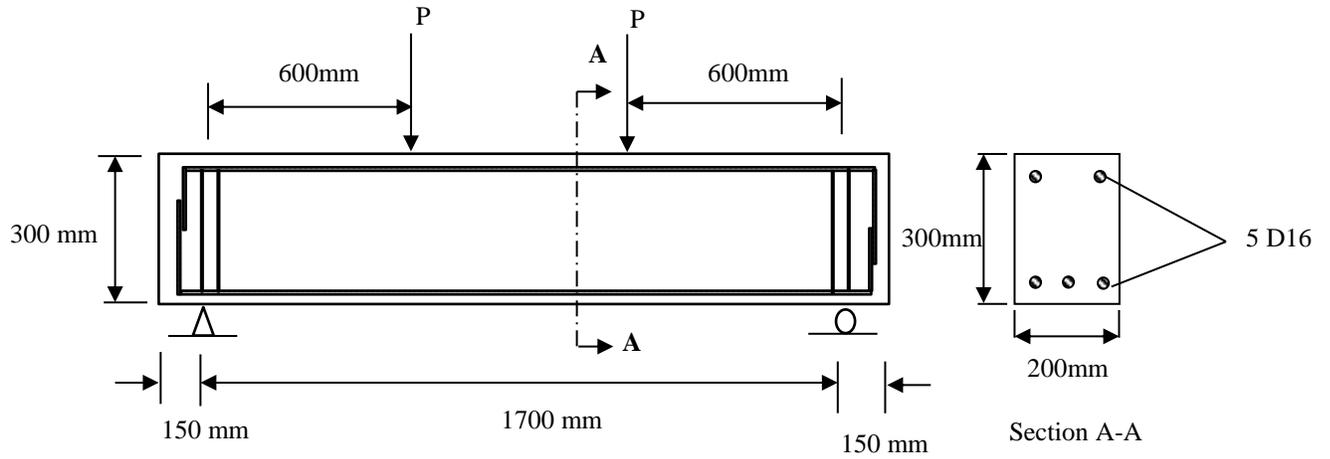


1 **SHEAR BEHAVIOUR OF LIGHTWEIGHT CONCRETE BEAMS**
2 **STRENGTHENED WITH CFRP COMPOSITE**



13 Figure 1: Beams reinforcement details

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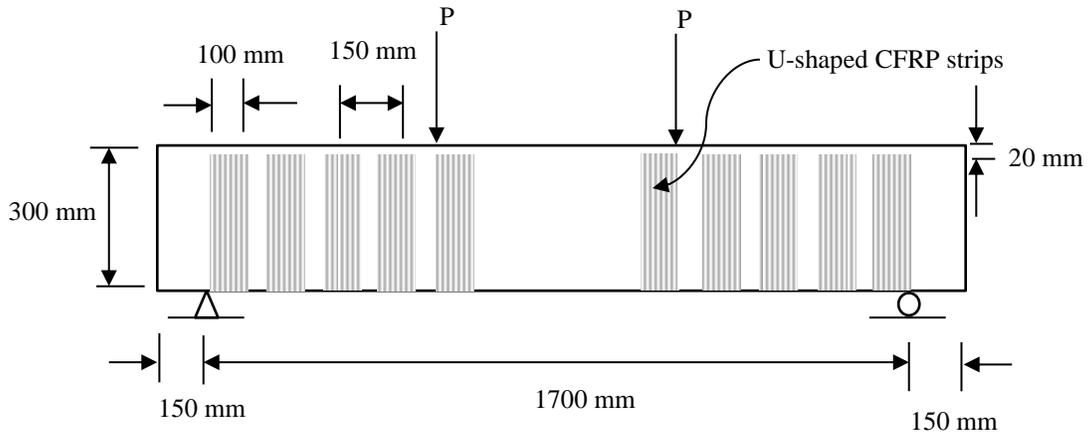
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BL/N-UST samples

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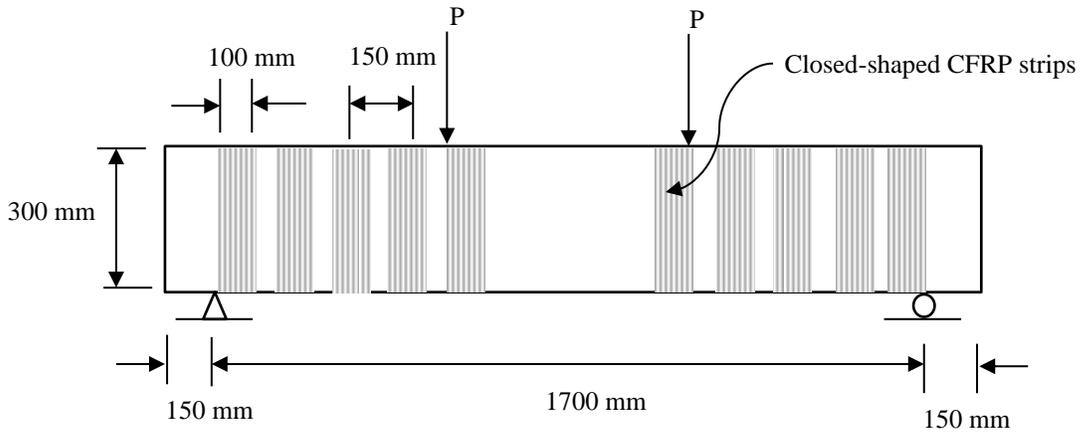
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BL/N-CST samples

