

Deliverables:

Lab 7 + 8 + 11 (Results and Analysis)

Concrete - slump, percent entrapped air, unit weight, yield

1.Cylinders

- Maximum load at 7 day
- Compressive strength 7 day = peak load / area
- maximum load at 28 day from load vs displacement plot
- Compressive strength 28 day = peak load / area
- Statistical analyses for 3 cylinders
- Load vs displacement for 3 cylinders
- Stress vs strain for 1 cylinder which was provided with strain gauge
- Modulus of elasticity from stress strain curve
- Modes of failure 7 day (1 photo and description)
- Modes of failure 28 day(1 photo and description)

2.Beam

- Rebound hammer results on beam and statistical analysis for various locations. Attach graphs showing how you calculated the strength.
- Report peak load from the load displacement plot given to you
- Calculate modulus of rupture (MOR) from the formula

3.Split tension

- Peak load obtained from Forney
- Tensile strength = peak load / area
- Statistical analysis

Discussion for 7 + 8 + 11 lab report

Discuss why cylinder attached with strain gauge gives appropriate results rather than calculating strain by using the formula displacement/length. Hint: Think about boundary conditions and stress concentrations in the cylinder. When you calculate using displacement, is that right?

Is the tensile strength of concrete using bending similar to that of split tension? If they are different why is that? (Discussion)

Calculate the ratio of tensile strength to compressive strength

Comment on the ratio of tensile strength (split tension and flexure) to the compressive strength of concrete (two ratios). (Discussion)

Lab 9 report: Cement mortar cubes:

Best mix for perfect consistency

initial setting time along with final penetration value

specific surface area

Load vs displacement plots of three cubes

Peak load

Report the 14 days compressive strength of mortar cubes

Report the statistics of mortar cubes strength

Determine whether the mortar cube results satisfy the strength requirements of ASTM C150.

Provide photos of the dominant failure mode of cement cubes (Use one sample only)