Provided Information

Figure 1 shows the overall geometry of the test specimen. The beam spans 70 ft (21.3 m) between two idealized roller supports and will be loaded essentially monotonically by self-weight plus a concentrated downward force at midspan. The test apparatus provides lateral bracing at the concentrated load point and near the roller supports.

The two spans on either side of the concentrated load point are reinforced differently and will be referred to here as Span 1 (right of the concentrated load point) and Span 2 (left of the concentrated load point). Span 1 has no shear reinforcement, while Span 2 has shear reinforcement comprising single-leg No. 5 A615 Grade 60 (420) headed bars spaced at 35” (890 mm) on centers.

The beam is reinforced longitudinally with A1035 Grade 120 (830) bottom reinforcement and A1035 Grade 100 (690) top reinforcement. Bottom reinforcement consists of eleven No. 9 bars that are continuous through the entire span, but five of the bars in Span 1 are in ungrouted corrugated ducts for Phase 1 testing, to be grouted for Phase 2 testing, as described below. Top longitudinal reinforcement is continuous and fully bonded along the entire beam length.

The beam will be tested in two phases, as follows:

For Phase 1 testing, the concentrated midspan force will be increased until initial failure occurs, which is expected to occur in Span 1 at a relatively small value of the concentrated force. We are interested in shear strength of Span 1 under a loading that produces reasonably high working stresses in the bottom longitudinal reinforcement, so we have left five of the bars in Span 1 in an unbonded condition such that they will not participate in Span 1 resistance during Phase 1 testing.

For Phase 2 testing, we will first repair the failure in Span 1 using external shear reinforcement and any other remedies as required and then we will grout the five ungrouted longitudinal bars in Span 1 to increase the moment strength. The concentrated midspan force will then be increased until failure occurs in Span 2.

The test specimen was cast in four lifts from four ready mix trucks on 18 August 2021. Table 1 summarizes the concrete mixture design. Note that W/CM ratio = 0.45.

Compressive strength development, as measured on 6” x 12” cylinders stored with the test specimen, is plotted in Figure 2. Target test dates for Phases 1 and 2 are 29 September and 6 October 2021.

Table 1. Concrete mixture design.

Material Code	Description	Source Supplier	Design Quantity (lbs/cy)	Volume
Cement	ASTM C150	Calportland-PORT OF STOCKTON	275 lb	1.40
Slag	ASTM C989	Lehigh-Stockton	165 lb	0.91
Fly Ash	ASTM C 618 Class F	SRMG-Gallup	110 lb	0.88
Coarse Aggregate	ASTM C 33 #67	Vulcan -Pleasanton	1675 lb	10.06
Fine Aggregate	ASTM C 33 Fine Agg	Vulcan -Pleasanton	727 lb	4.41
Fine Aggregate	ASTM C 33 Fine Agg	Hanson-Pier 94 - Orca	771 lb	4.40
Water	ASTM C1602	Central Concrete-Central Concrete	33.0 gal	4.41
Admixture	MASTER GLENIUM 7920	BASF -Cleveland	-	-
		Air Target:	2.00 %	0.54
		Totals:	3999 lb	27.00