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Figure 2: Strengthening detail

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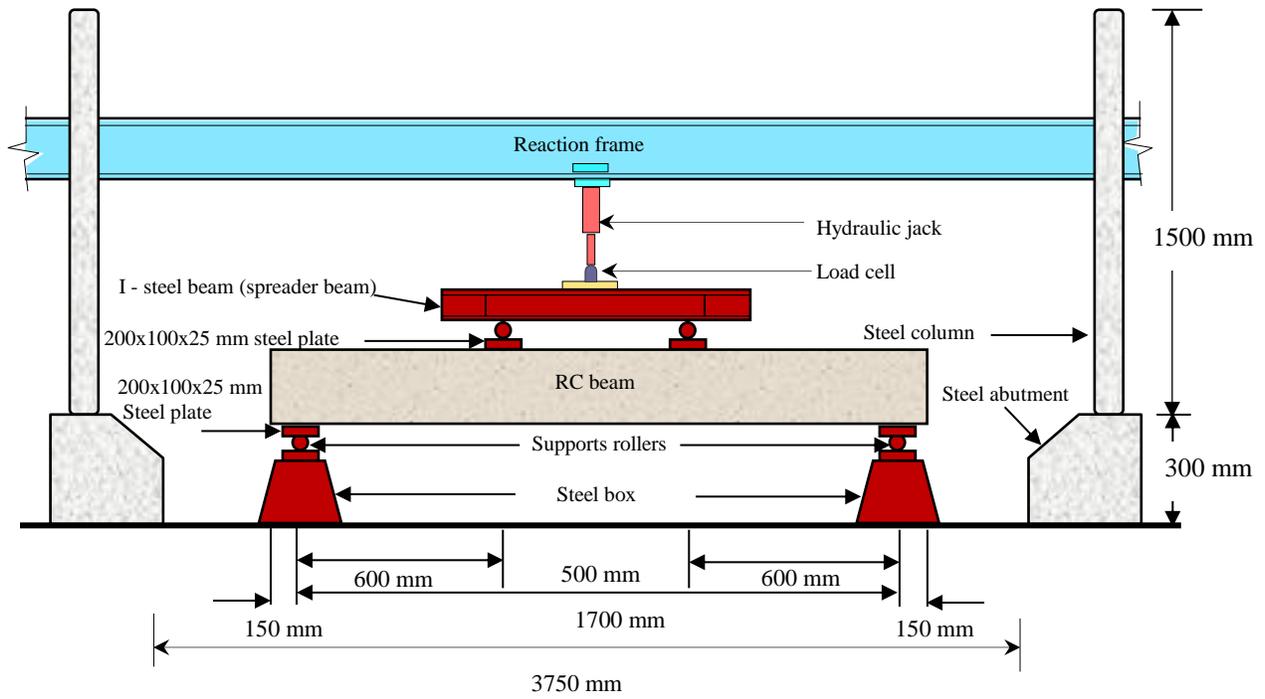


