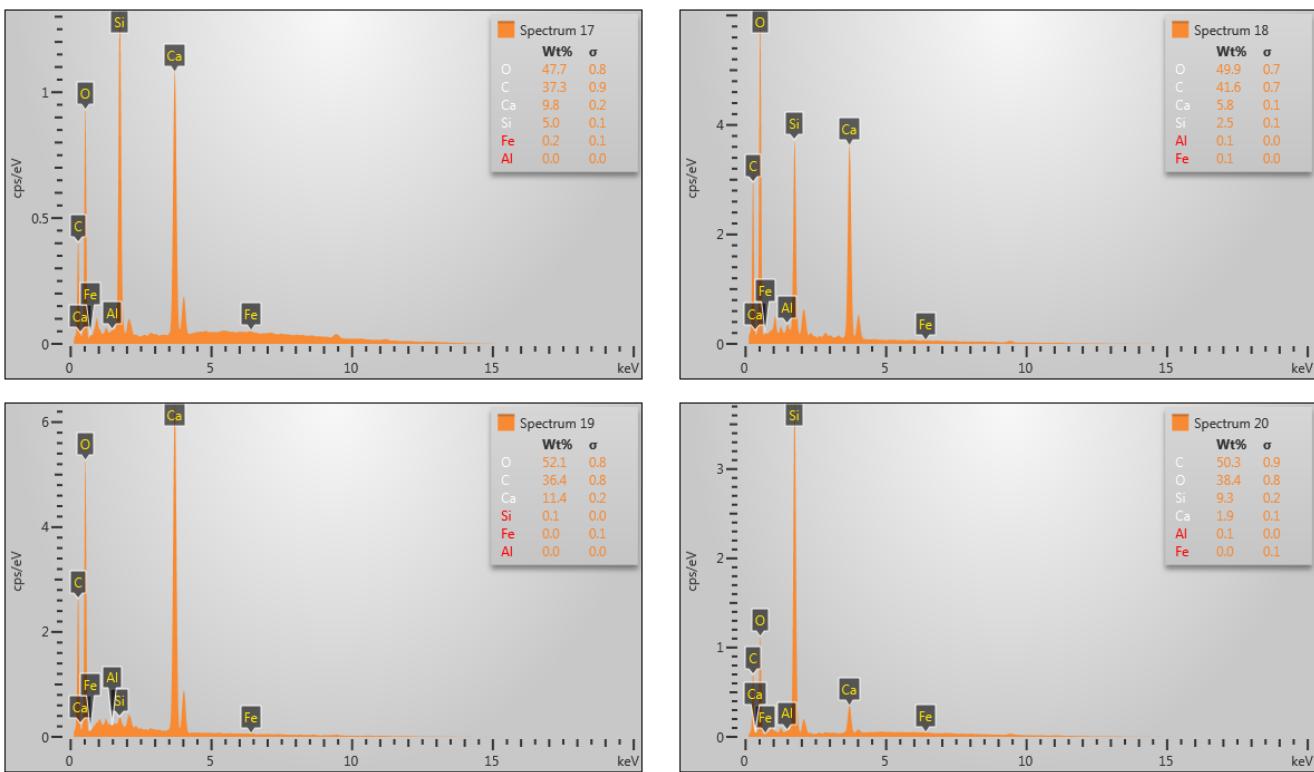
26 *Figure S5. Microscopic images of reference samples subjected directly to freezing and thawing (FT) or standard*
 27 *climate conditions (CC) (REF U) (SP: specimen, IM: image, W: crack width in mm)*

28 **3. Scanning Electron Microscopy (SEM) and Energy-Dispersive X-ray (EDX)
 29 spectroscopy**

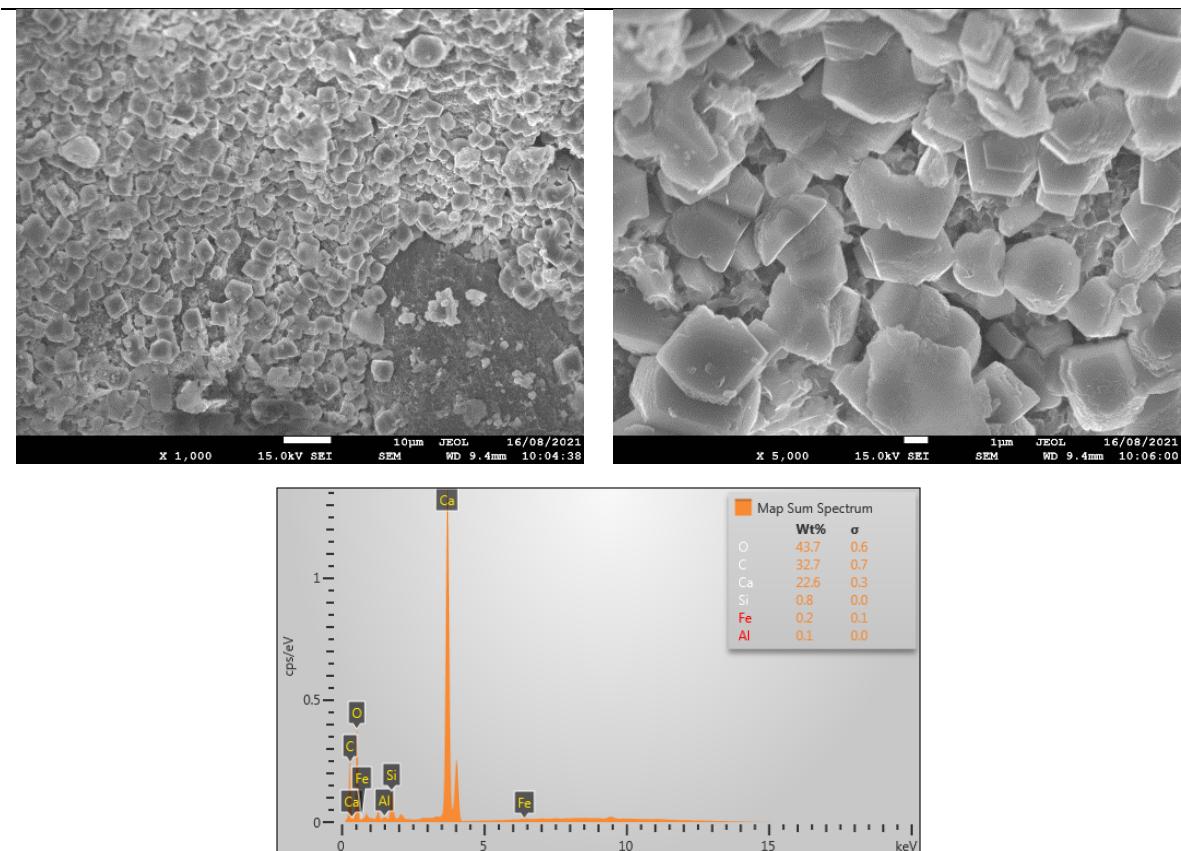








30 *Figure S6. SEM images by secondary electrons and EDX spectrums from the crack wall of the bacterial sample*
31 *were subjected to healing cycles (BAC H) and then kept at the standard climate conditions (CC)*



