Structural Performance of Fiber-Reinforced and Welded Wire Fabric-Reinforced Concrete Composite Slabs

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Thesis submitted to the faculty of the
Virginia Polytechnic Institute and State University
In partial fulfillment of the requirements for the degree
Master of Science
In
Civil Engineering

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December 12, 2006
Blacksburg, Virginia

Keywords: composite slabs, synthetic fibers, welded wire fabric, secondary reinforcement, residual strength

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Abstract

The purpose of this research is to evaluate and compare the structural performance of composite floor slabs reinforced with 6 x 6 W1.4/W1.4 welded wire fabric (WWF) and STRUX 90/40 synthetic macro fibers. Slabs were subjected to flexural strength tests and concentrated load tests while monitoring load, steel deck strains, and deflections. Test results obtained from this test program were also compared to results from a similar test program conducted in 2001. Tests were also performed to obtain the average residual-strength of the fiber-reinforced concrete using the ASTM C 1399 (2003) standard test.

All slabs were loaded until a complete failure was observed. The observed failure loads were compared to failure loads calculated by design guides published by the American Society of Civil Engineers (ASCE) and the Steel Deck Institute (SDI).

The flexural strength tests showed that composite slabs reinforced with synthetic macro fibers and WWF exhibited strength and behavior that was almost identical. The observed values of strength were also within the range that was predicted by ASCE prediction models. At a typical office design load of 70 psf, all slabs exhibited midspan deflections that were much smaller than those necessary for serviceability requirements.

The concentrated load tests also showed that the observed strength of all composite slabs tested was above those values predicted by ASCE and SDI models. However, an effective comparison between the WWF-reinforced and synthetic macro fiber-reinforced slab was difficult due to a poor shear bond in the latter slab prior to testing.

The results of the ASTM C 1399 test verified the ability of concrete reinforced with synthetic macro fibers to meet average residual-strength values recommended by the SDI.

Acknowledgements

I would like to express my gratitude to Dr. W. Samuel Easterling for his guidance and assistance in this project. I greatly appreciate the opportunity he gave me to do this research. I am also thankful for the help received from Dr. Carin Roberts-Wollmann and Dr. Thomas Murray as members of my research committee.

I owe a great deal of thanks to W.R. Grace for providing the funding for this project. I also appreciate the assistance and recommendations given by Alex Reider.

Many people contributed in some way to this project; I couldn't have completed this research on my own. I would like to thank my fellow grad students who assisted me in the lab in one way or another. And special thanks go to Clark Brown, Brett Farmer, and Dennis Huffman for their technical expertise and insight. Without them, my work at the lab would not have been possible.

I am grateful to the rest of the faculty of the Structural Engineering and Materials Department at Virginia Tech for their valuable learning experiences.

I would like to thank all of my friends here at Virginia Tech for their support, both academically and socially. They have truly made my experiences here unforgettable. And thanks to all of my friends back home in Connecticut that I grew up with. They have given me friendship and support throughout the years, and I know they always will.

And most importantly I would like to thank my parents, Victor and Roberta, and my sister, Christine, for all of their love and support. They have always given me encouragement and instilled the proper goals and values in me. Thanks for always being there.

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a = depth of equivalent rectangular stress block = $A_s F_y / 0.85 f`_c b$

a_p = distance from end of slab to loaded beam in a flexural strength test

ARS = average residual strength

A_s = cross-sectional area of steel deck

b = unit width of slab

b = average width of ARS test beam

b_2 = width of the load area in the transverse direction

b_3 = width of the load area in the longitudinal direction

b_d = total width of composite slab

b_e = effective transverse slab width using the SDI method

b_m = width of load area and two times the depth of concrete and/or topping

B_b = width of deck bottom flange

B_e = effective slab width using the ASCE Method

B_t = width of deck top flange

C = compressive force in the concrete

C_s = cell spacing

d = effective slab depth, distance from top of slab to centroid of steel deck

d = average depth of ARS test beam

d_d = overall depth of steel deck profile

D_w = width of deck web

e_1 = distance from C-resultant force to top of steel deck

e_2 = distance from C-resultant force to mid-height of deck web

e_3 = distance from C-resultant force to bottom of steel deck

E_c = modulus of elasticity of concrete

E_s = modulus of elasticity of steel deck

f_c = casting stress in steel deck due to fresh concrete

F_y = yield strength of steel

f_{yc} = corrected yield strength of steel

$f`_c$ = compressive strength of concrete

h = nominal out-to-out depth of slab

h_c = depth of concrete above top corrugation of steel deck

I_c = moment of inertia of composite section based on cracked section

I_d = moment of inertia of composite section considered effective for deflection computations

I_{sf} = moment of inertia of steel deck based on full cross sectional deck area

I_u = moment of inertia of composite section based on uncracked section

k = average residual strength dimension factor = L / bd^2

K = bond force transfer property

K_1 = steel section depth influence factor

K_2 = mechanical bond factor

K_3 = slab width factor

L = clear span between supports

ℓ_e = length of embossment

ℓ_f = length of span or shored span

$\ell`_i$ = length of shear span

ℓ_{nf} = length of clear span

M = moment due to concrete and steel deck load

M_{et} = calculated bending moment at first yield per unit width

M_n = calculated ultimate bending moment per unit width

M_t = calculated bending moment modified for bond limitations per unit width

M_{test} = observed test moment

n = modular ratio

N = number of cells in test slab width

N_h = number of horizontal elements in embossment pattern length

N_v = number of vertical elements in embossment pattern length

P = maximum applied load indicated by laboratory test equipment

P_i = recorded load at specified deflections with i = A, B, C, and D

p_h = embossment height

p_s = embossment intensity factor

s = length of repeating embossment pattern

S_c = cracked section modulus

S_p = positive deck section modulus

$SS1$ = variable for calculating K_2 dependent on length of clear span

$SS2$ = variable for calculating K_2 dependent on length of clear span and $f`_c$

t = thickness of ungalvanized steel deck

t_c = cover depth of the concrete, or distance from top of slab to top of steel deck

t_t = thickness of durable topping

T_i = deck element tension forces with i = 1 to 3

w = average width of embossment

w_d = distributed load due to concrete and steel deck

w_{et} = calculated distributed load at first yield

w_n = calculated distributed load at ultimate strength

W_r = average deck rib width

w_t = calculated distributed load modified for bond limitations

w_{test} = observed maximum distributed load

y_{cc} = distance from neutral axis of composite section to top of slab

y_{cs} = distance from neutral axis of composite section to bottom of slab

y_{sb} = distance from center of gravity of steel deck to bottom of slab

Z = distance between neutral axis and center of gravity of steel deck for SDI computations

Δ = calculated midspan deflection

ρ = reinforcement ratio of steel deck area to effective concrete area

CHAPTER 1
INTRODUCTION

The use of composite floor slab systems in steel framed buildings is a standard practice in today's construction industry. A composite slab is defined as a slab system comprising normal weight or lightweight structural concrete placed permanently over cold-formed steel deck in which the steel deck performs dual roles of acting as a form for the concrete during construction and as positive reinforcement for the slab during service. When the concrete hardens over the steel deck, a mechanical interlock is formed resulting in the unit action of the two materials. The extent of this composite action depends on the interaction at the interface of the two materials. The main shear transfer device present in composite slabs are rolled embossments on the flanges and webs of the deck. The advantages of composite slab construction over reinforced concrete slabs include the light weight of the steel deck and the ease with which it is handled and erected. By serving as the formwork for the fresh concrete as well as the positive moment reinforcement for the composite slab, there are considerable cost savings associated with time and construction.

The first use of steel decking to support a concrete floor was seen in a 1926 patent filed by Loucks and Gillet (Davison and Nethercot, 2003). In this early development, the steel deck provided all the structural resistance and concrete was added to give a level surface and provide fire resistance. The first composite slabs, as we know them today, began to appear in the 1950s. The first product, known as Cofar, was a trapezoidal deck section and included cold drawn wires welded transversely across the deck to aid in mechanical bonding. In 1961, the Inland-Ryerson Company produced a trapezoidal metal deck with indentations rolled into the profile, known as embossments, to achieve a horizontal shear transfer between the steel deck and concrete. This was a large advantage over the welded shear wires because it now allowed the steel decks to be nested together for shipping and storage purposes (Davison and Nethercot, 2003). By 1967, a number of steel manufacturers were producing their own composite steel decks and it had become apparent that a single design standard was needed. The American Iron and Steel Institute initiated a research project at Iowa State University to develop a design approach for

composite slabs. This research formed the basis for the American Society of Civil Engineers (ASCE) composite slab standards (ASCE, 1992).

Currently, two design approaches exist for determining the strengths of composite floor slabs. The first was introduced by ASCE (1992) and the second by the Steel Deck Institute (1997). These documents present standards for the structural design, construction and testing of composite slabs

A common practice in the construction of composite floor slabs is the use of welded wire fabric (WWF) as secondary reinforcement to control cracking associated with volume changes in the concrete due to shrinkage and temperature changes. However, there are disadvantages related to the use of WWF. Positioning the wire mesh correctly requires a significant amount of time and labor. WWF on a construction site is an added tripping hazard and increases site congestion. There are costs related to shipping the mesh as well as the crane time required to move it.

An alternative to WWF is the use of synthetic fiber reinforced concrete, in which fibers are mixed with the fresh concrete at a specific proportion. Mixing allows the fibers to become evenly distributed throughout the concrete, therefore improving the resistance to crack development. The use of synthetic fibers offers significant reductions in the time, cost, and hazards associated with placing wire mesh.

Because WWF has long been an industry standard as the secondary reinforcement in composite floor slabs, there is little data supporting the effects that its exclusion, or the inclusion of synthetic fibers, would have on strength. Therefore the purpose of this research was to compare the structural performance of composite slabs with WWF as secondary reinforcement to slabs with synthetic fiber-reinforced concrete.

1.1 Objective

The objective of this project was to compare the influence of two types of secondary reinforcement on the strength and behavior of composite slabs under a variety of loading conditions. The two types of secondary reinforcement are 6 x 6 W1.4/W1.4 WWF and STRUX 90/40 synthetic macro fibers (STRUX). This comparison allows us to establish, through test data, the adequacy of synthetic fibers as an alternative to WWF for secondary reinforcement. Ten slabs were cast during the course of this research. Six

simple span composite slabs were cast and subjected to flexural strength tests; half were reinforced with WWF and half were reinforced with STRUX. Four simple span composite slabs were cast and subjected to a variety of concentrated load tests. Of these slabs only one was reinforced with WWF; the other three were reinforced with STRUX. In addition to the slab tests, the average residual strength of the concrete mix reinforced with STRUX 90/40 was determined using the ASTM C 1399 standard test. Serviceability performance with respect to the control of temperature and shrinkage cracks was not addressed in this research. The test results are also compared to values predicted by current design standards presented by the ASCE and SDI.

1.2 Scope

For the first set of tests, six 10 ft simple-span composite slabs were constructed and tested using a modified flexural strength test. All specimens were constructed with 20 gauge, 2 in. rib height cold-formed steel deck (2VLI20 deck), 4.5 in. total slab thickness, and consisted of two adjacent deck panels for a total width of 6 feet. The concrete used was normal weight, with a nominal compressive strength of 3,000 psi. Two batches were made for the slabs reinforced with WWF and STRUX, respectively. Three of these specimens were reinforced with WWF and three with STRUX. The wire mesh was 6 x 6 W1.4/W1.4 WWF and the synthetic fibers were in the amount of 3 lb/yd^3 (fiber volume fraction 0.2%). Properties of STRUX 90/40 are presented in Table 1-1.

Table 1-1: STRUX 90/40 Properties

Property	STRUX 90/40
Fiber Length	40 mm (1.575 in)
Specific Gravity	0.92
Absorption	None
Modulus of Elasticity	1,400 ksi (9.5 Gpa)
Tensile Strength	90 ksi (620 Mpa)
Melting Point	320°F (160°C)
Ignition Point	1,094°F (590°C)
Alkali, Acid & Salt Resistance	High

Note: Information provided by W.R. Grace & Co. –Conn.

For the second set of tests, two 10 ft simple-span composite slabs were constructed and tested under concentrated line and point loads. All specimens were constructed with 20 gauge, 2 in. rib height cold-formed steel deck (2VLI20 deck), 5.5 in. total slab thickness, and consisted of three adjacent deck panels for a total width of 9 feet. The concrete used was normal weight, with a nominal compressive strength of 3,000 psi. One of these specimens was reinforced with WWF and one with STRUX. The secondary reinforcement used was the same as those used for the first set of tests. Following the tests of these slabs, two additional simple-span composite slabs were cast. These slabs had a smaller 8 ft span and were cast with nominal 2,500 psi concrete. These slabs were constructed and tested in exactly the same manner as the initial two, except that both were reinforced with STRUX.

For each slab specimen, two 6 in. x 12 in. concrete cylinders were cast to obtain the concrete compressive strength of the respective slab on the day of testing. Twelve concrete beams were cast using the STRUX-reinforced mixture for the ASTM C 1399 "Standard Test Method for Obtaining Average Residual-Strength of Fiber-Reinforced Concrete". The ASTM C 1399 standard and the results are explained in Chapter 5.

1.3 Report Organization

A summary of previous research related to the objectives and scope of this report are presented in the Literature Review in Chapter 2. The investigation of composite slabs subjected to modified flexural strength tests is detailed in Chapter 3. This chapter outlines the test setup, procedure, and results of the flexural strength tests. Comparisons are also made between the experimental and calculated results of these tests. A complete set of tabulated test data for the modified flexural strength tests is found in Appendix A. The investigation of composite slabs subjected to concentrated load tests is detailed in Chapter 4. This chapter outlines the test setup, procedure, and results of all concentrated load tests. A complete set of tabulated test data for the concentrated load tests is found in Appendices B–E. A description and results of the ASTM C 1399 Standard test method for determining the average residual strength of fiber-reinforced concrete are presented in Chapter 5. A summary of all test results, followed by conclusions and recommendations, are presented in Chapter 6.

CHAPTER 2
LITERATURE REVIEW

A considerable amount of research on composite slabs has been performed in the past and the behavior is generally well understood. Past research formed the basis for design methods published by both the Steel Deck Institute and American Society of Civil Engineers. The first comprehensive series of tests that analyzed the behavior of composite slabs was conducted at Iowa State University in 1967. These tests were conducted on single-span, simply supported specimens (Luttrell, 1995). This test program resulted in the development of the "shear bond" method which then provided the basis for the 1984 and the subsequent 1992 ASCE standard (Heagler et al., 1997).

Early in the 1980's research was initiated by SDI at West Virginia University to study the effect that more realistic conditions had on composite slabs. The investigation focused on end restraints, multi-panel deck widths and continuity, the use of welded wire fabric, and in-situ testing (Heagler et al., 1997). This research was then expanded to include multi-span full scale testing at Virginia Polytechnic Institute. Six foot wide specimens were placed in a three span condition; one of the exterior spans was tested at a time with a uniform load (Terry and Easterling, 1994).

Tests were conducted by various researchers that demonstrated the inadequacy of design standards related to concentrated loads on composite slabs that existed at the time. Test data gathered by Roeder suggested that the capacity of the composite slab to resist concentrated loads was much higher than suggested by current design methods (Roeder, 1981). Roeder concluded that the loaded deck panel directly supported approximately 50% of an applied concentrated load, and the remainder was evenly distributed to adjacent panels.

A study was conducted at West Virginia University (Mullennex, 1993) to develop transverse load distribution criteria for composite floor slabs subjected to concentrated loads. The results of Mullenex compared well with the results of Roeder in terms of the loads observed during testing. The composite slabs tested in the research were simple spans using normal weight structural concrete and light gage cold-formed steel deck. At the time, it was a common practice to assume a "strip width" over which the load acts,

which proved to not be realistic. Results of the research showed that the design standards at the time, which were based off one-way slab design, were very conservative and underestimated the ability of a composite slab to distribute a concentrated load.

This research was followed by additional tests in 1995 at West Virginia University to formulate a more analytical method for the design of composite slabs for non-uniform loading conditions (Luttrell, 1995). Six simple-span test specimens were constructed with total depths ranging from 5 – 7 in. Four of the slabs were subjected to concentrated loads at various positions and the other two were loaded with line loads. Luttrell was able to model the behavior of composite slabs during non-uniform loading conditions by directly relating the deflected curvature, steel strains, and depth of cover. Luttrell then derived an equation to describe the actual effective width of a slab subjected to a concentrated load. The method presented by Luttrell showed that the effective widths of composite slabs with relatively shallow cover can be predicted with a high degree of accuracy, whereas a slab's ability to distribute a concentrated load is severely underestimated by the ASCE design method and can be slightly overestimated by the SDI design approach.

Most of this past research involved the use of WWF as the secondary reinforcement in the test specimens. The design specifications for composite slabs were not developed on the premise that synthetic fibers would be used as secondary reinforcement.

A series of tests were conducted in 1994 at McGill University in Canada to investigate the effect that the use of steel fiber reinforcement in composite slabs had on crack width while under two-point concentrated line loading (Ibrahim and Jannoulakis 1994). The tests used composite slab specimens reinforced with variable volume fractions of steel fibers and equivalent specimens reinforced with WWF. For each type of reinforcement used, six specimens were constructed with variations in slab depth, steel deck gage and flute depth. By comparing crack widths seen in specimens reinforced with steel fibers to equivalent specimens reinforced with WWF, it was concluded that crack widths decreased as the proportion of steel fibers increased. Test results also showed that crack widths were smaller in specimens reinforced with steel fibers than those equivalent specimens reinforced with WWF. Specimens reinforced with steel fibers proved to be

more resistant to flexure than those reinforced with WWF. And being in agreement with all other studies associated with concentrated loads on composite slabs, the ultimate loads obtained during testing were higher than the calculated loads predicted by current design standards.

In 2001, research was done at Virginia Tech to evaluate and compare the influence of four types of secondary reinforcement on various component strengths related to composite slabs (Guirola et al., 2001). Testing was done to compare the strength and behavior of composite slabs under uniform and concentrated loads. Slabs were reinforced with WWF, two different volume fractions of steel fibers, and synthetic fibers. The first set of testing used four triple-span composite floor slabs, each using a different secondary reinforcement, tested under uniform load. The second set of tests used four single-span composite floor slabs, each using a different secondary reinforcement, tested under various concentrated loads. The same concentrated loading conditions used in the 2001 research were used for tests in this project and are explained in Chapter 4. Test results showed that all slabs failed in a similar manner and followed the same failure patterns. Slabs reinforced with steel fibers had the highest ultimate strength, and the ultimate strength increased with an increase in steel fibers. Slabs reinforced with synthetic fibers and WWF exhibited behavior and strength that were similar. At a load of 70 psf (a typical office design load), all slabs had similar load-deflection relationships and met all serviceability deflection requirements. It was also clear that the ASCE method used to predict ultimate loads underestimated the load distribution capacity of composite slabs with concentrated loads, whereas the method developed by Luttrell provided an accurate estimate.

For comparison purposes, some results observed by Guirola are included in this thesis. In this regard, this document also acts to compile research conducted at Virginia Tech that focuses on the structural impacts that a multitude of secondary reinforcements have on composite slabs. To distinguish results, all tests conducted by Guirola in the 2001 test program at Virginia Tech are referred to as the 2001 tests in this thesis. All results from the current test program are referred to as the 2006 tests. Test results observed by Guirola are also compared to values calculated through prediction models.

In these cases, all calculations were done using measured values that were reported in the 2001 thesis (Guirola et al., 2001).

CHAPTER 3
MODIFIED FLEXURAL STRENGTH TESTS OF COMPOSITE SLABS

3.1 Test Parameters

Six 10 ft simple-span composite floor slabs were constructed; three were reinforced with STRUX at a fiber volume fraction of 0.2% (3 lb/yd^3) and three were reinforced with 6 x 6 W1.4/W1.4 WWF. All specimens were constructed with 20 gauge, 2 in. rib height cold-formed steel deck, 4.5 in. total slab thickness, and consisted of two adjacent deck panels for a width of 6 ft. The main shear transfer device present in the composite slabs that were tested consisted of Type III (ASCE, 1992) rolled embossments on the flanges and webs of the deck. No shear studs were used in the test setup. Each slab was to be loaded with transverse line loads at 1/3 points until failure as shown in the elevation view of Figure 3-1.

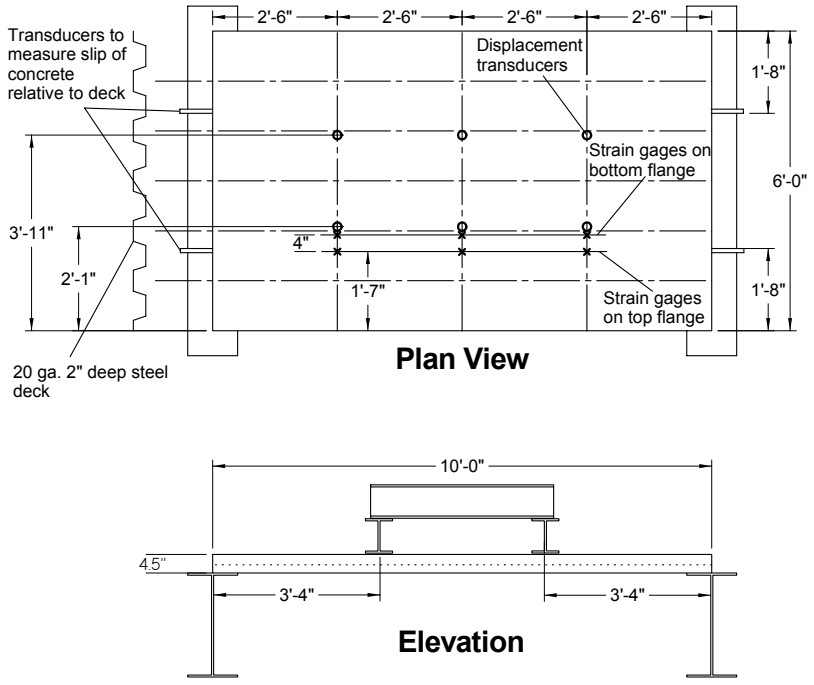

Figure 3-1: Test specimen and instrumentation for flexural strength tests

All specimens were constructed in the same manner. The steel deck was ordered cut to length. Strain gages were attached at the locations shown in Figure 3-1, following

the removal of the deck galvanizing in those areas. The steel deck was placed on the beam supports and adjacent deck sheets were connected by button punching. The deck was welded to the supports by 3/4 in. nominal spot welds at a spacing of 12 in. Pour stops were fit and screwed into the steel deck. For the specimens reinforced with WWF, chairs were used to seat the WWF off the surface of the deck by about 1 in. A threaded rod was fastened horizontally through the pour stop transversely at midspan to support the lateral pressure of the fresh concrete.

All slabs were cast on December 16, 2005. Concrete from the first batch was used to cast the composite slabs reinforced with WWF. A second batch of concrete was used to cast the composite slabs reinforced with the synthetic macro fibers. Fibers were weighed to meet the target fiber volume fraction of 0.2% and added to the concrete, allowing them to mix for a minimum of five minutes. Concrete slump was measured and water was added to the mix as needed. The concrete for all specimens was normal weight. Details of the concrete mix designs are presented in Table 3-1.

Table 3-1: Mix design details

	STRUX Mix 1	WWF Mix 1	STRUX Mix 2
Casting Date	12/16/2005	12/16/2005	6/16/2006
Mix Design Specification (psi)	3000	3000	2500
78 Stone (lbs/yd^3)	1400	1400	1400
Sand (lbs/yd^3)	1700	1700	1700
Cement (lbs/yd^3)	400	400	376
Fly Ash (lbs/yd^3)	70	70	94
Water (gal/yd^3)	35	35	35
Water Reducer (oz/yd^3)	24	24	23
Air Entrainment (oz/yd^3)	3	3	3
STRUX Macro Fibers (lbs/yd^3)	3	N/A	3

The steel deck was unshored during the concrete placement, and strains in the steel deck and deflections due to casting were not recorded. Two 6 in. x 12 in. concrete cylinders were cast for every slab that was constructed. Slabs and cylinders were covered with plastic and kept moist for seven days, after which the pour stops were removed. Cylinder molds were not removed until prior to the first flexural strength test, about a month after being cast. All slabs remained in place for a minimum of 28 days prior to

any testing. To prevent any damage to the slabs, they were tested in the same position in which they were cast.

3.2 Test Setup

A steel test frame was constructed and bolted to the reaction floor. This frame could be unbolted and moved to each slab as testing progressed. Two cross beams, resting on thin rubber pads, were placed transversely across the entire width of the composite slab at 1/3 points (40 in. from the end). A third beam was placed on top the two cross beams, aligned longitudinally to the slab. A hydraulic jack attached to the load frame was positioned over the center of the third beam, so that any applied load was evenly distributed to the two cross beams. The load cell was positioned between the hydraulic jack and the load frame. The test setup is depicted in Figure 3-2. Dimensions of all steel members that were resting on the composite slab were measured so that the effective load already on the slab could be factored into the acquired test data. All loads in this chapter are presented as a uniform load (psf). This equivalent uniform load was converted from the applied load, P, shown in Figure 3-2 using the equation:

$$w = \frac{8Pa}{12L^2}$$

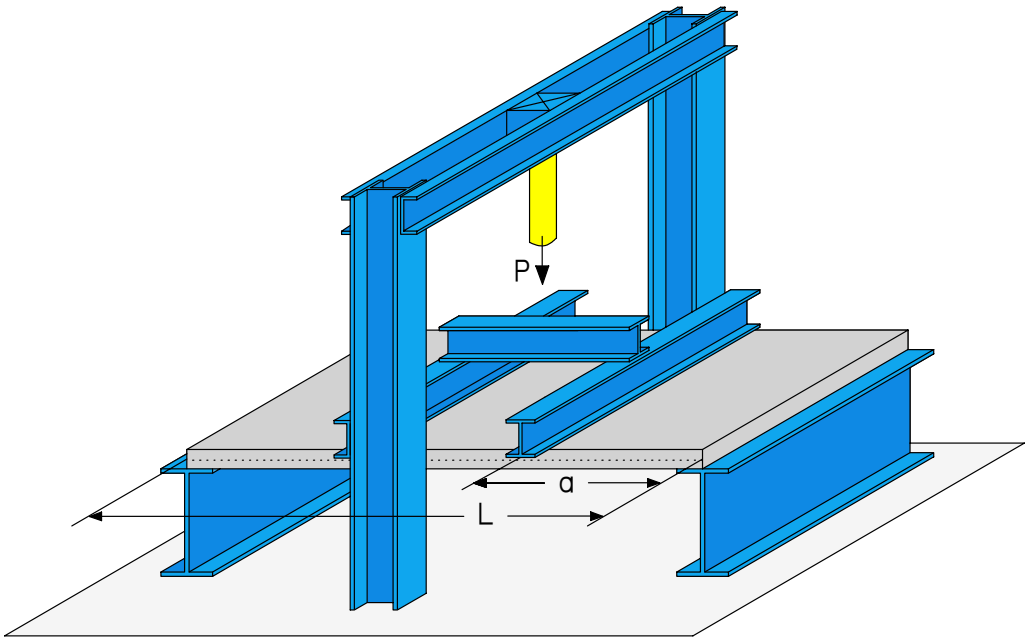

Figure 3-2: Test setup for composite slabs subjected to flexural strength test

3.3 Instrumentation

For testing, six strain gages were attached to the bottom of the steel deck as shown in Figure 3-1. Following the removal of galvanizing from the area, the gages were positioned at midspan and both quarter points. At each of the three span locations, one strain gage was placed on the bottom of the top flange and one was placed on the bottom of the bottom flange as shown in Figure 3-3.

To measure deflections, six displacement transducers were placed beneath the steel deck as shown in Figure 3-1. Each instrument was calibrated prior to its installation, and each was checked before beginning any tests. The transducers were positioned at midspan and at both quarter points. Two transducers were placed at each of the three span locations as shown in Figure 3-3.

Four displacement transducers were used to measure slip between the steel deck and the concrete. These instruments were calibrated and checked before any tests. Two transducers were positioned at each end of the slab as shown in Figure 3-1. A cross sectional view of the steel deck and previously described instrumentation is shown in Figure 3-3.

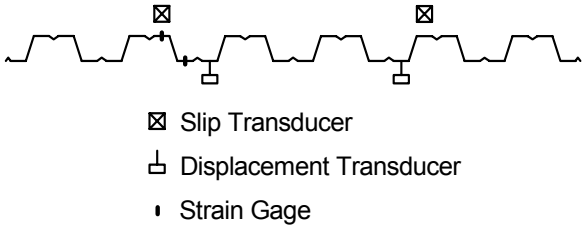

Figure 3-3: Cross-sectional view of deck and instrumentation locations for modified flexural strength tests at one quarter point

Load was measured during the tests using a 50 kip load cell. The load cell was calibrated prior to testing. All instruments were connected to a computer based data acquisition system so that all measurements could be monitored and recorded. Refer to Appendix A for all instrument names and locations used during modified flexural strength testing.

3.4 Test Procedure

The test procedure for all slabs was the same. The methods used for testing were the same as recommended by the ASCE Standard (ASCE, 1992) with the exception that pin and roller supports were not used. Prior to applying any loads or placing any steel members, all instrumentation was zeroed and a baseline recording was made. Then the steel members were placed on the slab and put into position, after which a second reading was taken. The slab being tested was then preloaded to approximately 100 psf in an effort to allow the specimen to settle and to ensure that all instrumentation was functioning properly. The slab was then unloaded and allowed to settle. Load was applied up to approximately 275 psf, including steel beam self weight, in increments of about 45 psf (2000 lb applied jacking force). Measurements were recorded at each load increment. Once the first visual crack appeared, test control was changed from load control to centerline displacement control. Recordings were taken approximately every 0.1 in. of maximum deflection. Testing was terminated after yielding of the steel deck; marked by the significant decrease in load carrying ability. All cracks formed during the test were noted and marked, but crack widths were not recorded.

Tensile coupons were machined from untested sheets of steel deck and tested for the actual yield strength of the steel. Four tensile coupons were tested, and the average of all results was taken. Coupon testing was performed in accordance with ASTM E8-04 (2004). Results of all performed coupon testing are presented in Appendix F. The average measured yield stress for the steel decks was 54.14 ksi. On the day a slab was tested, two concrete cylinders were also tested to obtain the compressive strength of the material. Cylinder tests were performed in accordance with ASTM C39-01 (2003). The measured compressive strengths obtained, shown in Table 3-2, were used for all calculations.

3.5 General Results of Flexural Strength Tests

The three slabs reinforced with STRUX 90/40 and the three slabs reinforced with WWF all exhibited similar behavior during the tests. As the load was applied, the measured deflections and strains all exhibited relatively linear behavior. Between 70 – 150 psf before maximum load, clicking and popping sounds could be heard as the

concrete began to debond from the steel deck. At the ultimate load, a transverse crack in the concrete formed at the location of one of the cross-beams marking the point at which the concrete was completely debonded from the steel deck. There was then an immediate slip between the steel deck and one of the outer 1/3 sections of concrete, depending on at which cross-beam the crack formed. Upon first cracking, the load dropped and the deflections increased significantly. As more load was applied, deflections, strains, and end slip would increase. Testing was terminated once the midspan deflection reached about 1.5 – 2.0 in.

A portion of the test results from the 2006 and 2001 flexural strength tests are presented in Table 3-2. Both sets of data are being included in this table as a means of comparison. A summary of the 2001 flexural strength test results is included Section 3.6. The current test results are summarized below.

Table 3-2: Experimental results from modified flexural strength tests

	Test Designation	f`c (psi)	Fy (ksi)	Maximum Load (psf)	Midspan Deflection at Max. Load (in)	End Slip at Max. Load (in)
2006 Results	WWF-1	4300	54.1	316	0.227	0.0001
	WWF-2	4800	54.1	354	0.305	0.0005
	WWF-3	4400	54.1	315	0.320	0.0009
	STRUX-1	3500	54.1	278	0.262	0.0001
	STRUX-2	3300	54.1	311	0.272	0.0003
	STRUX-3	3300	54.1	315	0.272	0.0002
2001 Results	WWF-1	4000	50	367	0.810	0.070
	WWF-2	4000	50	315	0.481	0.013
	XOREX25-1	4300	50	282	0.179	0
	XOREX25-2	4300	50	387	0.757	0.013
	XOREX50-1	5800	50	417	0.482	0
	XOREX50-2	5800	50	359	0.224	0
	MICROFIBER-MD-1	4250	50	360	0.278	0
	MICROFIBER-MD-2	4250	50	347	0.291	0

2001 test results from Guirola et al. (2001)

The results from the 2006 testing show that the highest measured failure load was obtained by WWF-2 (354 psf) and the lowest measured failure load was obtained by

STRUX-1 (278 psf). The other four slabs all obtained failure loads that were within 1.6% of each other (311 – 316 psf).

The applied loads versus midspan deflections of all six tests are shown in Figure 3-4. The midspan deflections shown in the figure, as well as subsequent figures, are equal to the average of the two measured midspan deflections for each test. It can be seen from this figure that the performance of all six composite slabs was very similar. Figure 3-5 shows the applied load versus midspan deflection of all six tests up to the maximum measured load. This figure is a better representation of the composite slab performance in the range of typical service loads. At a standard office design load of 70 psf, midspan deflections range from about 0.025 – 0.065 in. These deflections are very small compared to the serviceability limit of 0.33 in. for a 10 ft span (L/360 for live loads).

The test results of all six slab specimens that were subjected to flexural strength testing are found in Appendix A. For every specimen, a summary of test parameters and properties are included, as well as the crack profile of the specimen at the termination of the test. Measured test data is tabulated for load, vertical displacements, horizontal end slip, and deck strains of the top and bottom flanges. Graphical plots are also included for applied load versus midspan deflection and average end slip, applied load versus quarter point deflection, and applied load versus deck strains.

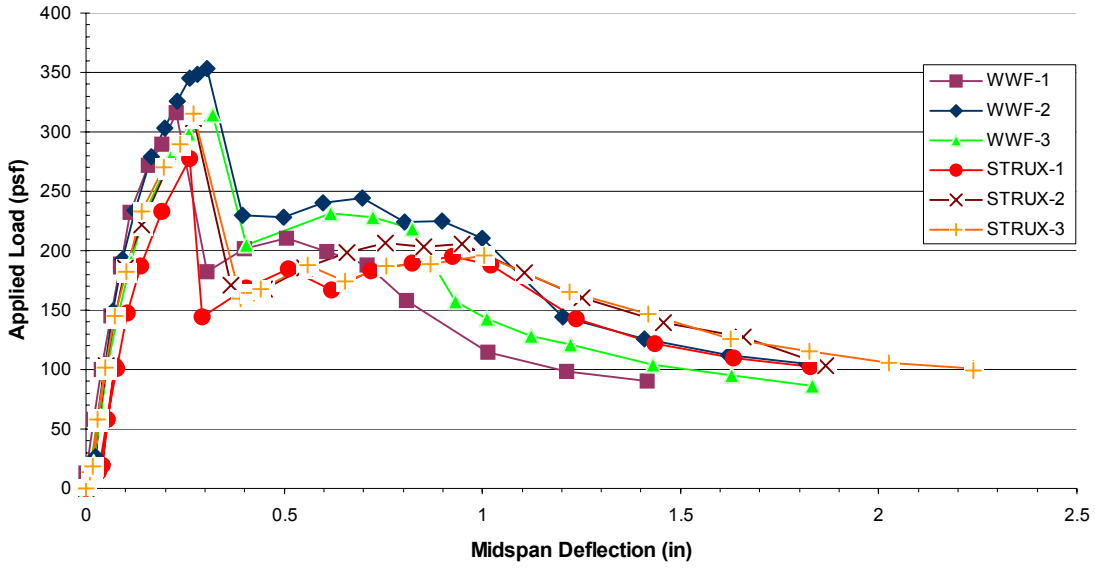

Figure 3-4: Applied load versus midspan deflection for all six tests

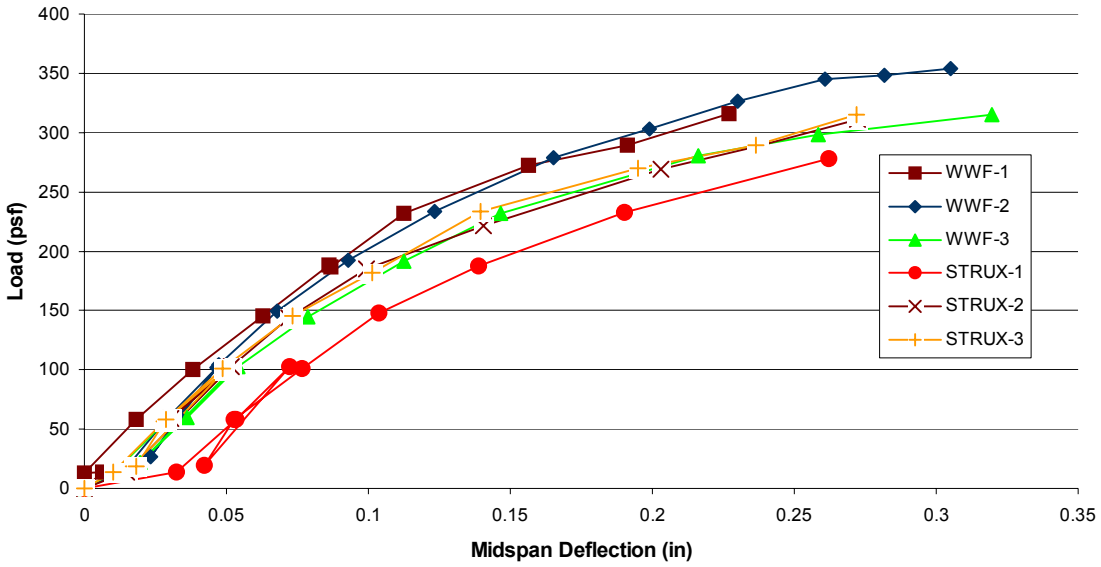

Figure 3-5: Applied load versus midspan deflection for all six tests up to maximum load

3.6 General results from the 2001 Flexural Strength Tests

This section summarizes results from the composite slab testing conducted at Virginia Tech in 2001. From Table 3-2, the WWF specimens made use of 6x6 W2.9/W2.9 welded wire fabric. The XOREX25 and XOREX50 specimens refer to steel fibers in the quantities of 25 lb/yd^3 and 50 lb/yd^3, respectively. And MICROFIBER-MD specimens refer to synthetic micro fibers in the quantity of 1.5 lb/yd^3. Each specimen is labeled with a -1 or -2, which denotes the test on one of the exterior spans of the test specimen. The parameters of this past experimentation were very similar to the present testing, so the results are being included in this report as a means of comparison. However, the test setups for both instances of research were different. In 2001, each slab was arranged as a continuous deck system with two 10 ft exterior spans and a 4 ft interior span. Note that the cold-formed steel deck was not continuous – it was arranged as simply supported with a continuous concrete slab cast over it. Only one exterior span was loaded at a time using a large air bag to represent a distributed load. The test setup for the current research was explained previously in Section 3.2. Figure 3-6 below shows a schematic of the two different loading conditions used during testing in 2001 and 2006.