Figure 3: Details of test set-up

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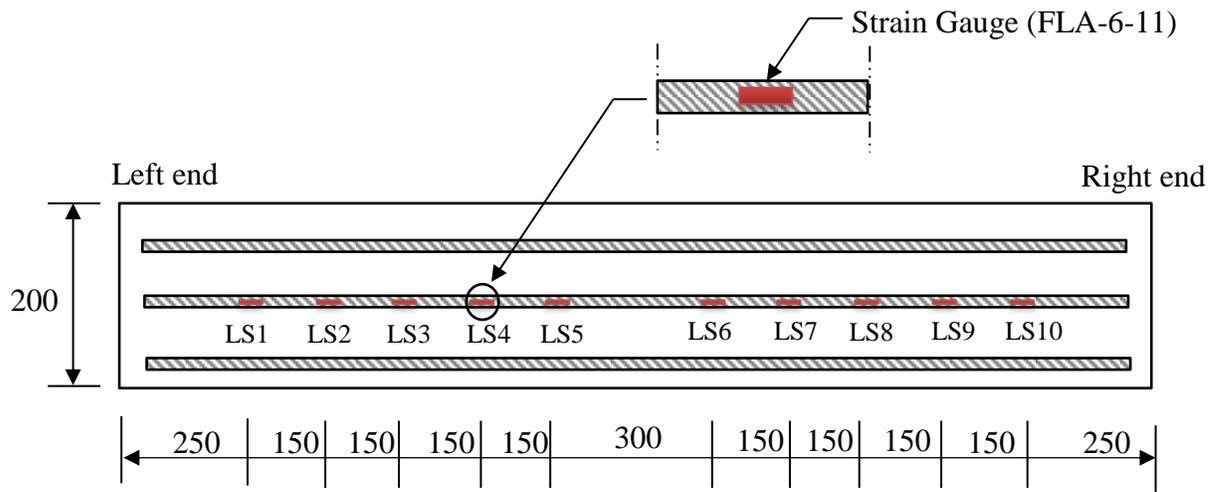


Figure 4: Position of strain gauges attached to the central bottom steel bar (plan view and all dimensions are in mm)

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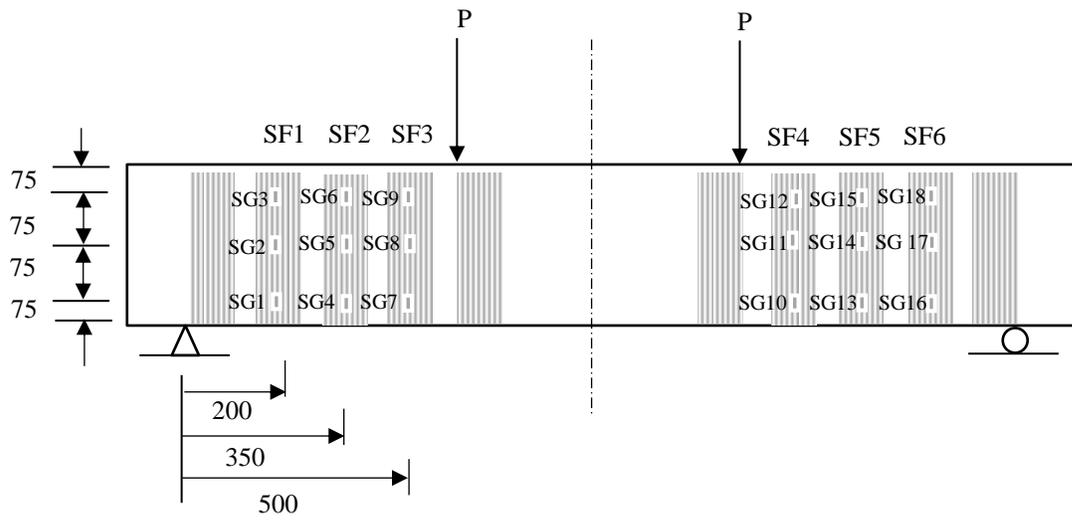
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Figure 5: Position of CFRP strips and strain gauges (all dimensions are in mm)

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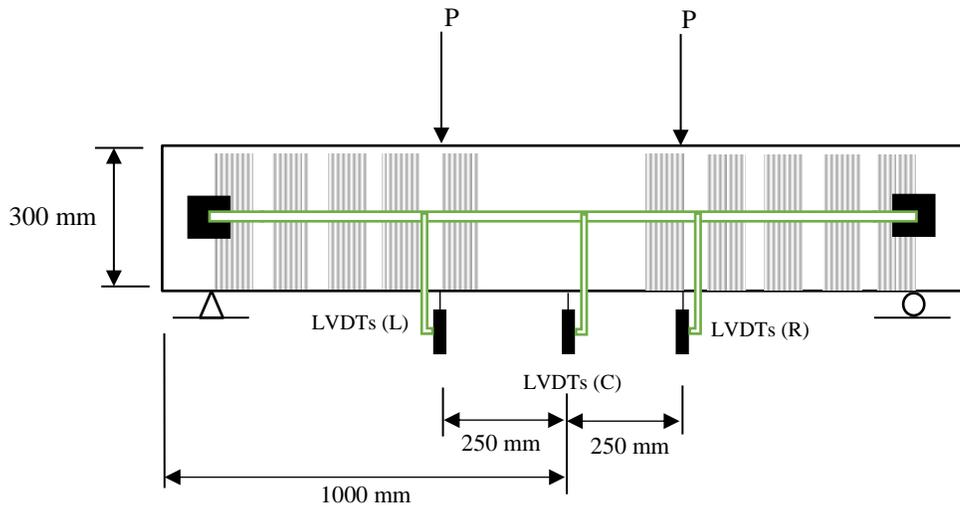
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Figure 6: Location of the LVDTs underneath the test samples