32 *Figure S7. SEM images by secondary electrons and EDX spectrums from the crack wall of the reference sample*
33 *were subjected to healing cycles (REF H) and then kept at the standard climate conditions (CC)*

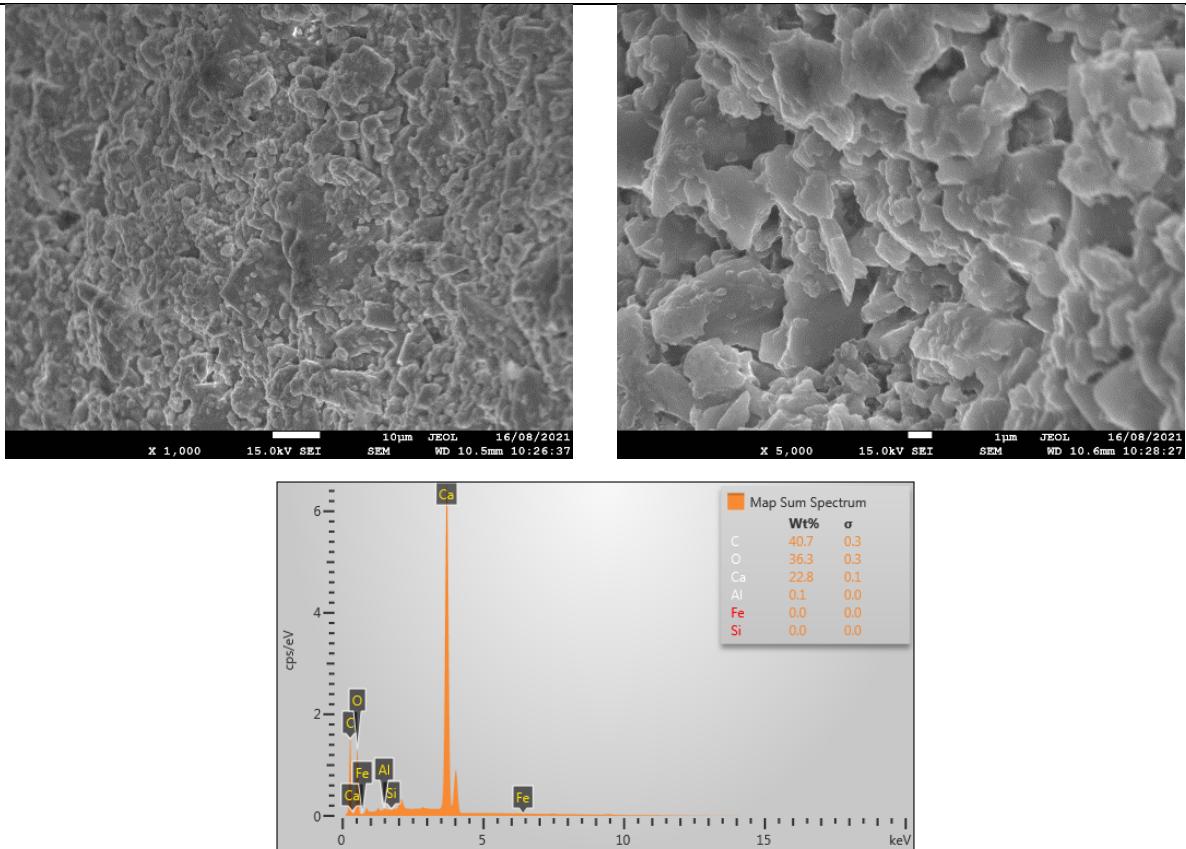
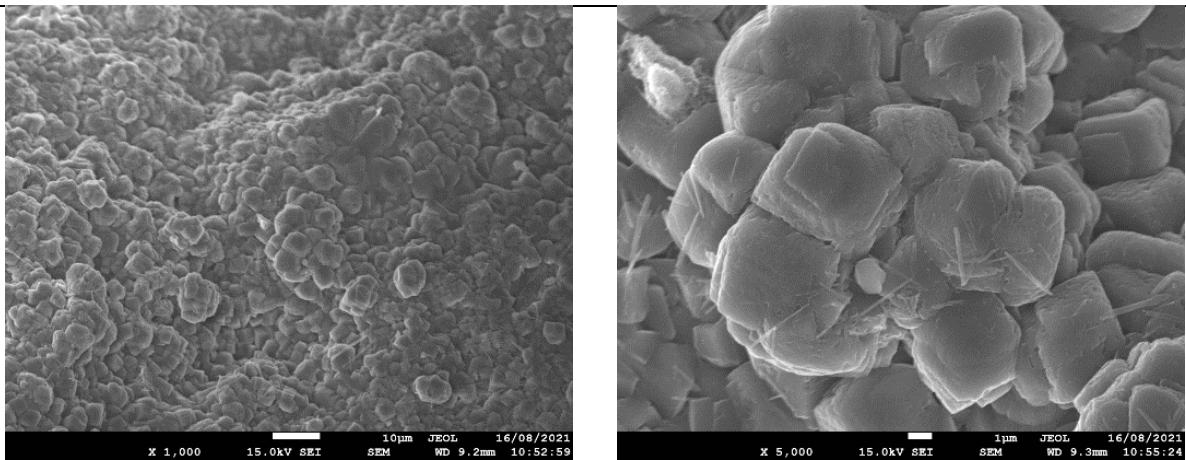
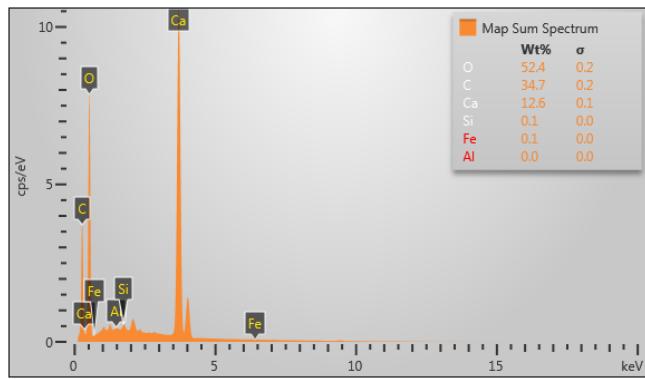
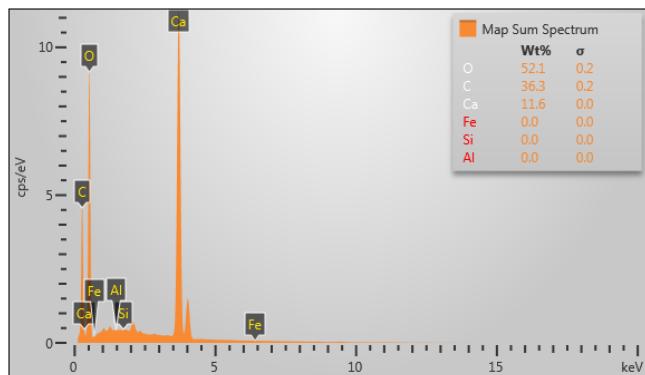
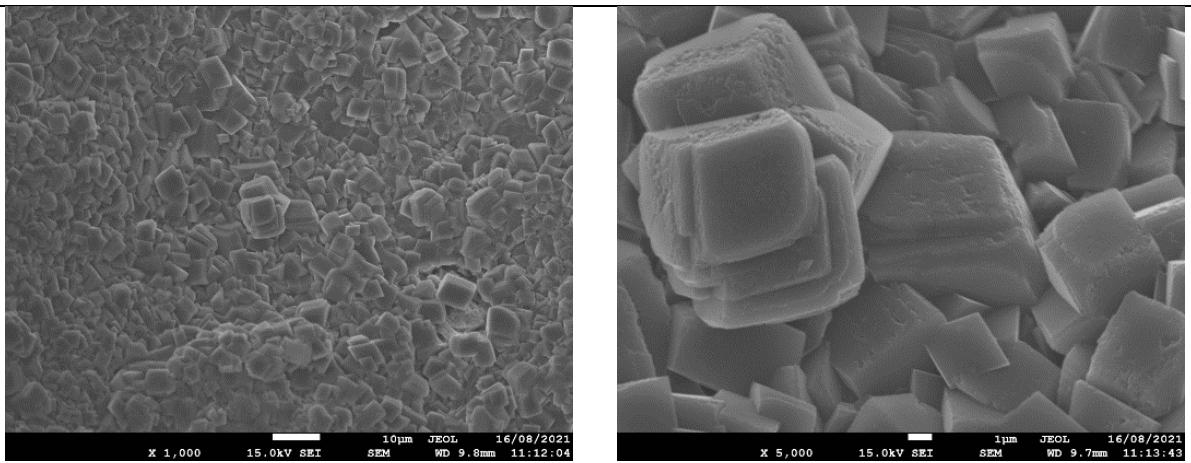