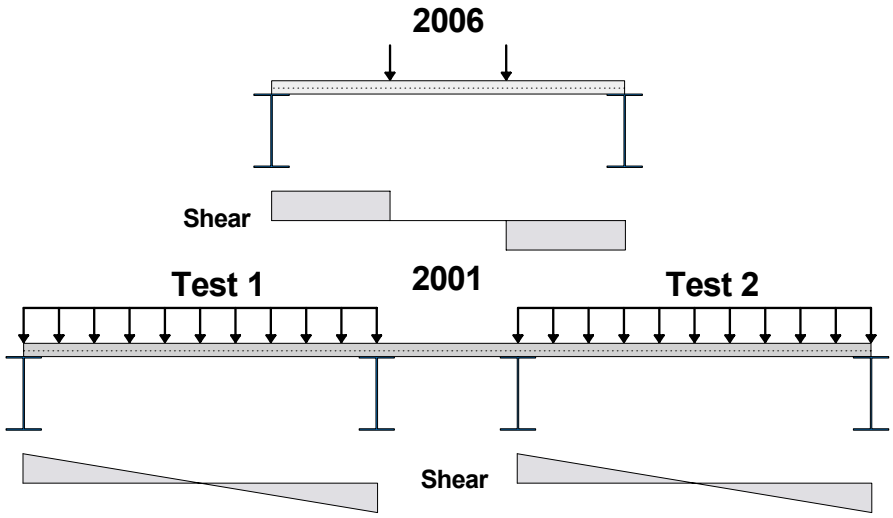

Figure 3-6: Schematic of loading conditions in 2001 and 2006 testing

The differences in span condition and load application proved to lend themselves considerably to differences in slab behavior and capacity during testing. A shear diagram of the two test setups is shown below its respective figure to demonstrate the difference in the shear gradients. In the 2006 tests, the maximum shear occurred from the end to the third point of the slab. In the 2001 tests, the maximum shear occurred at a point at the end of the slab. The resulting difference in slab behavior is apparent in Figure 3-7 below, which shows the graphs of applied load versus midspan deflection for the 2001 and 2006 test specimens together. Notice from this figure that the failure loads of all specimens were very similar, however the specimen reinforced with XOREX50 had a slightly higher strength. Figure 3-7 is also presented below to give a better representation of the composite slab performance in the range of typical service loads.

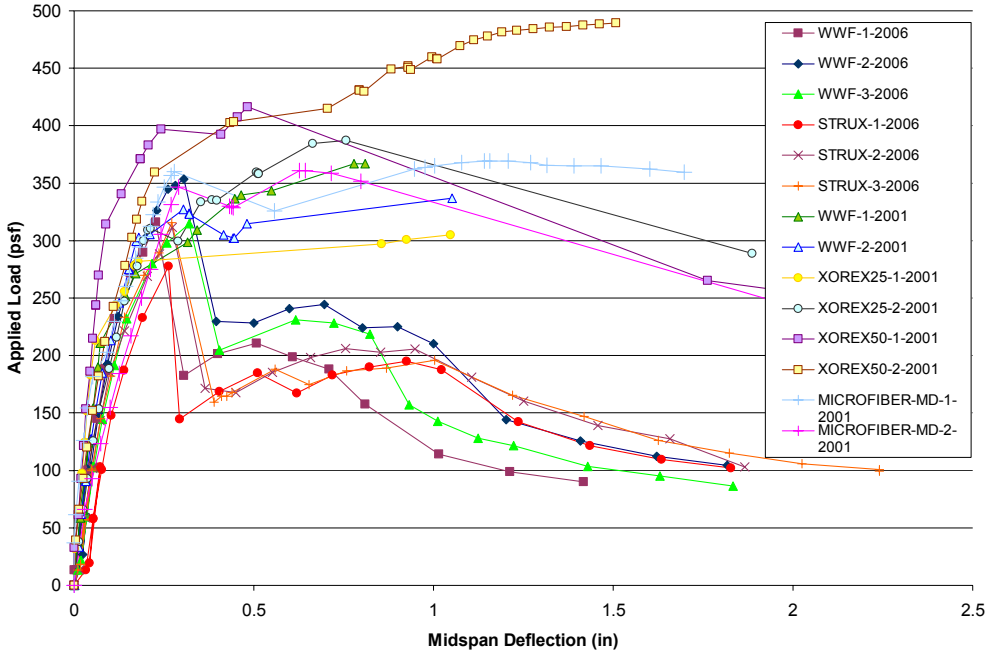

Figure 3-7: Applied load versus midspan deflection for the 2001 and 2006 flexural strength tests

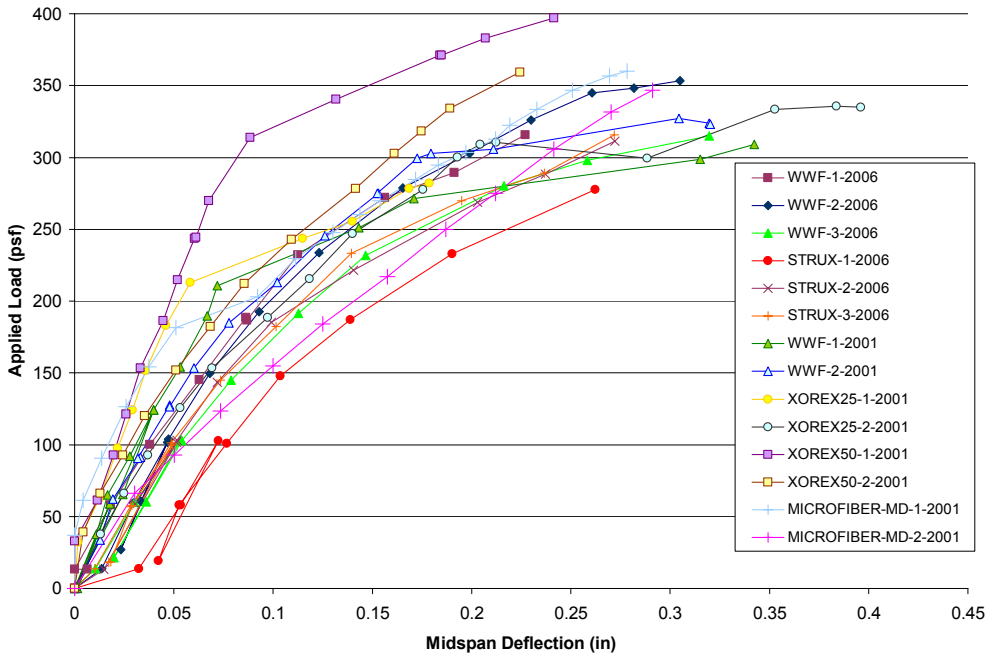

Figure 3-8: Close-up of applied load versus midspan deflection for the 2001 and 2006 flexural strength tests

Refer to the results from the 2001 flexural strength tests that were summarized in Table 3-2. Note that, in this case, the maximum load is not the highest load reached by the slab during the entire test. The maximum load in this table instead refers to the highest load reached before the initial failure. The initial failure was marked by the point where there was a significant drop in load, a large increase in deflection, or a sudden jump in end slip. In the 2006 tests, once this maximum load was reached the load simply dropped as failure progressed, which is apparent from Figure 3-7. In the 2001 tests, there was often a strength gain after the initial failure. Even after a significant end slip or increase in deflection, some slabs exhibited a substantial amount of additional load carrying ability. This was most likely due to the fact that the concrete of these test specimens was continuous over three spans. In the 2001 tests there was no negative moment reinforcement over the supports, and when the first crack formed over the support the slab being tested was assumed to be simply supported. However, the presence of secondary reinforcement, especially in the form of many interlocked fibers, should have offered at least some strength over the support. The ultimate loads that were reached on these slabs are summarized in a later section.

From the 2001 results seen in Table 3-2, it is clear that the XOREX50 specimens were the strongest of the four. If the average maximum load for each specimen type is taken, the initial failure loads of slabs reinforced with WWF, XOREX25, and MICROFIBER-MD (341, 335, 354 psf, respectively) are about equal. Also, from Figure 3-8, it should be noted that at a standard office design load of approximately 70 psf, midspan deflections ranged from about 0.01 – 0.03 in. These deflections are very small compared to the maximum allowed for serviceability, which is about 0.33 in (L/360 for live loads).

3.7 Individual Results of Composite Slabs for 2006 Flexural Strength Tests

3.7.1 WWF Reinforced Composite Slab 1

WWF-1 was the first composite slab reinforced with WWF to be tested. The test of the slab and corresponding concrete cylinders took place on February 2, 2006. The maximum load applied to the span was 316 psf. The average compressive strength of the concrete cylinders was 4300 psi. The failure of the slab was marked by a sudden crack and an instantaneous slip. At the maximum load, just before failure, the average midspan deflection and end slip were 0.23 in. and 0.0001 in., respectively. Immediately after failure, the average midspan deflection and end slip increased to 0.31 in. and 0.036 in., respectively. At the termination of the test, the average midspan deflection and end slip were 1.42 in. and 0.359 in., respectively. By the termination of the test, the crack that formed at failure had extended to the upper surface of the slab. Other flexural cracks that formed after failure were marked and noted. The applied load versus midspan deflection and end slip are shown in Figure 3-9. Values predicted by ASCE models, such as First Yield, Appendix D Alternate Method, and Ultimate, are also included in this figure. These prediction models are explained in Section 3.8.

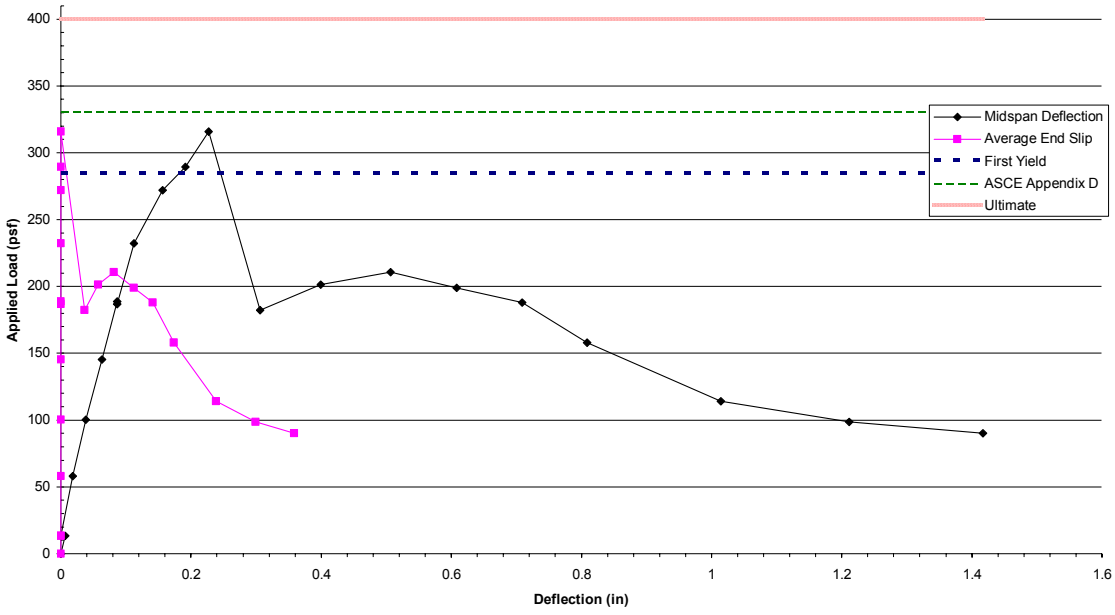

Figure 3-9: Applied load versus midspan deflection and average end slip for WWF-1

3.7.2 WWF Reinforced Composite Slab 2

WWF-2 was the third composite slab reinforced with WWF to be tested. The test of the slab and corresponding concrete cylinders took place on February 28, 2006. The maximum load applied to the span was 354 psf. The average compressive strength of the concrete cylinders was 4800 psi. The failure of the slab was marked by a sudden crack and an instantaneous slip. At the maximum load, just before failure, the average midspan deflection and end slip were 0.31 in. and 0.0005 in., respectively. Immediately after failure, the average midspan deflection and end slip increased to 0.40 in. and 0.042 in., respectively. At the termination of the test, the average midspan deflection and end slip were 1.82 in. and 0.494 in., respectively. By the termination of the test, the crack that formed at failure had extended to the upper surface of the slab. Other flexural cracks that formed after failure were marked and noted. The applied load versus midspan deflection and end slip are shown in Figure 3-10. Values predicted by ASCE models, such as First Yield, Appendix D Alternate Method, and Ultimate, are also included in this figure. These prediction models are explained in Section 3.8.

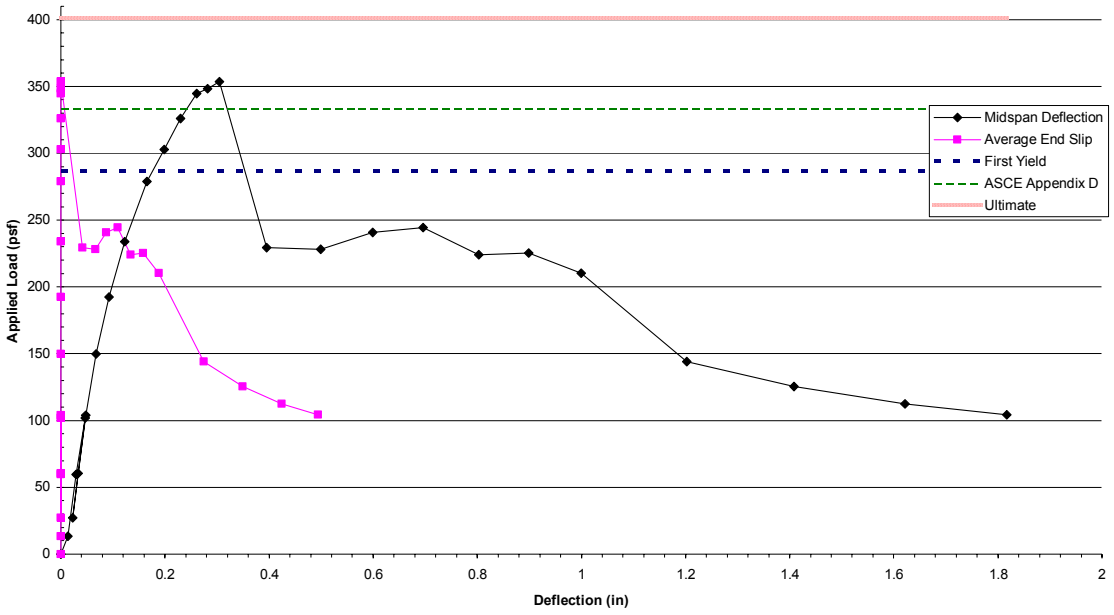

Figure 3-10: Applied load versus midspan deflection and average end slip for WWF-2

3.7.3 WWF Reinforced Composite Slab 3

WWF-3 was the second composite slab reinforced with WWF to be tested. The test of the slab and corresponding concrete cylinders took place on February 27, 2006. The maximum load applied to the span was 315 psf. The average compressive strength of the concrete cylinders was 4400 psi. The failure of the slab was marked by a sudden crack and an instantaneous slip. At the maximum load, just before failure, the average midspan deflection and end slip were 0.32 in. and 0.0009 in., respectively. Immediately after failure, the average midspan deflection and end slip increased to 0.40 in. and 0.080 in., respectively. At the termination of the test, the average midspan deflection and end slip were 1.83 in. and 0.881 in., respectively. By the termination of the test, the crack that formed at failure had extended to the upper surface of the slab. Other flexural cracks that formed after failure were marked and noted. The applied load versus midspan deflection and end slip are shown in Figure 3-11. Values predicted by ASCE models, such as First Yield, Appendix D Alternate Method, and Ultimate, are also included in this figure. These prediction models are explained in Section 3.8.

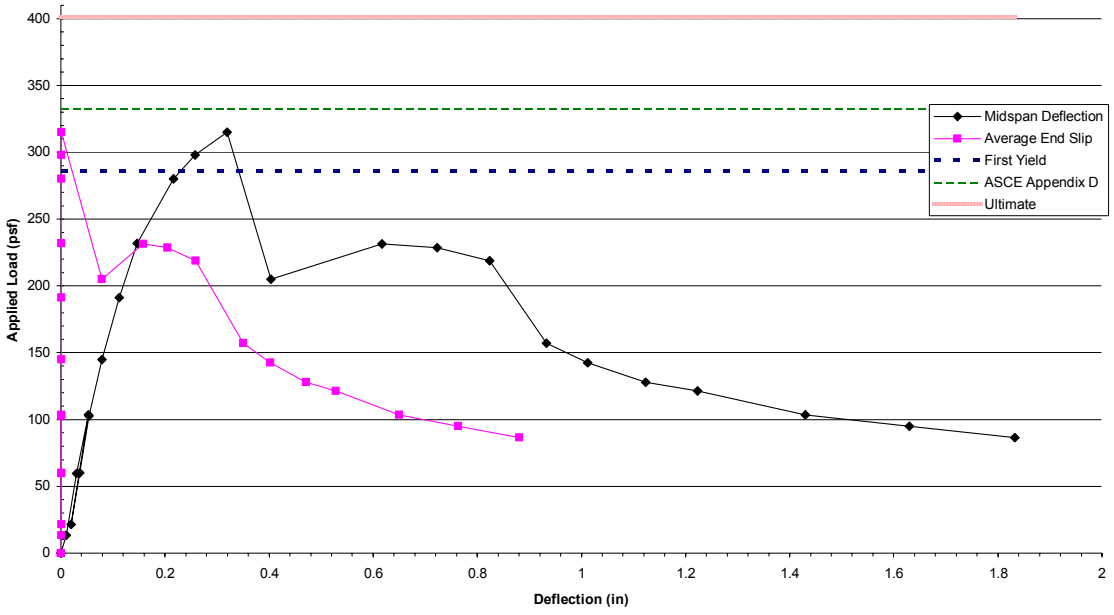

Figure 3-11: Applied load versus midspan deflection and average end slip for WWF-3

3.7.4 Fiber Reinforced Composite Slab 1

STRUX-1 was the third composite slab reinforced with synthetic macro fibers to be tested. The test of the slab and corresponding concrete cylinders took place on February 16, 2006. The maximum load applied to the span was 278 psf. The average compressive strength of the concrete cylinders was 3500 psi. The failure of the slab was marked by a sudden crack and an instantaneous slip. At the maximum load, just before failure, the average midspan deflection and end slip were 0.26 in. and 0.0001 in., respectively. Immediately after failure, the average midspan deflection and end slip increased to 0.29 in. and 0.054 in., respectively. At the termination of the test, the average midspan deflection and end slip were 1.83 in. and 0.849 in., respectively. By the termination of the test, the crack that formed at failure had extended to the upper surface of the slab. Other flexural cracks that formed after failure were marked and noted. The applied load versus midspan deflection and end slip are shown in Figure 3-12. Values predicted by ASCE models, such as First Yield, Appendix D Alternate Method, and Ultimate, are also included in this figure. These prediction models are explained in Section 3.8.

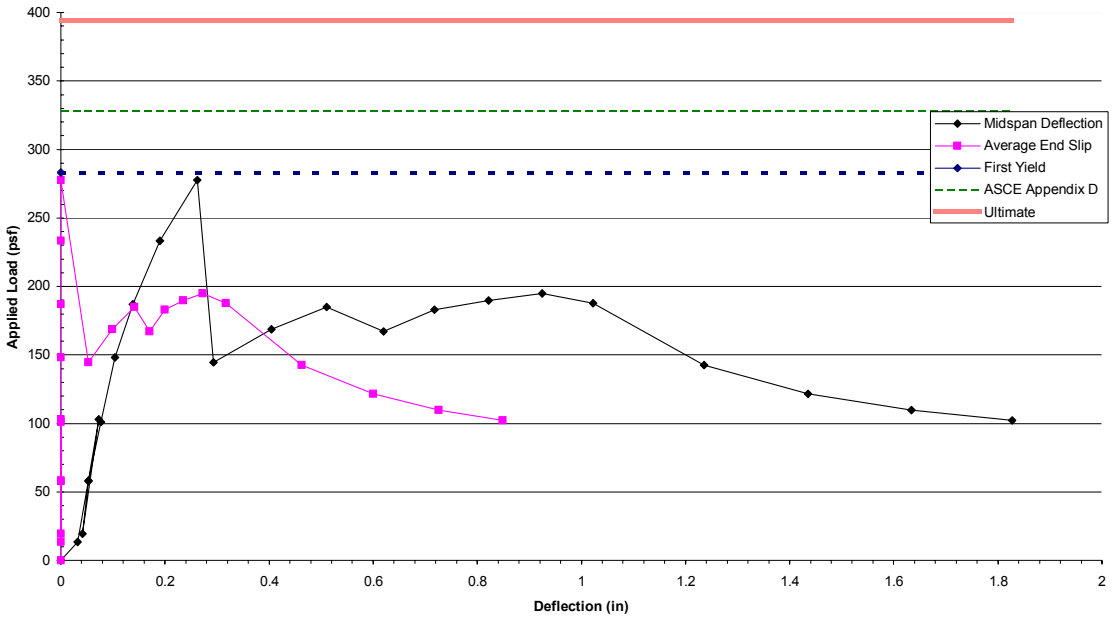

Figure 3-12: Applied load versus midspan deflection and average end slip for STRUX-1

3.7.5 Fiber Reinforced Composite Slab 2

STRUX-2 was the second composite slab reinforced with synthetic macro fibers to be tested. The test of the slab and corresponding concrete cylinders took place on February 9, 2006. The maximum load applied to the span was 311 psf. The average compressive strength of the concrete cylinders was 3300 psi. The failure of the slab was marked by a sudden crack and an instantaneous slip. At the maximum load, just before failure, the average midspan deflection and end slip were 0.27 in. and 0.0003 in., respectively. Immediately after failure, the average midspan deflection and end slip increased to 0.36 in. and 0.047 in., respectively. At the termination of the test, the average midspan deflection and end slip were 1.87 in. and 0.493 in., respectively. By the termination of the test, the crack that formed at failure had extended to the upper surface of the slab. Other flexural cracks that formed after failure were marked and noted. The applied load versus midspan deflection and end slip are shown in Figure 3-13. Values predicted by ASCE models, such as First Yield, Appendix D Alternate Method, and Ultimate, are also included in this figure. These prediction models are explained in Section 3.8.

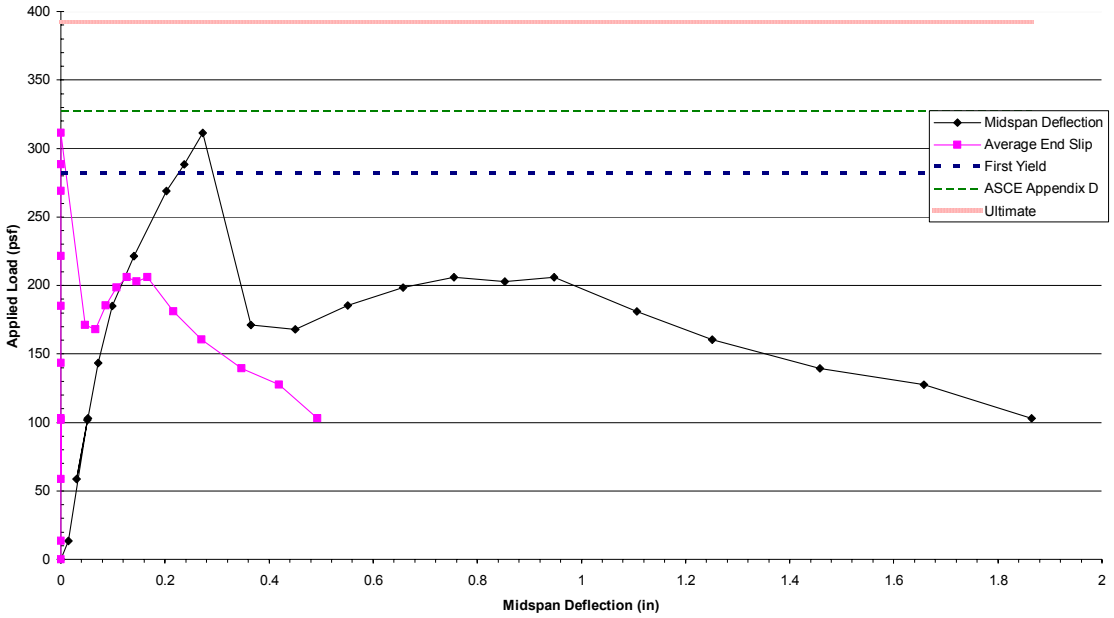

Figure 3-13: Applied load versus midspan deflection and average end slip for STRUX-2

3.7.6 Fiber Reinforced Composite Slab 3

STRUX-3 was the first composite slab reinforced with synthetic macro fibers to be tested. The test of the slab and corresponding concrete cylinders took place on February 6, 2006. The maximum load applied to the span was 315 psf. The average compressive strength of the concrete cylinders was 3300 psi. The failure of the slab was marked by a sudden crack and an instantaneous slip. At the maximum load, just before failure, the average midspan deflection and end slip were 0.27 in. and 0.0002 in., respectively. Immediately after failure, the average midspan deflection and end slip increased to 0.39 in. and 0.047 in., respectively. At the termination of the test, the average midspan deflection and end slip were 2.24 in. and 0.518 in., respectively. By the termination of the test, the crack that formed at failure had extended to the upper surface of the slab. Other flexural cracks that formed after failure were marked and noted. The applied load versus midspan deflection and end slip are shown in Figure 3-14. Values predicted by ASCE models, such as First Yield, Appendix D Alternate Method, and Ultimate, are also included in this figure. These prediction models are explained in Section 3.8.

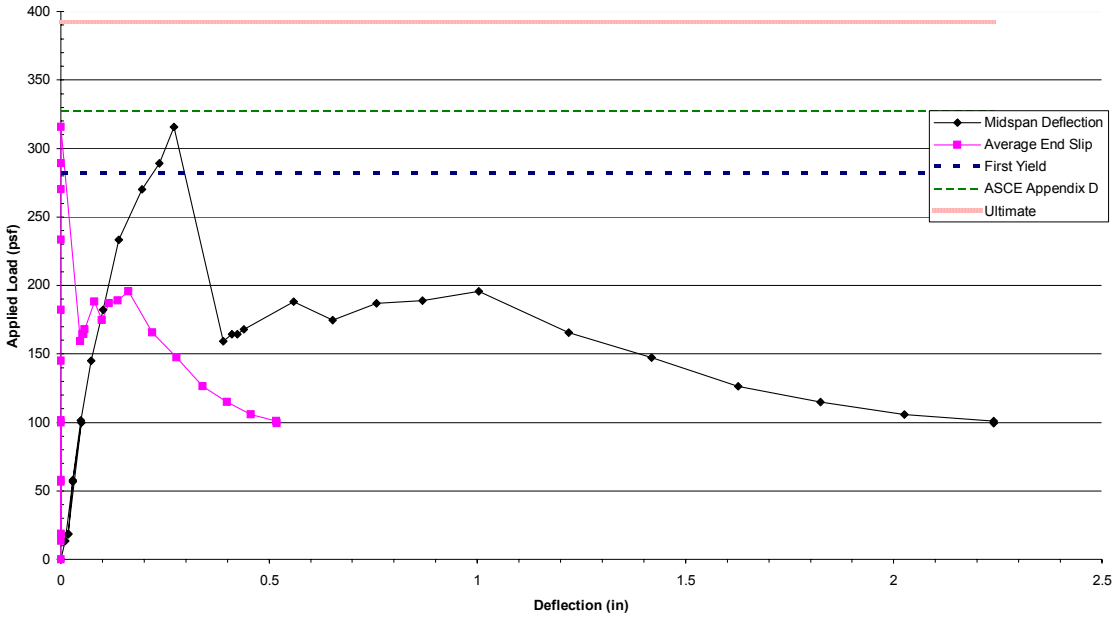

Figure 3-14: Applied load versus midspan deflection and average end slip for STRUX-3

3.8 Evaluation of Results

3.8.1 Analysis using the ASCE Standard for the Structural Design of Composite Slabs

This section details the First Yield Method and the Appendix D Alternate Method for predicting the strength of composite slabs and compares the predictions to actual test data. These methods are detailed in the ASCE Standard for the Structural Design of Composite Slabs (1992).

For deflection calculations, the moment of inertia of the composite section needs to be determined. This is found from the average of a cracked and uncracked moment of inertia. In the following equations, any variables that are not shown in Figure 3-15 are defined.

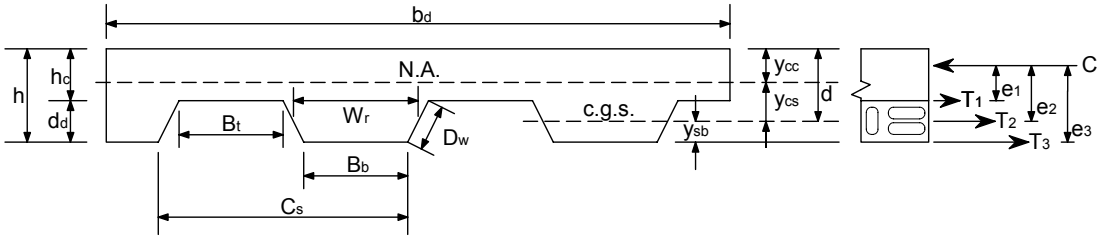

Figure 3-15: Deck cross section dimensions and force locations for First Yield Method calculations (After Guirola et al., 2001)

When calculating the moment of inertia of a cracked section, the following equations apply:

If $y_{cc} \le h_c$ then,

$$y_{cc} = d\{[2\rho n + (\rho n)^2]^{1/2} - \rho n\}$$

If $y_{cc} > h_c$ then use $y_{cc} = h_c$

$$I_c = \frac{b}{3}(y_{cc})^3 + nA_s(y_{cs})^2 + nI_{sf}$$

Where,

A_s = cross-sectional area of steel deck, in^2

ρ = reinforcement ratio of steel deck; A_s / bd

n = modular ratio; E_s / E_c

I_{sf} = moment of inertia of steel deck, in^4 per ft. of width

When calculating the moment of inertia of an uncracked section, the following equations apply:

$$y_{cc} = \frac{0.5bh_c^{\ 3} + nA_s d + W_r d_d (h - 0.5d_d)b / C_s}{bh_c + nA_s + W_r d_d b / C_s}$$

$$I_u = \frac{bh_c^{\ 3}}{12} + bh_c (y_{cc} - 0.5h_c)^2 + nI_{sf} + nA_s y_{cs}^{\ 2} + \frac{W_r b d_d}{C_s}[\frac{d_d^{\ 2}}{12} + (h - y_{cc} - 0.5d_d)^2]$$

The moment of inertia of a composite section considered effective for deflection computations is given by:

$$I_d = \frac{I_u + I_c}{2}$$

This average of the cracked and uncracked composite moments of inertia is recommended by the ASCE based on a review of deflection data from a series of specimen tests. Using this moment of inertia, the deflection during flexural strength testing of a simple span specimen with two symmetrically placed concentrated loads can be calculated by the following equation:

$$\Delta = \frac{Pa}{24E_c I_d b_d}(3L^2 - 4a_p^{\ 2})$$

Where,

a_p = distance from end of slab to cross beams, in this case at $L/3$, in.

b = unit width of slab, in.

b_d = total width of composite slab, ft

P = applied load, lb

L = clear span between supports, in.

E_c = modulus of elasticity of concrete, psi

Δ = midspan deflection due to live load, in.

The maximum stress in the steel deck due to the casting of concrete is calculated by the equation:

$$f_c = \frac{w_d L^2}{8S_p}$$

Where,

f_c = casting stress in steel deck due to fresh concrete, ksi

w_d = distributed load due to concrete and steel deck per unit width, k/in.

S_p = positive deck section modulus, in^3/ft

The calculation of the first yield moment (ASCE, 1992), for a cell of width C_s, is given by the equation:

$$M_{et} = (T_1 e_1 + T_2 e_2 + T_3 e_3)/12$$

$$e_3 = h - y_{cc}/3$$

$$e_2 = e_3 - d_d/2$$

$$e_1 = e_3 - d_d$$

$$T_1 = f_{yc}(B_t t)[(h - y_{cc} - d_d)/(h - y_{cc})]$$

$$T_2 = f_{yc}(2D_w t)[(h - y_{cc} - d_d/2)/(h - y_{cc})]$$

$$T_3 = f_{yc}(B_b t)$$

$$y_{cc} = d\{[2\rho n + (\rho n)^2]^{1/2} - \rho n\}$$

$$f_{yc} = F_y - f_c$$

Where,

M_{et} = first yield moment per unit width, kip-ft/ft

f_{yc} = corrected steel yield stress, ksi

F_y = steel yield stress, ksi

t = thickness of steel deck, in.

T_1, T_2, T_3 = the limiting steel tensile forces set for the top element, the two webs, and the bottom surface respectively for a single cell unit of width C_s, kip

The ASCE Appendix D Alternate Method (ASCE, 1992) adds a factor to the first yield moment to account for the transfer efficiency along the shear span. This factor is influenced by the number of cell widths, the effect of the steel deck depth, and the embossments in the webs. Figure 3-16 below shows the embossment details for the 2VLI20 deck used.

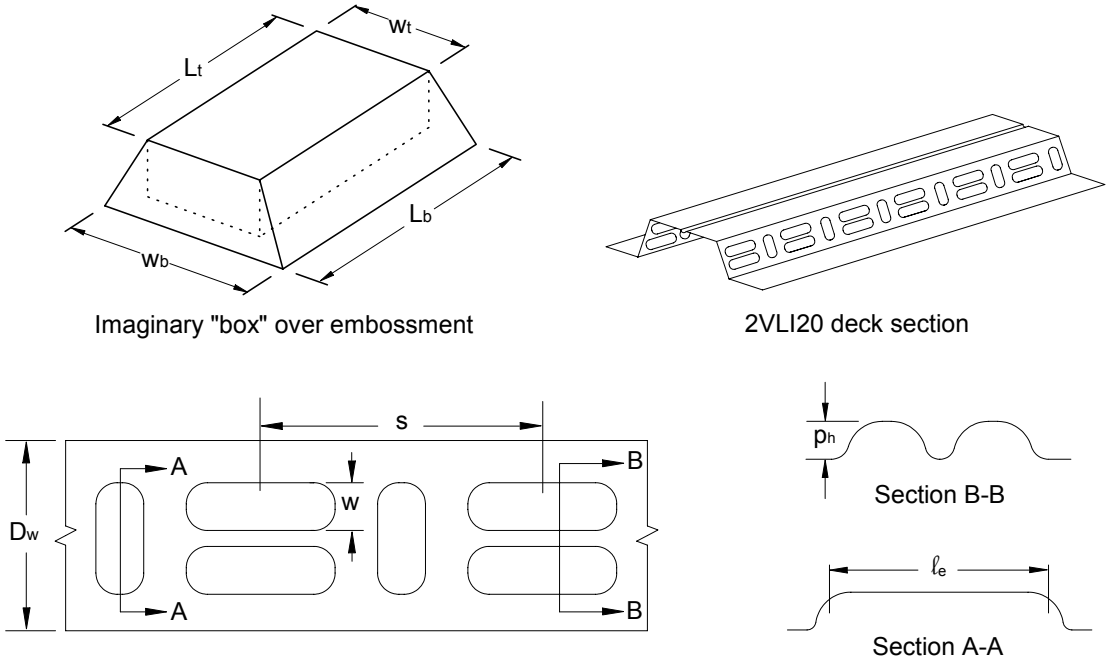

Figure 3-16: Embossment details for 2VLI20 deck

The equation for the calculated bending moment, M_t, is:

$$M_t = KM_{et}(12/C_s)$$

Where,

M_t = bending moment modified for bond limitations per unit width, k-ft/ft

$K = K_3/(K_1 + K_2)$

The factor K_3 establishes the increase in efficiency, with increasing slab width, of average bond transfer per cell.

$$K_3 = 0.87 + 0.0688N - 0.00222N^2 \leq 1.4$$

Where,

$N = 12b_d / C_s$ = the number of cells in the test slab width

The factor K_1 measures the influence of the steel section depth on bond development along the shear span.

$$K_1 = [d_d / 7.8]^{0.5}$$

The factor K_2 is an indicator of mechanical bond performance along the shear span ℓ'_i and depends on the type of deck used. The deck types are distinguished by their embossment patterns, which are explained in the ASCE Standard. For Type I and Type III decks, K_2 is given as:

$$K_2 = \frac{D_w^{0.8} K_3 / SS1}{1.0 + 60(p_h^2 p_s^{1/3})}$$

Where,

$SS1$ = $(3\ell_{nf} / 70)(\ell_{nf} - 14) + 3.6$

p_s = $12\ell_e / s$ for Type I decks

p_s = $12(N_v \ell_e + N_h w) / s$ for Type III decks

p_h = height of embossment, in.

ℓ_{nf} = length of clear span, ft.

ℓ_e = average length of embossment, in. = $(L_b + L_t) / 2$

N_v = number of vertical elements in embossment pattern lengths

N_h = number of horizontal elements in embossment pattern lengths

w = average width of embossment, in. = $(w_b + w_t) / 2$

s = length of repeating embossment pattern, in.

For Type II decks, K_2, which is dependent on the concrete strength f'_c and the span to shear-span ratio, is given as:

$$K_2 = \frac{627 t^2 SS2}{d_d e^x} + t\left(\frac{7}{d_d}\right)^2$$

Where,

$SS2$ = $\frac{f'_c}{5000} + \frac{(12\ell_f / \ell'_i)^{0.5}}{3.6}$

ℓ_f = length of span or shored span, ft.