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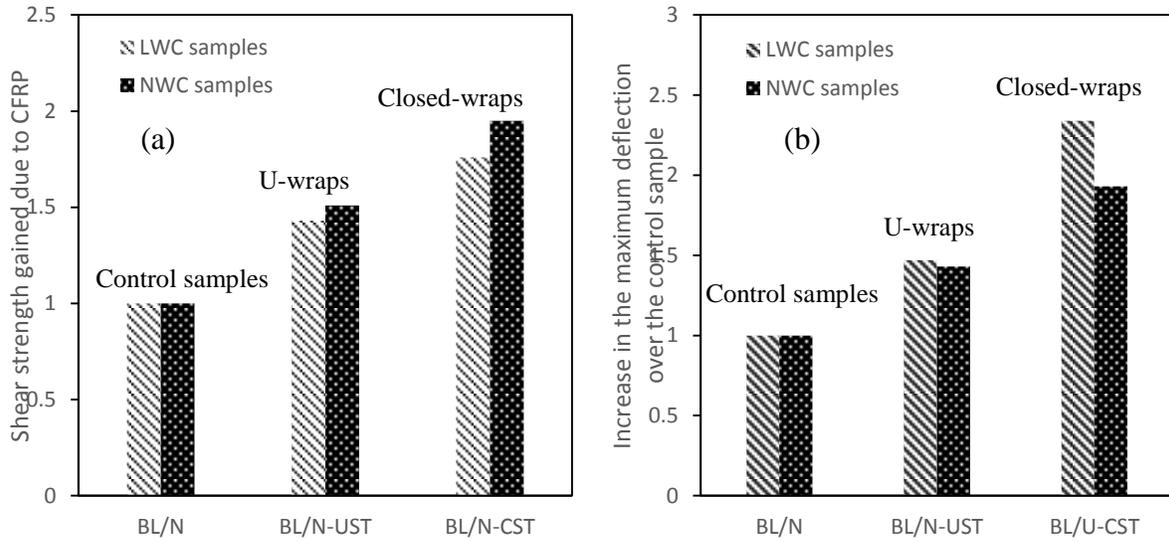
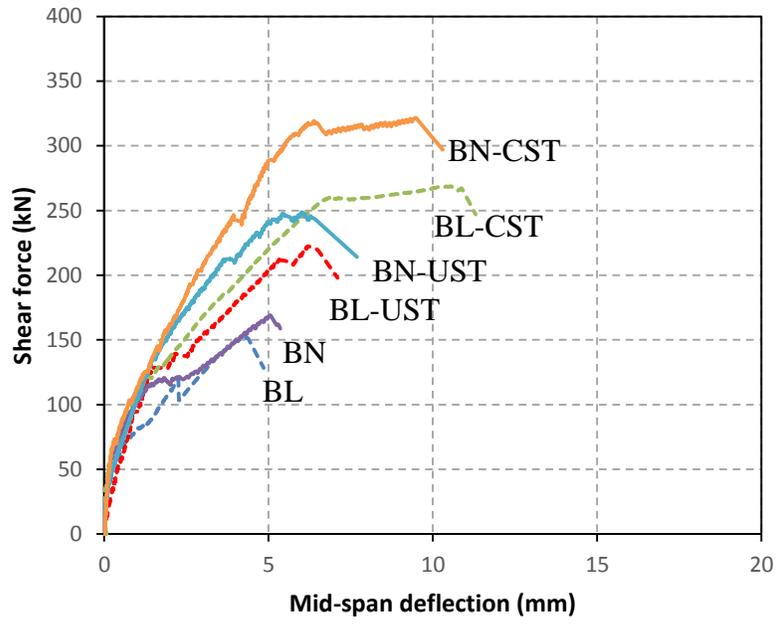


Figure 7: (a) Comparison of the shear strength gained due to CFRP reinforcement and (b) increase in the maximum deflection at failure compared with the control sample

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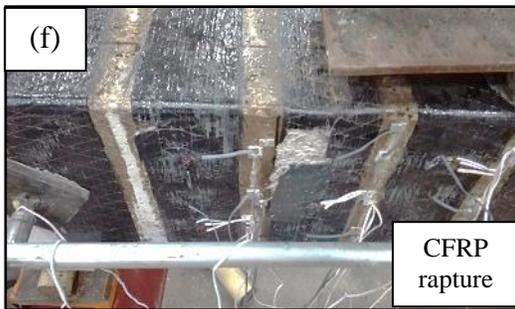
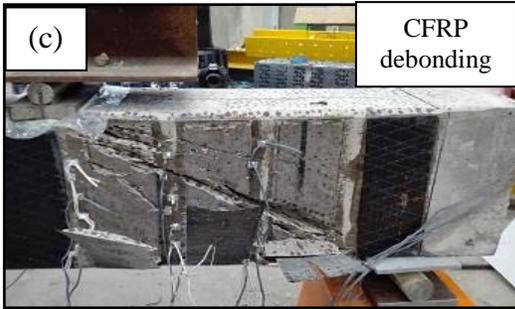