Figure S8. SEM images by secondary electrons and EDX spectrums from the crack wall of the bacterial sample were subjected to healing cycles (BAC H) and then either to freezing and thawing (FT)



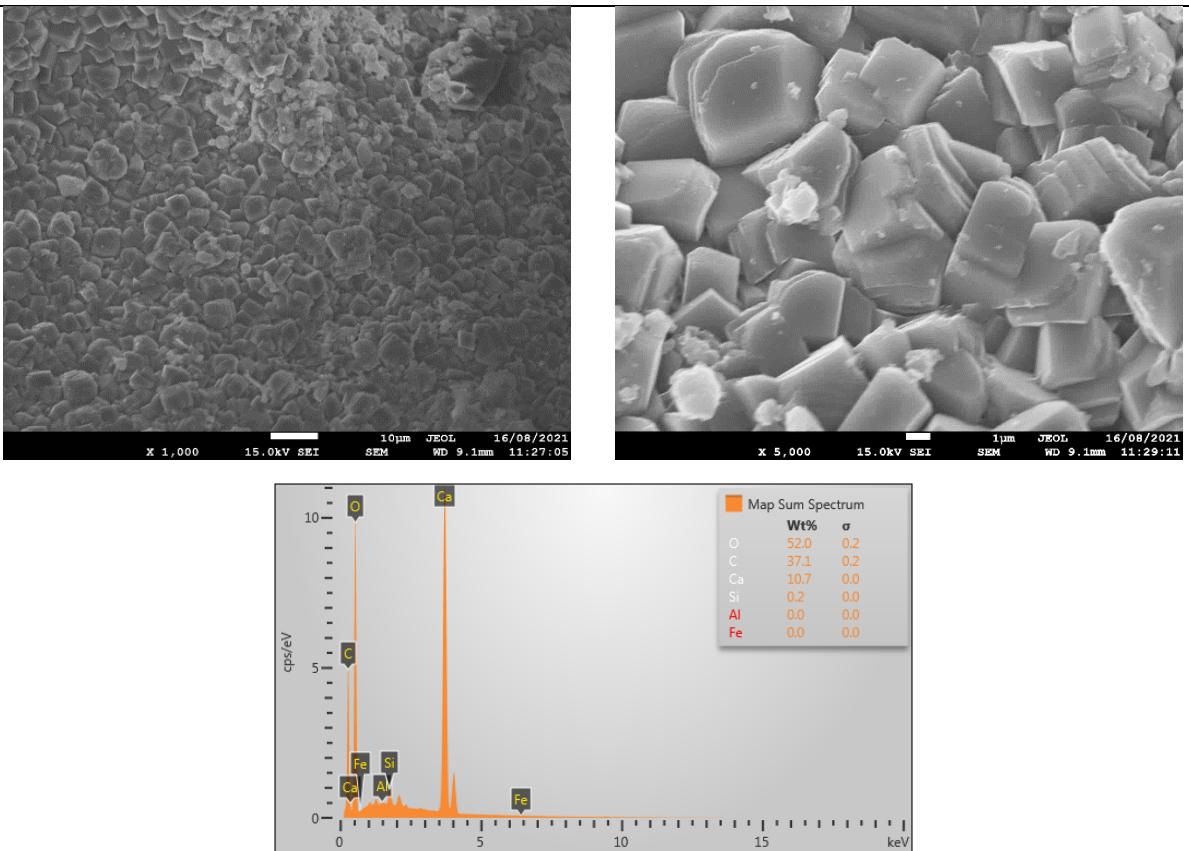


38 *Figure S9. SEM images by secondary electrons and EDX spectrums from the crack wall of the reference sample*
 39 *were subjected to healing cycles (REF H) and then either to freezing and thawing (FT)*



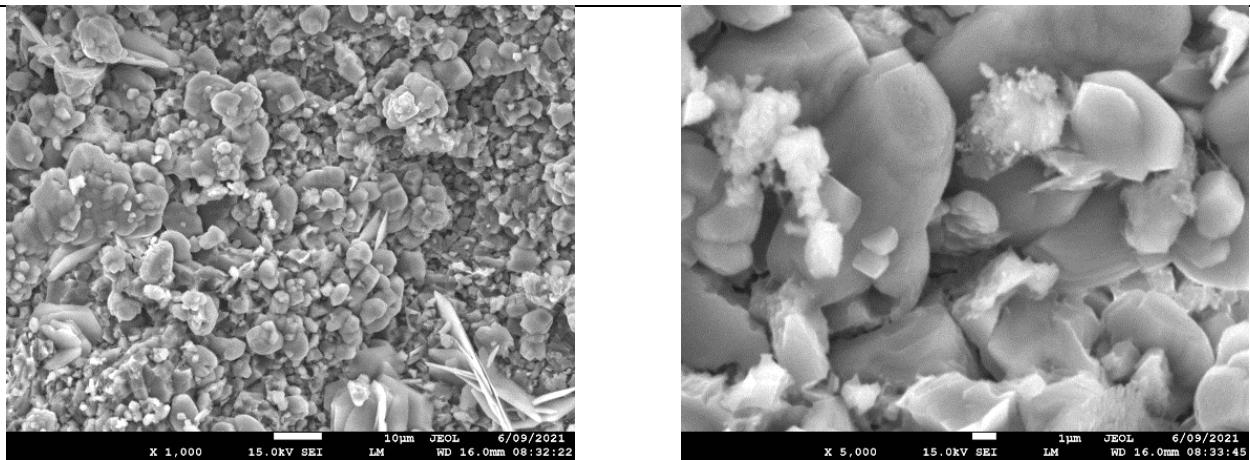
40 *Figure S2. SEM images by secondary electrons and EDX spectrums from the crack wall of the bacterial sample*
 41 *unhealed (BAC U) kept at the standard climate conditions (CC)*