ℓ'_i = length of shear span, in.

e^x = an exponential function with $x = 25 p_h$

Figure 3-16 above details the embossment pattern and measurements needed to calculate the K_2 factor of a Type III deck as was used in this research. Table 3-3 gives the embossment measurements used for the ASCE Appendix D Alternate Method calculations.

Table 3-3: Embossment measurements of 2VLI20 Type III Deck

Embossment Measurements (in.)			
w_b	0.565	w	0.43
w_t	0.295		
L_b	1.35	ℓ_e	1.225
L_t	1.10		
p_h	0.105		
s	3.32		

The calculated ultimate bending moment per foot of width is given by the equation:

$$M_n = \frac{A_s F_y}{12}\left[d - \frac{a}{2}\right]$$

Where,

M_n = calculated ultimate bending moment, kip-ft/ft

a = depth of equivalent rectangular stress block = $A_s F_y \Big/ 0.85 f`_c b$

3.8.2 Comparison of Experimental and Calculated Results

Using the ASCE Standard, the flexural strengths of all the composite slabs were calculated. The First Yield Method and the ASCE Appendix D Alternate Method were both used. The experimentally measured strengths and the calculated strengths are summarized in Table 3-4. Note that the table includes data for both the 2006 and 2001 test specimens as a means of comparison. Sample calculations for test designation WWF – 1 of both theoretical methods are presented in Appendix G.

Table 3-4: Comparison of experimental and calculated test results for modified flexural strength tests

	Test Designation	Load (psf)				w_{test}/w_{et}	w_{test}/w_t	w_{test}/w_n
		Test Maximum w_{test}	First Yield w_{et}	ASCE Appendix D Alternate Method w_t	ASCE Ultimate w_n			
2006 Results	WWF - 1	316	285	331	400	1.11	0.95	0.79
	WWF - 2	354	287	333	403	1.23	1.06	0.88
	WWF - 3	315	286	332	401	1.10	0.95	0.79
	STRUX - 1	278	283	328	394	0.98	0.85	0.70
	STRUX - 2	311	282	327	392	1.10	0.95	0.79
	STRUX - 3	315	282	327	392	1.12	0.96	0.80
					Mean	1.107	0.953	0.792
					σ	0.079	0.067	0.057
2001 Results	WWF-1	367	298	335	415	1.23	1.09	0.88
	WWF-2	337	298	335	415	1.13	1.00	0.81
	XOREX25-1	305	299	337	418	1.02	0.91	0.73
	XOREX25-2	387	299	337	418	1.30	1.15	0.93
	XOREX50-1	417	303	341	425	1.38	1.22	0.98
	XOREX50-2	489	303	341	425	1.61	1.43	1.15
	MICROFIBER-MD-1	372	299	336	417	1.25	1.11	0.89
	MICROFIBER-MD-2	361	299	336	417	1.21	1.07	0.87
					Mean	1.266	1.123	0.905
					σ	0.176	0.155	0.124

In the 2006 test results, the maximum observed load during testing, w_{test}, was calculated by converting the midspan moments created by point loads in a flexural test to a moment created by a distributed load, and assumes a simply supported structure. In the 2001 test results, w_{test} converted from a pressure (in psi) that was monitored directly from pressure transducers attached to the valves of the air bag. The variables w_{et}, w_t, and w_n refer to the calculated first yield strength, Appendix D flexural strength, and the ultimate capacity, respectively. Note that for any given calculated method, there are slight differences in the results. These variations are caused by the differences in concrete compressive strengths on the day of testing; all other values that factor into the calculations are identical. All calculations were made using measured material properties and a span length of 10 ft. A comparison of the observed results to the calculated results

for the 2001 tests is presented in Section 3.8.3. A comparison for the 2006 test program is given in the remainder of this section.

In the case of the particular Type III steel deck used, the Appendix D method yielded a flexural capacity greater than that calculated by the First Yield Method. The *K* factor limits the bending moment tension force to the maximum force that can be resisted by deck surface bond along the shear span. The limiting force used in the First Yield Method is the actual yield stress of the steel deck while in bending. For the deck profile and embossment details used, a K value of 1.161 was calculated.

Table 3-4 shows that all specimens except one had observed testing strengths that were higher than calculated by the First Yield Method. STRUX-1 had an observed failure load that was slightly less than the calculated first yield. WWF-2 had the highest observed failure load, exhibiting a strength that was almost 24% higher than the calculated first yield. The other four specimens had failure loads were also higher than the calculated first yield load, yet their values deviated very slightly. All observed failure loads, except that of WWF-2, were less than those calculated by the Appendix D method. Generally, it seems that the loads calculated from the ASCE First Yield Method are slightly conservative whereas the Appendix D Alternate Method is slightly unconservative. All experimentally observed failure loads were also well below the ultimate strength as predicted by ASCE. Overall, the Appendix D method yielded calculated strength capacities that were the closest to those observed. In any case, both the measured and calculated strengths were much higher than a typical office design load of 70 psf.

3.8.3 Comparison of Experimental and Calculated Results for the 2001 Tests

Refer back to the results from the 2001 flexural strength tests that were summarized in Table 3-4. In this case, Test Maximum or w_{test}, refers to the highest load reached by the slab within the duration of the test. As seen in the 2006 data, the Appendix D method yields a flexural capacity greater than that calculated by the First Yield Method. For the deck profile and embossment details reported in 2001, a *K* value of 1.127 was calculated. Note that the ultimate loads observed on the slabs were considerably higher in the 2001 testing. This was a direct result of testing a single span

in a continuous span system. The differences in maximum loads should also be attributed to the differences in load application between testing in 2001 and 2006. As shown in Figure 3-6, slabs tested in 2001 used an air bag to distribute load evenly, whereas slabs tested in 2006 used two transverse beams at third points to apply load.

All slab specimens had observed testing strengths that were higher than the loads calculated by the First Yield Method. Also, all specimens except one had observed testing strengths that were higher than the loads calculated by the ASCE Appendix D method. It is apparent from the results that both ASCE methods yield somewhat conservative results when applied to a continuous span system. Also, all experimentally observed failure loads except one were below the ultimate strength as predicted by ASCE. The XOREX50-2 specimen failed at 489 psf, about 15% higher than the predicted ultimate. The actual strength and amount of the steel fibers clearly plays a role in the strength and stiffness of the slab. This is indicated by the fact that the XOREX50-reinforced specimen exhibited failure loads higher than any other slab.

3.9 Summary of Flexural Strength Tests

Of the six composite slabs tested in 2006, a specimen reinforced with welded wire fabric had the highest observed ultimate load. The failure load of WWF-2 was 354 psf; about 12% higher than the other two slabs reinforced with WWF. A specimen reinforced with STRUX 90/40 synthetic macro fibers had the lowest observed ultimate load. The failure load of STRUX-1 was about 12 – 13% lower than the other two slabs reinforced with STRUX. Putting WWF-2 and STRUX-1 aside, the four remaining composite slabs exhibited failure loads that differed by no more than 1.6%. This is evidence that the use of synthetic macro fibers and WWF as secondary reinforcement have very similar effects on the structural strength and behavior of composite slabs.

The average failure load of the three specimens reinforced with WWF was 328 psf. The average failure load of the three specimens reinforced with STRUX was 301 psf. The minimum failure load of all specimens was still much higher than a typical design load of 70 psf for an office building. It is important to note that the concrete compressive strength on the day of testing was considerably higher for all concrete cylinders cast from the WWF mix than the cylinders cast from the STRUX mix. The

average cylinder compressive strength of the specimens reinforced with WWF and STRUX on the day of testing was 4500 and 3400 psi, respectively. The difference is due to the fact that the both mixes originated from two different batches of concrete. The mix designs were identical, but different amounts of water were added to the mix due to a variance in slump upon the arrival of the concrete.

Of the eight composite slab tests conducted in 2001, the specimen reinforced with XOREX steel fibers in the amount of 50 lb/yd^3 had the highest observed ultimate loads. Because each slab was tested twice, once on each of the exterior spans, the average of the two observed loads is used for comparison purposes. The average failure loads of the slabs reinforced with WWF, STRUX25, STRUX50, and MICROFIBER-MD are 352, 346, 453, and 367 psf, respectively. It is clear from these averages that composite slabs reinforced with WWF, XOREX25, and MICROFIBER-MD all had very similar capacities, with average failure loads within 6% of each other. The specimen reinforced with XOREX50 had an average failure load that was almost one-third stronger than the other three specimens. This is a considerable difference, and for applications in typical composite floor slabs, such a strength isn't necessary. It is important to remember that the compressive strength for the XOREX50 specimen was significantly higher than the other three specimens. Refer to Table 3-2 for these compressive strength values.

These 2001 results offer further evidence that fibers are an adequate alternative to WWF as secondary reinforcement in composite slabs. It is apparent from these results that synthetic micro fibers (1.5 lb/yd^3) offer about the same flexural strength as WWF, and that steel fibers (25 lb/yd^3) offer slightly more capacity. These results also show that as the quantity of steel fibers increase (50 lb/yd^3), the flexural strength of the composite slab increases.

CHAPTER 4
CONCENTRATED LOAD TESTS OF COMPOSITE SLABS

4.1 Test Parameters

A total of four composite slabs were constructed for concentrated load testing. Initially, two 10 ft simple-span composite floor slabs were constructed; one was reinforced with STRUX 90/40 at a fiber volume fraction of 0.2% (3 lb/yd^3) and one was reinforced with 6 x 6 W1.4/W1.4 WWF. Two additional 8 ft simple-span composite floor slabs were then constructed; both reinforced with STRUX at a fiber volume fraction of 0.2%. All specimens were constructed with 20 gauge, 2 in. rib height cold-formed steel deck, 5.5 in. total slab thickness, and consisted of three adjacent deck panels for a width of 9 ft. No shear studs were used in the test setup. Each slab was to be loaded at 11 different locations using point loads, transverse line loads, and longitudinal line loads.

All four specimens were constructed in the same manner. The steel deck was ordered cut to length. Strain gages were attached following the removal of the deck galvanizing in those areas. The steel deck was placed on the beam supports and adjacent deck sheets were connected by button punching. The deck was welded to the supports by 3/4 in. nominal spot welds approximately every 12 in. Pour stops were fit and screwed into the steel deck. For the specimen reinforced with wire mesh, chairs were used to seat the WWF off the surface of the deck by about 1 in. A threaded rod was fastened horizontally through the pour stop transversely at midspan to support the lateral pressure of the wet concrete.

The first two slabs were cast on December 16, 2005. Concrete from the first batch was used to cast the composite slab reinforced with WWF. A second batch of concrete was used to cast the composite slab reinforced with the synthetic macro fibers. The last two slabs were cast on June 16, 2006, the mix design for which was presented in Table 3-1. Fibers were weighed to meet the target fiber volume fraction of 0.2% and added to the concrete truck, allowing them to mix for a minimum of five minutes. Concrete slump was measured and water was added to the mix as needed. The concrete for the first two specimens was 3000 psi normal weight concrete, whereas the last two specimens were cast from 2500 psi normal weight concrete. The steel decks were

unshored during the pour, and strains in the steel deck due to casting were only recorded during the June casting date; deflections were not recorded. Two 6 in. x 12 in. concrete cylinders were cast for each of the slabs poured. Slabs and cylinders were covered with plastic and kept moist for seven days, after which the pour stops were removed. Cylinder molds were not removed until prior to the first test, about a month after being cast. All slabs remained in place for a minimum of 28 days prior to any testing. The slabs were tested in the same position that they were cast.

4.2 Test Setup

The first step in building the test frame was to bolt four columns vertically to the reaction floor. Two beams were then bolted from one column to the other horizontally in the direction longitudinal to the span. A cross-beam was then attached, transverse to the span, to the bottom flange of the bolted beams. The test setup is depicted in Figure 4-1. This cross beam was attached using four c-clamps, and could be moved to different positions for each test using an overhead crane. A hydraulic jack was attached to the cross-beam and could be moved along the length of the beam as needed for testing. The load cell was positioned between the hydraulic jack and the cross-beam.

For the concentrated loads, the hydraulic jack was centered over a 9 in. square steel block placed over a 1 in. thick and 10 in. square rubber pad as shown in Figure 4-2. For the line loads, the hydraulic jack was centered over an 8 in. deep, 8 ft long steel beam as shown in Figure 4-3. When testing the 8 ft simple span composite slabs, a shorter beam 5 ft in length was used instead. The beam was placed over a 1/8 in. thick rubber pad to help distribute the load over the length of the beam. The weights of the steel block and beam were not factored into the applied load on the composite slab because their effects were minimal.

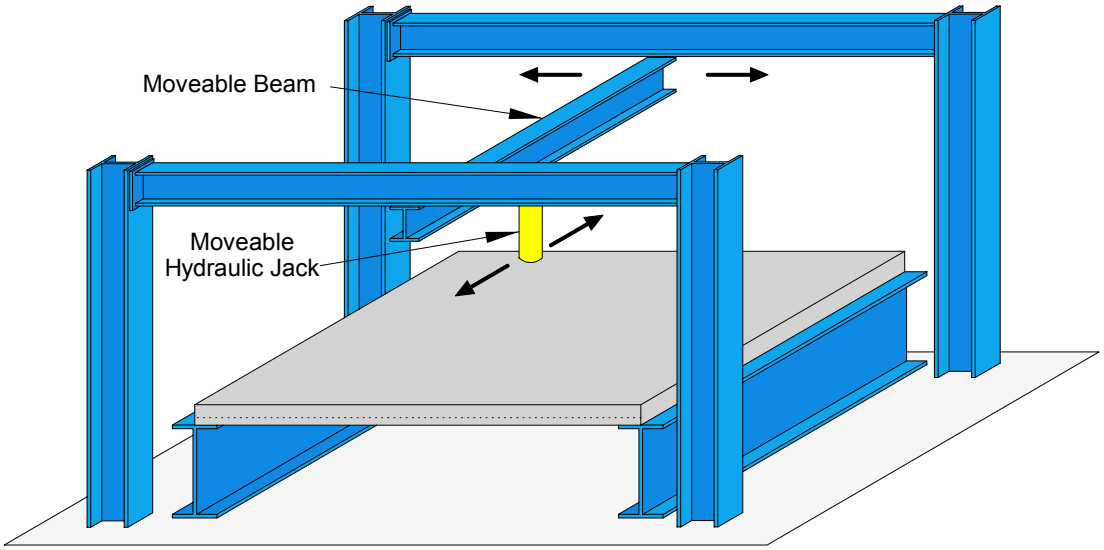

Figure 4-1: Schematic of test setup for composite slabs subjected to concentrated load tests

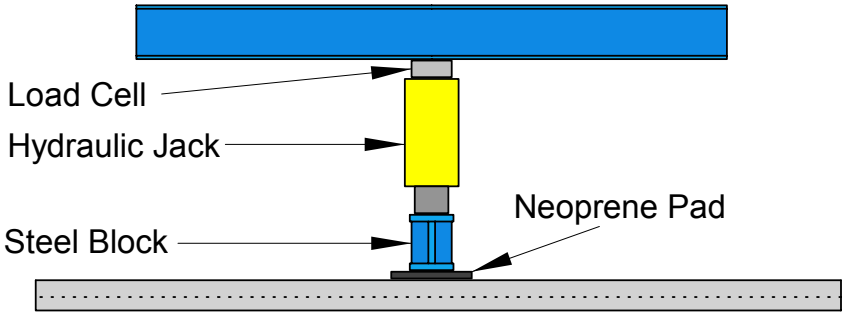

Figure 4-2: Setup detail for concentrated load tests

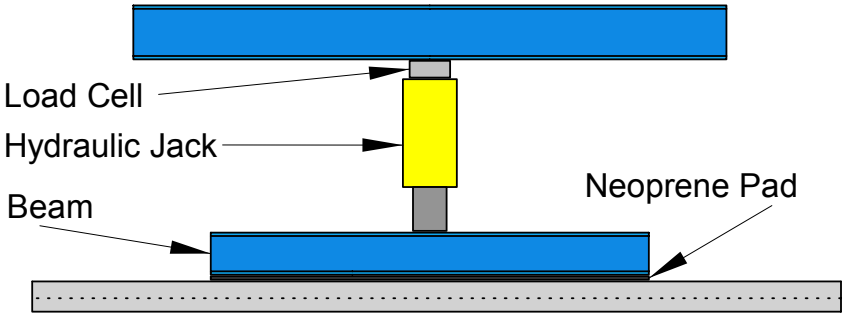

Figure 4-3: Setup detail for line load tests

4.3 Instrumentation

For testing, eighteen strain gages were attached to the underside of the steel deck as shown in Figure 4-4. Following the removal of galvanizing from the area, the gages were positioned at midspan and both quarter points. All strain gages were placed on the bottom flange of the steel deck as shown in Figure 4-5.

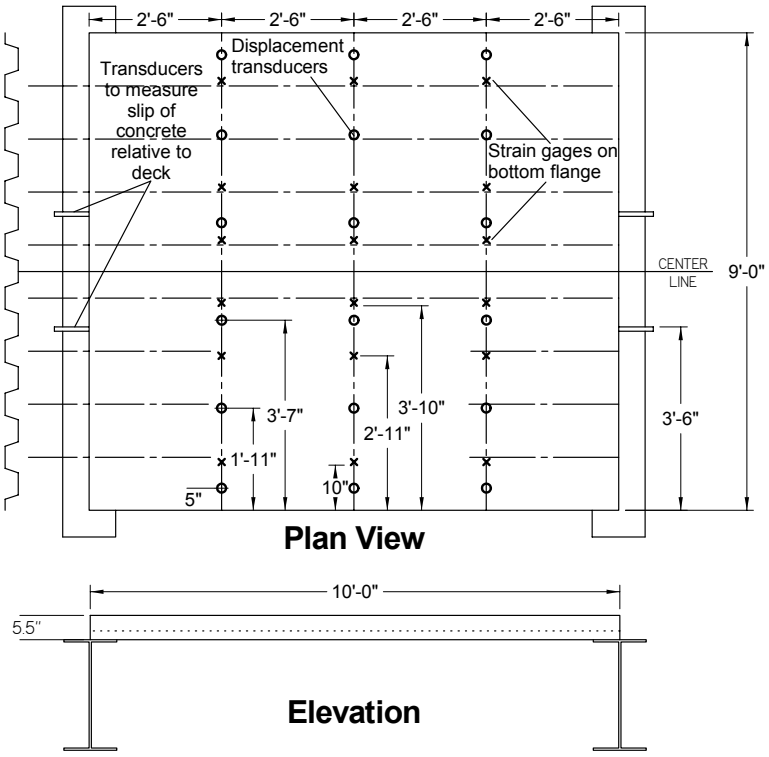

Figure 4-4: Test specimen and instrumentation for concentrated load tests

To measure deflections, eighteen displacement transducers were placed beneath the steel deck as shown in Figure 4-4. Six transducers were placed at each quarter point and at midspan as shown in Figure 4-5.

Four displacement transducers were used to measure slip between the steel deck and the concrete. Two transducers were positioned at each end of the slab as shown in Figure 4-4. A cross sectional view of the steel deck (at one quarter point) and previously described instrumentation is shown in Figure 4-5. Results hereafter refer to measured displacements associated with instruments labeled Slip 1 and 2 as A-end slip and displacements associated with Slip 3 and 4 as C-end slip. Refer to Appendix B for all instrument names and locations used during concentrated load testing.

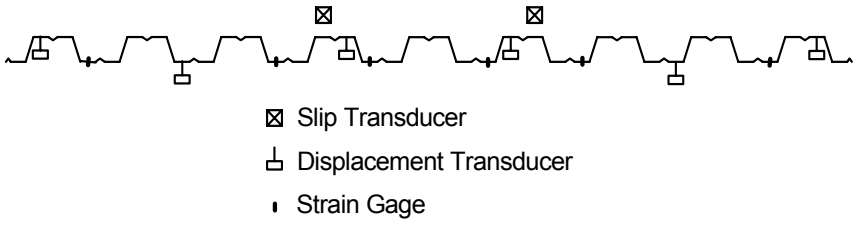

Figure 4-5: Cross-sectional view of deck and instrumentation for concentrated load tests

Load was measured during the tests using a 50 kip load cell. All instruments were connected to a computer based data acquisition system so that measurements could be monitored and recorded. Instruments were calibrated and checked prior to any tests.

4.4 Test Procedure

The test procedure for both slabs was the same. A total of eleven tests were performed on each slab. The different load locations, shown in Figure 4-6, are designated Tests 1 – 11. The tests were performed in the numerical order that they appear in the figure. The concentrated loads are located at midspan and at each quarter and third point. Transverse line loads, relative to the deck span, are located at midspan and quarter points. Longitudinal line loads are located at midspan and 2.5 ft from each of the slab's outer edges. The tests that had the highest probability of failing the slab were done last. This was done so that the integrity of the slab could be preserved as much as possible throughout the duration of all tests. First, the slabs were taken through all eleven tests, but only up to 5 kips. The loading was done in increments of 500 lb, and the slab was given some time to settle between each increment. By loading the slab up to 5 kips at each test location, the slab was allowed to settle and all instruments could be checked for proper functionality. Once all eleven "proof tests" were conducted on the slab, the full-scale testing was performed as described in the following paragraph.

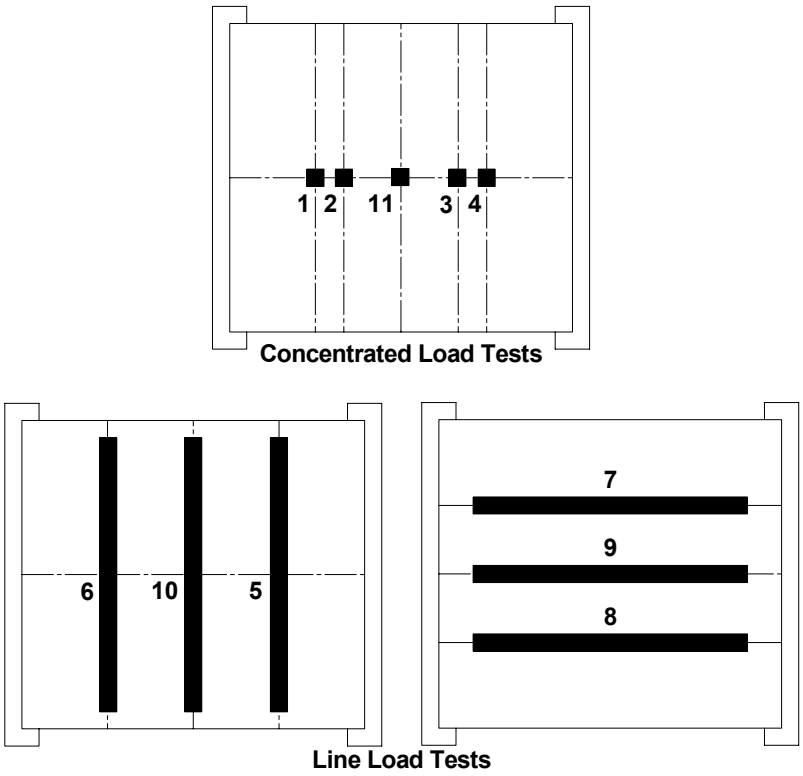

Figure 4-6: Loading configurations for concentrated and line load tests

For the concentrated load tests, the slabs were loaded in increments of 500 lb. For the line load tests, the slabs were loaded in increments of 1000 lb. After each load increment, recordings were taken and any cracks were identified and marked. The target load at each location was 15 kips. Because the most important test was Test 11, it was vital that the composite slab did not fail prior to this test. A concentrated load at midspan is the most critical load type of those shown in Figure 4-6 and gives the greatest indication of a slab's behavior and resistance to a large concentrated force. The integrity of each slab was to be preserved as best as possible until the last test was reached. This meant that, during Tests 1 – 10, if the slab began showing signs of an impending failure, a recording at the highest load was taken and the slab was unloaded. This point was at the discretion of the author. This process was important because there was an instance in past research at Virginia Tech where a slab failed prior to all tests being completed. Testing was terminated at the end of Test 11 once the composite slab was loaded to failure.

Tensile coupons were machined from untested steel deck and tested for the actual yield strength of the steel. Four tensile coupons were tested, and the average of all results was taken. Coupon testing was performed in accordance with ASTM E8-04 (2004). Results of all performed coupon testing are presented in Appendix F. The measured yield stress for the steel decks was 54.1 ksi. On the day a slab was tested, two concrete cylinders were tested to obtain the compressive strength of the material. Cylinder tests were performed in accordance with ASTM C39-01 (2003). The actual compressive strengths obtained were used for all calculations.

4.5 General Results for the First Pair of Composite Floor Slabs

The following section summarizes the results of concentrated load tests on the first two composite slabs cast. The results from the second pair of slabs cast are included in a later section because those slabs had a shorter span, and therefore exhibited a different structural behavior.

All eleven tests were performed on each composite slab, and both were tested to failure on Test 11 (the concentrated load test at midspan.) The behavior of both slabs was similar during the tests, however the ultimate failure load of the fiber-reinforced slab was lower than that of the WWF-reinforced slab. The slabs reinforced with fiber and WWF failed at load magnitudes of 12.2 kips and 15.5 kips, respectively. Note that because the failures were so sudden, no data could be recorded at these exact loads. Instead, data was collected at the interval prior to these loads; for example at 12 and 15 kips, respectively. A complete set of tabulated test results for the eleven tests of the WWF- and fiber-reinforced slab are presented in Appendix B and C, respectively.

Table 4-1: Experimental results of 10 kip concentrated load at midspan

Test Designation	f`c (psi)	Fy (ksi)	Deflection Along Center Strip (in)			Strain Along Center Strip (ue)		
			Midspan	Quarter Point A	Quarter Point C	Midspan	Quarter Point A	Quarter Point C
10 Kip Concentrated Point Load at Midspan for 2006 Tests								
WWF	5200	54.14	0.148	0.084	0.081	483	195	79
STRUX	3800	54.14	0.149	0.089	0.138	275	125	268
10 Kip Concentrated Point Load at Midspan for 2001 Tests (Guirola et al., 2001)								
WWF	3400	50	0.069	0.045	0.044	266	70	108
XOREX25	4000	50	0.051	0.037	0.041	129	115	71
XOREX50	4200	50	0.053	0.032	0.044	127	79	62
MICROFIBER-MD	3800	50	0.064	0.043	0.046	251	77	111

Table 4-1 shows some of the experimental results exhibited by the composite slabs with a 10 kip concentrated load at midspan. Specifically, deflections and strains along the longitudinal center strip of the slab, which were calculated as the average of the two center instruments (numbered 3 and 4 in the tabulated data found in Appendix B and C), are shown. Note that results are included from the current research as well as 2001 results for comparison purposes. All strains were measured on the bottom flange of the deck. All strains shown are measured values during testing and do not include casting strains.

Referring to the 2006 test results, it can be noticed that the deflection profile of the fiber-reinforced slab was slightly uneven. There was a high deflection at Quarter Point C, which also led to the significant concentrations of strain near this location. The WWF-reinforced slab had a symmetric deflection profile, yet the midspan strain was much higher than at any other location for any other slab. Referring to the 2001 test results, it is clear that the deflected shapes of all four slabs were very similar. Also, the strains observed in the WWF-reinforced and MICROFIBER-MD-reinforced slab were nearly identical. The midspan strains observed in the two slabs reinforced with steel fibers were lower; an effect caused by the slightly smaller midspan deflections.

These results may be better understood by taking a closer look at the individual behavior of the slabs during testing. The next sections describe concentrated load testing (2006) on the WWF and fiber-reinforced composite slabs in better detail. Any tests are referred to by test number as shown in Figure 4-6.

4.5.1 WWF-Reinforced Composite Slab

The composite slab reinforced with WWF was the first slab to be tested under concentrated loads. The test of the slab and corresponding concrete cylinders took place on March 28, 2006. The average compressive strength of the concrete cylinders on the day of testing was 5200 psi. All eleven tests were performed on this slab, and the 15 kip target load was reached for all tests. Data from all eleven tests are tabulated in Appendix B.

Throughout Tests 1 – 9, the WWF reinforced composite slab easily reached the target load. During Test 10 the slab was loaded to 15 kips, however in the short time while it was being allowed to settle before the last reading was taken there was a sudden "pop". At this point a crack at midspan was formed, but it had not propogated through the entire cross section of the slab. Prior to the first crack, the midspan deflection was 0.110 in. and there was zero end slip. Following the first crack, the midspan deflection increased to 0.221 in. and there was a measured slip of 0.0124 in. at the A-end of the slab. Note that the only data available prior to the first crack was that recorded at the 14 kip interval. The slab was then unloaded to avoid any further damage and prepared for its final test. A complete failure was observed at the end of Test 11. The peak observed load of 15.5 kips was marked by a second crack that propagated from the first, extending completely through the depth of the slab. At the maximum recorded load of 15.0 kips, the midspan deflection and A-end slip were 0.393 in. and 0.0459 in., respectively. Crack patterns observed during testing are shown in Figure 4-7. Figure 4-8 and Figure 4-9 depict the deflection profile of the WWF-reinforced concrete slab under an applied 10 kip concentrated load at midspan. Figure 4-10 shows the longitudinal line strains in the bottom flanges of the steel deck with an applied 10 kip concentrated load at midspan.

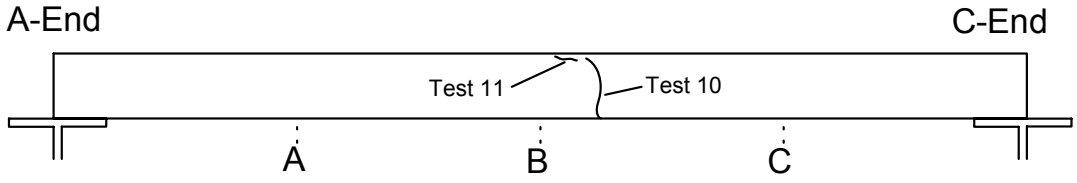

Figure 4-7: Cracks formed during concentrated load tests of the WWF-reinforced slab

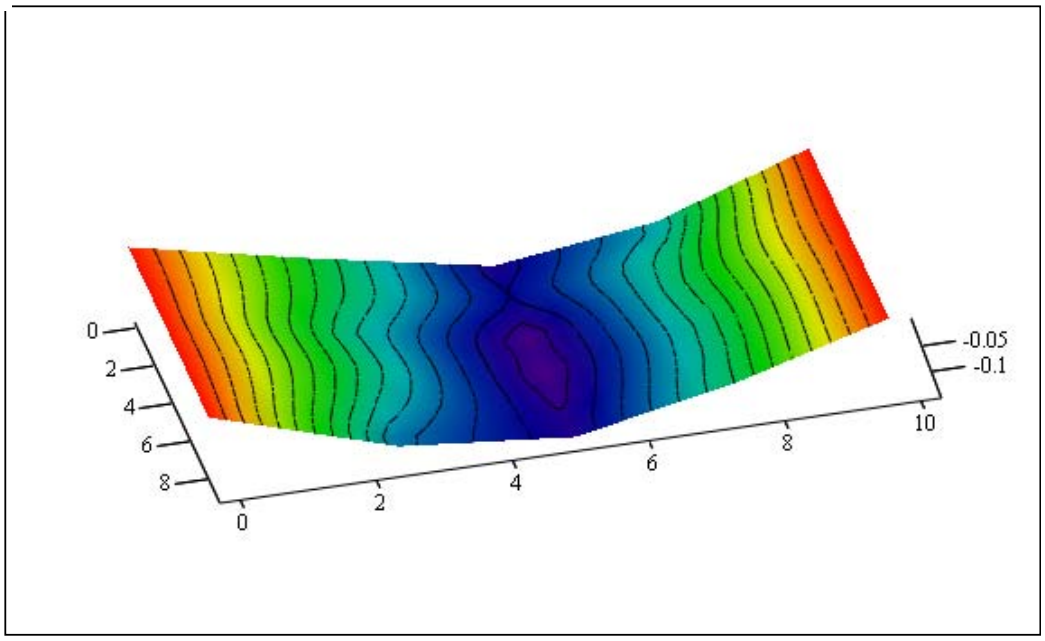

Figure 4-8: Deflection profile of WWF-reinforced slab under 10 kip concentrated load at midspan

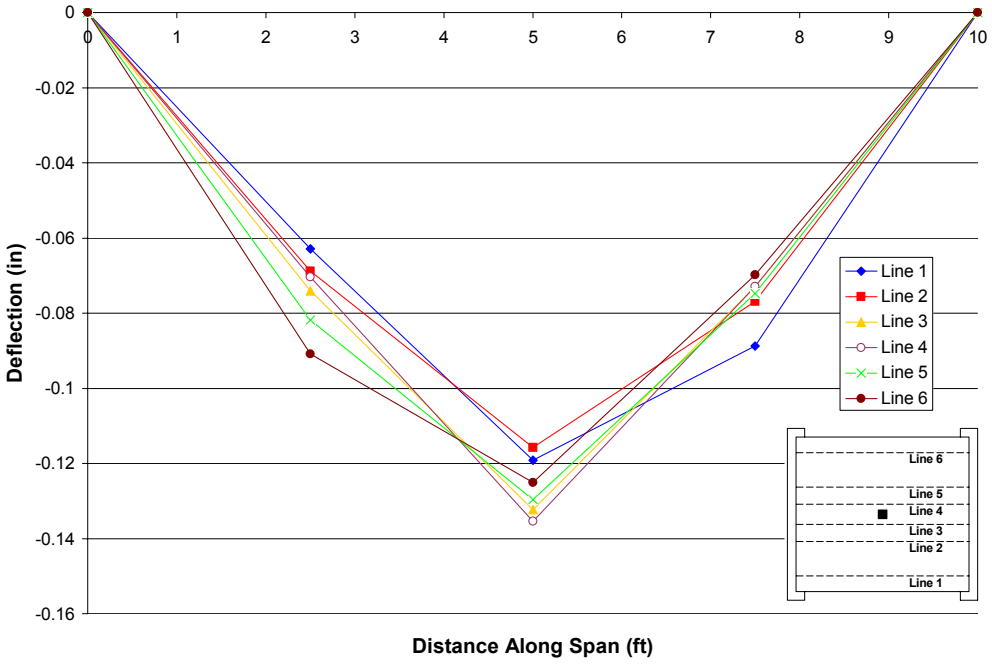

Figure 4-9: WWF – longitudinal line deflections with 10 kip concentrated load at midspan

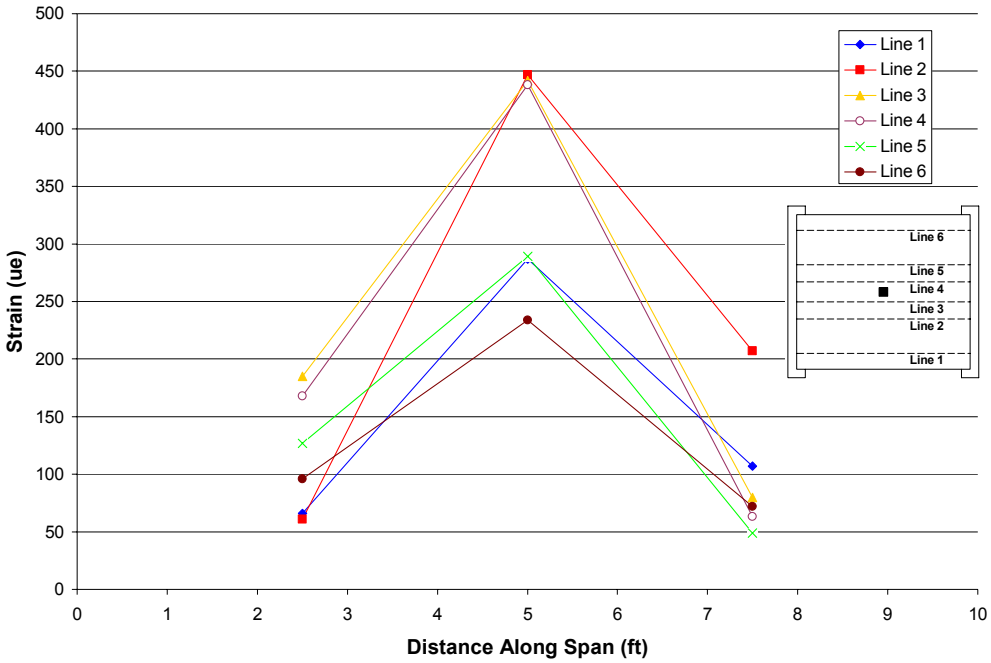

Figure 4-10: WWF – longitudinal line strains with 10 kip concentrated load at midspan

4.5.2 Fiber-Reinforced Composite Slab

The composite slab reinforced with STRUX 90/40 was the second slab to be tested under concentrated loads. The test of the slab and corresponding concrete cylinders took place on April 18, 2006. The average compressive strength of the concrete cylinders on the day of testing was 3800 psi, which was 1400 psi less than that of the WWF-reinforced specimen. All eleven tests were performed on this slab, but the 15 kip target load was not able to be reached for all tests. The target load was only reached in five of the eleven tests, which can be seen from the test data in Appendix C. It is important to note that prior to beginning any tests, the slab was inspected. It was found that two opposite corners of the slab had a poor bond between the steel deck and the concrete. There was a small gap between the deck and the concrete, as shown in Figure 4-11 below.

Figure 4-11: Photograph of gap between the concrete and steel deck prior to testing

During testing, it was apparent that this gap had an effect on the strength of the fiber-reinforced composite slab – over half the tests had to be stopped before the target load was reached. During Test 1, there were a lot of "popping and clicking" sounds and the load had to be dropped after getting to 14 kips. Then during Test 2, there was already an average measured A-end slip of 0.0005 in. by the time 15 kips was reached. Tests 3 and 4 proceeded without any measured slip, however Test 3 only reached a load of 13.5 kips before having to be unloaded. During Test 5, a load of 14 kips was reached and there was now a measured C-end slip of 0.009 in. By referring to Appendix C it can be seen that Tests 6 – 9 also had measured slip at either the A or C-end, or both, at the end of the test; however the target load was reached for all four tests. During Test 10 the slab was loaded to up to 14.3 kips at which point there was a sudden "pop" followed by a drop in load to 12.5 kips, however no crack was formed. At the maximum recorded load, there was an additional measured C-end slip of 0.0064 in.