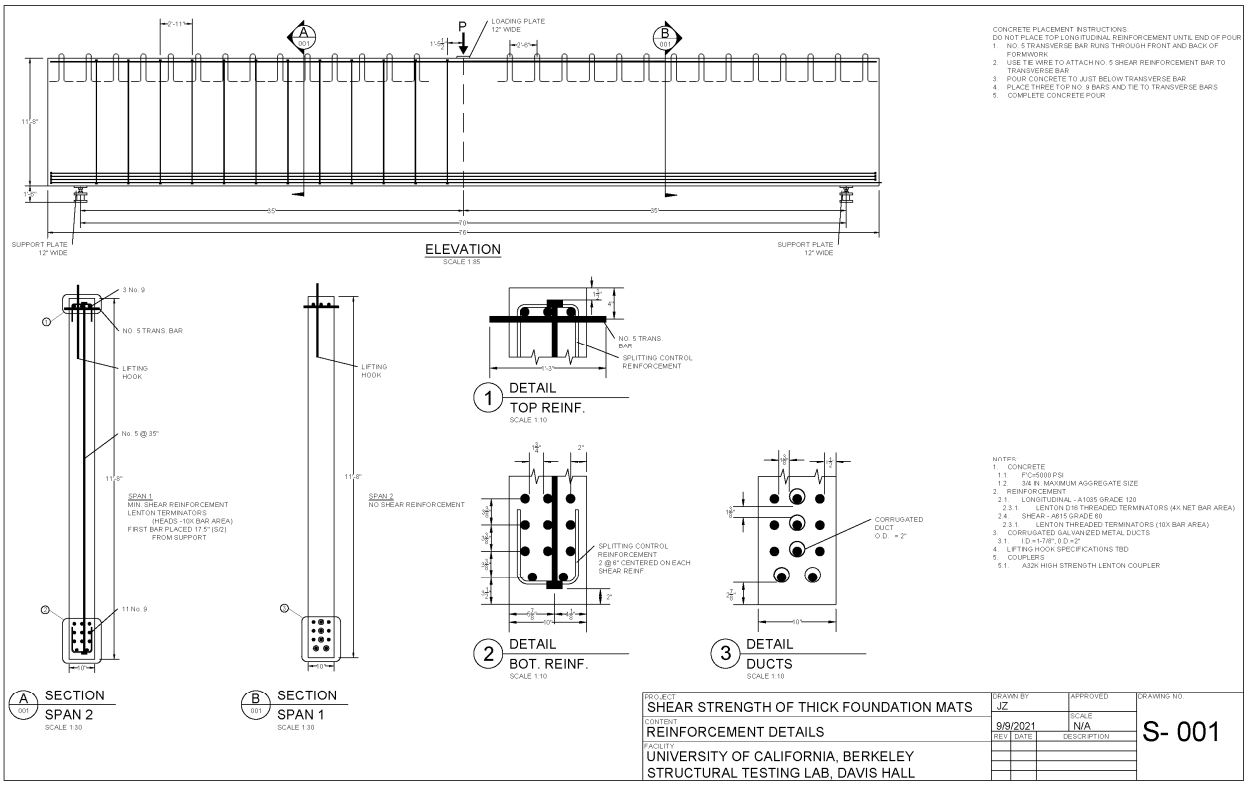

Figure 1. Test specimen details.

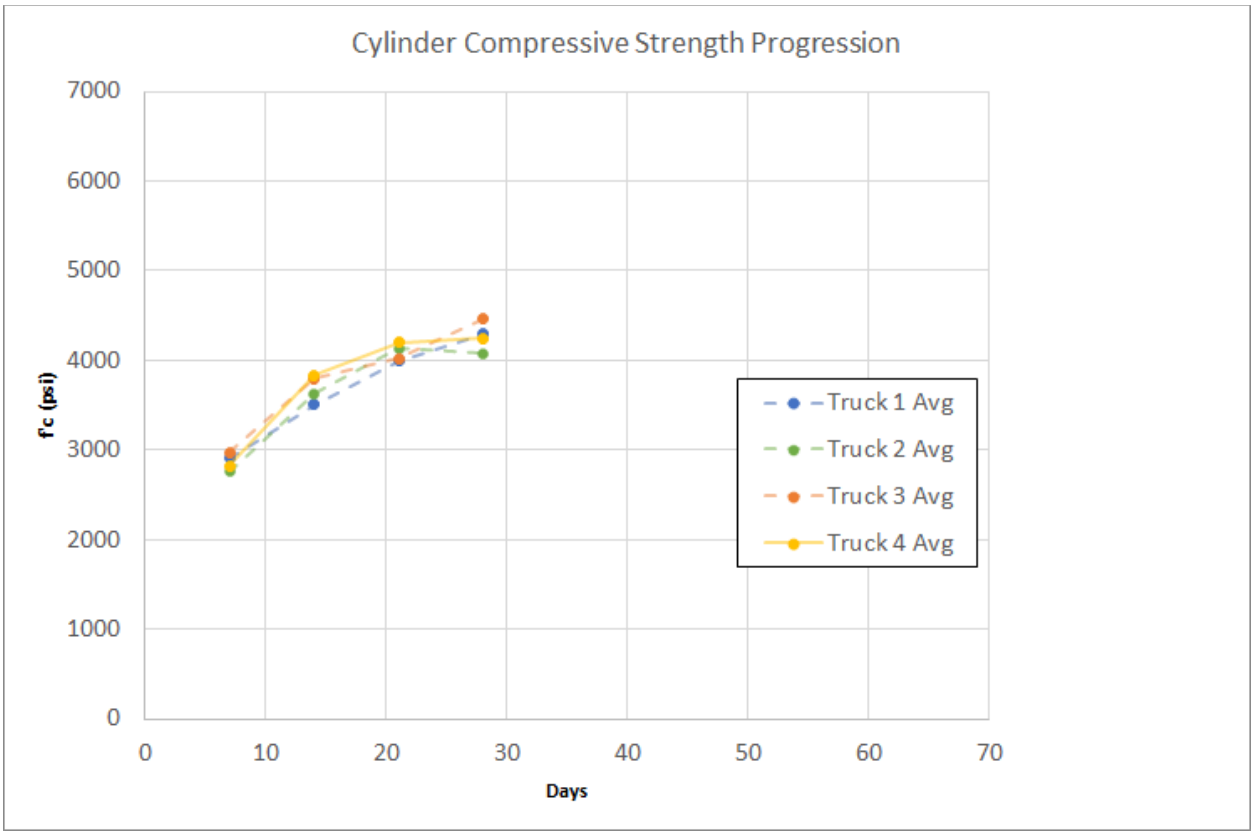

Figure 2. Concrete strength development.