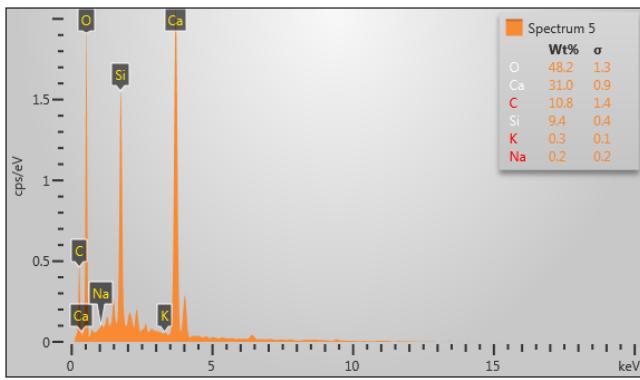
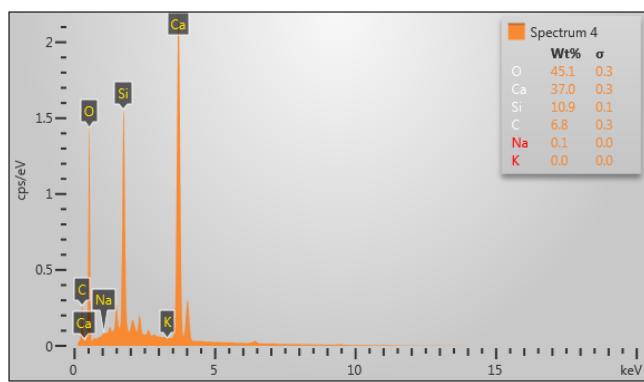
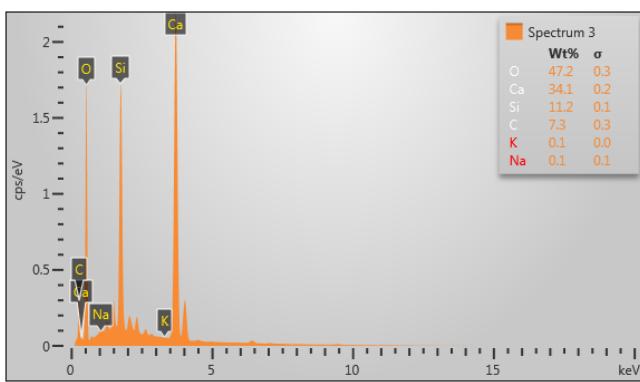
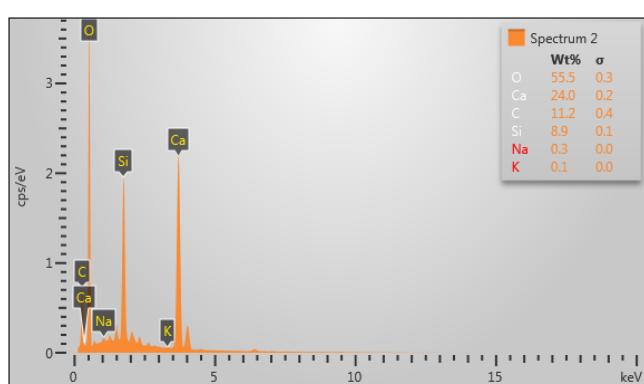
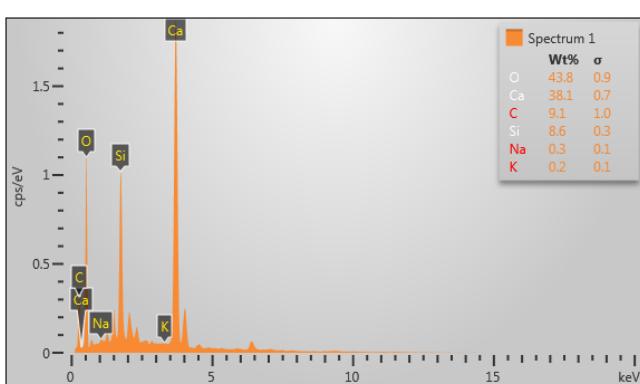
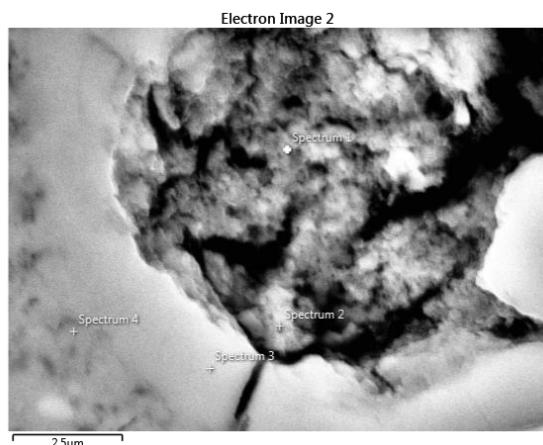
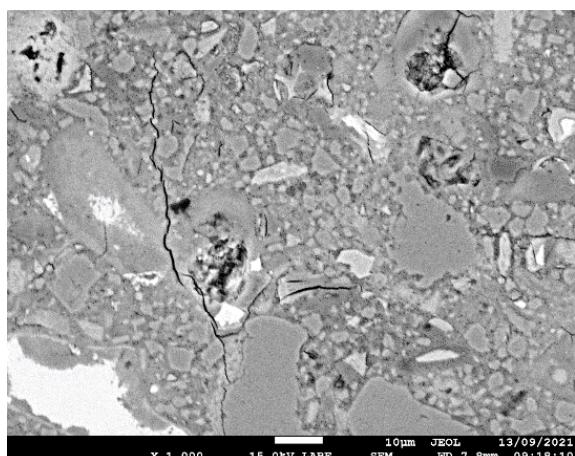
42



43 *Figure S3. SEM images by secondary electrons and EDX spectra from the crack wall of the reference sample*
 44 *unhealed (REF U) kept at the standard climate conditions (CC)*