The observed failure load in Test 11 was smaller than that of the WWF-reinforced slab. The maximum load reached in this test was 12.2 kips, at which point the slab cracked suddenly. The largest load that was recorded before this failure was 12.0 kips. Prior to the first crack, the midspan deflection was 0.213 in. and there was 0.0295 in. C-end slip. Following the first crack, the midspan deflection increased to 0.487 in. and there was a measured slip of 0.0233 and 0.0472 in. at the A-end and C-end of the slab, respectively. The quarter point deflections at the max load were 0.124 in. for Quarter A and 0.210 in. for Quarter B. Crack patterns observed during testing are shown in Figure 4-12. Figure 4-13 and Figure 4-14 depict the deflection profile of the fiber-reinforced concrete slab under an applied 10 kip concentrated load at midspan. It can be seen from

this figure that the deflected shape was very unsymmetrical for a point load at midspan. Figure 4-15 shows the longitudinal line strains in the bottom flanges of the steel deck with an applied 10 kip concentrated load at midspan. This figure shows the highest stress concentrations mainly at the right quarter point of the slab. This concentration of stresses is the direct result of the deflected shape of the slab as seen in Figure 4-13.

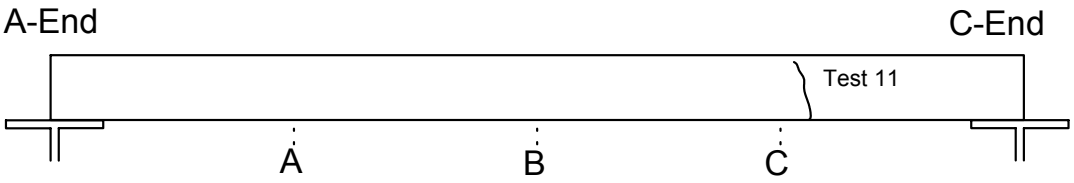

Figure 4-12: Cracks formed during concentrated load tests of the fiber-reinforced slab (STRUX)

It should be noted that the gap between the steel deck and concrete slab shown in Figure 4-11 had an effect on the composite slab's resistance to bending moment. The presence of this gap leads the author to believe that the poor results gathered from the fiber-reinforced composite slab were caused by an inadequate shear bond. The most likely sources of this gap are either insufficient curing or premature loading of the slab. If the concrete was not hydrated enough or if a heavy piece of lab equipment were set on the slab too early without the knowledge of the authors, a total composite interface may not have been allowed to develop. This poor shear bond is what led to the strange deflected shape as seen in Figure 4-13 below, as well as the larger deflections, compared to the WWF-reinforced slab, seen overall. Also, it would explain the smaller midspan strain that was noted in Table 4-1; the inadequate composite bond would create smaller strains in the deck.

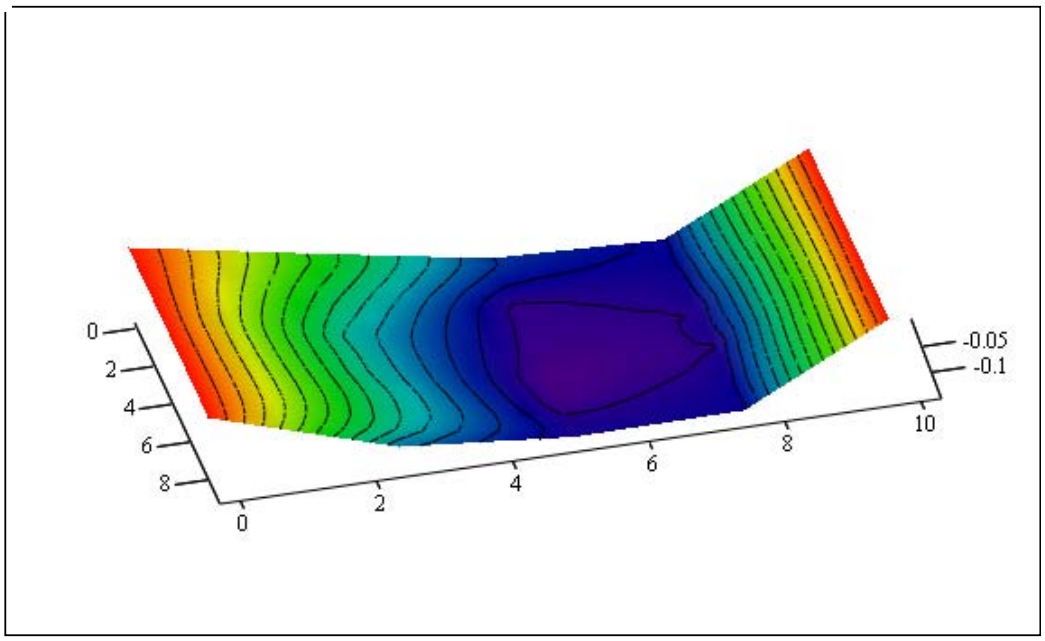

Figure 4-13: Deflection profile of fiber-reinforced slab (STRUX) under 10 kip concentrated load at midspan

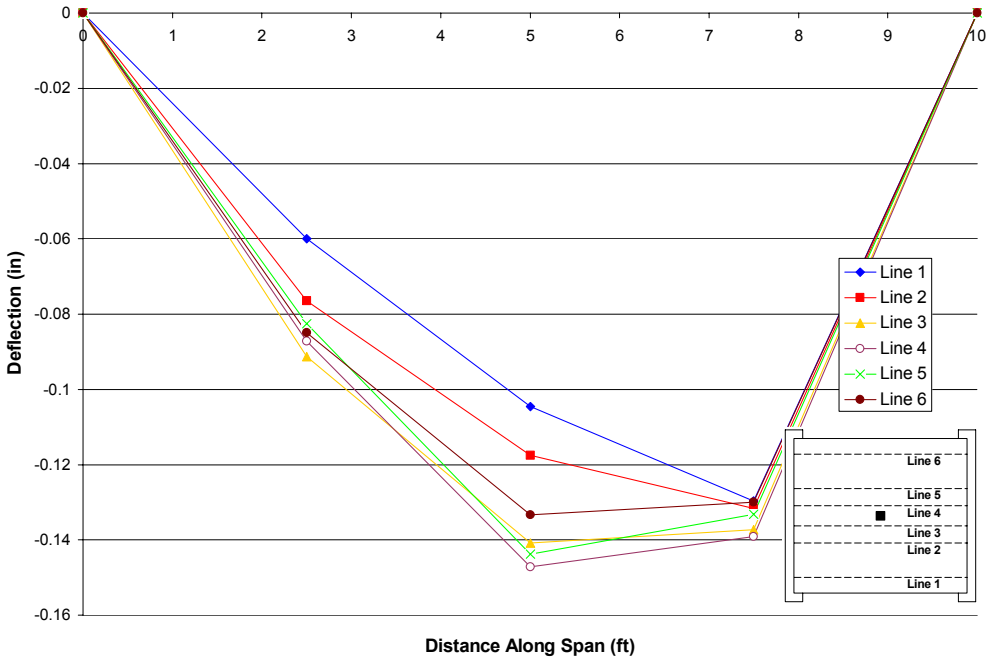

Figure 4-14: STRUX – longitudinal line deflections with 10 kip concentrated load at midspan

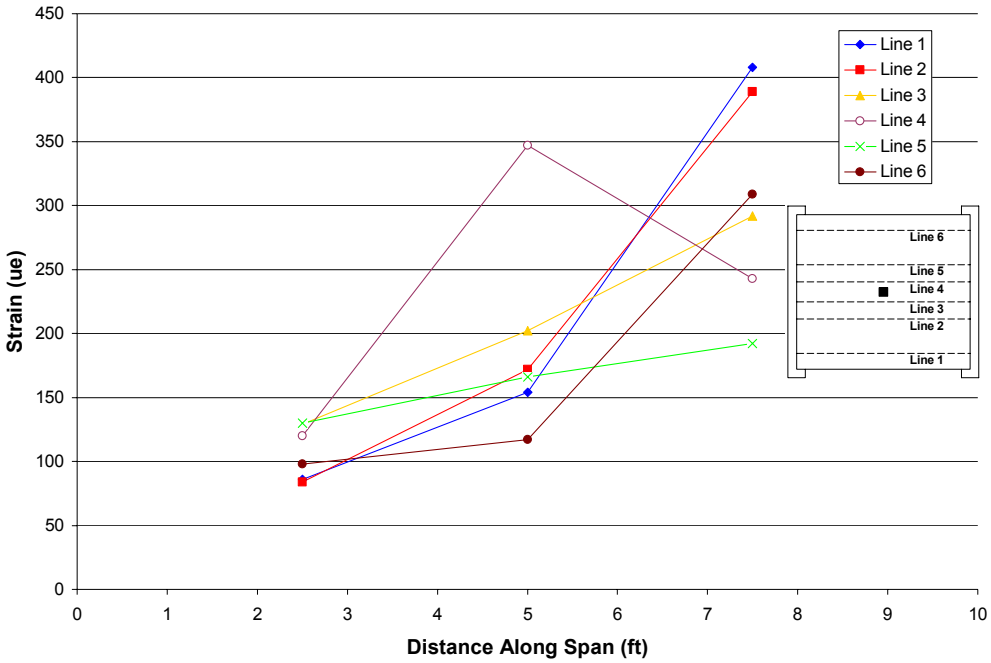

Figure 4-15: STRUX – longitudinal line strains with 10 kip concentrated load at midspan

4.6 Comparison Graphs for the First Pair of Composite Floor Slabs

This section illustrates strains and deflections observed both across the midspan of the slabs and along the center longitudinal strip of the slabs. Graphs are presented for three different load patterns; a concentrated load at midspan, transverse line load at midspan, and a longitudinal line load at midspan. These are Tests 11, 10, and 9, respectively. In order to help understand each graph, a diagram of the load and instrument locations under consideration are included. The three loading conditions presented are all under a 10 kip load.

Note that only the first pair of composite slabs can be compared graphically in this section because the slab dimensions were the same. The recast slabs had a shorter clear span and need to be compared in separate graphs. Because the slabs tested in 2001 had the same dimensions as those in this section, they are included in the graphs for comparison purposes. All graphs in this section use available data from Guirola et al. (2001).

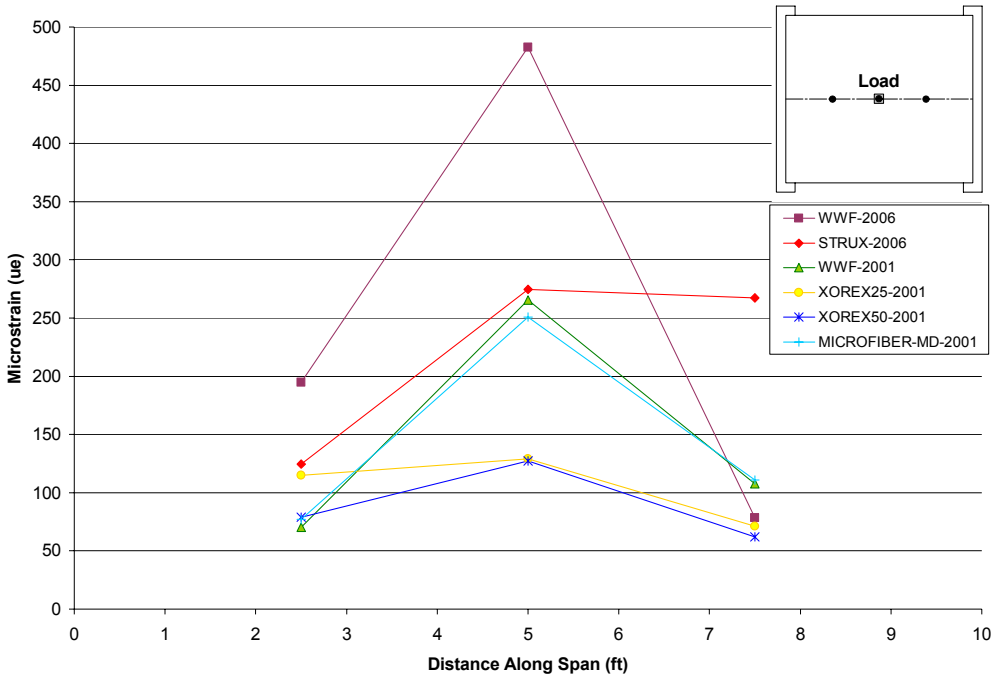

Figure 4-16: Strain along span's center strip with 10 kip concentrated load at midspan

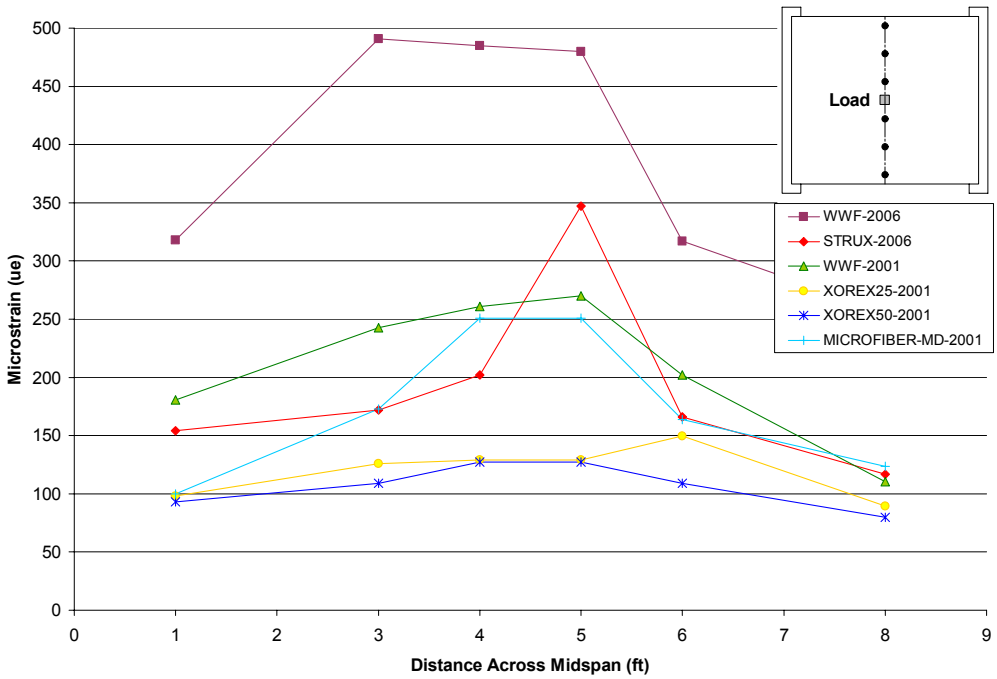

Figure 4-17: Strain across midspan with 10 kip concentrated load at midspan

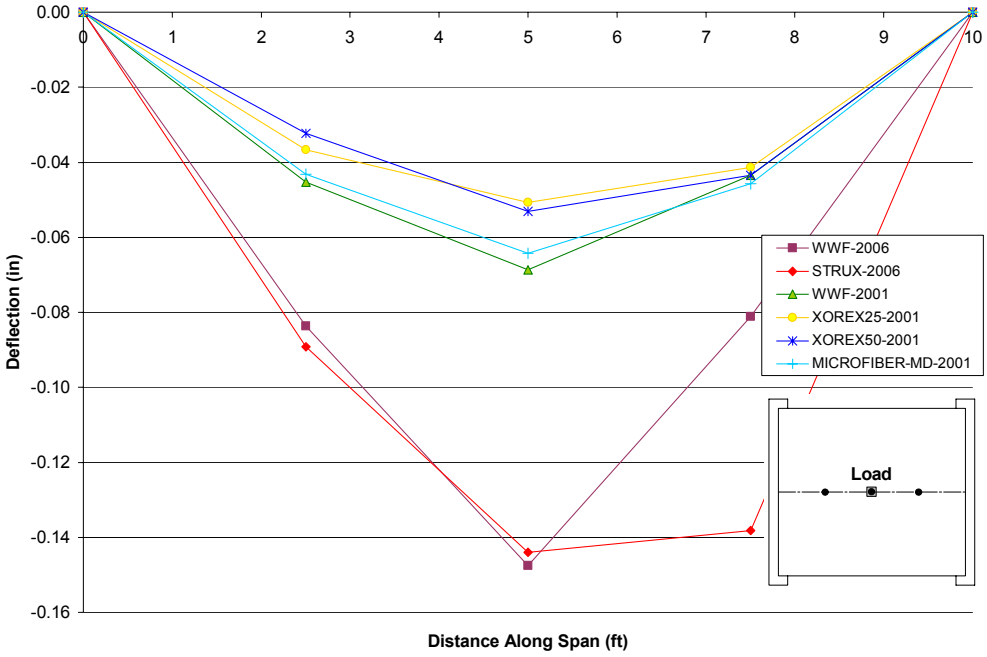

Figure 4-18: Deflection along span's center strip with 10 kip concentrated load at midspan

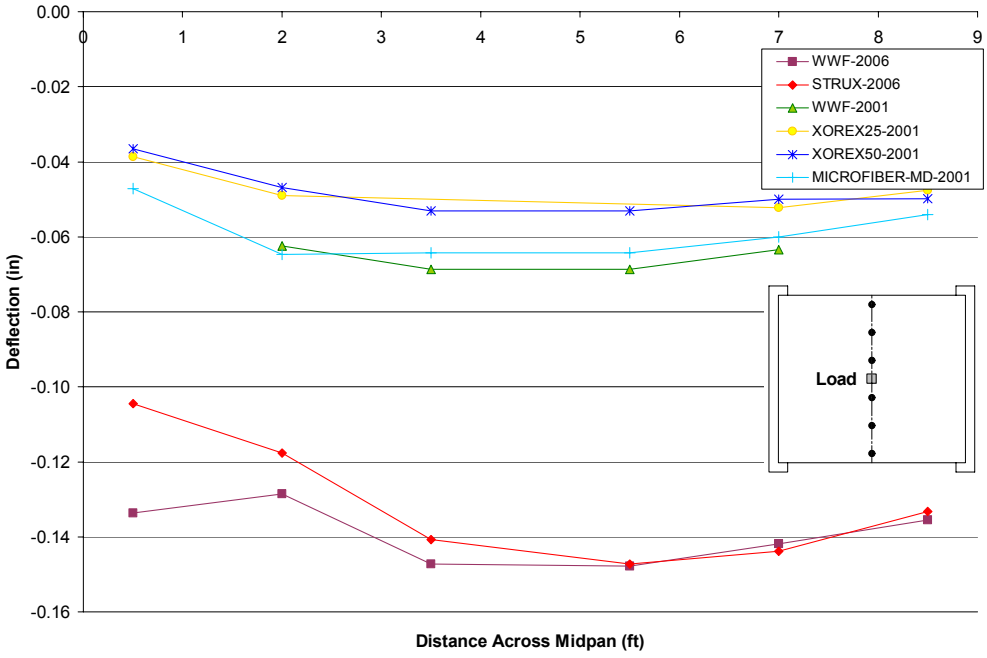

Figure 4-19: Deflection across midspan with 10 kip concentrated load at midspan

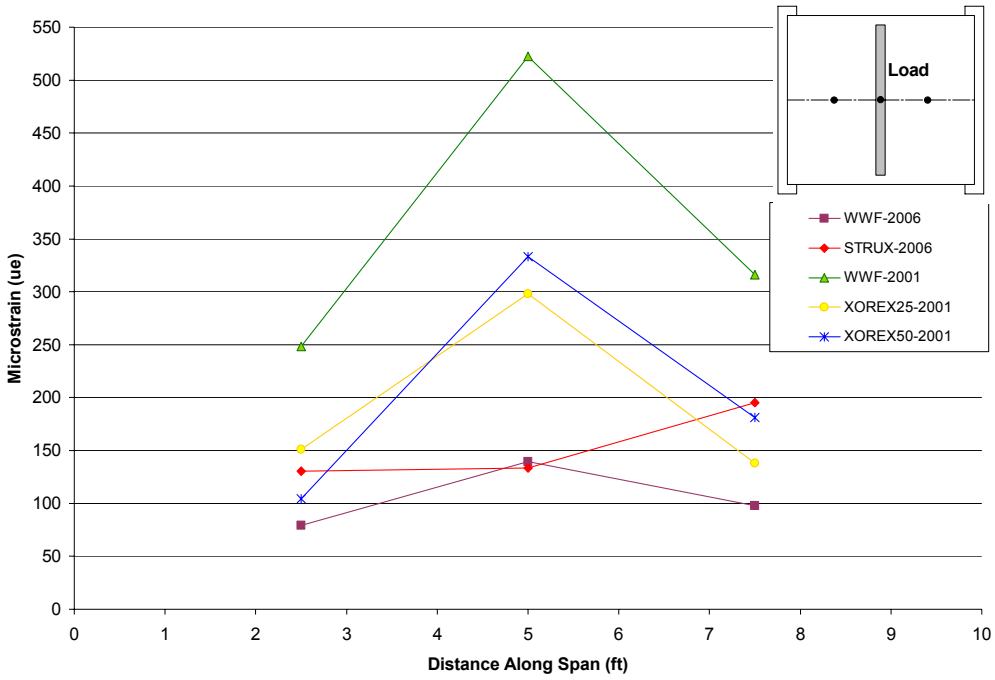

Figure 4-20: Strain along span's center strip with 10 kip transverse line load at midspan

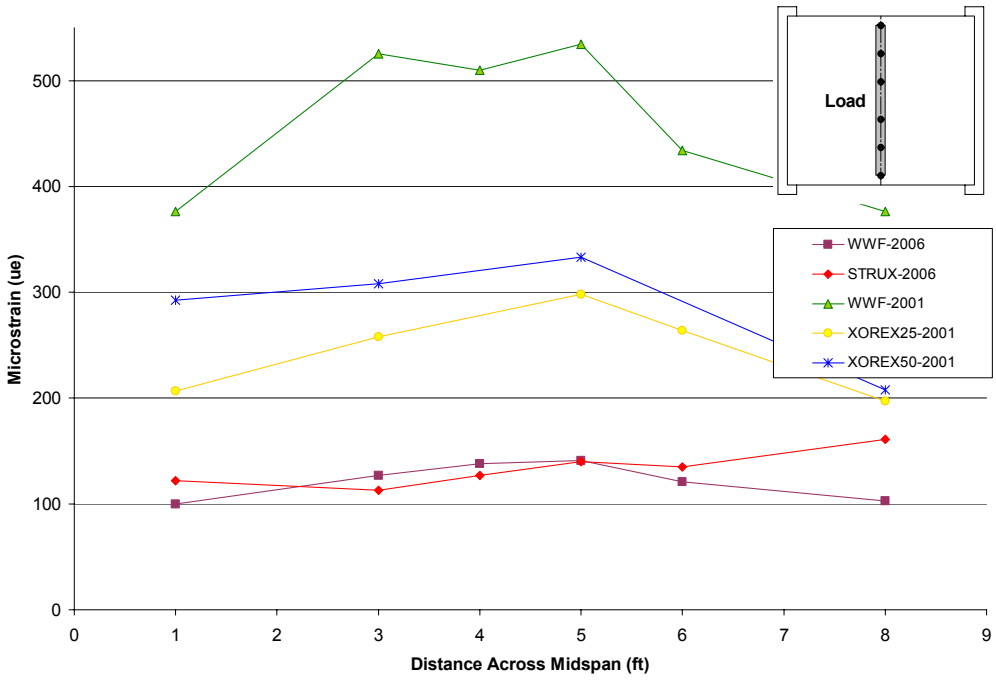

Figure 4-21: Strain across midspan with 10 kip transverse line load at midspan

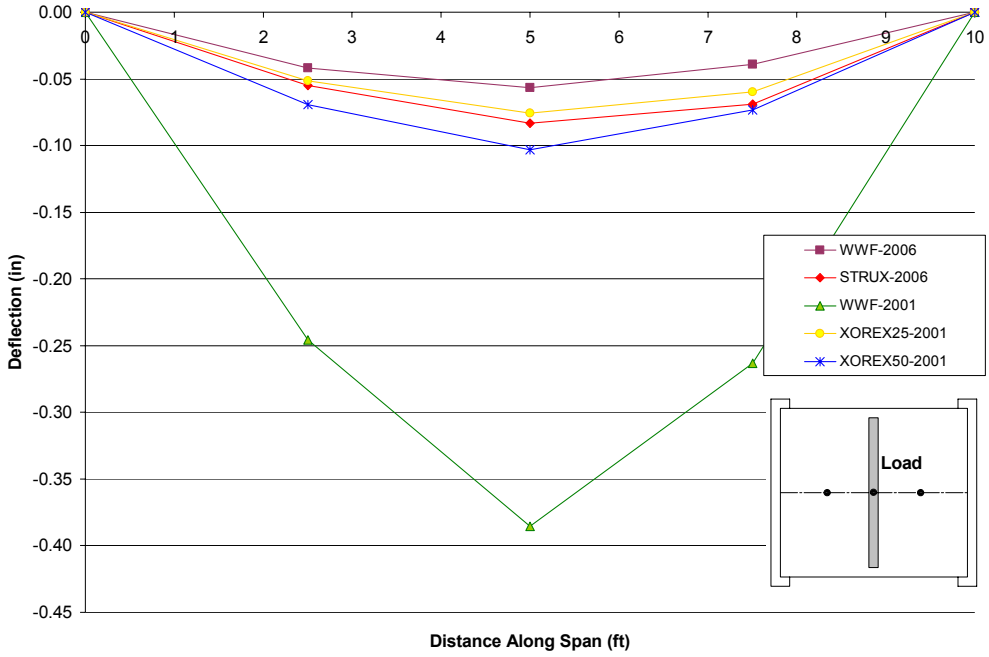

Figure 4-22: Deflection along span's center strip with 10 kip transverse line load at midspan

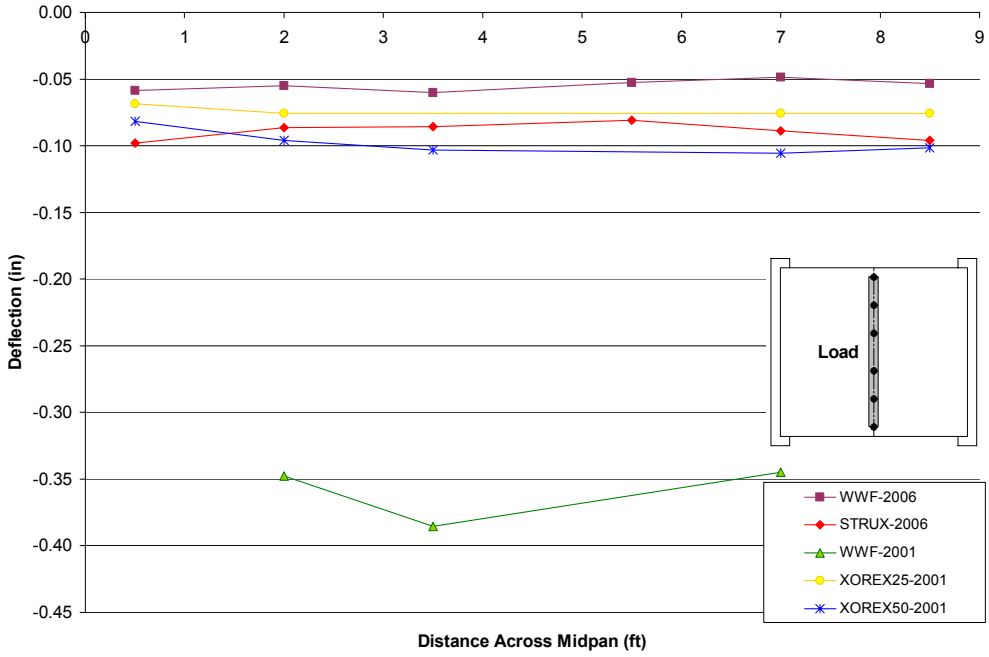

Figure 4-23: Deflection across midspan with 10 kip transverse line load at midspan

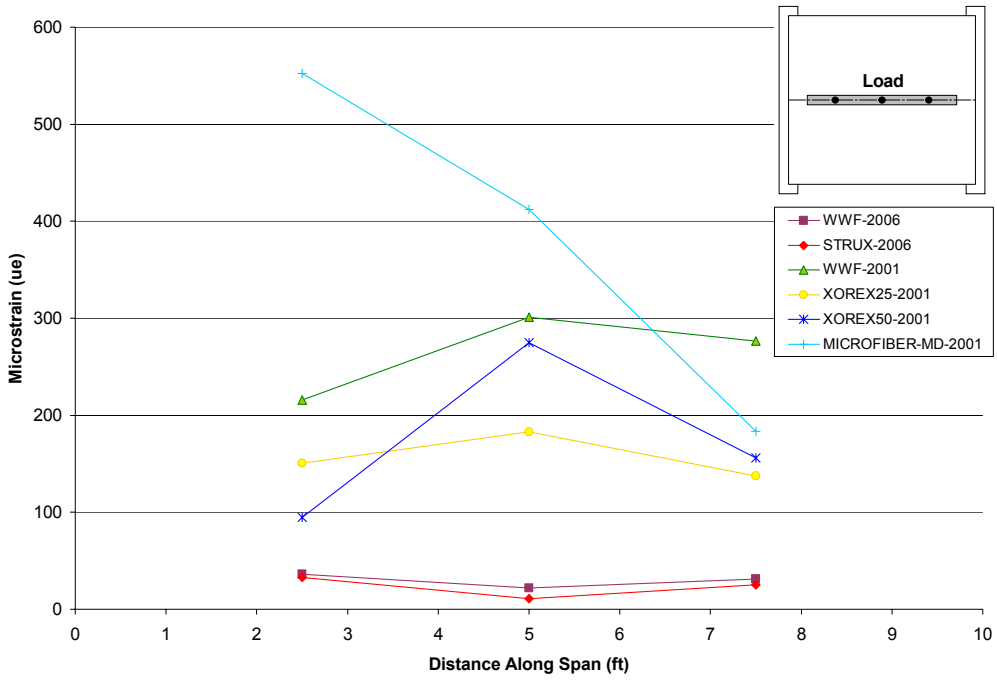

Figure 4-24: Strain along span's center strip with 10 kip longitudinal line load at midspan

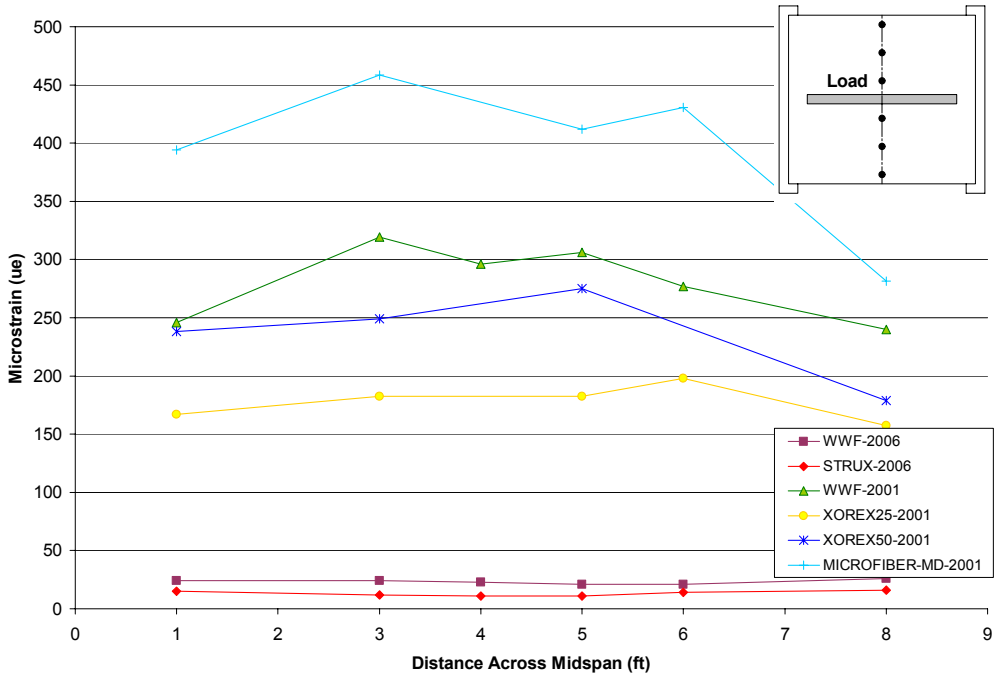

Figure 4-25: Strain across midspan with 10 kip longitudinal line load at midspan

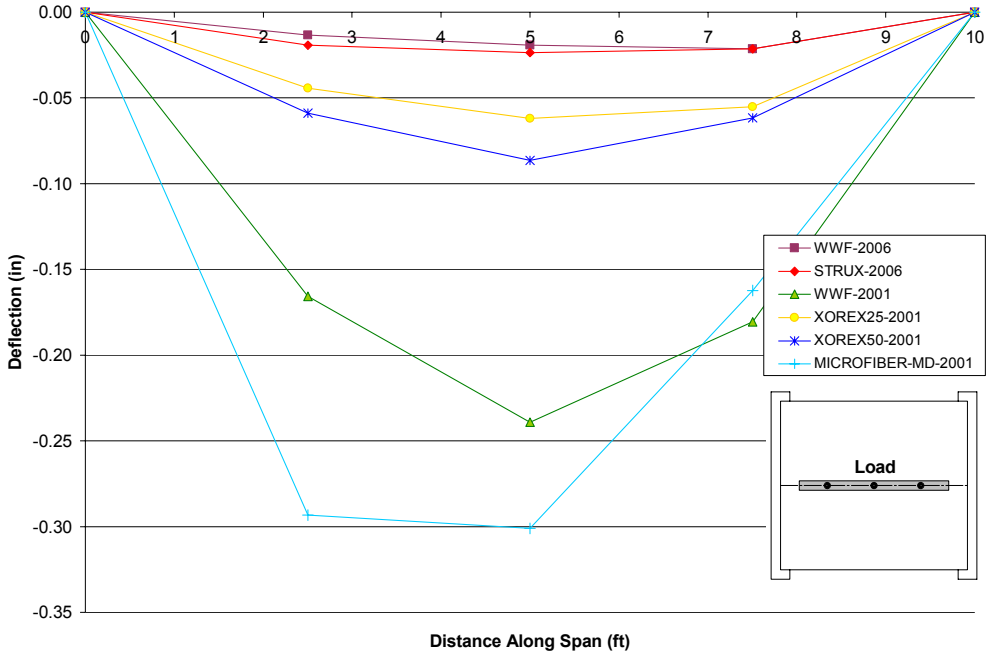

Figure 4-26: Deflection along span's center strip with 10 kip longitudinal line load at midspan

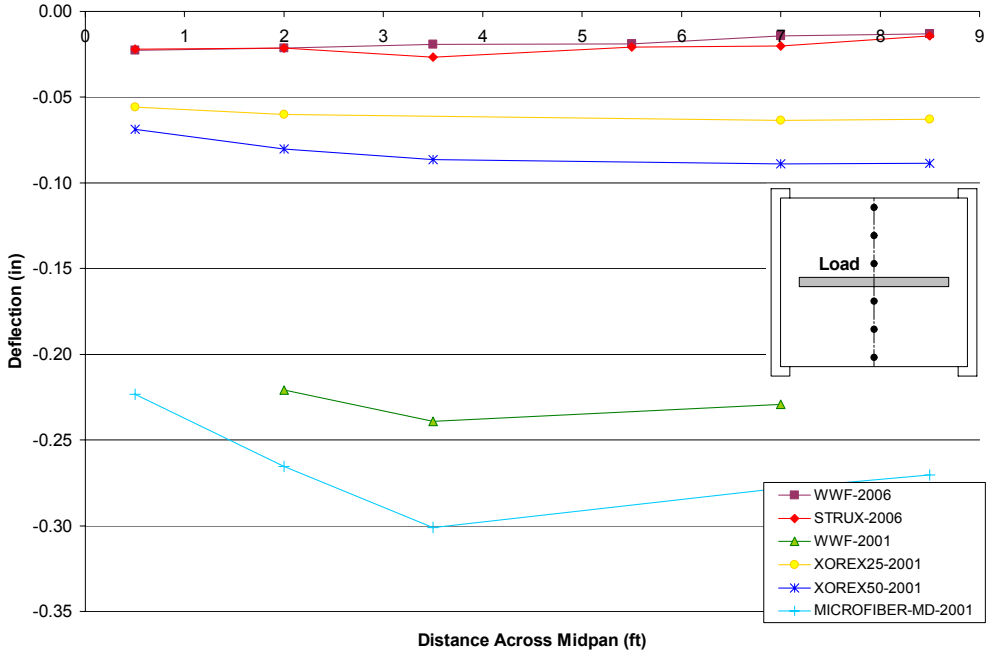

Figure 4-27: Deflection across midspan with 10 kip longitudinal line load at midspan

4.7 Addendum to the Concentrated Load Tests

Because the asymmetric cracking pattern of the fiber-reinforced slab, it was difficult to make an effective comparison of the structural behavior of fiber and WWF-reinforced composite slabs subjected to concentrated loads. It was decided to construct two more full scale test specimens reinforced with STRUX 90/40 synthetic macro fibers. These would be constructed in the same manner the previous composite slabs were and would use the same materials. However, this time the slabs would be constructed unshored, using an 8 ft span rather than a 10 ft span. It was noticed after the original slabs were constructed that the recommended span length was exceeded for a single span condition and a 5.5 in total depth. This exceedance was not governed by the strength of the slab, but instead by deflection criteria.

The slabs were cast on June 16, 2006; this time while monitoring casting strains in the steel deck. The two new composite slabs followed the same testing protocol and procedures as used before. Figure 4-28 below represents the casting strains (με) and locations for both slabs.

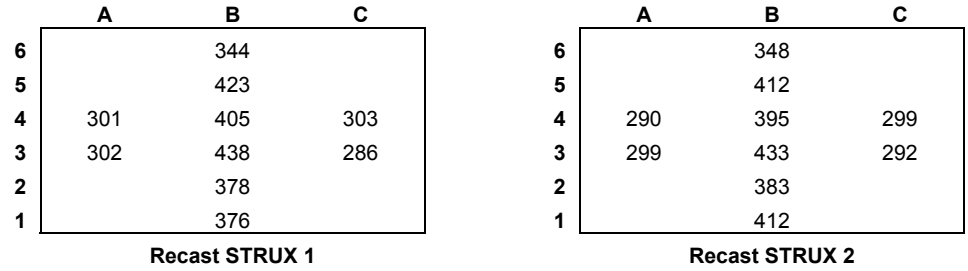

Figure 4-28: Schematic of casting strains and locations for second set of slabs

4.8 General Results for the Second Pair of Composite Floor Slabs

All eleven tests were performed on each composite slab, and both were tested to failure on Test 11 (the concentrated load test at midspan.) The behavior of both slabs was similar during the tests, the failure loads during the last test were 21.0 and 20.5 kips, respectively. A complete set of tabulated test results for the eleven tests of the two fiber-reinforced slabs are presented in Appendix D and E, respectively.