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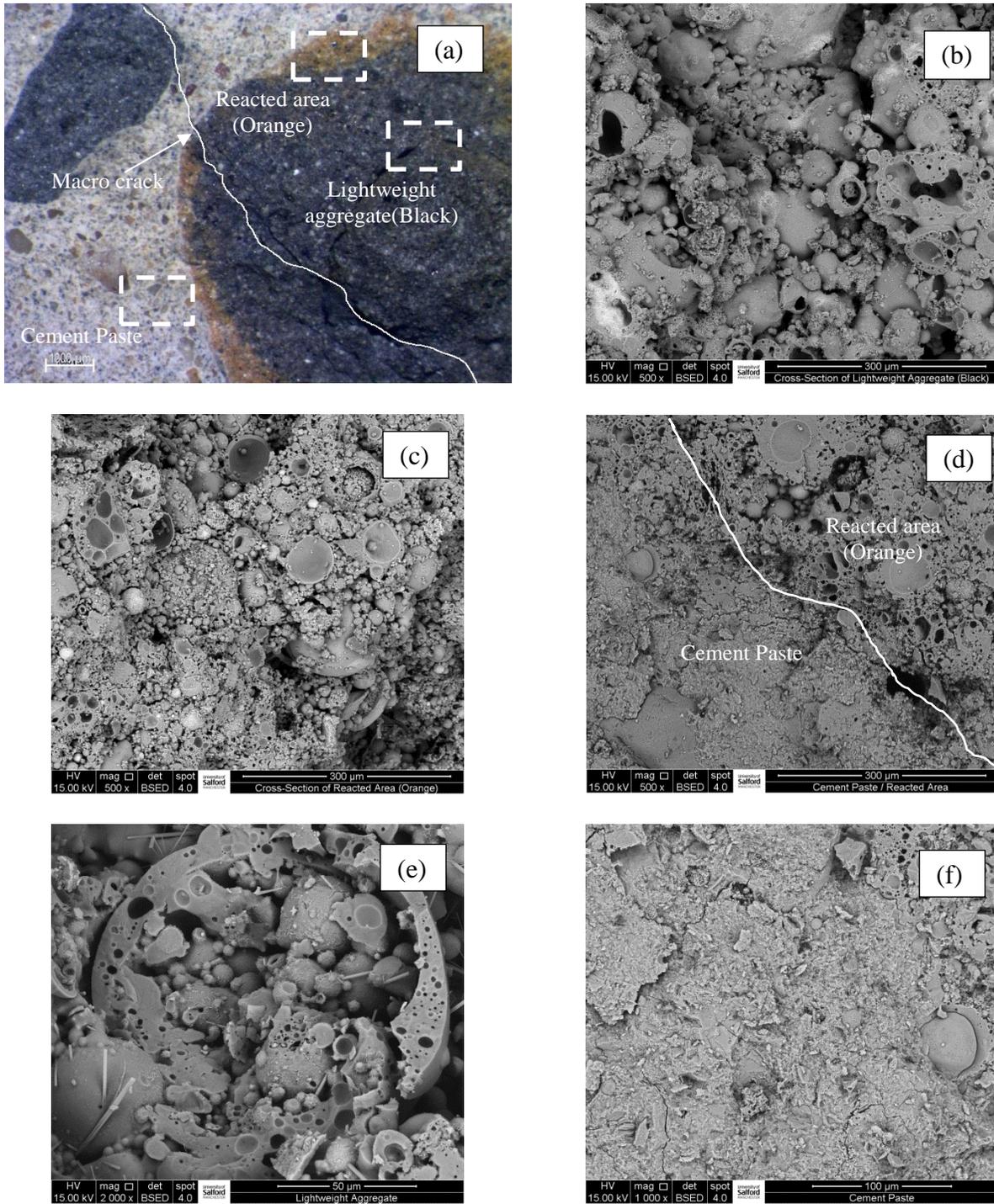
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Figure 8: Comparison of load-deflection of LWC and NWC samples