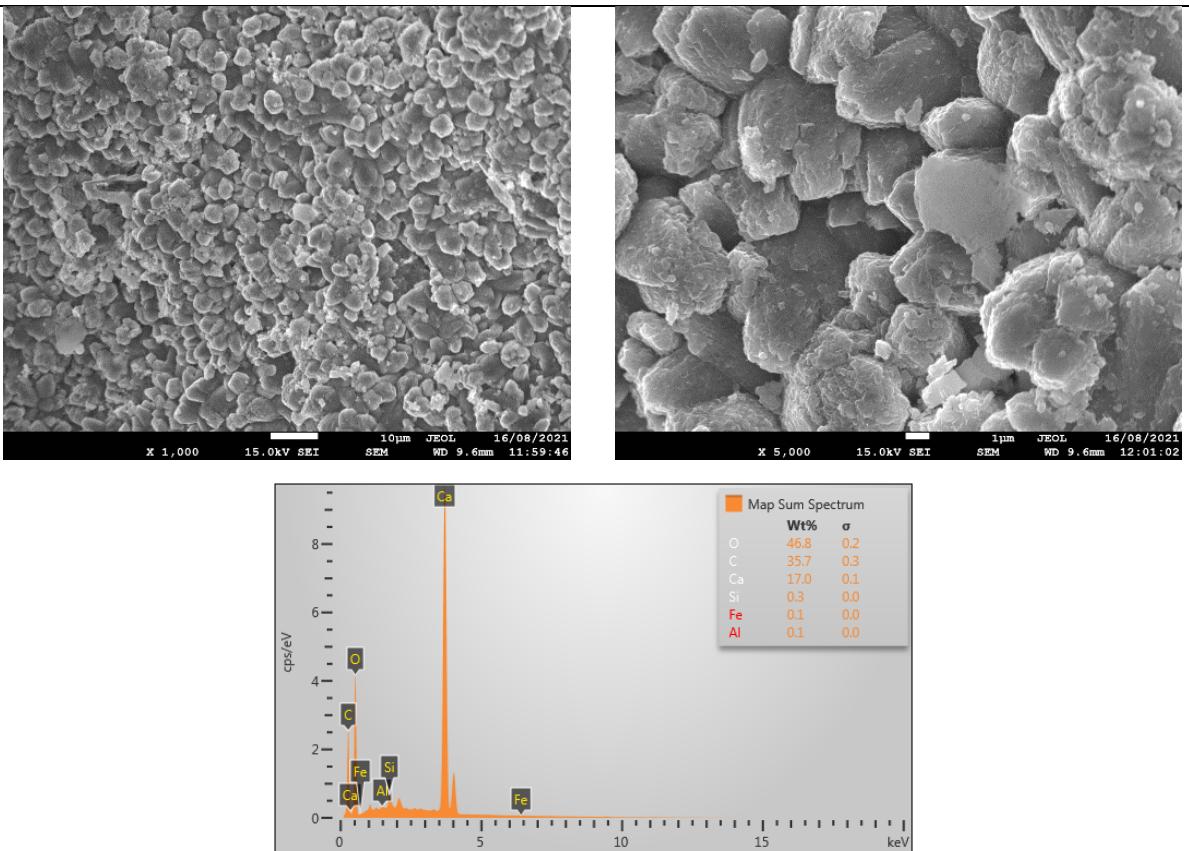
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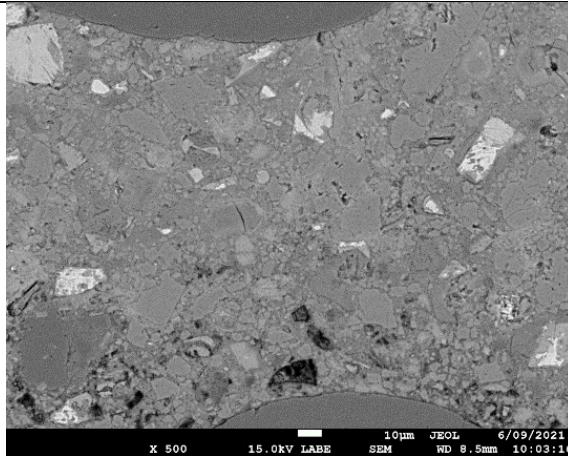
46 Figure S4. SEM images by secondary electrons and EDX spectrums from the crack wall of the bacterial sample
47 unhealed (BAC U) and subjected to freezing and thawing (FT)

48



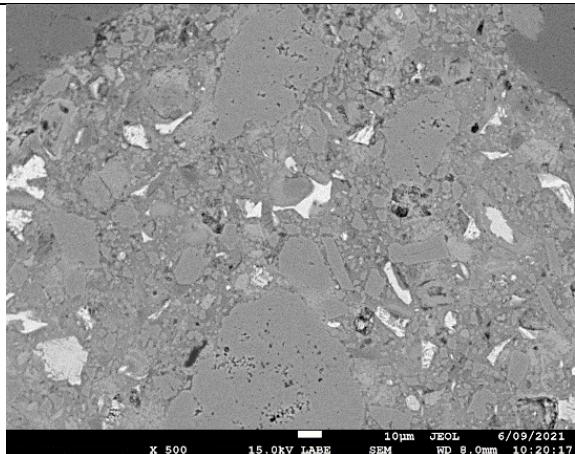
49 *Figure S5. SEM images by secondary electrons and EDX spectra from the crack wall of the reference sample*
50 *unhealed (REF U) and subjected to freezing and thawing (FT)*

51



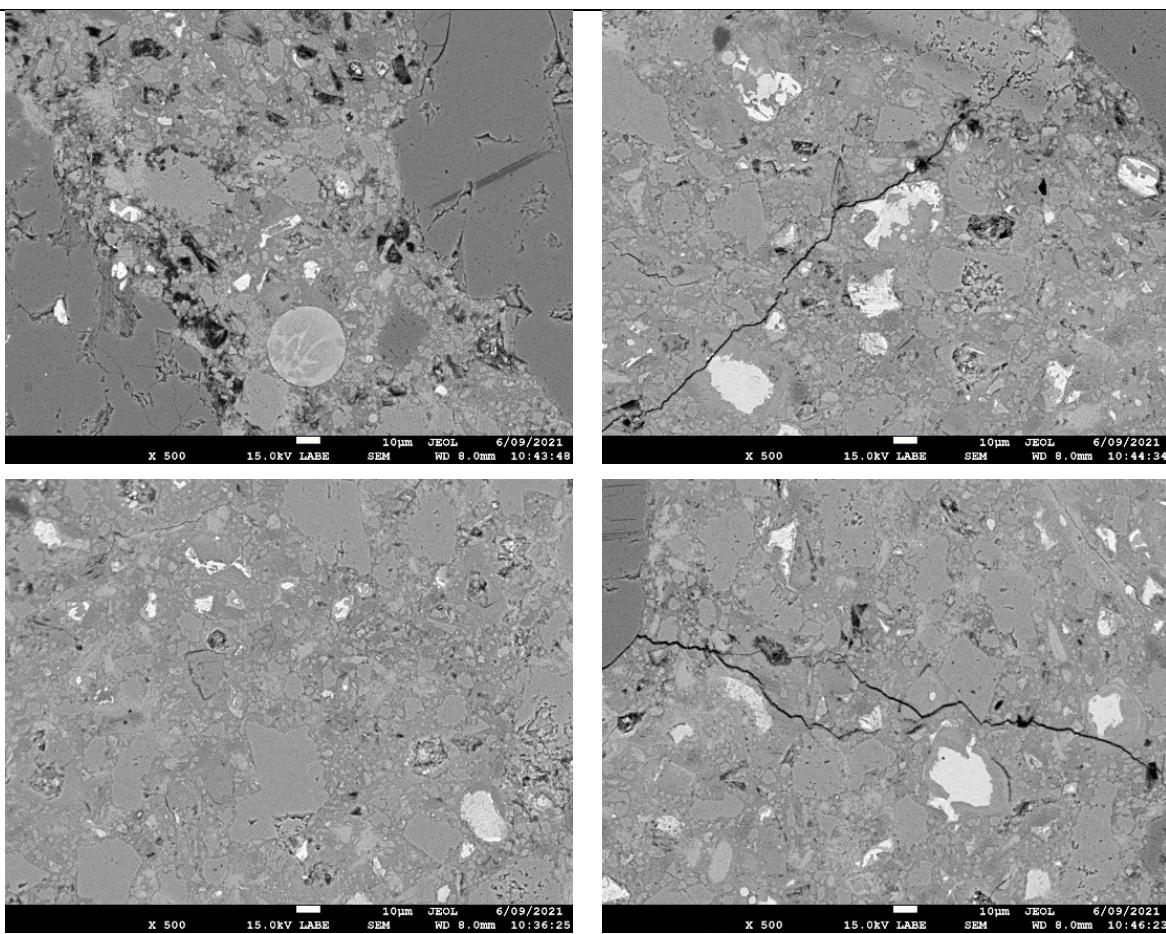
52 *Figure S6. SEM images by backscattered electrons (BSE) mode from the concrete matrix of the bacterial sample*
53 *were subjected to healing cycles (BAC H) and then kept at the standard climate conditions (CC)*