Table 4-2: Experimental results of 20 kip concentrated load and 15 kip transverse line load at midspan

Test Designation	f`c (psi)	Fy (ksi)	Deflection Along Center Strip (in.)			Strain Along Center Strip (με)		
			Midspan	Quarter Point A	Quarter Point C	Midspan	Quarter Point A	Quarter Point C
20 Kip Concentrated Point Load at Midspan								
Recast STRUX 1	4700	54.1	0.095	0.062	0.060	494	231	260
Recast STRUX 2	4700	54.1	0.116	0.074	0.078	513	288	194
15 Kip Transverse Line Load at Midspan								
Recast STRUX 1	4700	54.1	0.055	0.035	0.032	344	95	101
Recast STRUX 2	4700	54.1	0.064	0.042	0.048	336	156	136

Table 4-2 shows some of the experimental results exhibited by both slabs with a 20 kip concentrated load and a 15 kip transverse line load at midspan. Specifically, deflections and strains along the longitudinal center strip of the slab, which were calculated as the average of the two center instruments (numbered 3 and 4 in the tabulated data of Appendix D and E), are shown. All strains were measured on the bottom flange of the deck.

The results in Table 4-2 show that both slabs exhibited similar behavior during testing. With the 20 kip concentrated load at midspan, the center strip deflections and strains behaved with a curved profile that one would expect. This behavior was also present with the 15 kip transverse line load at midspan. The table shows that generally, the deflections in recast slab 1 were slightly higher than those in recast slab 2, but the difference was almost negligible. Note that an effective comparison between Table 4-1 and Table 4-2 is not possible because the loads and the clear span of the slabs are different. The following sections describe concentrated load testing on the both recast fiber-reinforced composite slabs in better detail. Any tests are referred to by test number as shown in Figure 4-6.

4.8.1 Recast Fiber-Reinforced Composite Slab 1 (Recast STRUX 1)

The test of the slab and corresponding concrete cylinders took place on July 17, 2006. The average compressive strength of the concrete cylinders on the day of testing was 4700 psi. All eleven tests were performed on this slab, and the 15 kip target load was reached for all tests. Data from all eleven tests are tabulated in Appendix D.

Throughout Tests 1 – 10, the fiber-reinforced composite slab easily reached the target load. During the first 10 tests, there was no measured slip or "clicking" noises heard. A complete failure was observed at the end of Test 11. The peak load of 21.0 kips was marked by a crack and a small slip of the C-end. At the maximum recorded load of 21.0 kips, just prior to the first crack, the midspan deflection and C-end slip were 0.129 in. and 0.001 in., respectively. Following the first crack, the midpsan deflection and C-end slip increased to 0.214 in. and 0.018 in., respectively. Crack patterns observed during testing are shown in Figure 4-29. Figure 4-30 and Figure 4-31 depict the deflection profile of the fiber-reinforced concrete slab under an applied 20 kip concentrated load at midspan. Figure 4-32 shows the longitudinal line strains in the bottom flanges of the steel deck with an applied 20 kip concentrated load at midspan.

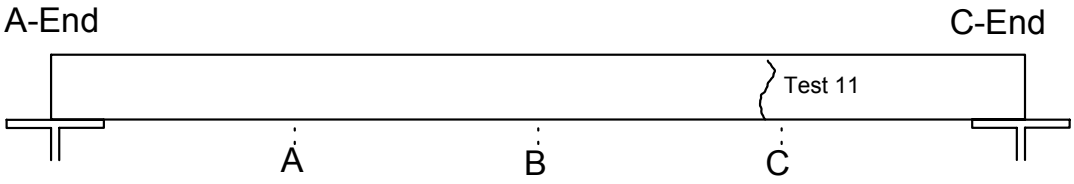

Figure 4-29: Cracks formed during concentrated load tests of the recast fiber-reinforced slab 1 (Recast STRUX 1)

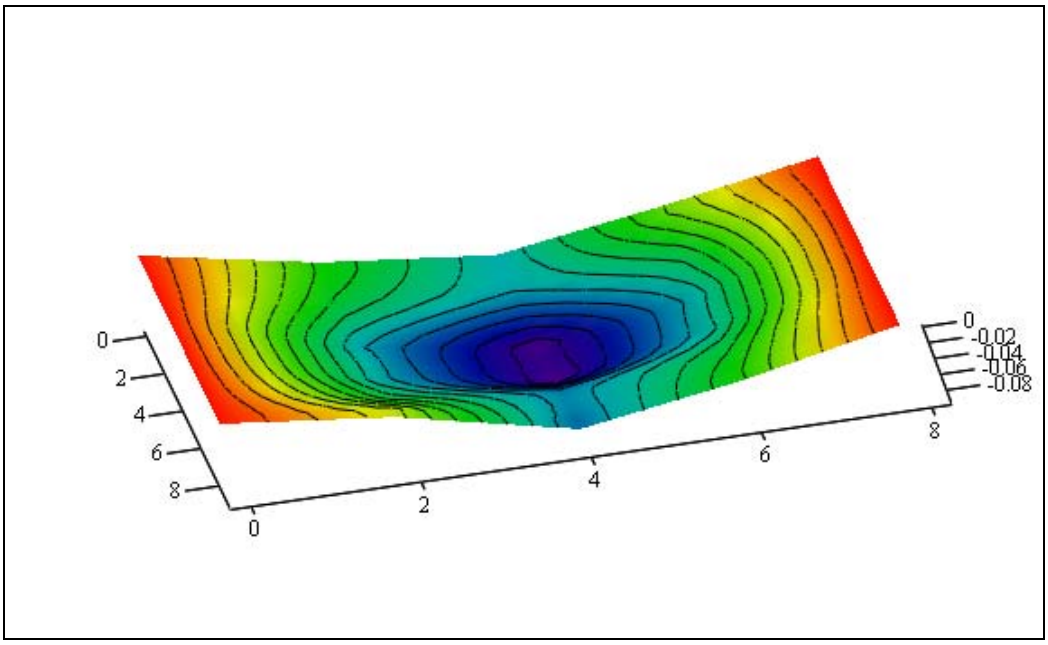

Figure 4-30: Deflection profile of recast fiber-reinforced slab 1 (Recast STRUX 1) under 20 kip concentrated load at midspan

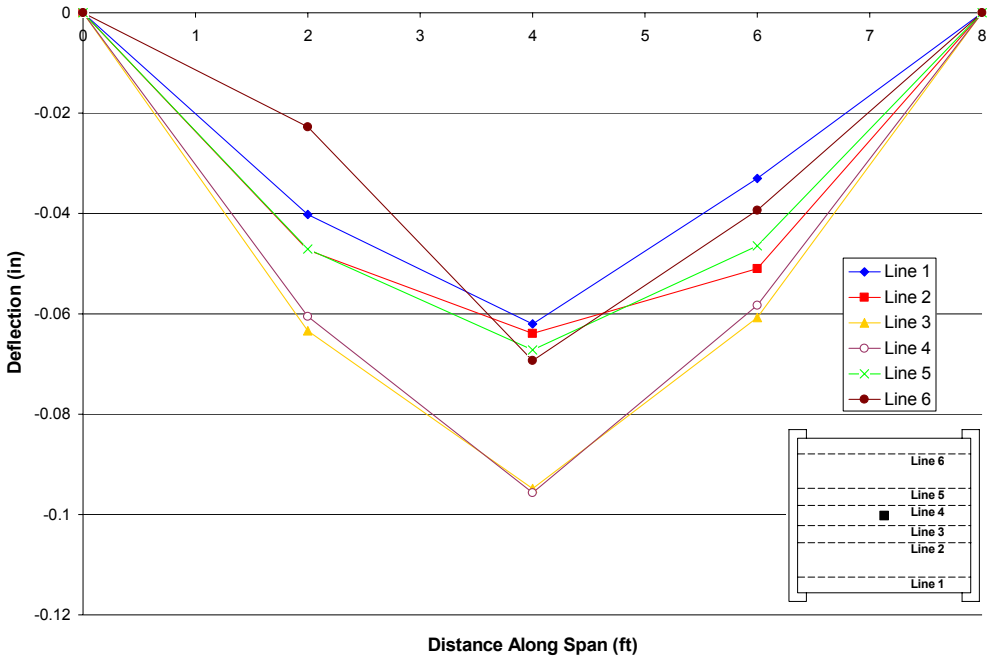

Figure 4-31: Recast STRUX 1 – longitudinal line deflections with 20 kip concentrated load at midspan

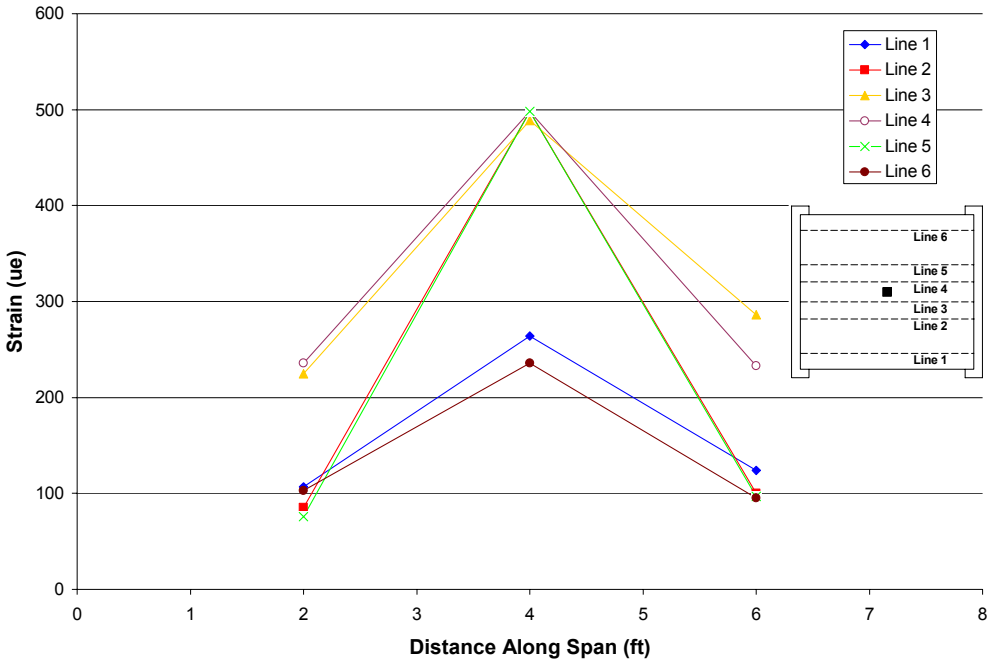

Figure 4-32: Recast STRUX 1 – longitudinal line strains with 20 kip concentrated load at midspan

4.8.2 Recast Fiber-Reinforced Composite Slab 2 (Recast STRUX 2)

The test of the slab and corresponding concrete cylinders took place on July 19 - 20, 2006. The average compressive strength of the concrete cylinders on the day of testing was 4700 psi. All eleven tests were performed on this slab, and the 15 kip target load was reached for all tests. Data from all eleven tests are tabulated in Appendix E.

There was no measured slip during the first 10 tests, but there was a small amount of "clicking" noises heard. During Test 8 (the longitudinal line load at the left third of the slab), one corner of the slab came unbonded from the metal deck. Generally during Tests 7 and 8, as one side of the slab is loaded and deflects downward, the other side deflects upward, or at least has zero deflection. This small twisting motion was seen on just about every slab subjected to concentrated loading during Tests 7 and 8. Such an occurrence is apparent from the tabulated data by comparing values from Wire Pots A1, B1, and C1 with values from Wire Pots A6, B6, and C6. During Test 8, as load was applied to the left side of the slab, the right corner at the C-end was pulled off the metal deck. The affected area was small, and all subsequent tests did not seem to be influenced

by its presence. Figure 4-33 below is a photograph taken of the debonded deck at the corner of the slab.

Figure 4-33: Photograph of debonded deck at the corner of the slab during Test 8

A complete failure was observed at the end of Test 11 where the peak load of 20.5 kips was marked by a crack as shown in Figure 4-34. At the maximum recorded load of 20.5 kips, just prior to the first crack, the midspan deflection was 0.131 in. and there was no measured slip. However, immediately following failure there was a midspan deflection of 0.272 in. and an average slip of 0.034 in. at the C-end. Crack patterns observed during testing are shown in Figure 4-34. Figure 4-35 and Figure 4-36 depict the deflection profile of the fiber-reinforced concrete slab under an applied 20 kip concentrated load at midspan. Figure 4-37 shows the longitudinal line strains in the bottom flanges of the steel deck with an applied 20 kip concentrated load at midspan.

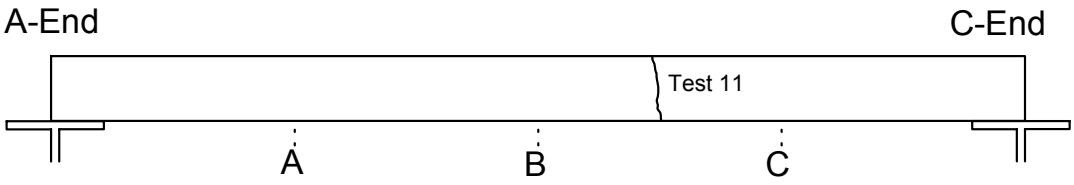

Figure 4-34: Cracks formed during concentrated load tests of the recast fiber-reinforced slab 2 (Recast STRUX 2)

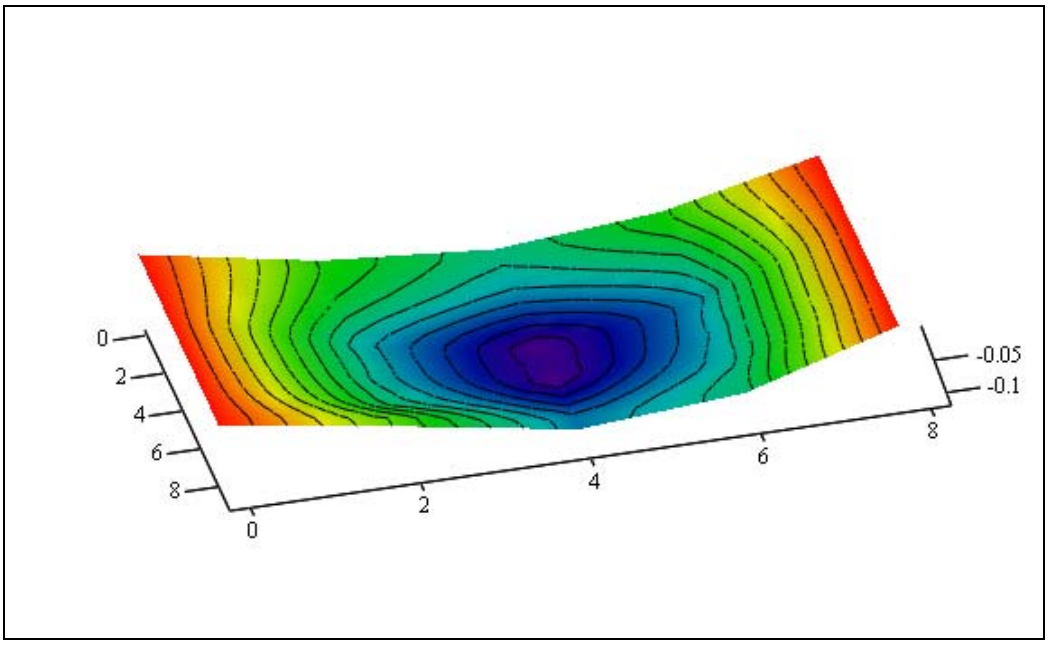

Figure 4-35: Deflection profile of recast fiber-reinforced slab 2 (Recast STRUX 2) under 20 kip concentrated load at midspan

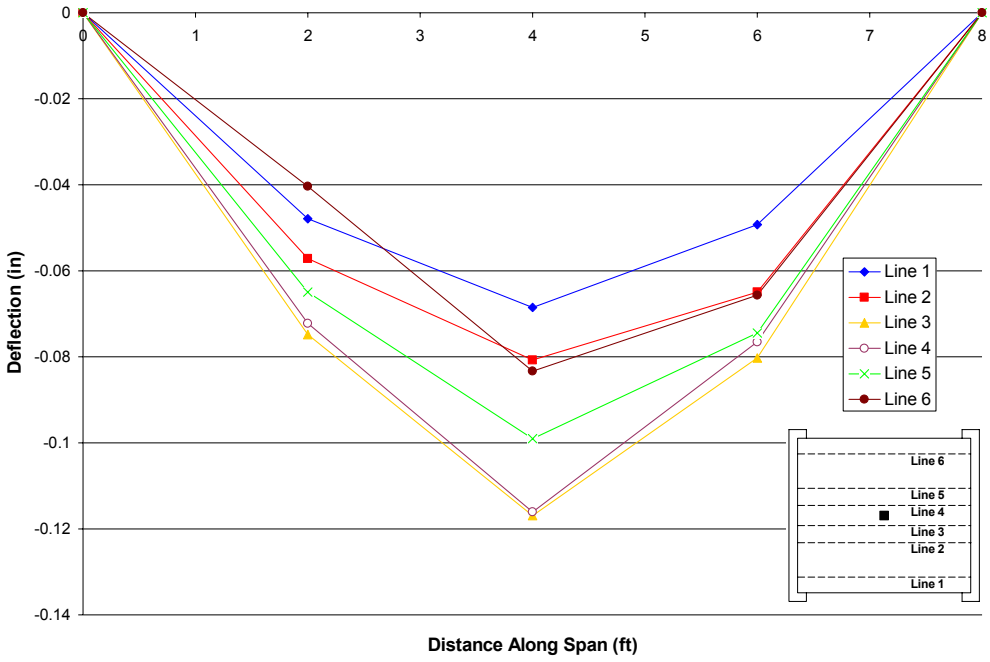

Figure 4-36: Recast STRUX 2 – longitudinal line deflections with 20 kip concentrated load at midspan

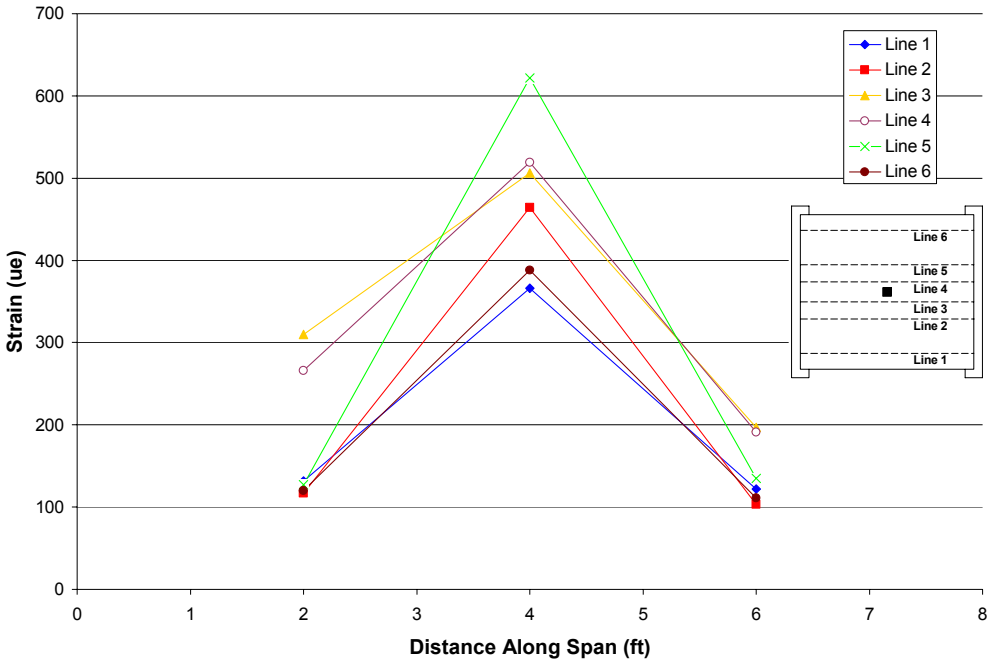

Figure 4-37: Recast STRUX 2 – longitudinal line strains with 20 kip concentrated load at midspan

4.9 Comparison Graphs for the Second Pair of Recast Composite Floor Slabs

This section illustrates strains and deflections observed both across the midspan of the slabs and along the center longitudinal strip of the slabs. Graphs are presented for three different load patterns; a concentrated load at midspan, transverse line load at midspan, and a longitudinal line load at midspan. These are Tests 11, 10, and 9, respectively. In order to help understand each graph, a diagram of the load and instrument locations under consideration are included. Note the three loading conditions presented are different, the applied concentrated load is 20 kips whereas the applied line loads are at 15 kips.

Only the second pair of recast composite slabs can be compared graphically in this section because the slab dimensions were the same. The first pair of slabs had a longer clear span and was already compared in separate graphs in Section 4.6.

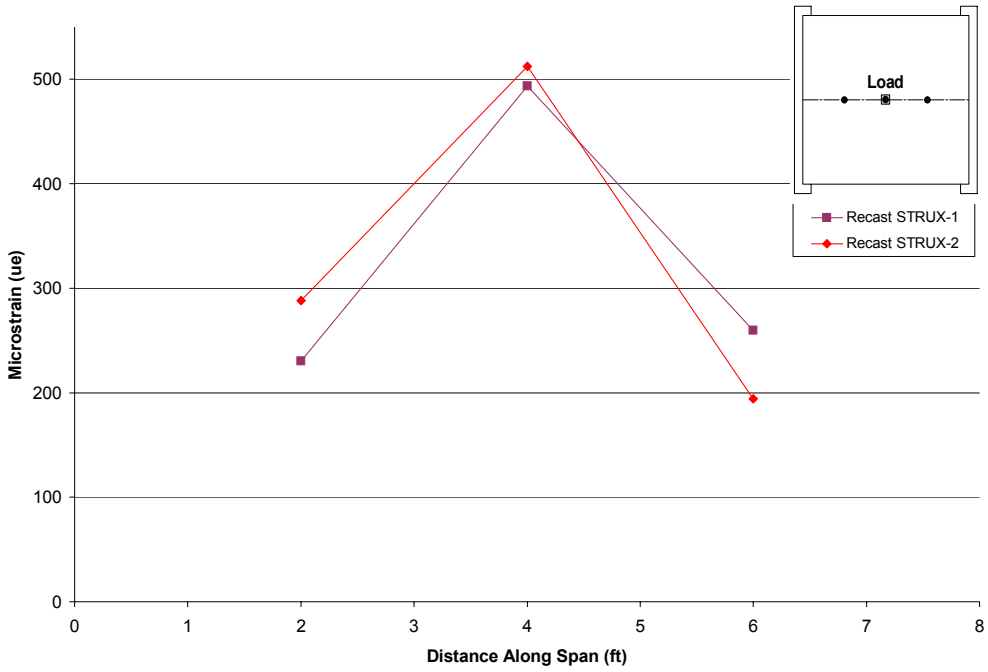

Figure 4-38: Strain along span's center strip with 20 kip concentrated load at midspan

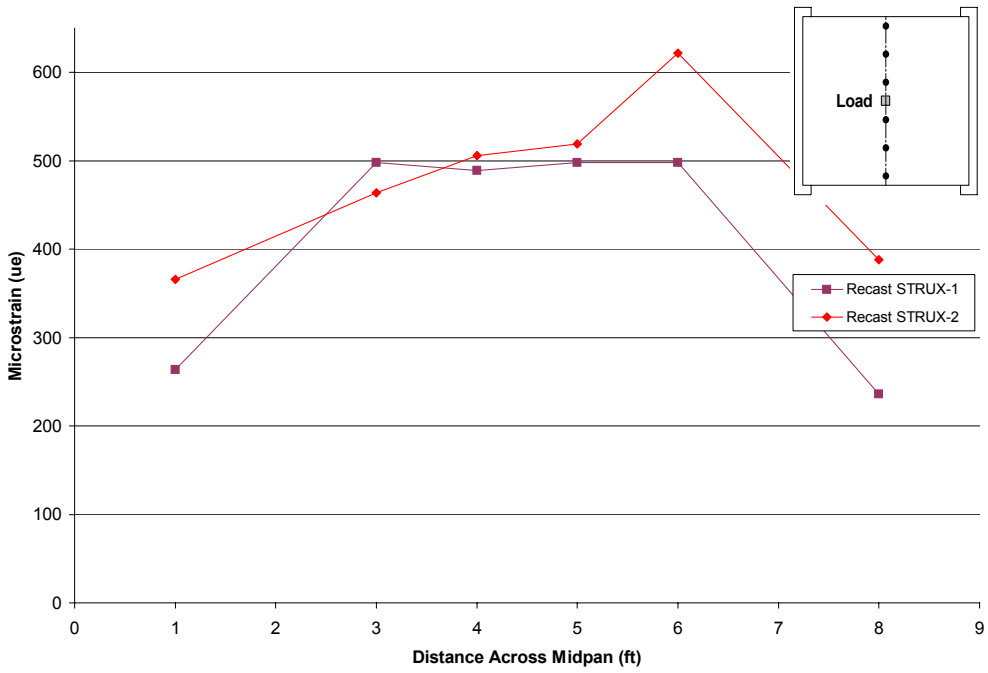

Figure 4-39: Strain across midspan with 20 kip concentrated load at midspan

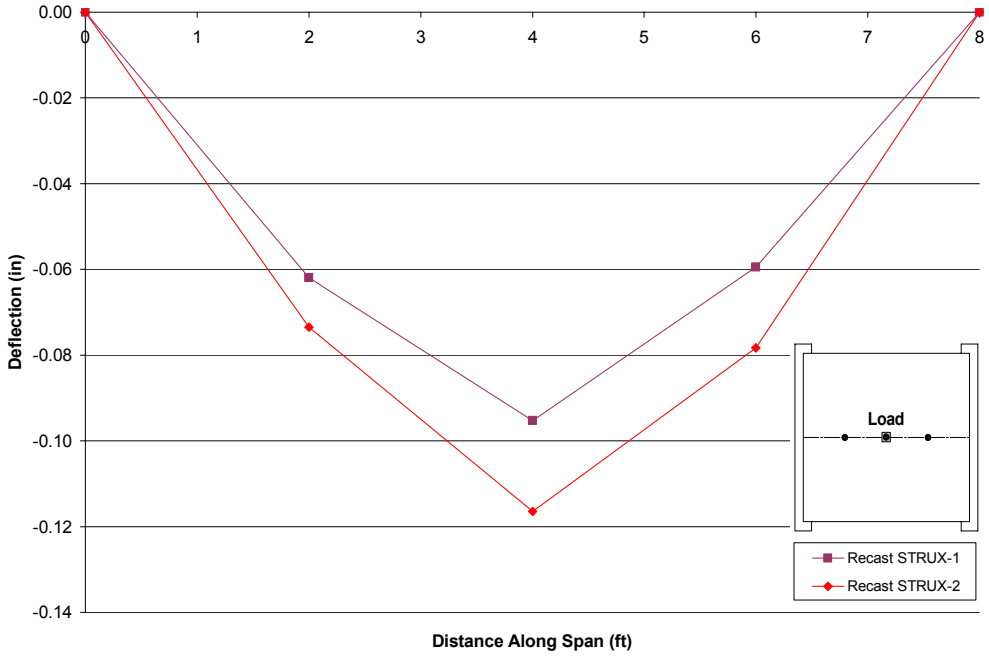

Figure 4-40: Deflection along span's center strip with 20 kip concentrated load at midspan

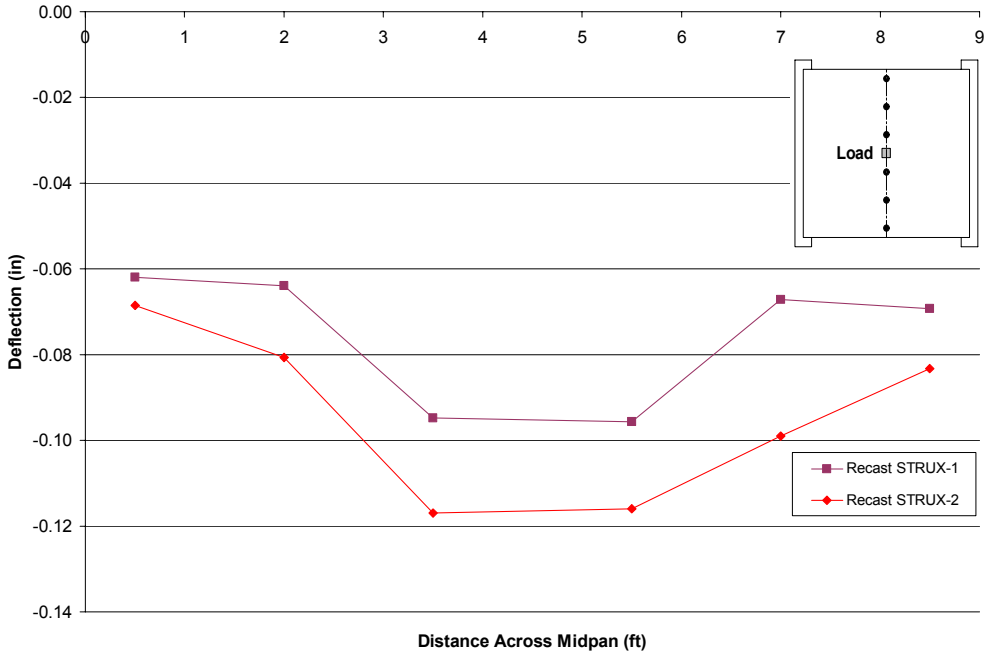

Figure 4-41: Deflection across midspan with 20 kip concentrated load at midspan

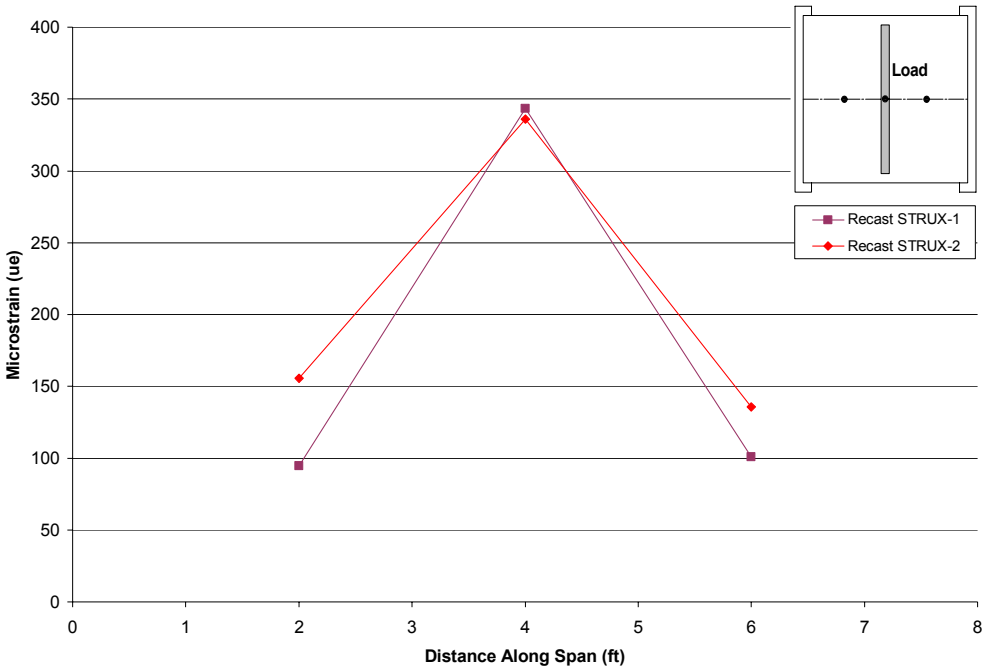

Figure 4-42: Strain along span's center strip with 15 kip transverse line load at midspan

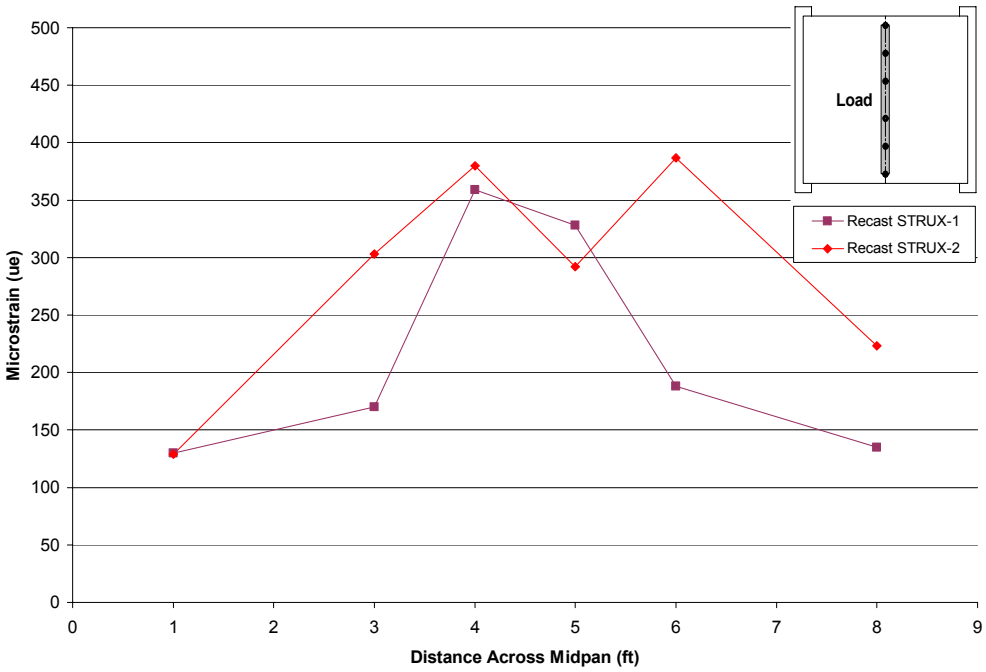

Figure 4-43: Strain across midspan with 15 kip transverse line load at midspan

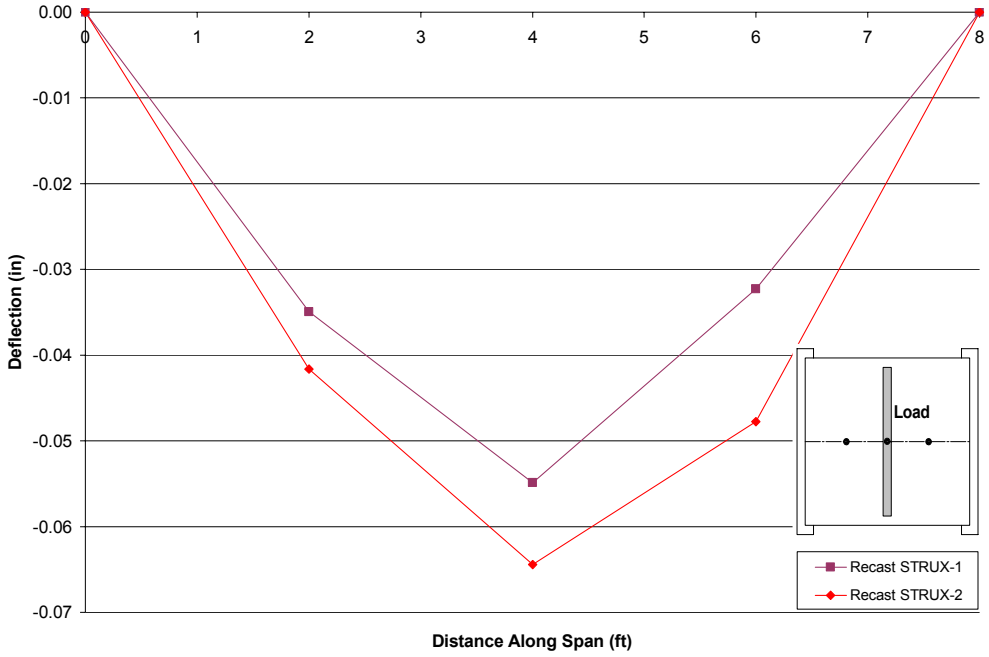

Figure 4-44: Deflection along span's center strip with 15 kip transverse line load at midspan

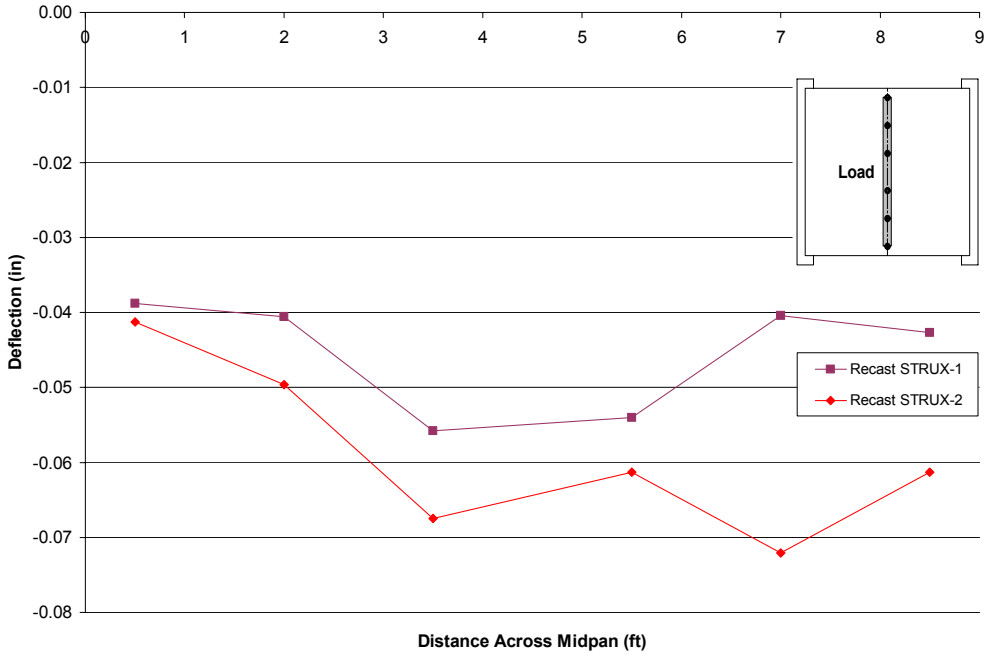

Figure 4-45: Deflection across midspan with 15 kip transverse line load at midspan