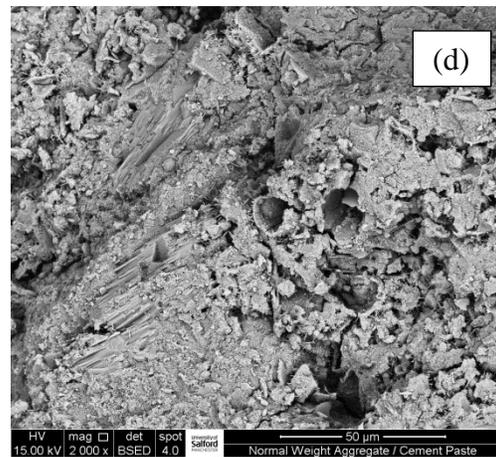
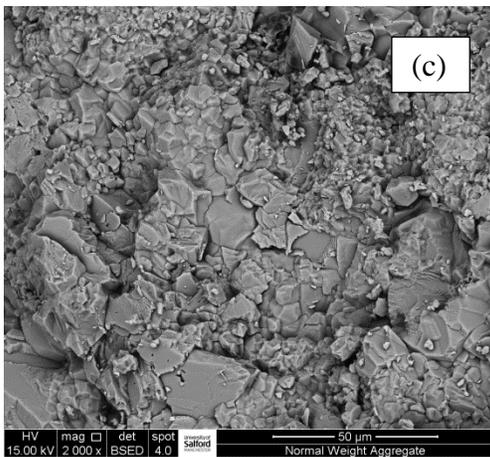
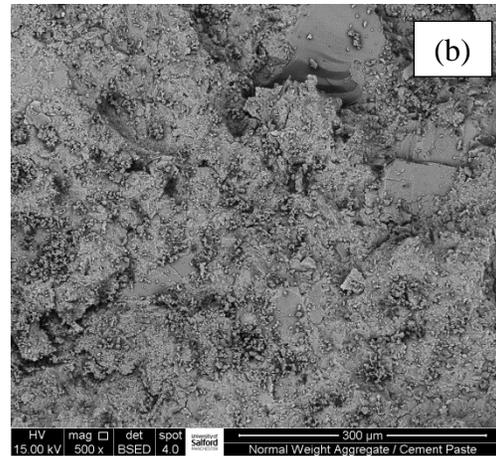
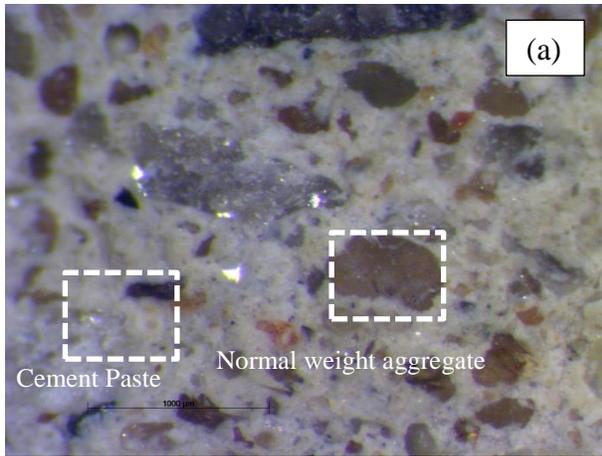
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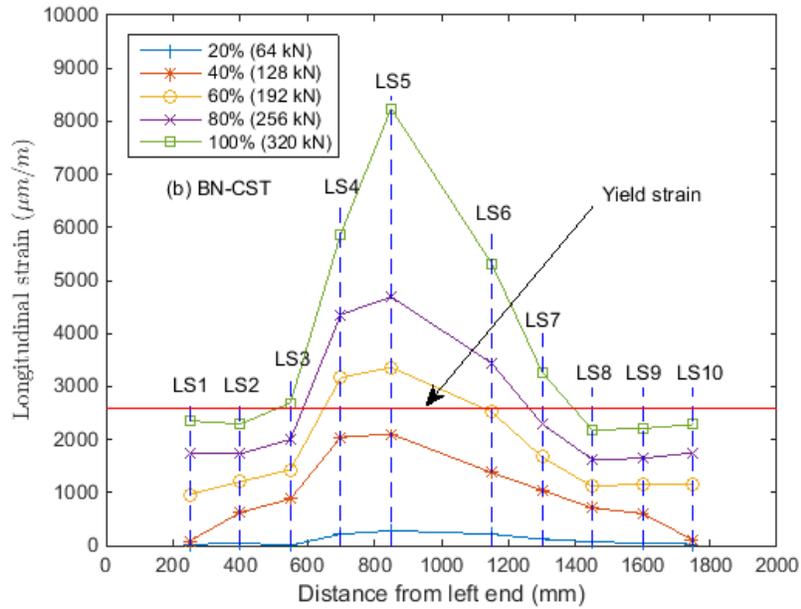
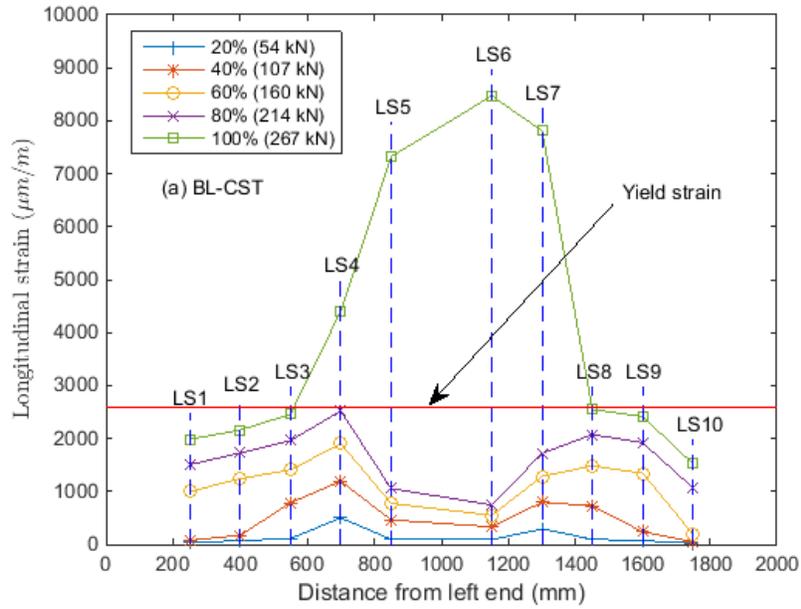
87 Figure 9: Failure mode of samples (a) BL, (b) BN, (c) BL-UST, (d) BN-UST, (e) BL-CST and
88 (f) BN-CST
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90 Figure 10: (a) Light micrograph of lightweight concrete sample, (b) SEM micrograph of
 91 lightweight aggregate, (c) SEM micrograph of reacted area of lightweight aggregate, (d) SEM
 92 micrograph of reacted area of lightweight aggregate and cement paste, (e) SEM micrograph of
 93 lightweight aggregate and (f) SEM micrograph of cement paste



