

7 October 2005

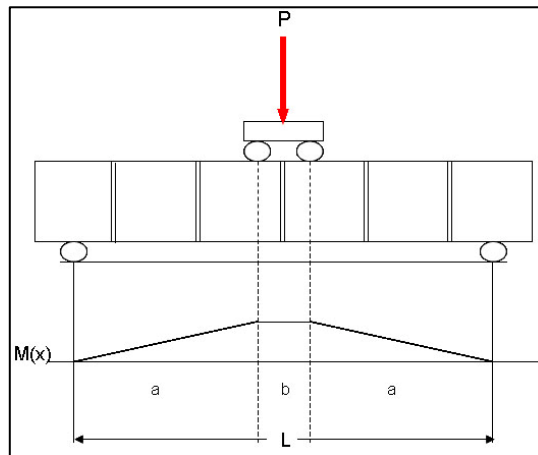
Memorandum

From: Student
To: Professor

Subject: BOND STRENGTH TESTING

1. Modulus of rupture:

The modulus of rupture test set up was as follows



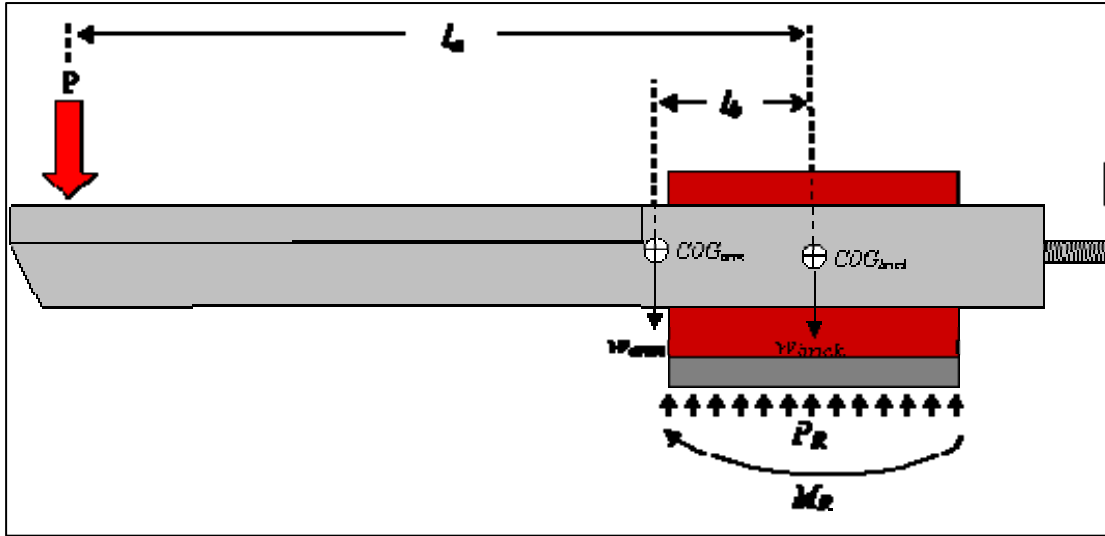
Results yielded were as follows:

Group	Load lbs (N)	Stress psi (kPa)	Group	Load lbs (N)	Stress psi (kPa)
PCL 1	663 (2949)	104 (719)	MC 1	472 (2100)	74 (512)
PCL 2	499 (2220)	78 (541)	MC 2	525 (2335)	83 (569)
PCL 3	540 (2402)	85 (585)	MC 3	466 (2073)	73 (505)
PCL 4	354 (1575)	56 (384)	MC 4	426 (1895)	67 (462)
PCL 5	497 (2211)	78 (539)	MC 5	641 (2851)	101 (695)
			MC 6	513 (2282)	81 (556)
Average	511 (2271)	80 (553)	Average	507 (2256)	80 (550)
COV		22%	COV		15%
Note: $a=5.25$ in (133 mm), $I=30.27$ in ⁴ (12599325 mm ⁴) and $c=1.81$ in (46.0 mm)					

The magnitudes of our average stresses are close to the 75 psi for portland cement lime mortar and well above the 38 psi for masonry cement as given in table 3.1.8.2.1 for type N mortar. The codes value for masonry cement is low due to the variability in different mortar cements due to the different admixtures.

Bond wrench:

The bond wrench test setup was as follows:



Results yielded were as follows:

Group	Load lbs (N)	Stress psi (kPa)	Group	Load lbs (N)	Stress psi (kPa)
PCL 1	175 (778)	141 (972)	MC 1	180 (801)	145 (1000)
PCL 2	200 (890)	161 (1110)	MC 2	140 (623)	113 (779)
PCL 3	150 (667)	121 (834)	MC 3	220 (979)	177 (1221)
PCL 4	190 (845)	153 (1055)	MC 4	190 (845)	153 (1055)
PCL 5	215 (956)	173 (1193)	MC 5	205 (912)	165 (1138)
PCL 6	220 (979)	177 (1221)	MC 6	200 (890)	161 (1110)
PCL 7	190 (845)	153 (1055)	MC 7	150 (667)	121 (834)
PCL 8	160 (712)	129 (889)	MC 8	200 (890)	161 (1110)
PCL 9	230 (1023)	185 (1276)	MC 9	200 (890)	161 (1110)
PCL 10	170 (756)	137 (944)	MC 10	170 (756)	137 (944)
PCL 11	180 (801)	145 (1000)	MC 11	180 (801)	145 (1000)
PCL 12	140 (623)	113 (779)	MC 12	110 (489)	89 (613)
PCL 13	260 (1157)	209 (1442)	MC 13	140 (623)	113 (779)
PCL 14	160 (712)	129 (889)	MC 14	190 (845)	153 (1055)
			MC 15	150 (667)	121 (834)
Average	189 (839)	158 (1089)	Average	175 (778)	141 (972)
COV		18%	COV		18%

Note: $l_a=14$ in (356 mm), $l_b=2$ in (51mm), $w_{arm}=8.95$ lb (4.06 kg), $w_{brick}=3.6$ lb (1.63 kg), $I=30.27$ in⁴ (12599325 mm⁴) and $c=1.81$ in (46.0 mm)

Our bond wrench data exhibits higher bond strength than modulus of rupture testing as is expected. The bond wrench data also is much higher than the MSJC code bond strength values.

Overall, both tests yielded valid bond strength data. Both tests gave results higher than MSJC given design values as is expected to account for material uncertainty and follow the lower bound.

Very Respectfully,

STUDENT