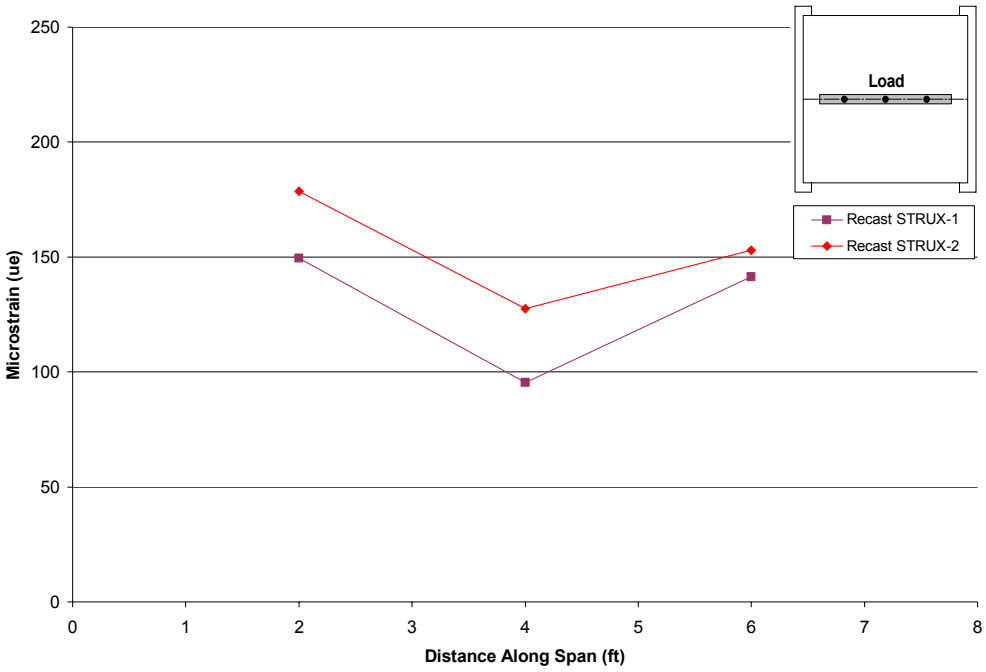

Figure 4-46: Strain along span's center strip with 15 kip longitudinal line load at midspan

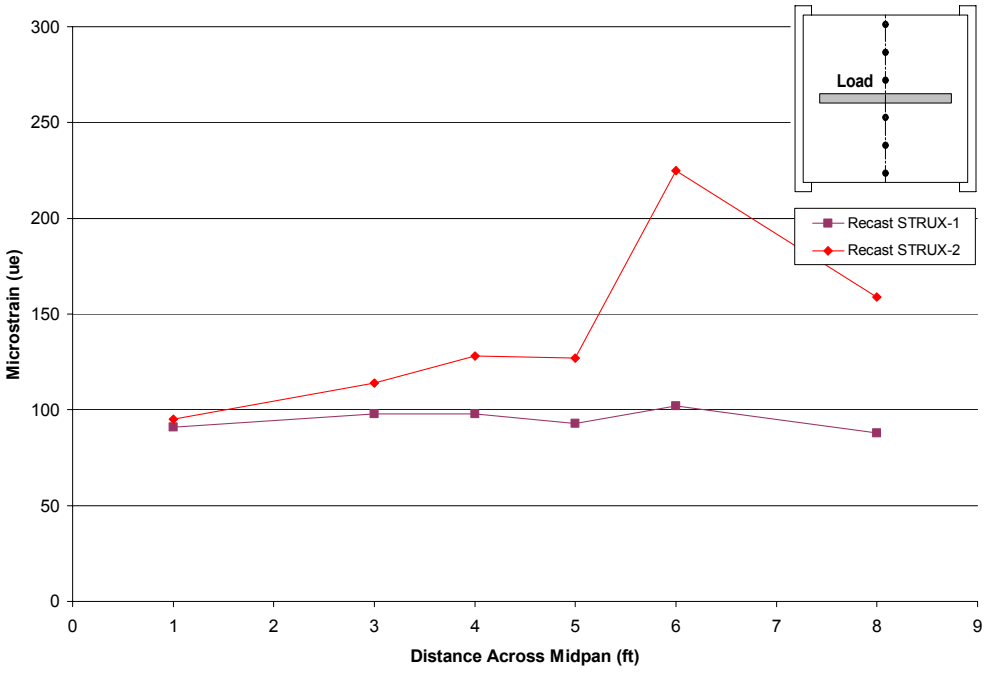

Figure 4-47: Strain across midspan with 15 kip longitudinal line load at midspan

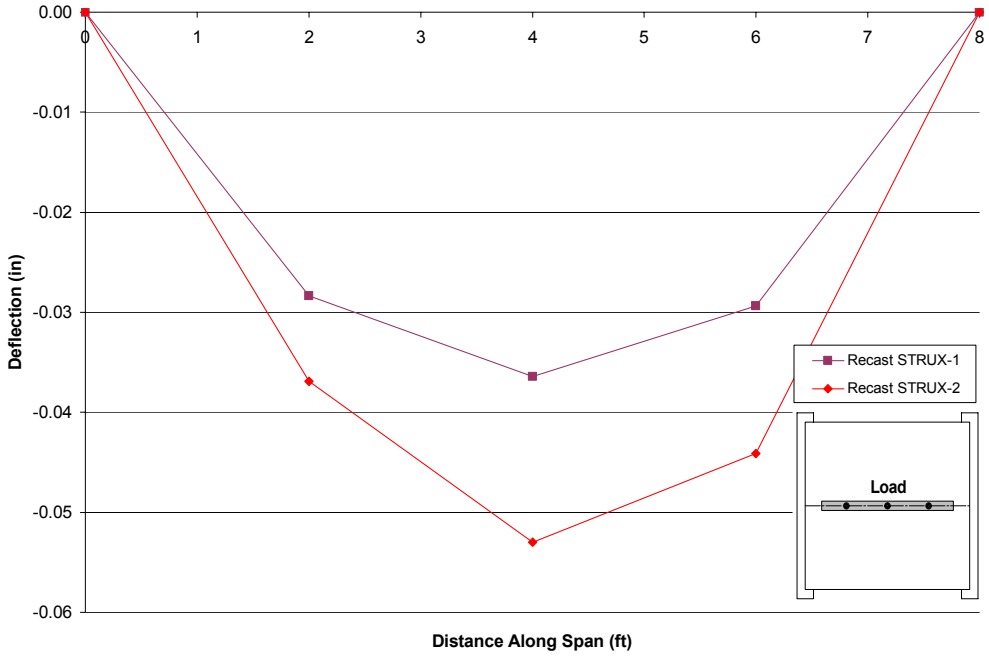

Figure 4-48: Deflection along span's center strip with 15 kip longitudinal line load at midspan

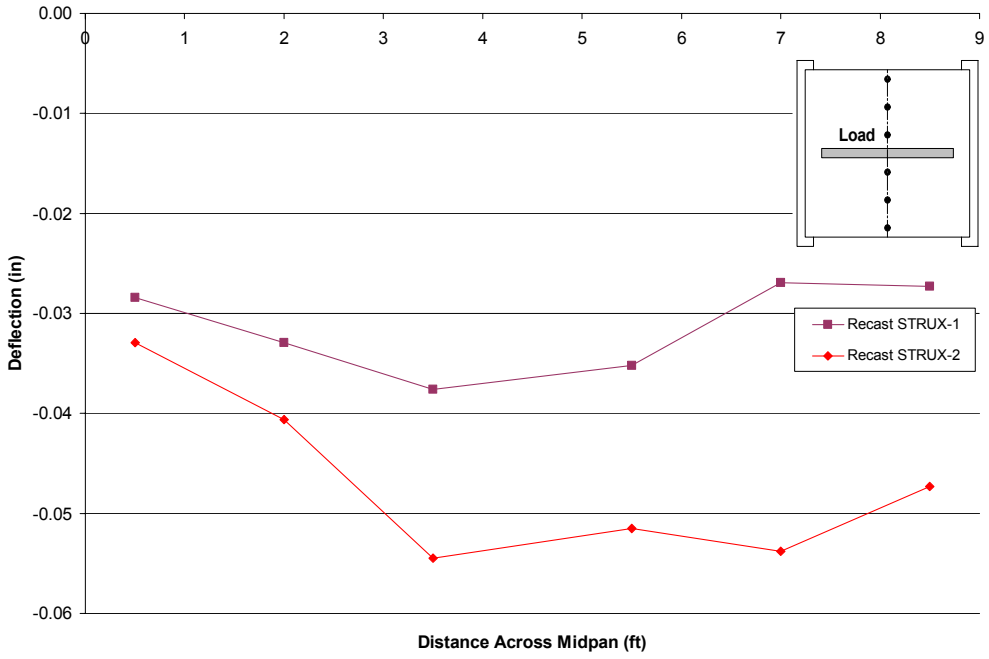

Figure 4-49: Deflection across midspan with 15 kip longitudinal line load at midspan

4.10 Evaluation of Results

4.10.1 Analysis Using the ASCE Method for the Structural Design of Composite Slabs Subjected to Concentrated Loads

This section details the ASCE Method for predicting the strength of a composite slab subjected to concentrated loading. This method calculates an effective width that a non-uniform load is distributed over. According to the ASCE Method, the effective width of a slab is given by the following equation:

$$B_e = b_2 + t_c$$

Where,

b_2 = width of the load area in the transverse direction, in.

t_c = cover depth of concrete, in.

To find the moment capacity of the slab, multiply B_e by the moment M_t as calculated by the ASCE Appendix D Alternate Method. Example calculations for this method are presented in Appendix G.

4.10.2 Analysis Using the SDI Handbook for the Structural Design of Composite Slabs Subjected to Concentrated Loads

This section details the SDI Composite Deck Design Handbook for predicting the strength of a composite slab subjected to concentrated loading. First the cracked moment of inertia is calculated using allowable stress design (ASD) calculations that assume all concrete below the neutral axis is cracked. All concrete is transformed into equivalent steel based off a foot width of concrete. To locate the depth of the neutral axis (N.A.), sum moments of areas about the N.A. and solve for the distance a, as shown in Figure 4-50.

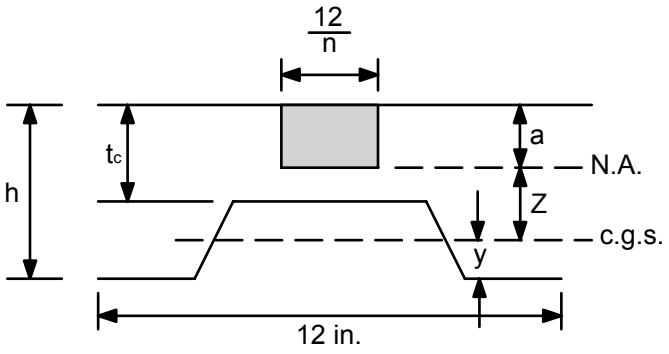

Figure 4-50: SDI approach to calculating composite section properties (After Heagler et al., 1997)

Once the depth of the equivalent rectangular stress block is known, the cracked moment of inertia I_c and cracked section modulus S_c can be calculated as shown below:

$$I_c = \frac{12a^2}{2n} - A_s Z$$

$$S_c = \frac{I_c}{h-a}$$

The moment capacity per foot width of the composite slab is given by the following equation:

$$M_o = f_{yc} S_c$$

The SDI Handbook then calculates an effective width that a non-uniform load is distributed over. Refer to the schematic in Figure 4-51 for help understanding this approach. The curved lines in the figure represent the distribution of force. The following equations are used to calculate the effective transverse width of a composite slab:

$$b_m = b_2 + 2t_c + 2t_t$$

For single span bending:

$$b_e = b_m + 2(1 - \frac{x}{L})x$$

For continuous span bending:

$$b_e = b_m + \frac{4}{3}(1 - \frac{x}{L})x$$

Where,

t_t = thickness of a durable topping (if none used t_t = 0), in.

x = the location of the load, in.

But in no case shall $b_e > 8.9(t_c/h)$, measured in feet.

The following equation is used to calculate the effective width in the longitudinal direction:

$$w = \frac{L}{2} + b_3 \leq L$$

The live load moment per foot of width on the slab with a point load at the center is given by:

$$M = \frac{PL}{4}\frac{12}{b_e}$$

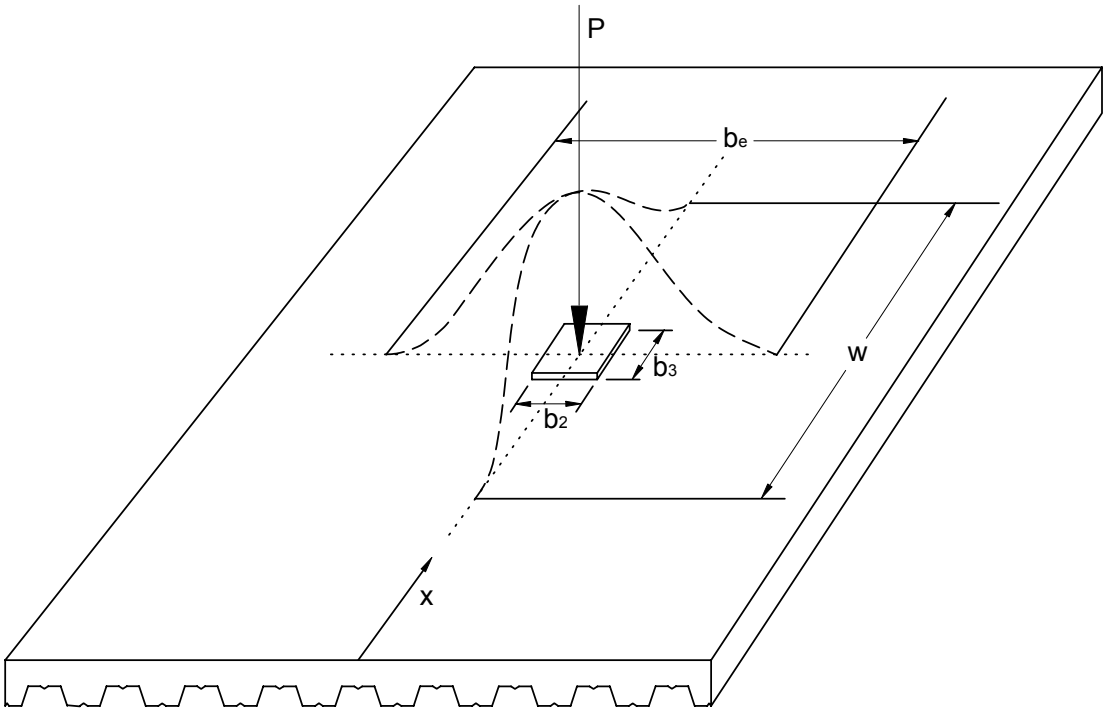

Figure 4-51: Distribution of concentrated load for SDI Handbook method (After Heagler et al., 1997)

4.10.3 Comparison of Experimental and Calculated Results

Using the ASCE Standard and the SDI Handbook, the moment capacity of all four slabs subjected to a concentrated load at midspan was calculated. The experimentally measured strengths and the calculated strengths are summarized in Table 4-3. Sample calculations for test designation WWF (2006 Results) of both calculated methods are presented in Appendix G.

Table 4-3: Comparison of observed and calculated test results

	Test Designation	Moment (ft-lbs)			M_{test}/M_{th}	M_{test}/M_n
		Test Ultimate M_{test}	ASCE M_{th}	SDI M_n		
2006 Results	WWF	38,750	5,271	23,932	7.35	1.62
	STRUX	30,500	5,204	23,633	5.86	1.29
	Recast STRUX 1	41,948	6,049	28,923	6.93	1.45
	Recast STRUX 2	40,870	5,996	28,674	6.82	1.43
				Mean	6.740	1.448
				σ	0.630	0.135
2001 Results	WWF	35,750	5,366	20,282	6.66	1.76
	XOREX-25	34,300	5,403	20,420	6.35	1.68
	XOREX-50	34,250	5,392	20,460	6.35	1.67
	MICROFIBER-MD	33,168	5,392	20,377	6.15	1.63
2001 test results from Guirola et al. (2001)				Mean	6.378	1.685
				σ	0.211	0.054

The ultimate moment capacity observed during testing, M_{test}, was calculated by the equation PL/4 which is assumed to act over the entire transverse width of the structure. M_{th} and M_n refer to the calculated moment capacities using the ASCE standard and the SDI Handbook, respectively. Calculations for test designations WWF and STRUX, as well as all 2001 results, in Table 4-3 were made using measured material properties and a span length of 10 ft. Calculations for the Recast STRUX test designations were made using an 8 ft span.

Table 4-3 demonstrates the inadequacy of the ASCE method in instances of concentrated loads on composite slabs. The method severely underestimates the ability of a composite slab to distribute a concentrated load in the transverse direction. The SDI Handbook method predicts the moment capacity of a composite slab subjected to non-

distributed loads to a much greater degree of accuracy. The SDI method yields a much larger effective slab width than the ASCE method.

From the results, it seems that both methods predict the actual slab strengths conservatively. It is important to remember that all calculations are based off an assumed simply supported slab. In reality, these slabs were not purely simply supported because the metal deck was spot welded to the steel support beams on which it rested. Due to the partially fixed supports, the observed moment capacity is larger than what would be expected with a simple span condition.

4.11 Summary of Concentrated Load Tests

A total of eleven tests were performed on each slab, one reinforced with WWF and three with STRUX 90/40 synthetic macro fibers. For each test, a concentrated point or linear load was applied at the locations, and in the order as, depicted in Figure 4-6. The results from the 10 ft simple span composite slabs are summarized first, followed by a summary of the 8 ft simple span recast slabs.

During testing of the composite slab reinforced with WWF, the target 15 kip load was reached in all eleven tests. Whereas for the fiber-reinforced slab, the target load was only reached in five of the eleven tests. Test 11, the concentrated point load at midspan, was the most crucial of all tests performed. It was the most effective test to show the ability of the composite slab to distribute a concentrated load into other areas. However, the WWF and fiber-reinforced slab failed at 15.5 kips and 12.2 kips respectively. Regardless of the difference, both failure loads were above those calculated using the ASCE and SDI methods.

One explanation for the poor performance of the fiber-reinforced slab is that it didn't cure correctly. There may have not been enough moisture applied to the concrete during the first seven days, which are critical. A second explanation is that the slab was loaded shortly after being cast, possibly with a heavy piece of laboratory equipment, without the knowledge of the author. It was apparent that the mechanical bond between the concrete and the steel deck was severely lacking during the eleven tests, which is supported by the photograph in Figure 4-11. The fact that there was a consistent measured slip in the fiber-reinforced slab tests, as early as Test 2, is also evidence of this.

Also, the compressive strength of this fiber mix was significantly lower compared to the other WWF mix or the second series of fiber tests. The compressive strength of the WWF-reinforced concrete and the first fiber-reinforced was 5200 psi and 3800 psi, respectively. The difference is due to the fact that the two mixes originated from two different batches of concrete and had slightly different water/cement ratios.

The results of the recast fiber-reinforced composite slabs were very similar to each other. The failure loads and measured deflections observed during testing were almost identical. The first and second fiber-reinforced slab failed at 21 kips and 20.5 kips, respectively. These failure loads were above those calculated using the ASCE and SDI methods.

Also, the flexural strengths observed in the composite slabs tested in 2001 were similar to those observed in the current research, as shown in Table 4-3. And when referring to the graphs presented in Section 4.6, it is important to keep in mind that the composite slabs were tested in different orders in 2001 and 2006. In the current research, the slabs were tested in an order that would help to preserve the integrity of the slab. In the 2001 research, this was not the case; the order seemed a bit more arbitrary. During the testing of the WWF and MICROFIBER-MD-reinforced slabs in 2001, cracks formed during several of the tests as reported by Guirola et al. (2001). The presence of these cracks has a direct effect on the strength and stiffness of a composite slab. By referring back to some of the graphs in Section 4.6, the resulting differences in strains and deflections become apparent.

Referring to the results in Table 4-3 demonstrates the adequacy of fibers as secondary reinforcement in composite slabs. The flexural strengths observed for the fiber-reinforced slabs were similar to those of the WWF-reinforced slabs. The one exception would be the 2006 tests, denoted WWF and STRUX, where the flexural strength of the fiber-reinforced slab was considerably lower. As described previously, this was due to an issue with the shear bond and not with the secondary reinforcement itself.

CHAPTER 5
ASTM C 1399 STANDARD TEST METHOD FOR OBTAINING AVERAGE RESIDUAL-STRENGTH OF FIBER-REINFORCED CONCRETE

5.1 Scope

The ASTM C 1399 (2003) standard test presents methods for determining the average residual strength of fiber-reinforced concrete. The average residual strength (ARS) is computed using measured beam deflections from a test beam that has already been cracked in a controlled manner. The test provides data needed to obtain that portion of the load-deflection curve beyond which a significant amount of cracking damage has occurred and it provides a measure of post-cracking strength, as such strength is affected by the use of fiber-reinforcement.

This test method offers the ability to make a comparative analysis among beams containing different fiber types, including materials, dimension and shape, and different fiber contents. The test results are intended to reflect the residual strength of test beams reinforced with STRUX 90/40 at a fiber volume fraction of 0.2% with a degree of consistency.

Six fiber-reinforced concrete test beams were cast on December 16, 2005, the day the first eight slabs were poured. Six more test beams were cast on June 16, 2006 during the second pour. The concrete used for the specimens was from the same fiber mix used to construct the composite slabs and compression cylinders. The test beams were cured in the lab and then shipped to the facilities of the project sponsor, W.R. Grace, for testing. The project sponsor took the responsibility of all ASTM C 1399 testing and results. The test procedure and results are described in the following sections.

5.2 Test Setup

To perform the ASTM C 1399 test method, a testing apparatus like the one shown in Figure 5-1 must be used. Displacement transducers are used to measure deflections, within 0.001 in. of precision, at midspan and at the supports. The difference between the deflection at midspan and the supports is the net deflection. A load cell is used to

measure applied load. Before testing, a 0.472 x 3.937 x 13.780 in. (12 x 100 x 350 mm) stainless steel plate is first placed over the pin and roller supports as shown. The concrete test beam is then placed on top the plate. The load is applied by a second set of pin and rollers at third points as shown in Figure 5-1.

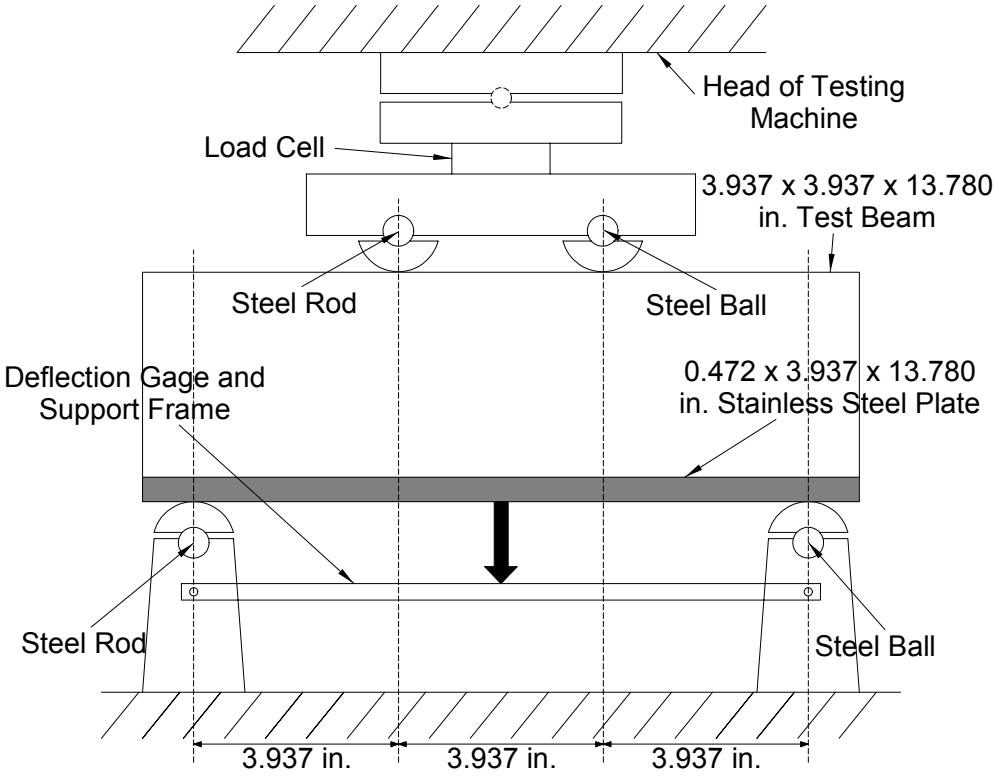

Figure 5-1: Schematic of testing apparatus where the deflection gage support frame is clamped to the beam supports (After ASTM, 2003)

5.3 Test Procedure

The test procedure for obtaining the average residual strength of the fiber-reinforced test beams is specified in the ASTM C 1399 Standard. First, the beam needs to be cracked in a controlled manner. The steel plate ensures that the beam is restricted from a sudden failure. The beam must be loaded until a deflection of 0.020 in. (0.5 mm) is reached; if no crack appears before this point the test is invalid.

Once a crack forms and the deflection limit of 0.020 in. (0.5 mm) has been reached, the beam can be unloaded and the steel plate can be removed. After zeroing all deflection gages, the beam is then reloaded at the same rate used in the initial loading

sequence up to a deflection of 0.049 in. (1.25 mm). At the final deflection, the beam and crack location can be measured. To calculate the ARS of the beam, the loads determined at reloading curve deflections of 0.020, 0.029 0.039, and 0.049 in. (0.50, 0.75, 1.00, and 1.25 mm, respectively) must be used ($P_A + P_B + P_C + P_D$). The average residual strength, as stated in the ASTM C 1399 Standard, can be calculated using the following equation:

$$ARS = \frac{(P_A + P_B + P_C + P_D)}{4} k$$

$$k = L / bd^2$$

Where,

ARS = Average residual strength, psi (Mpa)

$P_A + P_B + P_C + P_D$ = Sum of recorded loads at specified deflections, lb (N)

L = Span length, in. (mm)

b = Average width of beam, in. (mm)

d = Average depth of beam, in. (mm)

The graph below in Figure 5-2 is an example of the initial loading and reloading curved used for the ASTM C 1399 Standard test method.

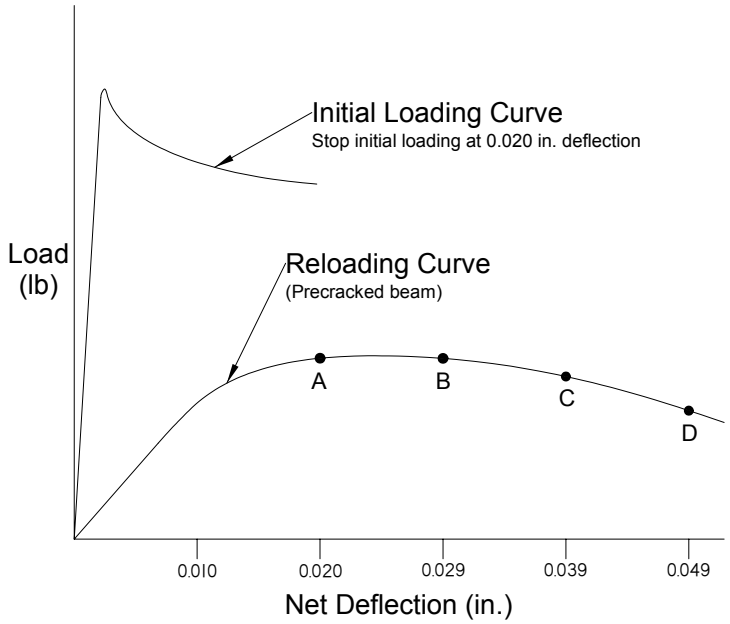

Figure 5-2: Load-deflection curves used for calculating average residual strength

5.4 Results of ASTM C 1399 Tests

The first set of six specimens was tested after 68 days of curing. All test beams exhibited similar behavior. The initial load increased linearly with the deflections until the first crack formed, at which point there was a large load decrease. The maximum load reached during the initial loading ranged from 2914 lb (12.96 kN) to 4672 lb (20.78 kN); the average being 3954 lb (17.59 kN). During reloading, the load would increase somewhat linearly with the deflections until a maximum load was reached. At that point, the load would decrease slowly and level off at a near-constant value as the deflection increased. Table 5-1 below summarizes all measured and calculated test data for the first set of the ASTM C 1399 tests. A span length of 12 in. (304.8 mm) was used during all tests. The average value of ARS from the first series of tests was 81 psi (0.5563 MPa). Figure 5-3 through Figure 5-8 show the load-deflection curves of the first set of specimens used to calculate the ARS.

The second set of six specimens was tested after 28 days of curing. All test beams exhibited similar behavior, and the load-deflection curves followed the same patterns as seen in the first set of specimens. The maximum load reached during the initial loading ranged from 2947 lb (13.11 kN) to 3716 lb (16.35 kN; the average being 3325 lb (14.79 kN). Table 5-1 below summarizes all measured and calculated test data for the second set of the ASTM C 1399 tests. The average value of ARS from the second series of tests was 109 psi (0.7485 Mpa). Note that the ARS of test specimen T06224-3A was abnormally low. Ignoring this result brings the average value of ARS to 120 psi (0.8281 Mpa). Figure 5-9 through Figure 5-14 show the load-deflection curves of the second set of specimens.

Results presented in Table 5-1 and Figure 5-3 through Figure 5-14 were supplied by the project sponsor, W.R. Grace. Note that in Table 5-1 all data was measured in metric units, however the ARS values were converted to psi. All the load-deflection curves presented in this section were also measured in metric units.

Table 5-1: Results of average residual strength for ASTM C 1399 tests

Test Specimen	Beam dimensions (mm)		Recorded Loads (N)				k	ARS	
	b	d	P_A	P_B	P_C	P_D	(mm^{-2})	(Mpa)	(psi)
T06000-1A	101.15	99.9	2023.16	1987.91	1978.71	1972.58	0.000302	0.601	87
T06000-1B	103.12	100.1	1984.11	1932.43	1941.04	1951.37	0.000295	0.5759	84
T06000-1C	102.94	102.33	1449.88	1380.9	1350.24	1336.45	0.000283	0.39	57
T06000-1D	104.88	101.11	2592.2	2480.23	2466.45	2471.62	0.000284	0.7114	103
T06000-1E	103.3	100.51	2138.13	2044.62	2003.24	1990.97	0.000292	0.5971	87
T06000-1F	102.96	99.5	1646.47	1539.66	1510.38	1491.43	0.000299	0.4626	67
							Mean	0.556	81
							σ	0.114	16.351
T06224-3A	104.35	102.93	1410.02	1265.94	1218.42	1183.16	0.000276	0.3504	51
T06224-3B	100.44	101.06	3931.56	3893.24	3853.39	3723.1	0.000297	1.1435	166
T06224-3C	103.15	101.38	3082.36	2892.29	2769.66	2627.11	0.000288	0.8187	119
T06224-3D	102.74	101.53	2800.32	2757.4	2754.33	2755.87	0.000288	0.7969	116
T06224-3E	100.76	100.88	2705.28	2601.05	2552	2483.02	0.000297	0.7678	111
T06224-3F	102.13	101.53	2136.6	2141.19	2119.73	2092.14	0.00029	0.6155	89
Note: All data in this table supplied by W.R. Grace							**Mean**	0.749	109
							σ	0.261	37.856