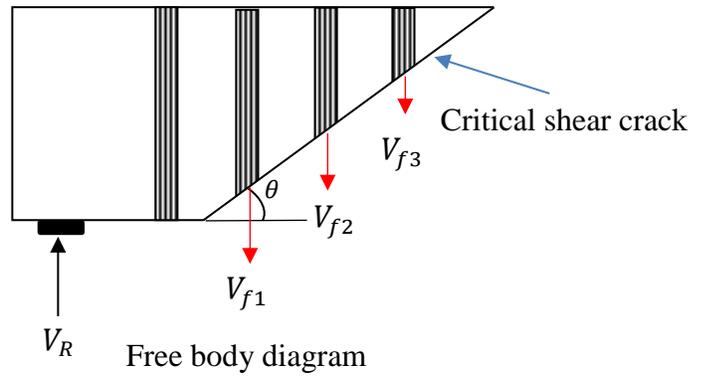
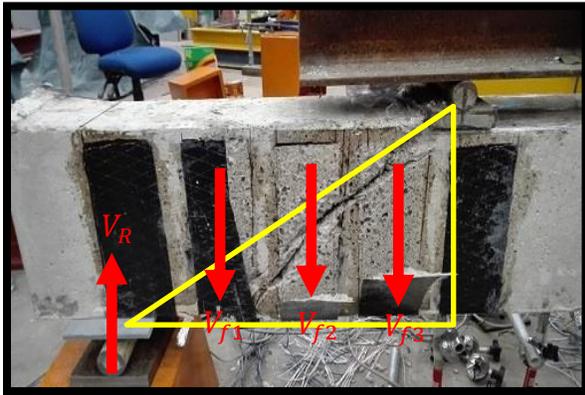
94 Figure 11: (a) Light micrograph of normal weight concrete sample, (b) SEM micrograph of
 95 normal weight aggregate and cement paste, (c) SEM micrograph of normal weight aggregate and
 96 (d) SEM micrograph of normal weight aggregate and cement paste
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101 Figure 12: Strain profile along longitudinal steel reinforcement of specimen (a) BL-CST and (b)