54



55 *Figure S7. SEM images by backscattered electrons (BSE) mode from the concrete matrix of the reference sample*
56 *were subjected to healing cycles (REF H) and then kept at the standard climate conditions (CC)*

57



58 *Figure S8. SEM images by backscattered electrons (BSE) mode from the concrete matrix of the bacterial sample*
59 *were subjected to healing cycles (BAC H) and then either to freezing and thawing (FT)*

60

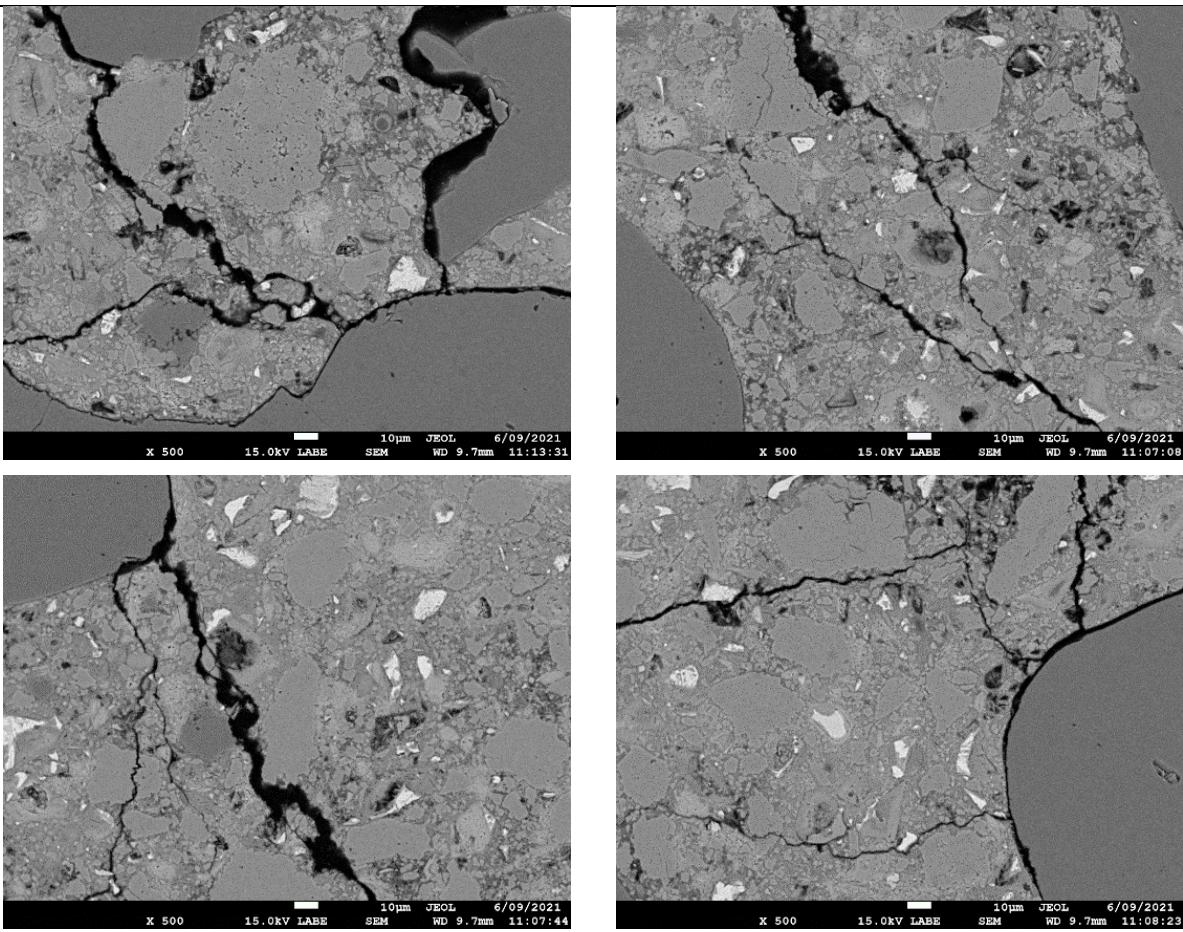
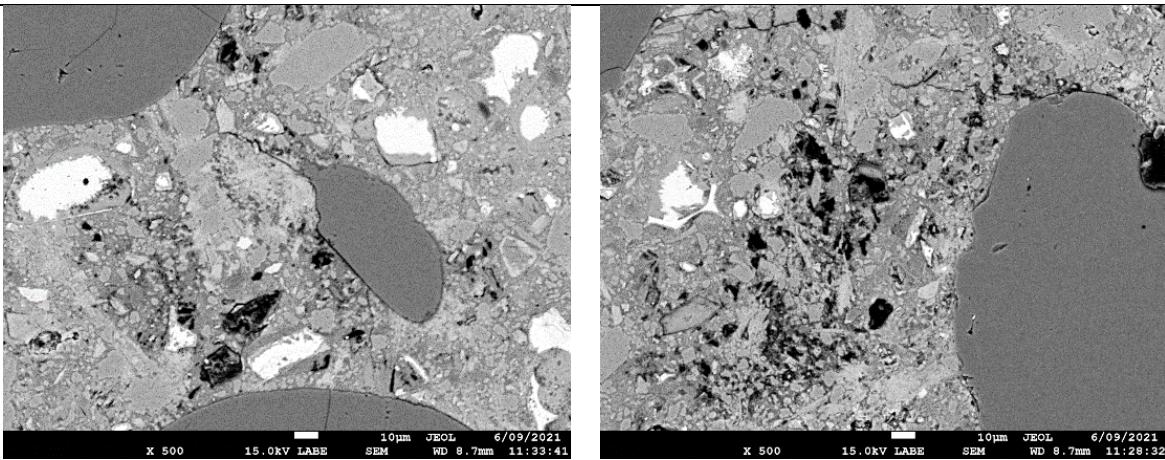
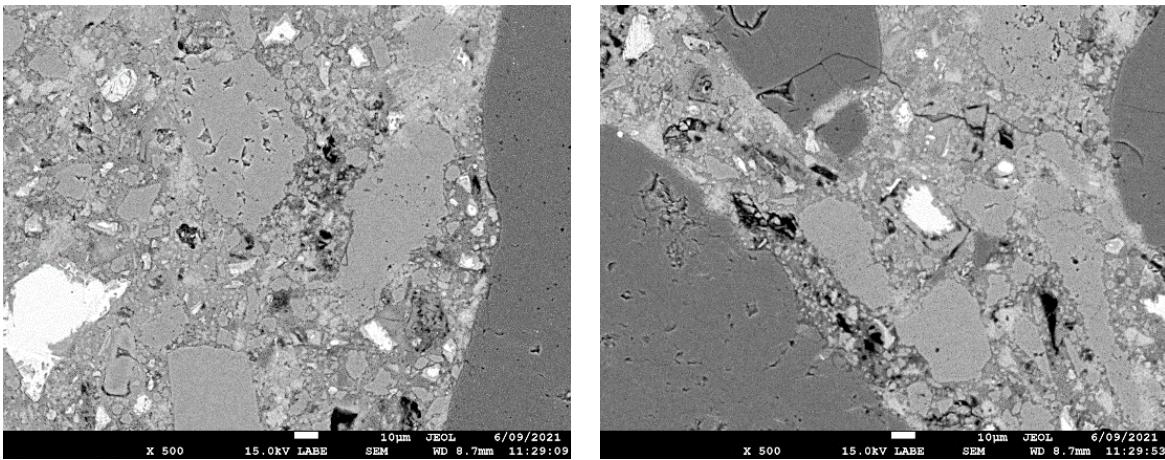