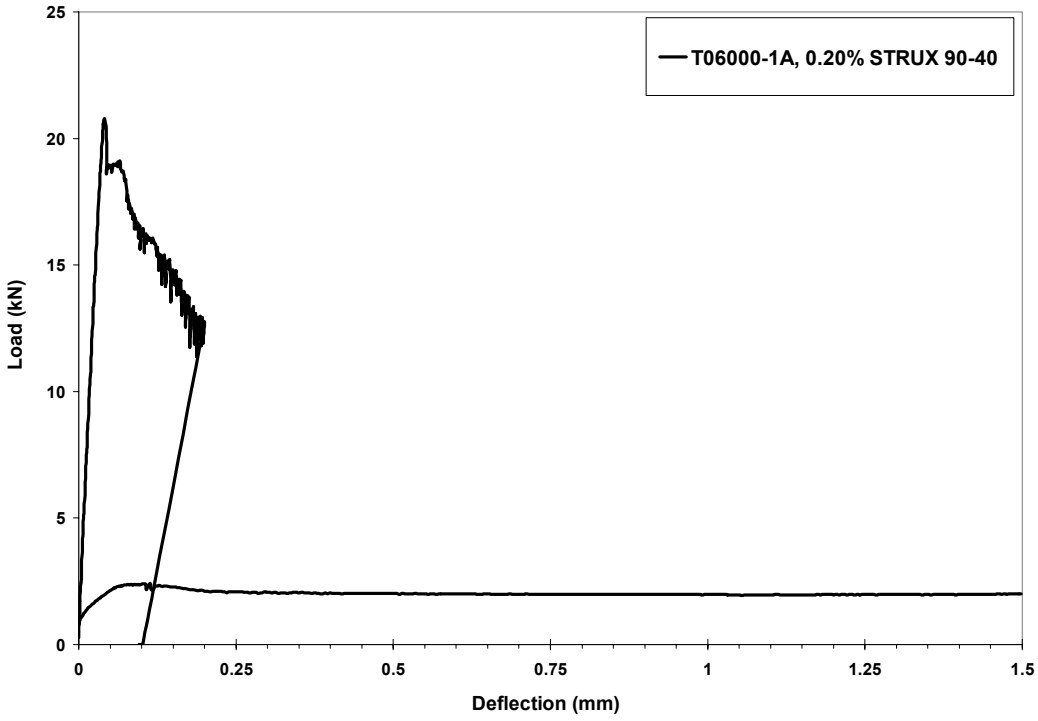

Figure 5-3: Load-deflection curve for ASTM C 1399 test specimen T06000-1A

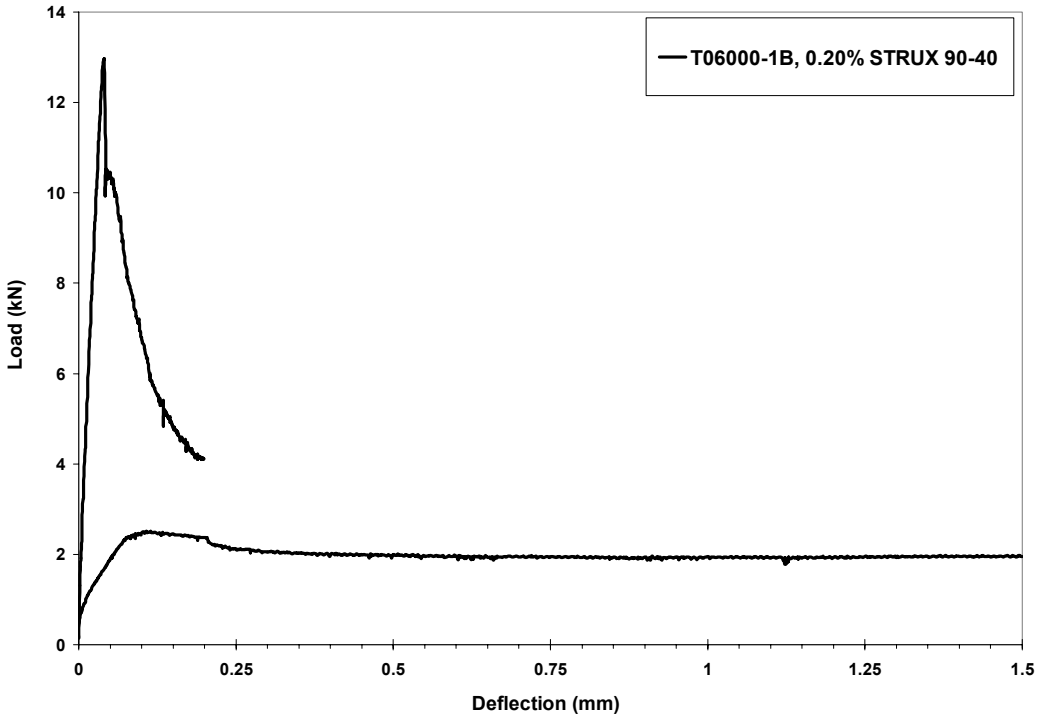

Figure 5-4: Load-deflection curve for ASTM C 1399 test specimen T06000-1B

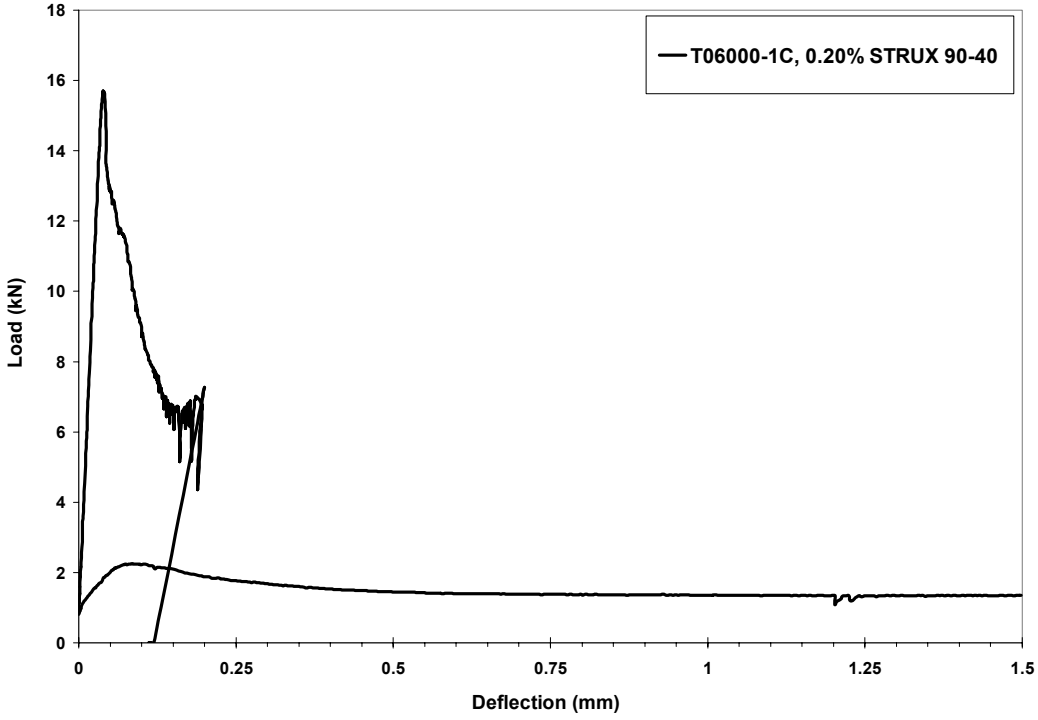

Figure 5-5: Load-deflection curve for ASTM C 1399 test specimen T06000-1C

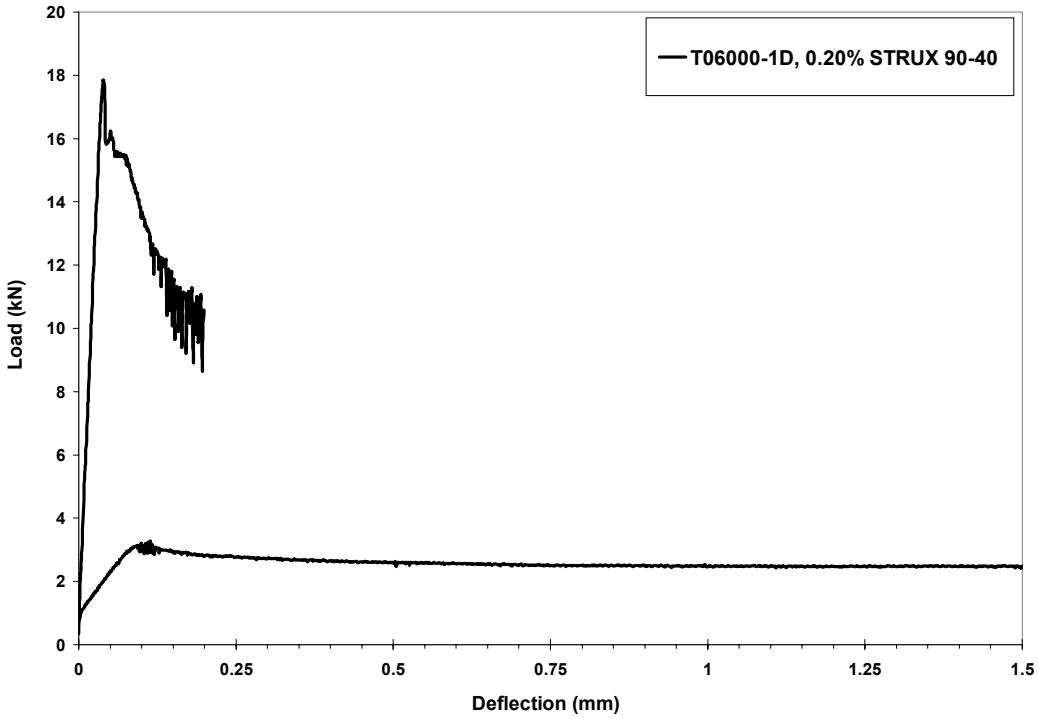

Figure 5-6: Load-deflection curve for ASTM C 1399 test specimen T06000-1D

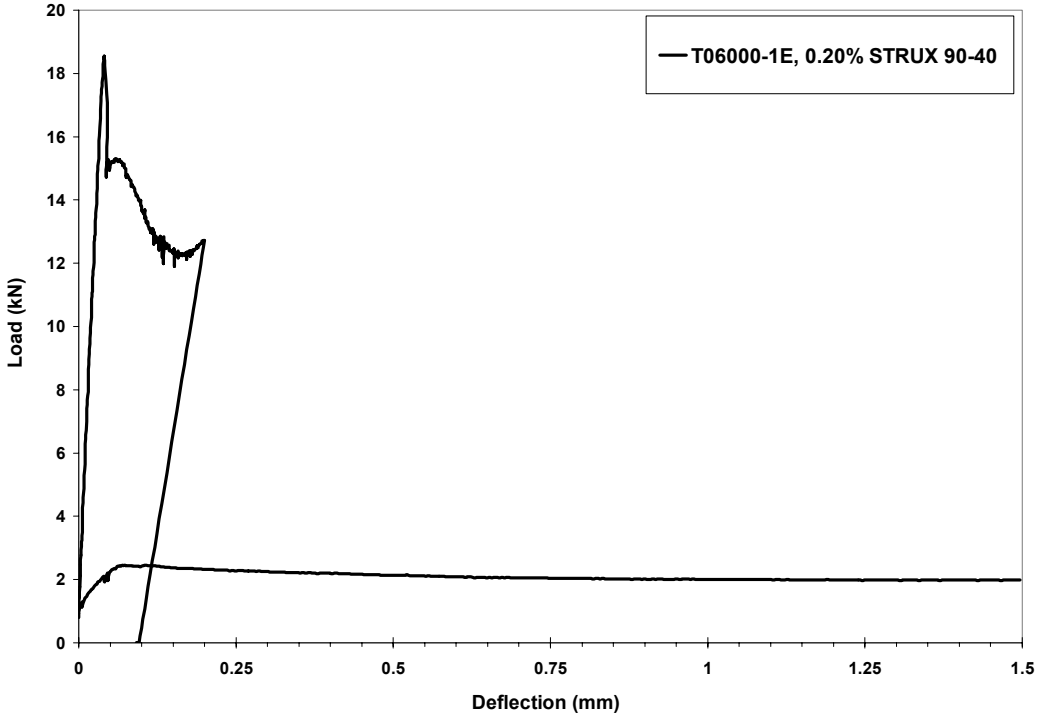

Figure 5-7: Load-deflection curve for ASTM C 1399 test specimen T06000-1E

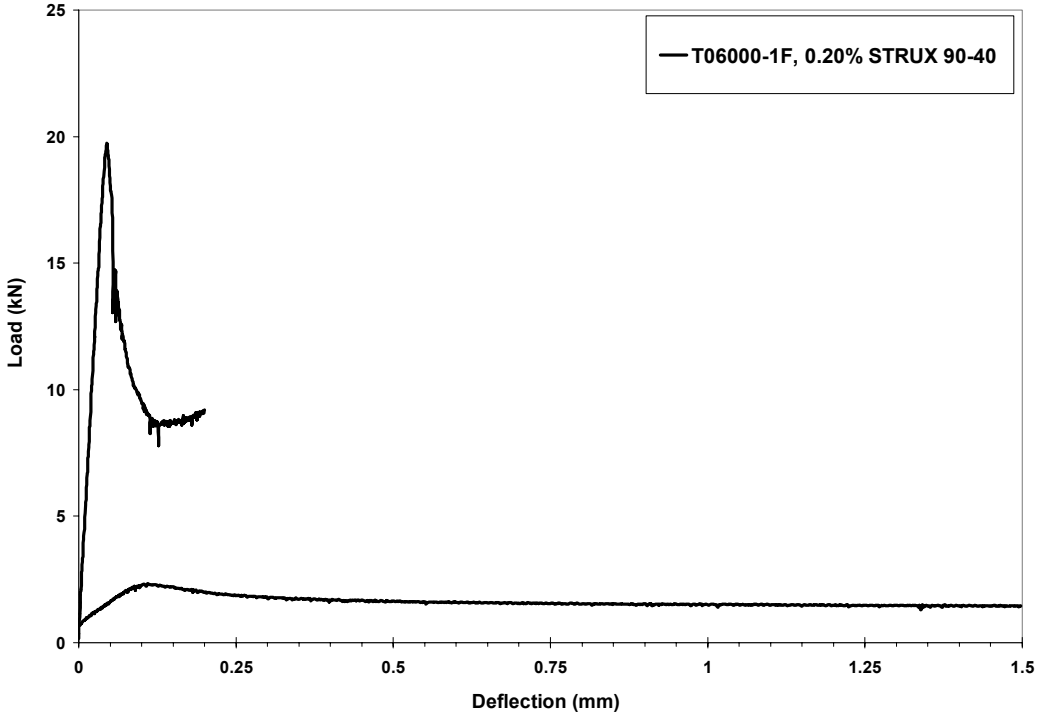

Figure 5-8: Load-deflection curve for ASTM C 1399 test specimen T06000-1E

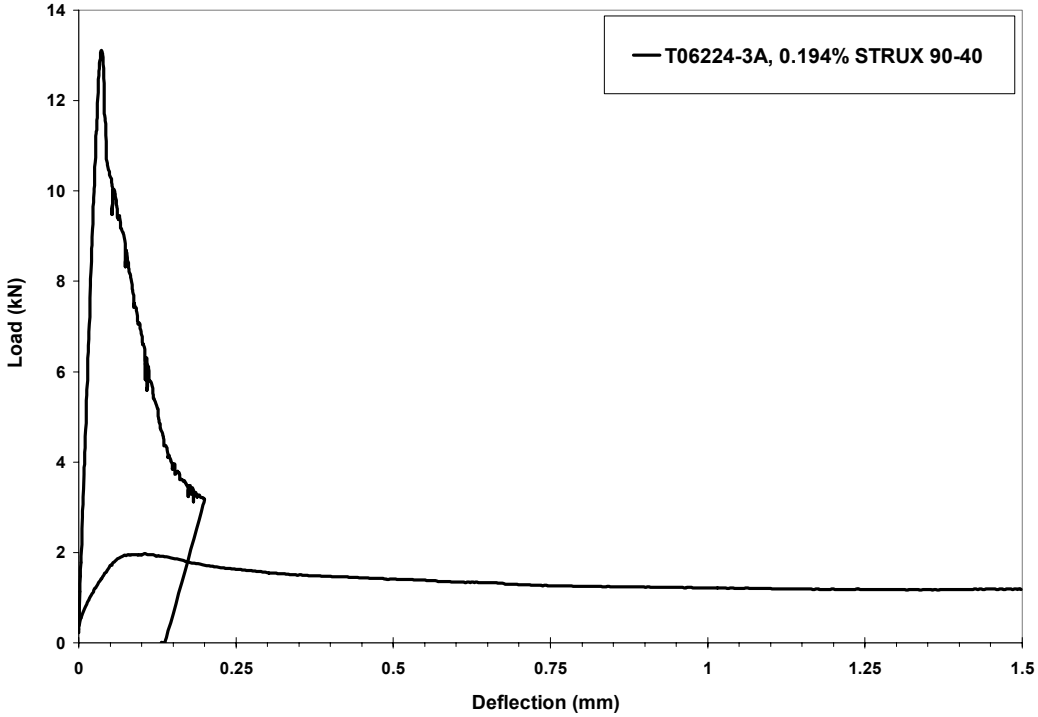

Figure 5-9: Load-deflection curve for ASTM C 1399 test specimen T06224-3A

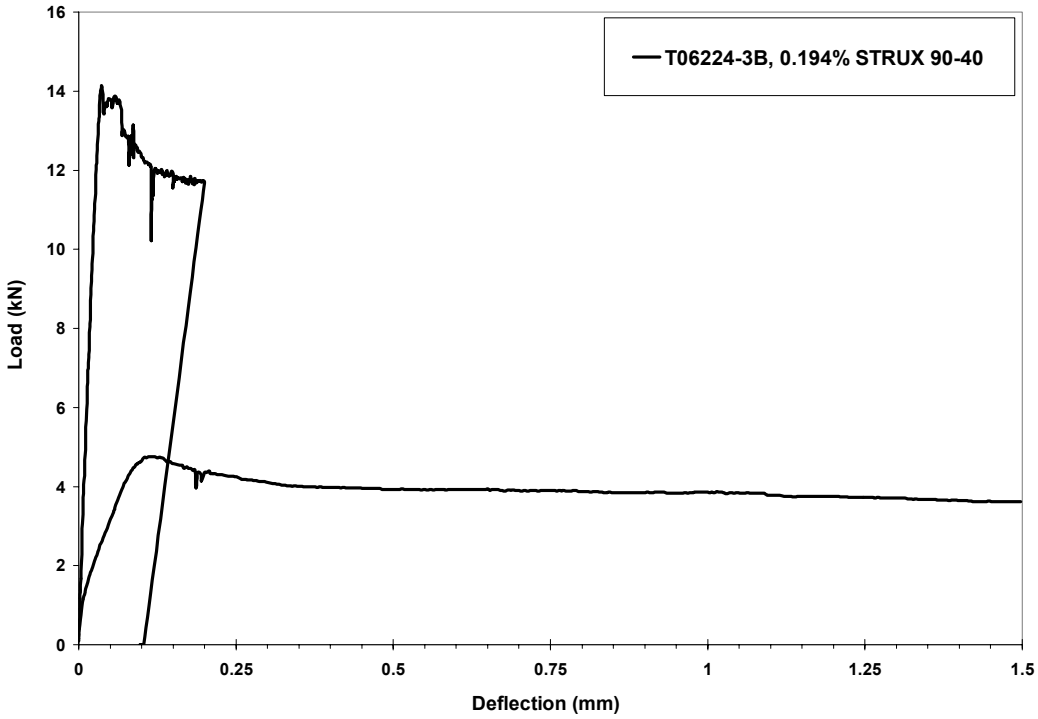

Figure 5-10: Load-deflection curve for ASTM C 1399 test specimen T06224-3B

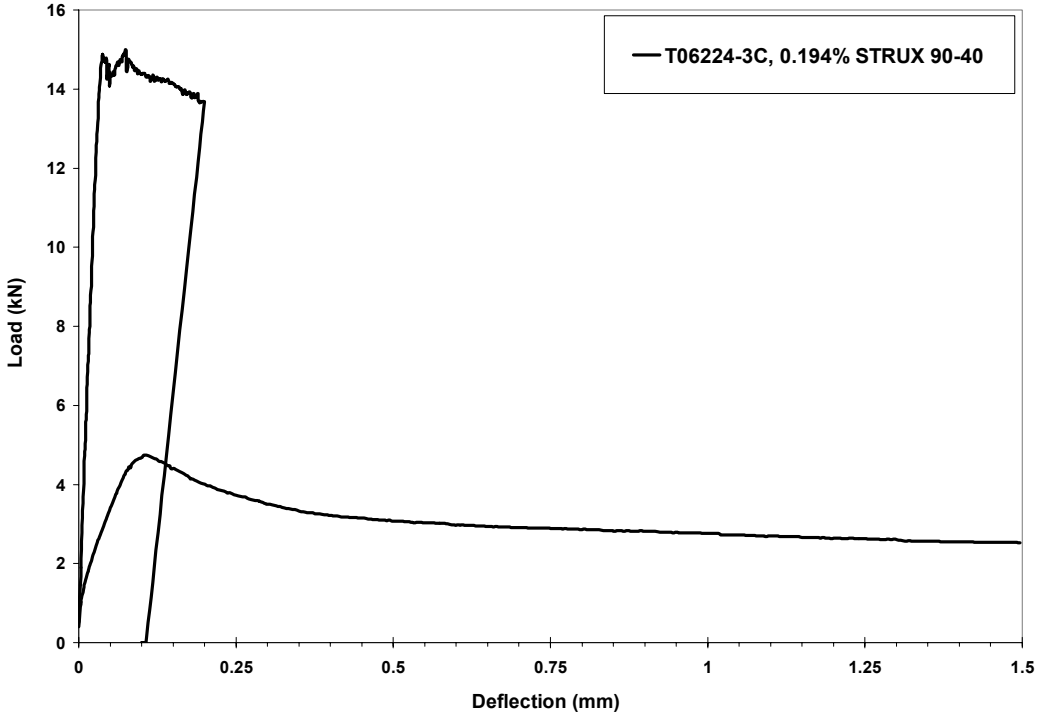

Figure 5-11: Load-deflection curve for ASTM C 1399 test specimen T06224-3C

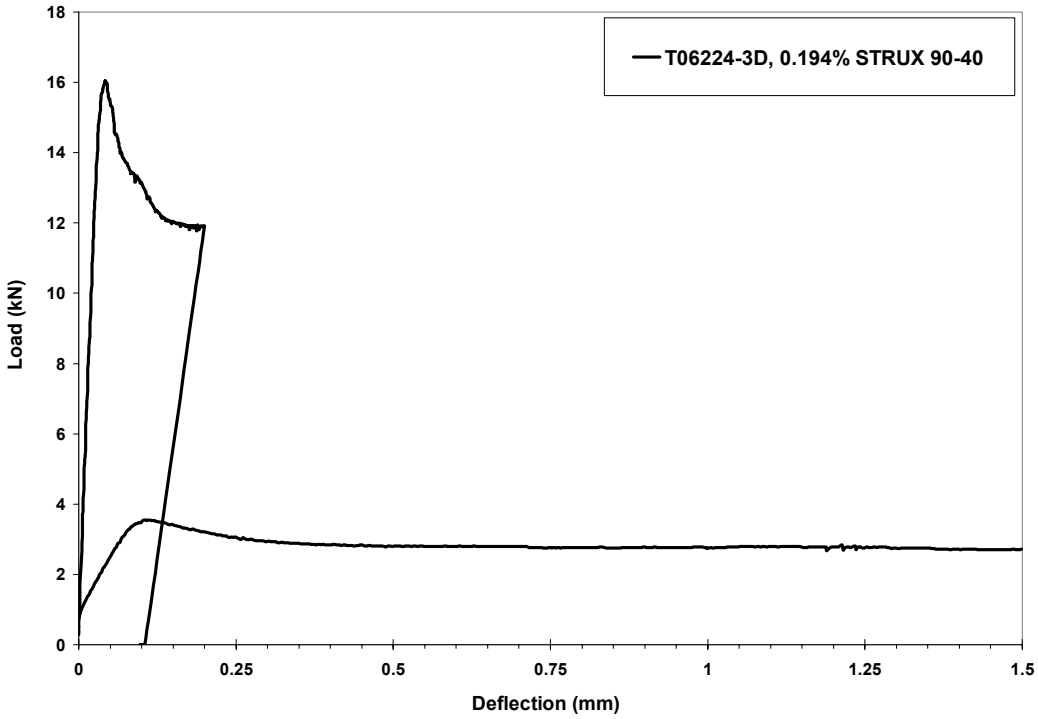

Figure 5-12: Load-deflection curve for ASTM C 1399 test specimen T06224-3D

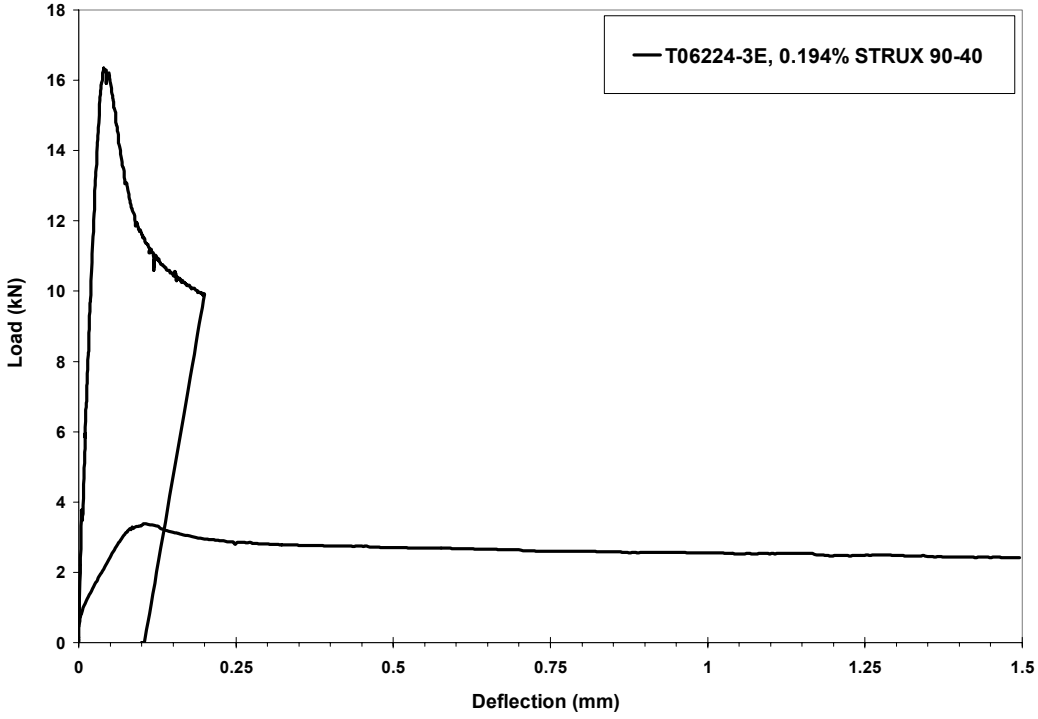

Figure 5-13: Load-deflection curve for ASTM C 1399 test specimen T06224-3E

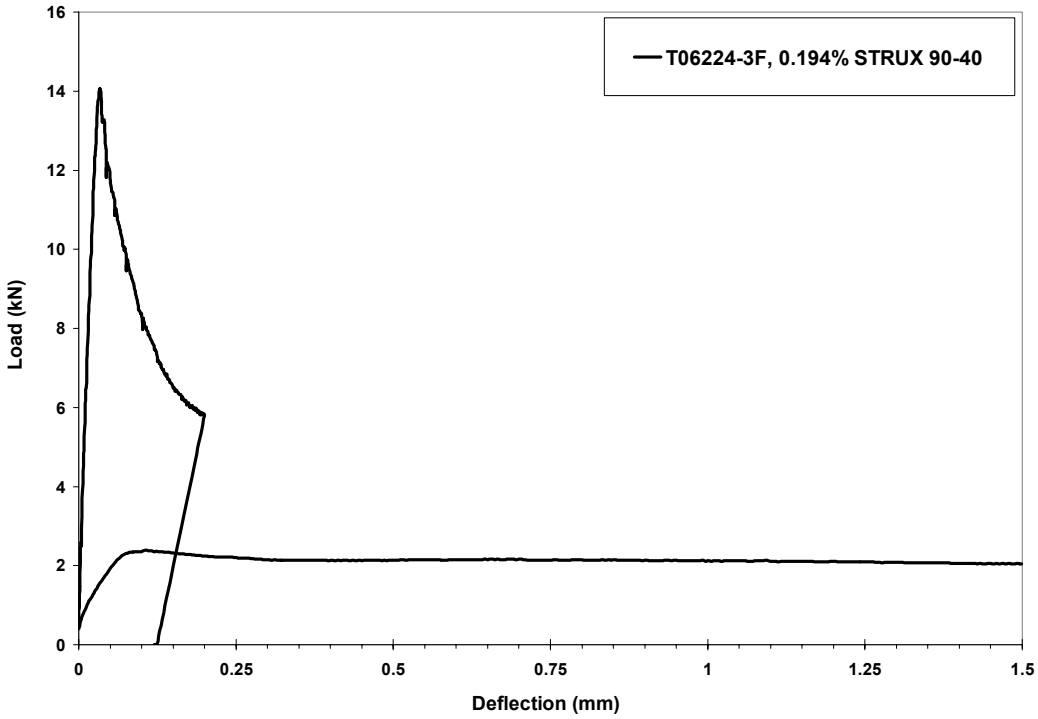

Figure 5-14: Load-deflection curve for ASTM C 1399 test specimen T06224-3F

CHAPTER 6
SUMMARY AND CONCLUSIONS

6.1 Summary

Composite floor slabs are utilized in almost all multi-story steel framed buildings that are constructed today. Their use has proven to be highly beneficial to the construction industry in terms of time, labor, and cost. The steel deck acts as a form for the concrete during construction and as a safe working platform for laborers. It also serves as the positive reinforcement for the slab during service which eliminates the need to install additional reinforcements for strength. Generally, added reinforcements would only be necessary in an area of negative moment. However for serviceability reasons, temperature and shrinkage reinforcement are required.

WWF is the most common form of secondary reinforcement used in composite slabs, but recently fiber-reinforced concrete has become an attractive alternative. When compared to WWF, fibers are much easier to handle and cheaper to ship. The focus of this research was to compare the influence that concrete reinforced with 6 x 6 W1.4/W1.4 WWF and STRUX 90/40 synthetic macro fibers had on the strength and behavior of composite slabs. This investigation would provide the data needed to support the use of STRUX 90/40 as an equivalent alternative to WWF. This research did not address the serviceability performance of the WWF and fibers with respect to the control of temperature and shrinkage cracks; such investigations have already been well documented in previous studies. The synthetic macro fiber mixture was in the amount of 3 lb/yd^3 (fiber volume fraction 0.2%).

Composite slab specimens were tested under flexural strength tests and concentrated load tests. Measurements such as applied load, vertical deflections, deck strains, and end slip were recorded so that effective comparisons could be made between slabs reinforced with WWF and STRUX 90/40. Current composite slab design guides were used to calculate the theoretical moment capacity of the slabs, which were then compared to the observed moment capacity. These design standards were developed by drawing on years of research on the subject, and describe how to analyze, construct, and test a composite slab. The First Yield Method and the ASCE Appendix D Alternate

Method from the ASCE Standard for the Structural Design of Composite Slabs (1992) were used to analyze the composite slabs subjected to flexural strength tests. The slabs subjected to concentrated loading were analyzed using the ASCE Method and the effective width method presented in the SDI Composite Deck Design Handbook (1997).

The ASTM C 1399 standard test (2003) was performed on concrete test beams reinforced with STRUX 90/40. The tests, which were performed by W.R. Grace, yielded the average residual strength of the fiber-reinforced concrete.

6.2 Conclusions

This report outlines all research done and data gathered. Based off the collected information, conclusions were made. The following sections outline the conclusions drawn from the performed testing.

6.2.1 Composite Slabs Subjected to Flexural Strength Test Conclusions

- All slabs failed in the same manner and the exhibited behaviors followed similar patterns.
- Composite slabs reinforced with 3 lb/yd^3 failed at loads that were equivalent to slabs reinforced with 6 x 6 W1.4/W1.4 WWF.
- One of the three WWF-reinforced specimens exhibited a failure load significantly higher than all other specimens and one of the three fiber-reinforced specimens exhibited a failure load significantly lower than all the other specimens. The remaining 4 specimens failed at loads that were within 1.6% of each other.
- At failure, all slabs exhibited similar crack patterns
- At the maximum load, the midspan deflections and average end slip of all six slabs were almost identical.
- At a typical office design load of 70 psf, all six slabs exhibited similar load-deflection relationships. The midspan deflections at this load magnitude were much smaller than required for serviceability requirements.
- Mixing the synthetic macro fibers was much easier than placing and seating the welded wire fabric correctly.
- The shipping cost associated with the WWF was much higher than the shipping cost of the fibers.

- The main disadvantage of using the synthetic macro fibers is for purely aesthetic reasons. The fibers give the surface of the slab a "hairy" appearance, whereas the WWF is completely encased in the concrete.
- The behavior of slabs tested in 2001 was slightly different from those tested in the current research. This difference is due to the fact that the span conditions and methods of load application were different.
- In the 2001 research, the strength and behavior of slabs reinforced with WWF, 25 lb/yd^3 of XOREX steel fibers, and 1.5 lb/yd^3 of synthetic micro fibers were all very similar. The slab reinforced with 50lb/yd^3 of XOREX steel fibers had the highest strength.

6.2.2 Composite Slabs Subjected to Concentrated Load Test Conclusions

- The behavior and failure patterns of all four composite slabs were similar.
- The first pair of 10 ft simple span slabs exhibited failure loads that were significantly different. The failure load of the WWF-reinforced slab with a concentrated load at midspan was about 3 kips larger than that of the fiber-reinforced slab. The author concluded that this was due to improper curing or premature loading of the fiber-reinforced slab resulting in a loss of bond.
- At equivalent load magnitudes, the 10 ft simple span slab reinforced with STRUX 90/40 fibers had slightly larger deflections and strains than the WWF-reinforced slab. However, it is important to note that the deflected shapes of the slabs were different.
- There was poor bond between the steel deck and the concrete slab of the first fiber-reinforced slab tested. This claim is verified by the gap seen in Figure 4-11 and the end slip that was already occurring by the end of Concentrated Load Test 2.
- The second pair of 8 ft simple span composite slabs exhibited failure loads that were very similar. The failure loads with a concentrated load at midspan were 21 kips and 20.5 kips for the first and second slab, respectively.
- The ASCE method greatly underestimates the ability of composite slabs to distribute concentrated loads. The SDI Handbook provides a much more accurate

estimate of a composite slab's strength under concentrated loads, but is still slightly conservative.

- The strength and behavior of the slabs tested in 2001 were similar to the first set of slabs tested in current research. However, the order of testing was different and the WWF- and MICROFIBER-MD-reinforced slabs tested in 2001 had cracked significantly throughout the duration of testing.

6.2.3 ASTM C 1399 Standard Test Conclusions

- All fiber-reinforced test beams exhibited similar load-deflection behavior.
- The first batch of fiber-reinforced concrete yielded an average value for ARS of 80.3 psi.
- The second batch of fiber-reinforced concrete yielded an average value for ARS of 109 psi. Ignoring the one low result yields an average value for ARS of 120 psi.

6.3 Recommendations

Based on the results of this test program, the 2001 Virginia Tech test program, and input from W.R. Grace and the SDI, the following recommendations were developed.

6.3.1 Requirements for Temperature and Shrinkage Reinforcement

Temperature and shrinkage reinforcement, consisting of welded wire fabric or reinforcing bars, shall have a minimum area of 0.00075 times the area of the concrete above the deck (per foot or meter of width), but shall not be less than the area provided by 6 x 6 W1.4/W1.4 welded wire fabric. Fibers satisfying the requirements of section 6.3.2 can be used as a suitable alternative to the welded wire fabric specified for temperature and shrinkage reinforcement.

6.3.2 Requirements for Fiber reinforcement

Cold-drawn steel fibers meeting the criteria of ASTM A820, at a minimum addition rate of 25 lb/cu yd (14.8 kg/cu meter), or synthetic macro fibers with an equivalent diameter greater than 0.012 in. (0.3 mm), at a minimum addition rate of 3 lb/cu yd (1.8 kg/cu meter), are suitable to be used as minimum temperature and shrinkage

reinforcement. In addition to the minimum dosage rate requirement, the rate of fiber addition to the concrete shall not be less than the dosage rate required to satisfy the Average Residual Strength requirements at different compressive strengths as summarized in Table 6-1. For this table to be applicable, all test cylinders and beams must be made from the same batch of fiber-reinforced concrete.

Table 6-1: Requirements for average residual strength values of fiber-reinforced concrete at different concrete compressive strength levels

Concrete compressive strength, f_c' (average of 3 cylinders) tested according to ASTM C 39	Minimum requirement for ARS value (average of 6 beams) tested according to ASTM C 1399	
≤ 2,500 psi (17.2 MPa)	80 psi	0.55 MPa
2,500 < 3,000 psi (17.2 < 20.7 MPa)	100 psi	0.69 MPa
3,000 < 3,500 psi (20.7 < 24.1 MPa)	125 psi	0.86 MPa
3,500 < 4,000 psi (24.1 < 27.6 MPa)	145 psi	1.00 MPa
4,000 < 4,500 psi (27.6 < 31.0 MPa)	165 psi	1.14 MPa
≥ 4,500 psi (≥ 31.0 MPa)	185 psi	1.28 MPa

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APPENDIX A
RESULTS OF COMPOSITE SLABS UNDER MODIFIED FLEXURAL STRENGTH TESTS

The following section presents test results for all six slab specimens that were subjected to flexural strength testing. For each specimen, a summary of test parameters and properties are included, as well as the crack profile of the specimen at the termination of the test. Measured test data is tabulated for load, vertical displacements, horizontal end slip, and deck strains of the top and bottom flanges. Strains at the top flange are highlighted, and strains in the bottom flange are not highlighted. In the tabulated test data, 'wire pot' refers to the vertical displacements and 'slip' refers to the displacement between the concrete and steel deck. Graphical plots are also included for Applied Load versus Midspan Deflection, Quarter Point Deflections, End Slip, Deck Top Flange Strains, and Deck Bottom Flange Strains. Data is tabulated only up to the maximum load, however the graphical plots show all data points measured.

For purposes of better understanding the given test data, Figure A-1 below shows the layout of all instrumentation, except for the load cell, and their respective names that were monitored during flexural strength tests. The crack patterns in the following sections were drawn so that one could visualize the slab from above with its sides folded outwards. Also note that "Quarter A' refers to a point L/4 from the left support and is labeled as location A; 'Quarter B' refers to a point L/4 from the right support, which is labeled as location C.

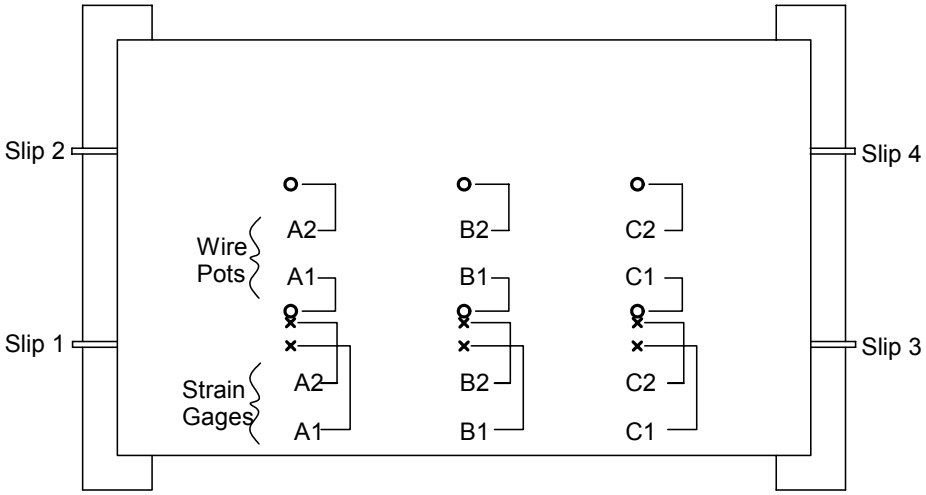

Figure A-1: Instrumentation locations and designations for modified flexural strength tests

Test Designation: WWF-1 Flexural Strength Test
Cast Date: 12/16/2005
Test Date: 2/2/2006

Materials and Dimensions

Composite Slab:

Width:	6 ft (2 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4300 psi
Total Depth:	4.5 in

Results

Maximum Applied Load:	316 psf
Midspan Deflection at Maximum Load:	0.227 in
Quarter A Deflection at Maximum Load:	0.168 in
Quarter B Deflection at Maximum Load:	0.154 in
End Slip at Maximum Load:	0.0001 in

Crack Patterns

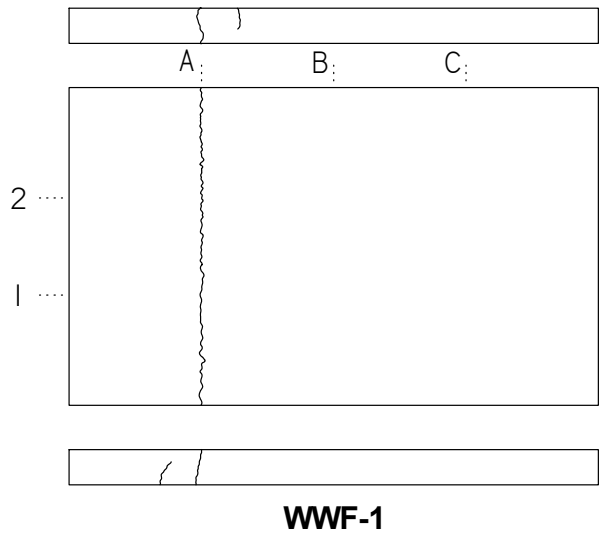

Figure A-2: Crack patterns for WWF-1

Table A-1: Experimental results of flexural strength testing of WWF-1

Load	0	13	58	100	145	189	187	232	272	290	316
Wire Pot A1	0	0.013	0.021	0.035	0.049	0.068	0.069	0.090	0.121	0.143	0.171
Wire Pot A2	0	0.010	0.016	0.030	0.057	0.070	0.069	0.085	0.117	0.139	0.164
Wire Pot B1	0	0.007	0.023	0.044	0.072	0.093	0.092	0.123	0.163	0.199	0.235
Wire Pot B2	0	0.005	0.014	0.033	0.054	0.079	0.082	0.102	0.150	0.184	0.219
Wire Pot C1	0	0.005	0.011	0.028	0.041	0.063	0.064	0.077	0.110	0.125	0.153
Wire Pot C2	0	0.011	0.015	0.030	0.050	0.065	0.065	0.081	0.115	0.134	0.156
Strain Gage A1	0	5	11	21	33	44	44	59	96	114	134
Strain Gage A2	0	11	31	65	101	137	137	182	302	347	408
Strain Gage B1	0	4	16	34	51	70	70	94	142	184	231
Strain Gage B2	0	17	43	90	140	192	192	259	381	469	536
Strain Gage C1	0	2	10	19	30	40	41	51	69	83	96
Strain Gage C2	0	10	33	65	101	137	137	174	222	251	290
Slip 1	0	-0.0003	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-1E-04	-1E-04
Slip 2	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 3	0	0	0	0	0	0	0	0	0	0	0
Slip 4	0	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002	-0.0002	-0.0001

Note: Load is in units of psf. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

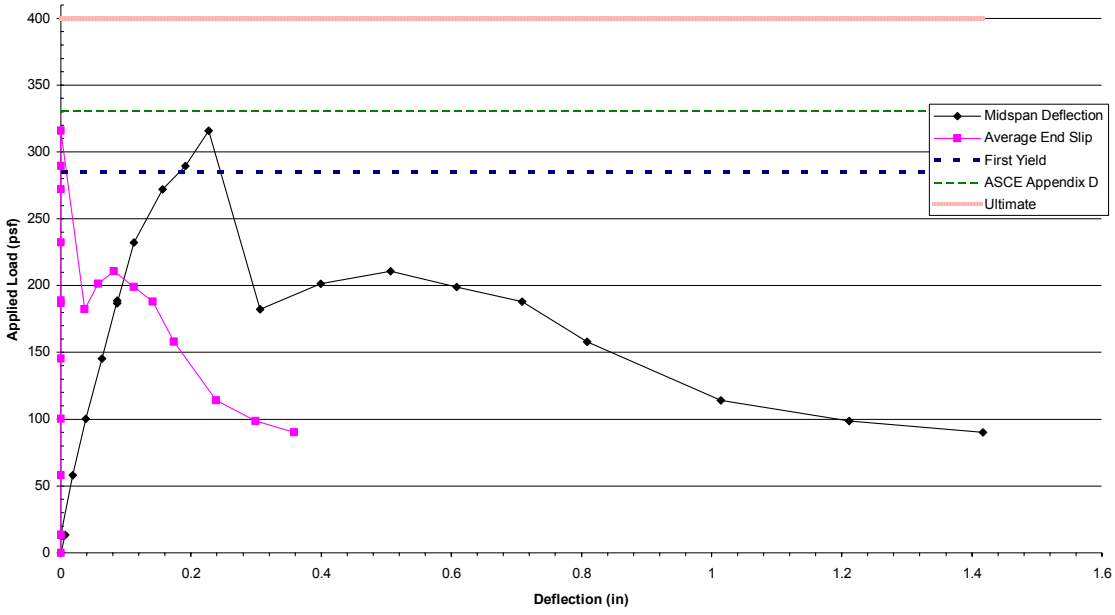

Figure A-3: Applied load versus midspan deflection and average end slip for WWF-1