BN-CST

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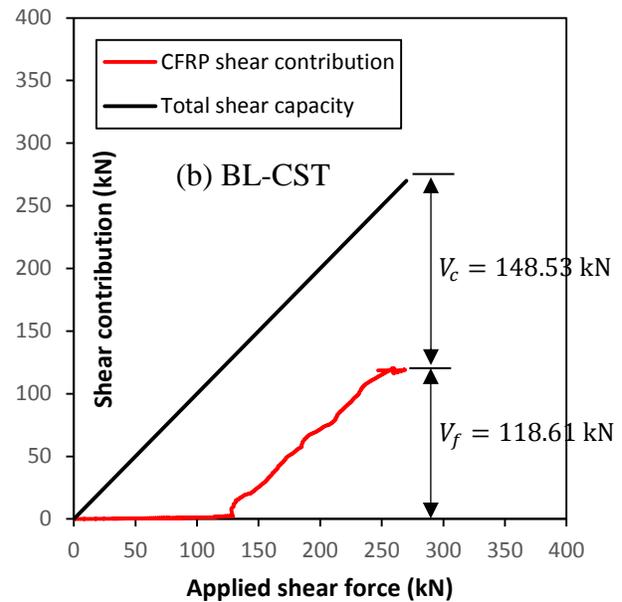
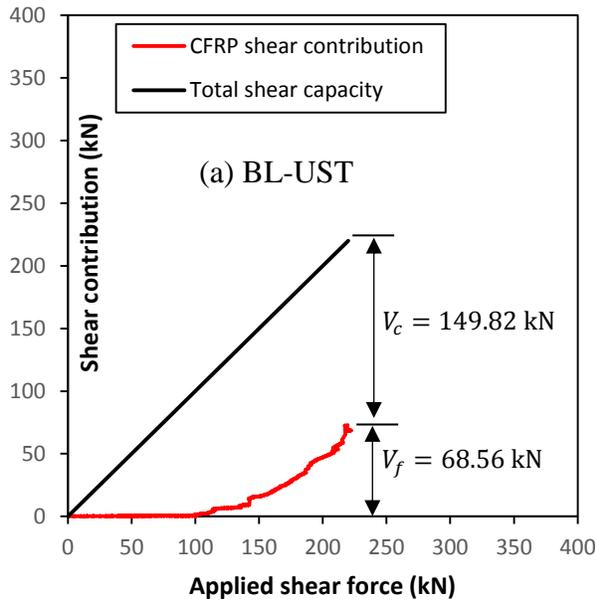
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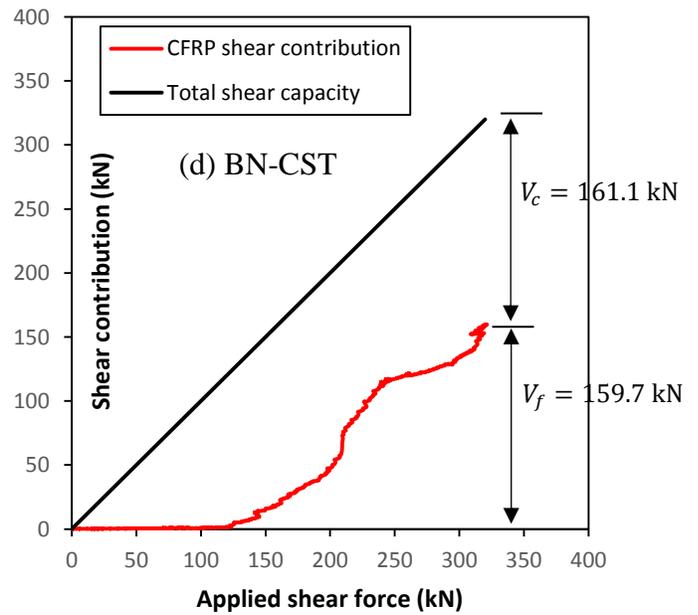
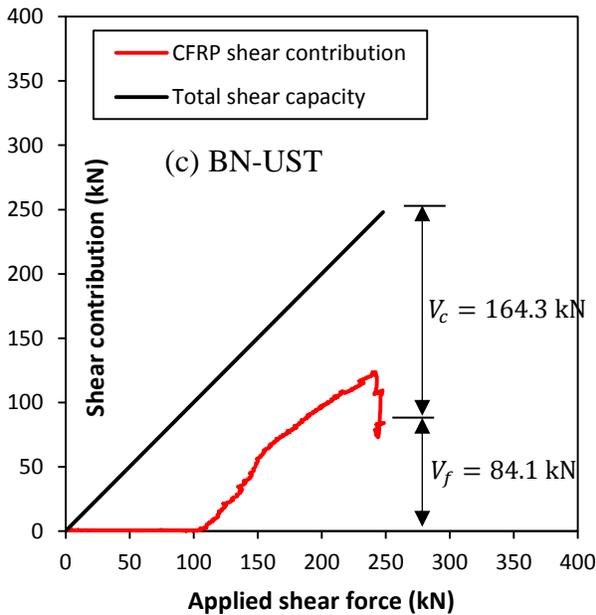
Figure 13: Internal forces in a failed concrete strengthened beam strengthened with CFRP

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111 Figure 14: Estimated shear contribution of (a) BL-UST, (b) BL-CST, (c) BN-USL and (d) BN-

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CST