Figure S9. SEM images by backscattered electrons (BSE) mode from the concrete matrix of the reference sample were subjected to healing cycles (REF H) and then either to freezing and thawing (FT)

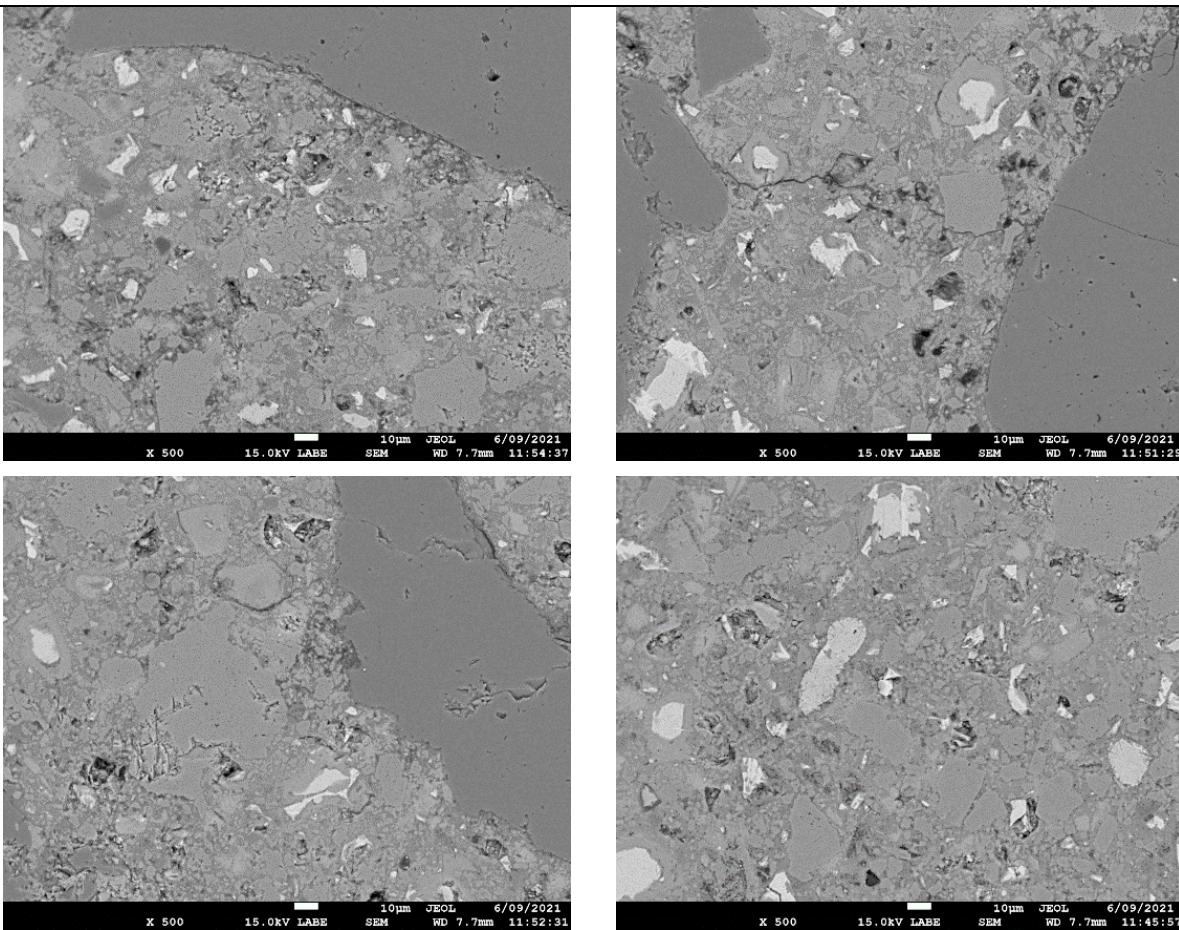
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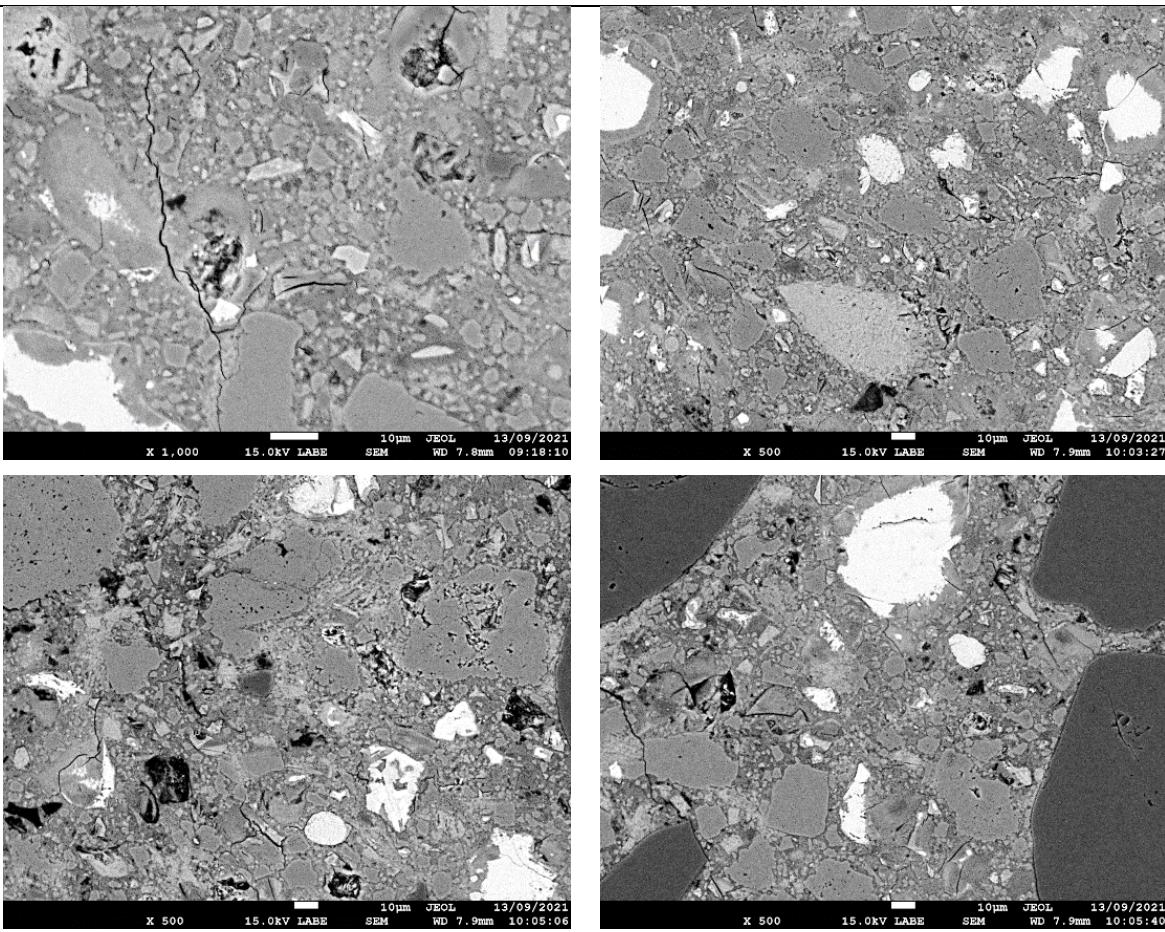
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65 *Figure S10. SEM images by backscattered electrons (BSE) mode from the concrete matrix the bacterial sample
unhealed (BAC U) kept at the standard climate conditions (CC)*

66



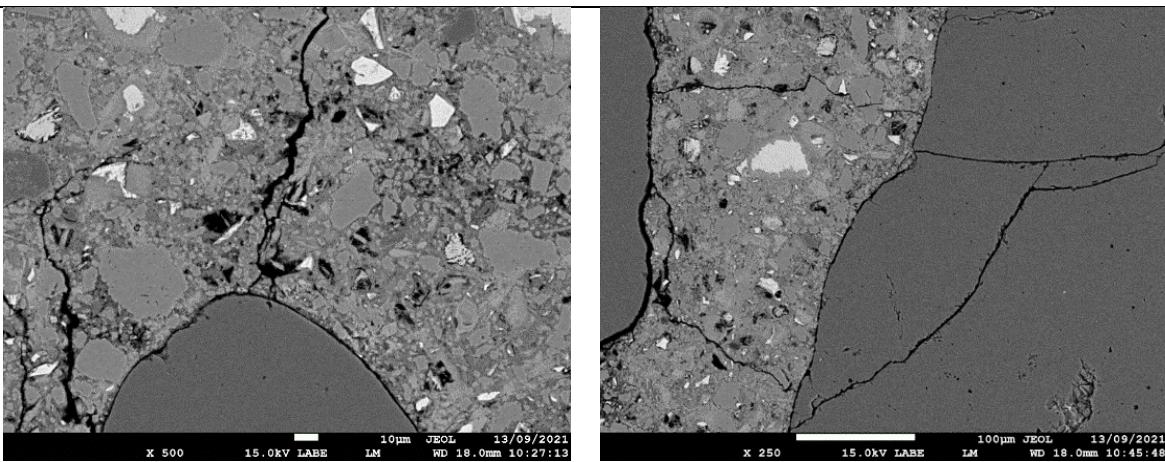
67
68 *Figure S11. SEM images by backscattered electrons (BSE) mode from the concrete matrix the reference sample
unhealed (REF U) kept at the standard climate conditions (CC)*

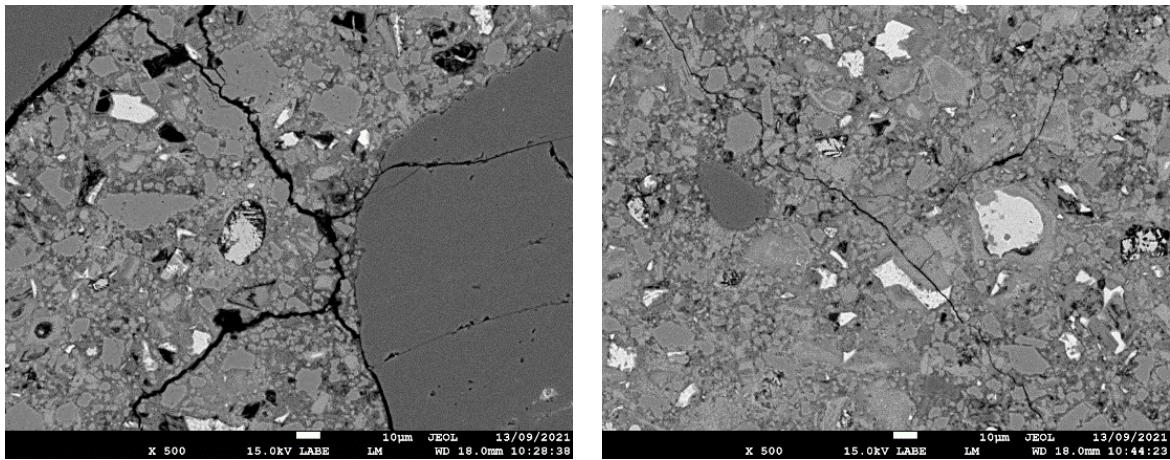
69



70
71 *Figure S20. SEM images by backscattered electrons (BSE) mode from the concrete matrix the bacterial sample*
unhealed (BAC U) and subjected to freezing and thawing (FT)

72





73 *Figure S12. SEM images by backscattered electrons (BSE) mode from the concrete matrix of the reference sample*
74 *unhealed (REF U) and subjected to freezing and thawing (FT)*