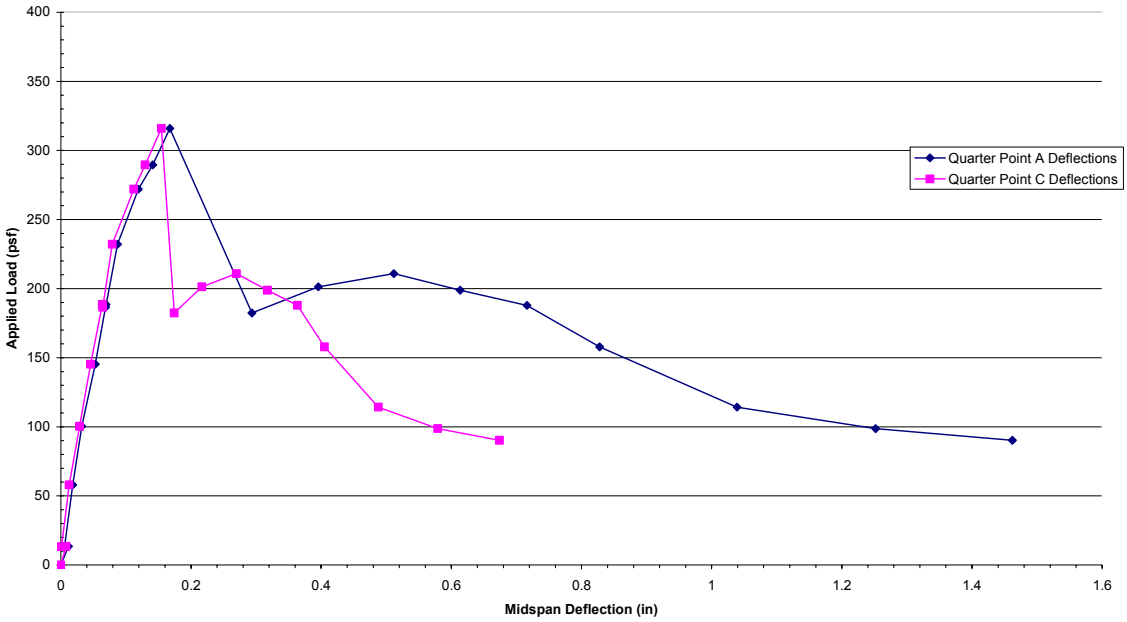

Figure A-4: Applied load versus quarter point deflections for WWF-1

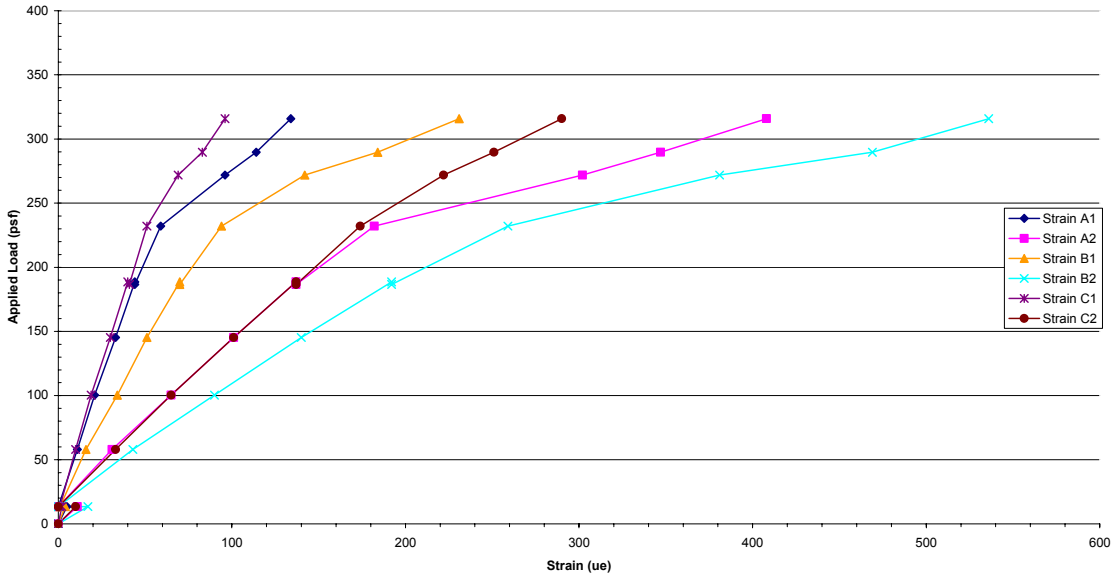

Figure A-5: Applied load versus deck strains along span for WWF-1 up to maximum load

Test Designation: WWF-2 Flexural Strength Test
Cast Date: 12/16/2005
Test Date: 2/28/2006

Materials and Dimensions

Composite Slab:

Width:	6 ft (2 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4800 psi
Total Depth:	4.5 in

Results

Maximum Applied Load:	354 psf
Midspan Deflection at Maximum Load:	0.305 in
Quarter A Deflection at Maximum Load:	0.205 in
Quarter B Deflection at Maximum Load:	0.208 in
End Slip at Maximum Load:	0.0005 in

Crack Patterns

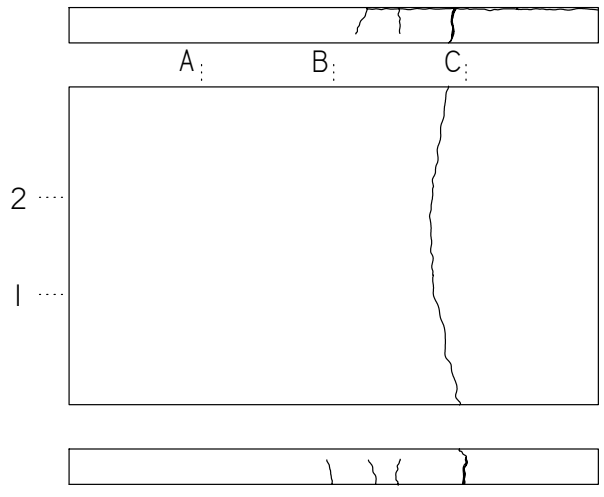

Figure A-6: Crack patterns for WWF-2

Table A-2: Experimental results of flexural strength testing of WWF-2

Load	0	14	60	102	27	60	104	150	193	234	279	303	326	345	348	354
Wire Pot A1	0	0.008	0.021	0.036	0.017	0.023	0.036	0.053	0.073	0.097	0.121	0.140	0.159	0.180	0.196	0.211
Wire Pot A2	0	0.005	0.015	0.030	0.016	0.021	0.029	0.047	0.063	0.083	0.112	0.132	0.153	0.172	0.188	0.199
Wire Pot B1	0	0.015	0.031	0.049	0.023	0.037	0.049	0.071	0.095	0.127	0.170	0.204	0.238	0.267	0.287	0.315
Wire Pot B2	0	0.012	0.029	0.044	0.023	0.029	0.045	0.065	0.091	0.120	0.160	0.194	0.222	0.255	0.277	0.295
Wire Pot C1	0	0.009	0.023	0.036	0.020	0.022	0.037	0.051	0.072	0.092	0.121	0.141	0.154	0.174	0.189	0.208
Wire Pot C2	0	0.012	0.026	0.041	0.020	0.028	0.041	0.056	0.069	0.092	0.118	0.139	0.157	0.174	0.191	0.207
Strain Gage A1	0	4	12	21	9	14	21	29	40	50	65	78	90	101	126	137
Strain Gage A2	0	10	37	66	25	43	67	105	148	204	254	292	328	382	445	471
Strain Gage B1	0	3	15	27	9	17	28	42	62	94	134	161	195	230	286	365
Strain Gage B2	0	9	47	82	27	51	85	132	172	217	294	314	432	679	724	753
Strain Gage C1	0	4	13	22	9	15	23	33	45	60	79	94	106	117	129	288
Strain Gage C2	0	9	40	72	27	48	74	120	161	195	230	257	279	310	398	629
Slip 1	0	0.0003	0.0006	0.0008	0.0007	0.0005	0.0005	0.0008	0.0008	0.0007	0.0007	0.0006	0.0006	0.0005	0.0005	0.0007
Slip 2	0	0.0007	0.0007	0.0007	0.0007	0.0009	0.0008	0.0008	0.0009	0.0008	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
Slip 3	0	-0.0009	-0.0008	-0.0008	-0.0008	-0.0008	-0.0008	-0.0009	-0.0009	-0.0009	-0.0009	-0.0009	-0.001	-0.001	-0.001	-0.0011
Slip 4	0	0.0001	0.0001	0.0001	0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002

Note: Load is in units of psf. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

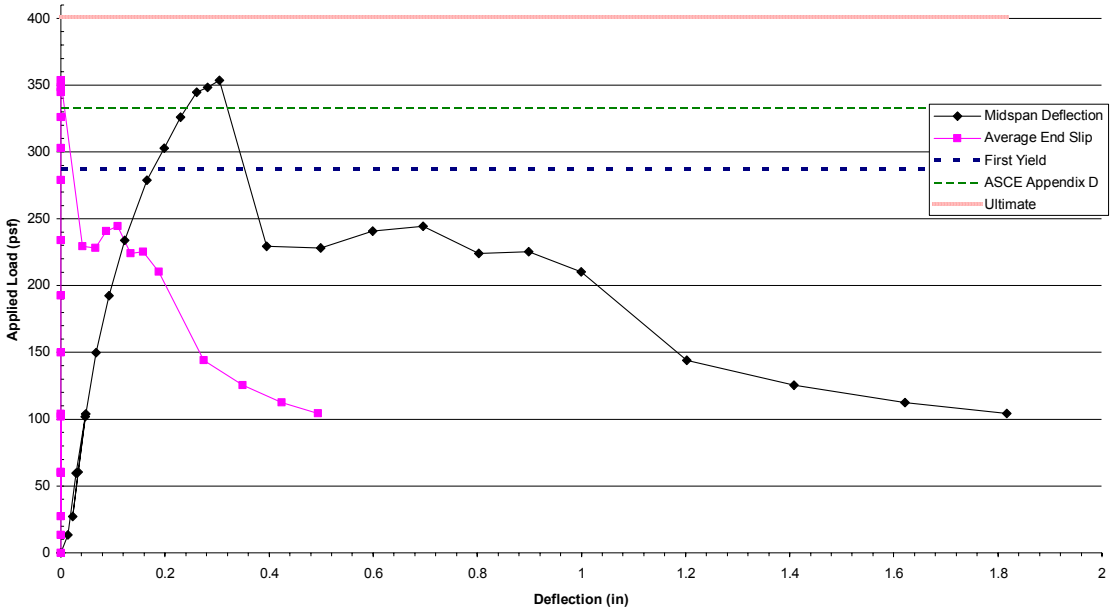

Figure A-7: Applied load versus midspan deflection and average end slip for WWF-2

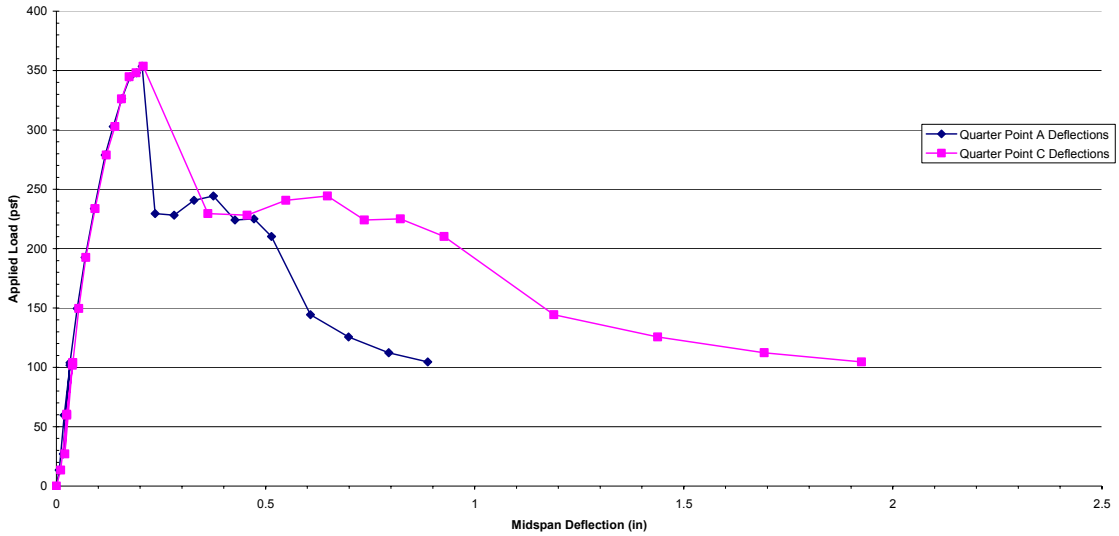

Figure A-8: Applied load versus quarter point deflections for WWF-2

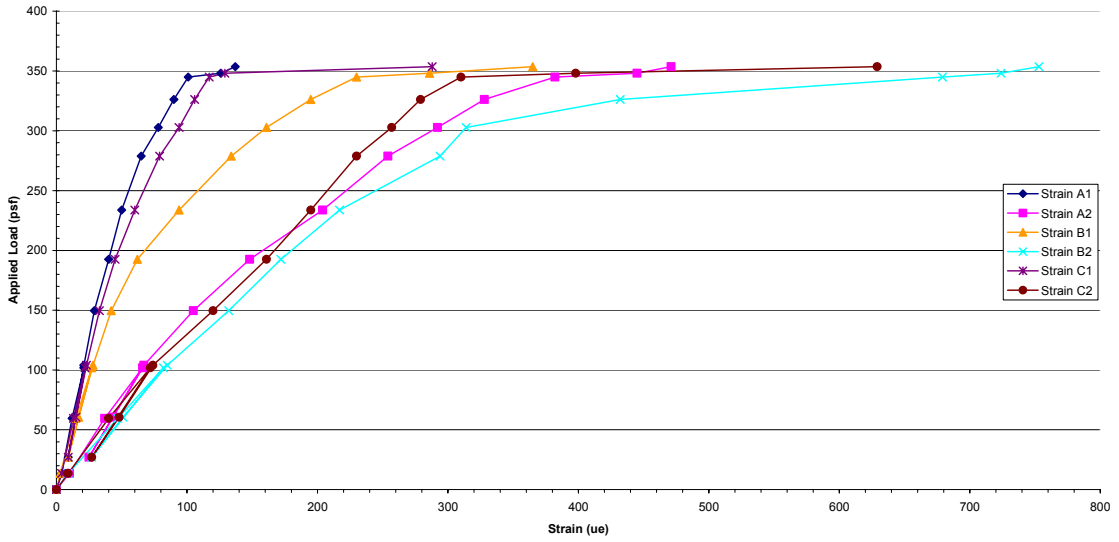

Figure A-9: Applied load versus deck strains along span for WWF-2 up to maximum load

Test Designation: WWF-3 Flexural Strength Test
Cast Date: 12/16/2005
Test Date: 2/27/2006

Materials and Dimensions

Composite Slab:

Width:	6 ft (2 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4400 psi
Total Depth:	4.5 in

Results

Maximum Applied Load:	315 psf
Midspan Deflection at Maximum Load:	0.320 in
Quarter A Deflection at Maximum Load:	0.237 in
Quarter B Deflection at Maximum Load:	0.221 in
End Slip at Maximum Load:	0.0009 in

Crack Patterns

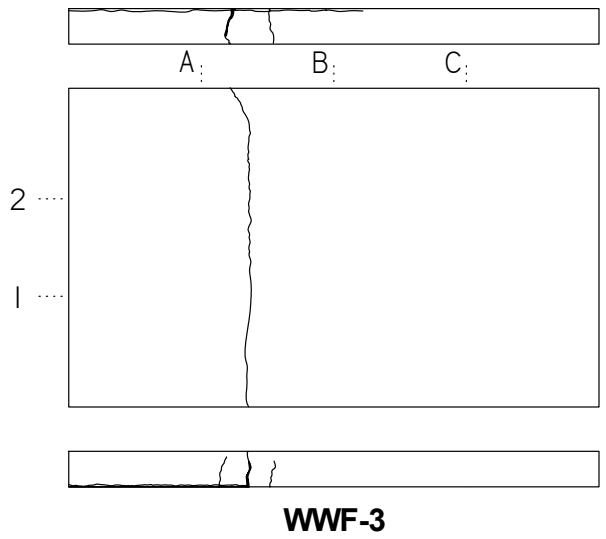

Figure A-10: Crack patterns for WWF-3

Table A-3: Experimental results of flexural strength testing of WWF-3

Load	0	14	60	103	22	60	103	145	191	232	280	298	315
Wire Pot A1	0	0.010	0.027	0.040	0.016	0.030	0.042	0.062	0.087	0.114	0.160	0.185	0.243
Wire Pot A2	0	0.008	0.019	0.042	0.014	0.021	0.042	0.056	0.082	0.109	0.151	0.185	0.230
Wire Pot B1	0	0.007	0.029	0.055	0.016	0.035	0.057	0.078	0.113	0.148	0.217	0.260	0.322
Wire Pot B2	0	0.014	0.031	0.052	0.023	0.038	0.051	0.080	0.112	0.146	0.216	0.257	0.318
Wire Pot C1	0	0.007	0.021	0.040	0.015	0.021	0.038	0.056	0.081	0.107	0.153	0.179	0.222
Wire Pot C2	0	0.007	0.020	0.041	0.014	0.028	0.043	0.062	0.084	0.111	0.153	0.182	0.221
Strain Gage A1	0	5	15	24	8	16	24	35	50	72	102	126	354
Strain Gage A2	0	11	42	69	20	44	69	95	129	183	264	311	693
Strain Gage B1	0	5	17	30	9	20	30	47	74	116	185	285	432
Strain Gage B2	0	11	52	95	28	59	95	131	163	282	375	607	695
Strain Gage C1	0	5	14	25	9	17	25	35	50	69	98	123	155
Strain Gage C2	0	8	42	80	25	51	81	122	170	212	249	262	526
Slip 1	0	0.0019	0.0017	0.0017	0.0019	0.0018	0.0017	0.0017	0.0017	0.0017	0.0016	0.0017	0.0018
Slip 2	0	0	0.0001	0.0001	0	0	0	0.0001	0	0	0	0	0
Slip 3	0	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0003	0.0004	0.0003	0.0003	0.0003
Slip 4	0	-0.0004	-0.0003	-0.0005	-0.0004	-0.0005	-0.0004	-0.0004	-0.0005	-0.0005	-0.0004	-0.0005	-0.0005

Note: Load is in units of psf. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

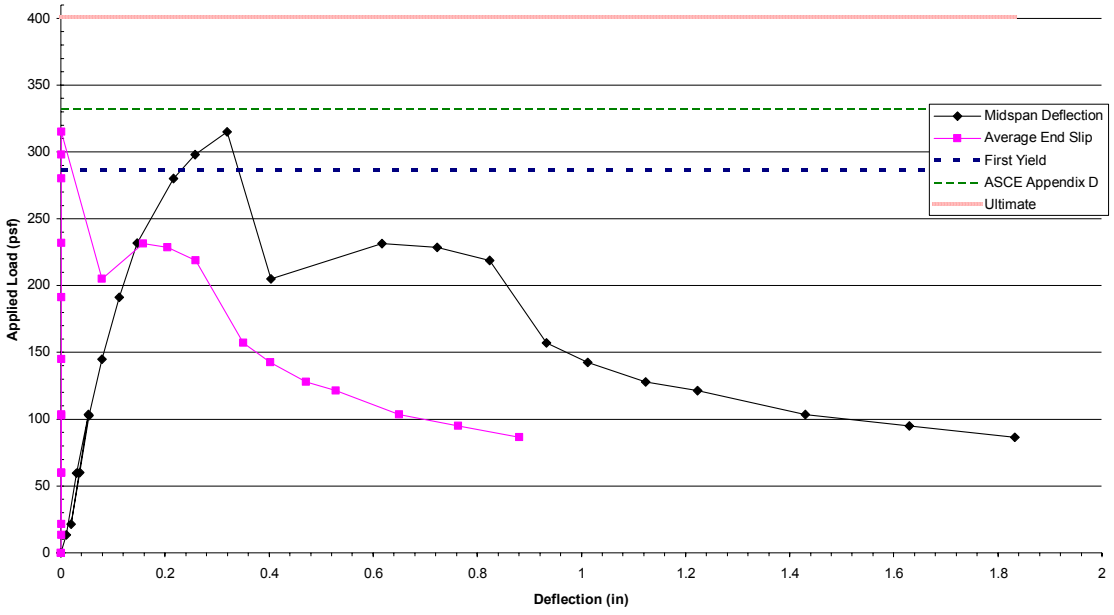

Figure A-11: Applied load versus midspan deflection and average end slip for WWF-3

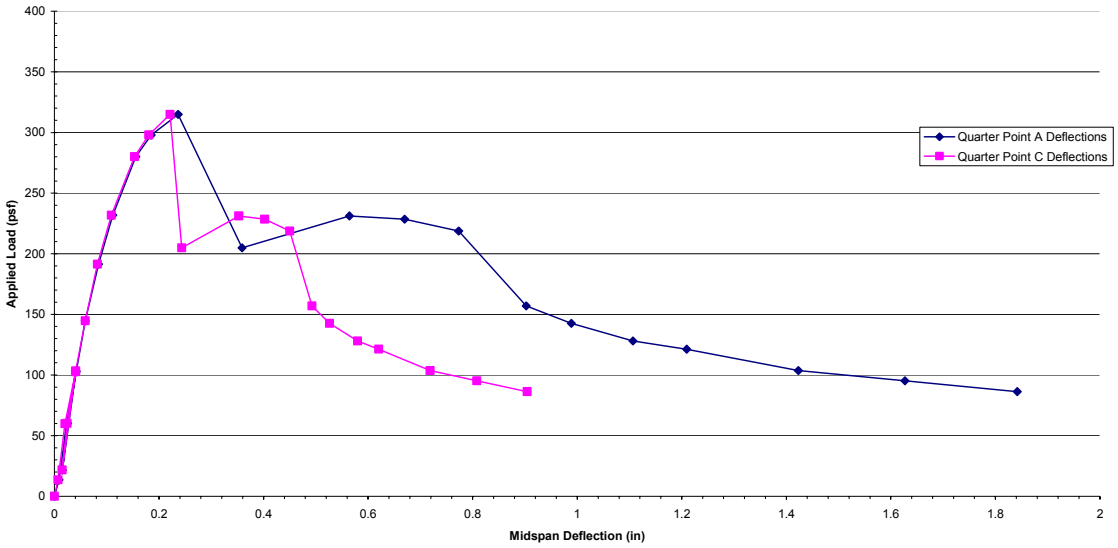

Figure A-12: Applied load versus quarter point deflections for WWF-3

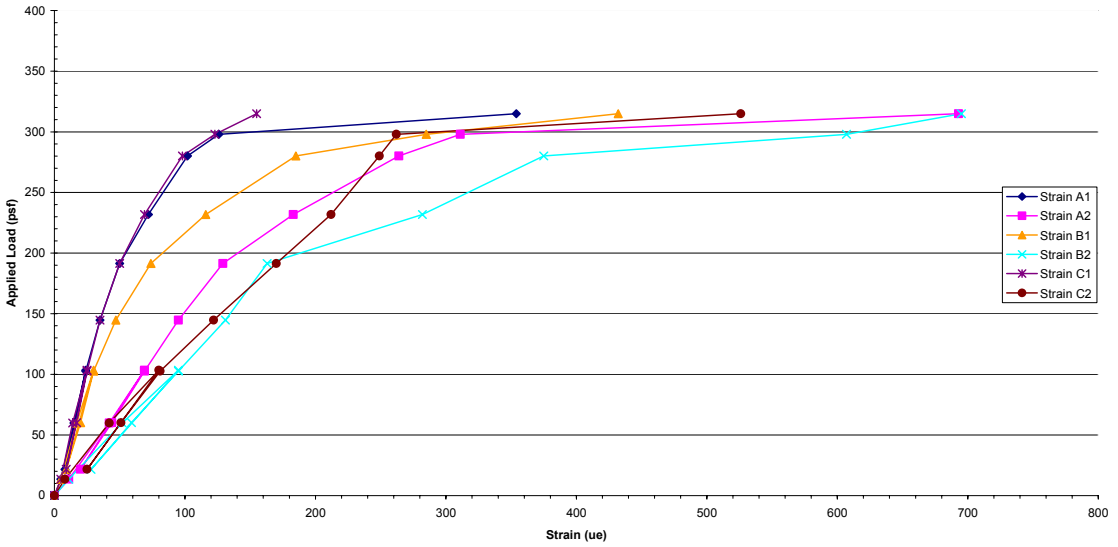

Figure A-13: Applied load versus deck strains along span for WWF-3 up to maximum load

Test Designation: STRUX-1 Flexural Strength Test
Cast Date: 12/16/2005
Test Date: 2/16/2006

Materials and Dimensions

Composite Slab:

Width:	6 ft (2 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3500 psi
Total Depth:	4.5 in

Results

Maximum Applied Load:	278 psf
Midspan Deflection at Maximum Load:	0.262 in
Quarter A Deflection at Maximum Load:	0.166 in
Quarter B Deflection at Maximum Load:	0.162 in
End Slip at Maximum Load:	0.0001 in

Crack Patterns

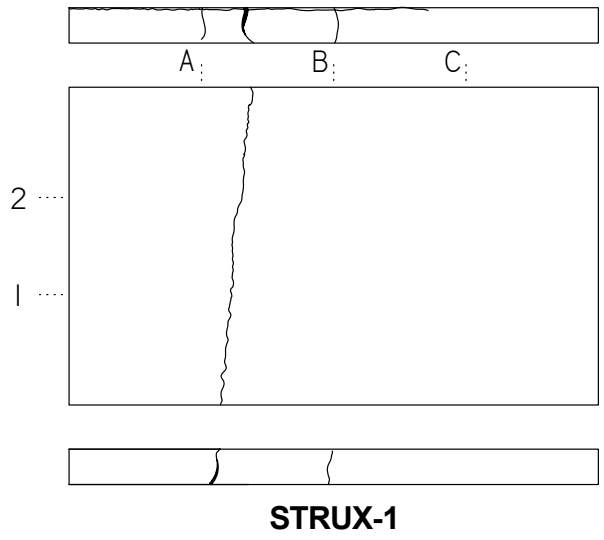

Figure A-14: Crack patterns for STRUX-1

Table A-4: Experimental results of flexural strength testing of STRUX-1

Load (psf)	0	14	58	103	19	58	101	148	187	233	278
Wire Pot A1	0	0.006	0.025	0.043	0.009	0.028	0.043	0.066	0.089	0.129	0.172
Wire Pot A2	0	0.005	0.019	0.041	0.012	0.024	0.039	0.060	0.080	0.114	0.161
Wire Pot B1	0	0.019	0.040	0.059	0.025	0.039	0.067	0.095	0.131	0.179	0.255
Wire Pot B2	0	0.046	0.067	0.086	0.059	0.066	0.087	0.113	0.147	0.201	0.269
Wire Pot C1	0	0.007	0.021	0.041	0.014	0.027	0.042	0.061	0.089	0.123	0.172
Wire Pot C2	0	0.005	0.020	0.034	0.013	0.020	0.033	0.055	0.074	0.110	0.151
Strain Gage A1	0	5	15	26	9	17	27	40	53	74	108
Strain Gage A2	0	10	46	81	21	49	80	113	126	163	361
Strain Gage B1	0	4	20	34	11	22	35	58	93	160	230
Strain Gage B2	0	11	52	94	25	56	94	173	271	420	593
Strain Gage C1	0	3	12	21	7	14	21	33	46	69	124
Strain Gage C2	0	10	46	78	23	49	80	114	146	258	407
Slip 1	0	0.0002	1E-04	0.0002	1E-04	1E-04	1E-04	1E-04	0.0002	1E-04	0
Slip 2	0	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0003	0.0002	0.0001	0.0001
Slip 3	0	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04
Slip 4	0	0.0001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002

Note: Load is in units of psf. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

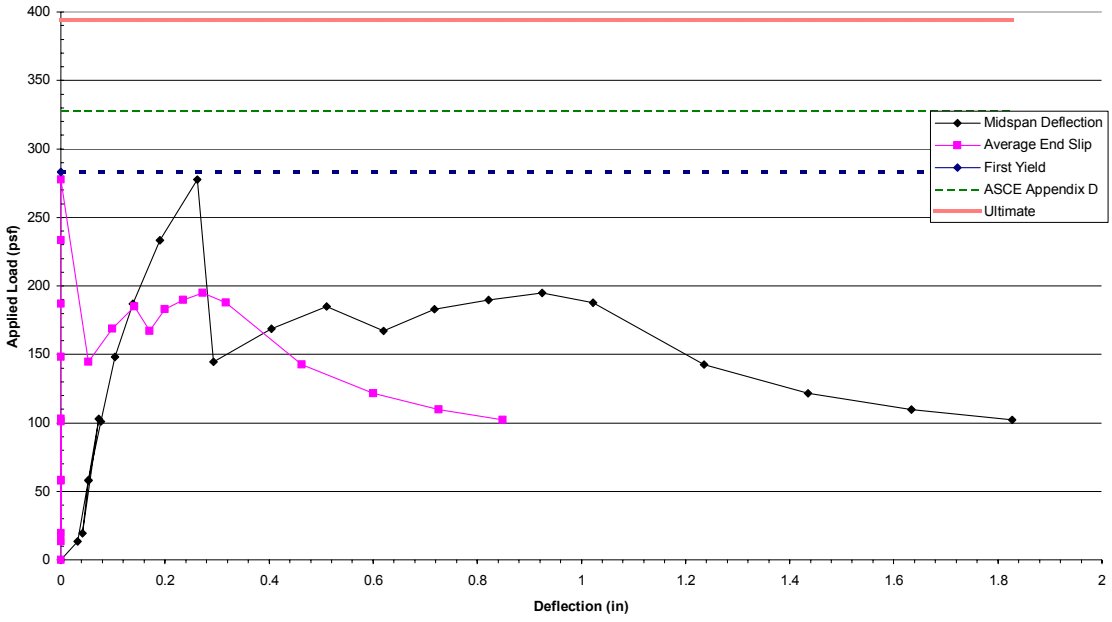

Figure A-15: Applied load versus midspan deflection and average end slip for STRUX-1

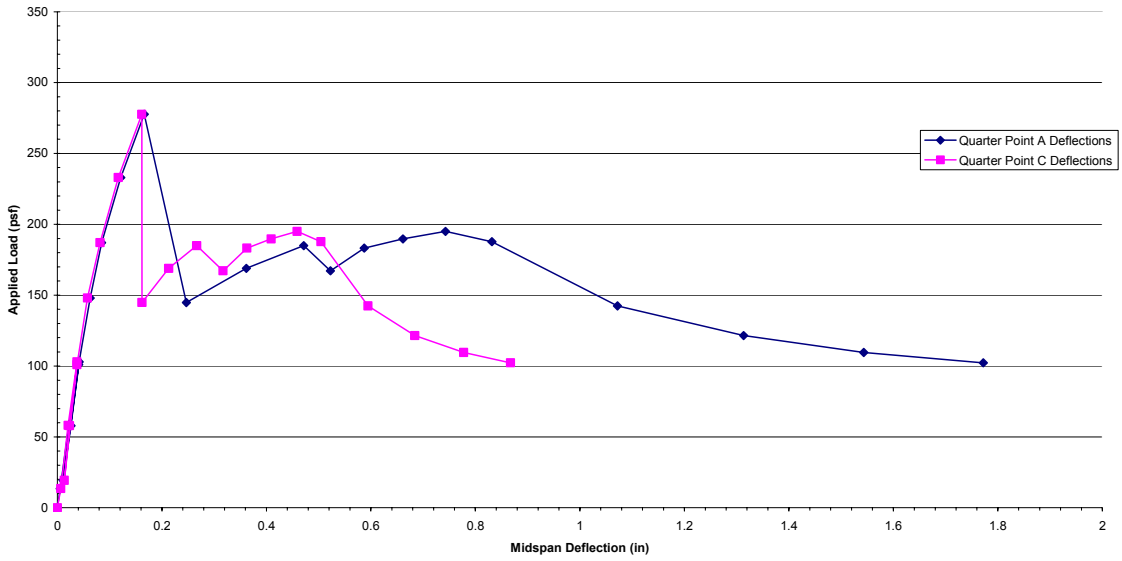

Figure A-16: Applied load versus quarter point deflections for STRUX-1

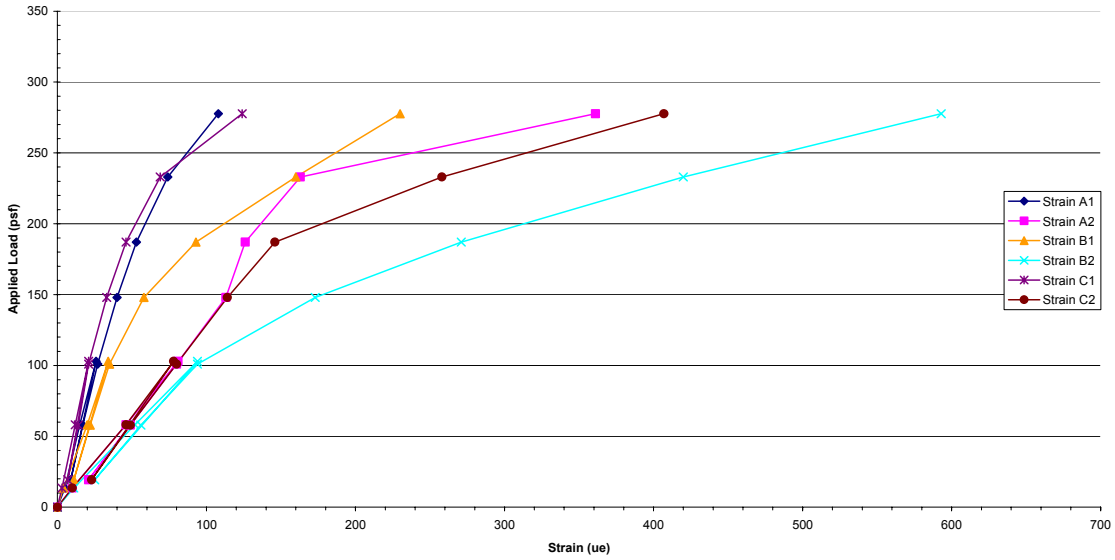

Figure A-17: Applied load versus deck strains along span for STRUX-1 up to maximum load

Test Designation: STRUX-2 Flexural Strength Test
Cast Date: 12/16/2005
Test Date: 2/9/2006

Materials and Dimensions

Composite Slab:

Width:	6 ft (2 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3300 psi
Total Depth:	4.5 in

Results

Maximum Applied Load:	311 psf
Midspan Deflection at Maximum Load:	0.272 in
Quarter A Deflection at Maximum Load:	0.188 in
Quarter B Deflection at Maximum Load:	0.178 in
End Slip at Maximum Load:	0.0004 in

Crack Patterns

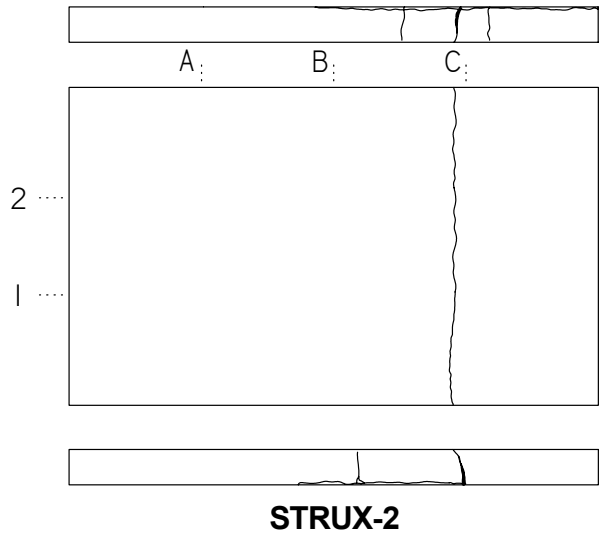

Figure A-18: Crack patterns for STRUX-2

Table A-5: Experimental results of flexural strength testing of STRUX-2

Load (psf)	0	13	102	59	103	143	185	221	269	288	311
Wire Pot A1	0	0.007	0.038	0.023	0.038	0.054	0.073	0.099	0.140	0.162	0.191
Wire Pot A2	0	0.014	0.037	0.028	0.042	0.055	0.073	0.094	0.136	0.164	0.184
Wire Pot B1	0	0.015	0.056	0.035	0.056	0.077	0.104	0.146	0.209	0.244	0.280
Wire Pot B2	0	0.015	0.047	0.027	0.047	0.067	0.095	0.135	0.197	0.231	0.265
Wire Pot C1	0	0.005	0.036	0.023	0.036	0.050	0.069	0.098	0.131	0.152	0.180
Wire Pot C2	0	0.007	0.036	0.021	0.034	0.048	0.071	0.092	0.132	0.154	0.175
Strain Gage A1	0	2	23	14	24	34	50	74	108	128	148
Strain Gage A2	0	9	80	50	83	118	163	209	253	361	541
Strain Gage B1	0	3	32	20	33	49	78	119	181	241	306
Strain Gage B2	0	12	91	57	95	133	196	261	416	611	708
Strain Gage C1	0	3	22	15	23	33	45	63	87	101	121
Strain Gage C2	0	9	72	45	74	102	132	175	200	241	465
Slip 1	0	0.0003	0.0008	0.0006	0.0008	0.0006	0.0008	0.0007	0.0008	0.0009	0.0008
Slip 2	0	0	0.0001	0.0001	0.0002	0.0002	0.0001	0.0002	0.0003	0	0.0001
Slip 3	0	0	-0.0001	-0.0001	-0.0002	-0.0001	0	-0.0001	-0.0002	-0.0002	-0.0002
Slip 4	0	-0.0003	-0.0002	-0.0003	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0003

Note: Load is in units of psf. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

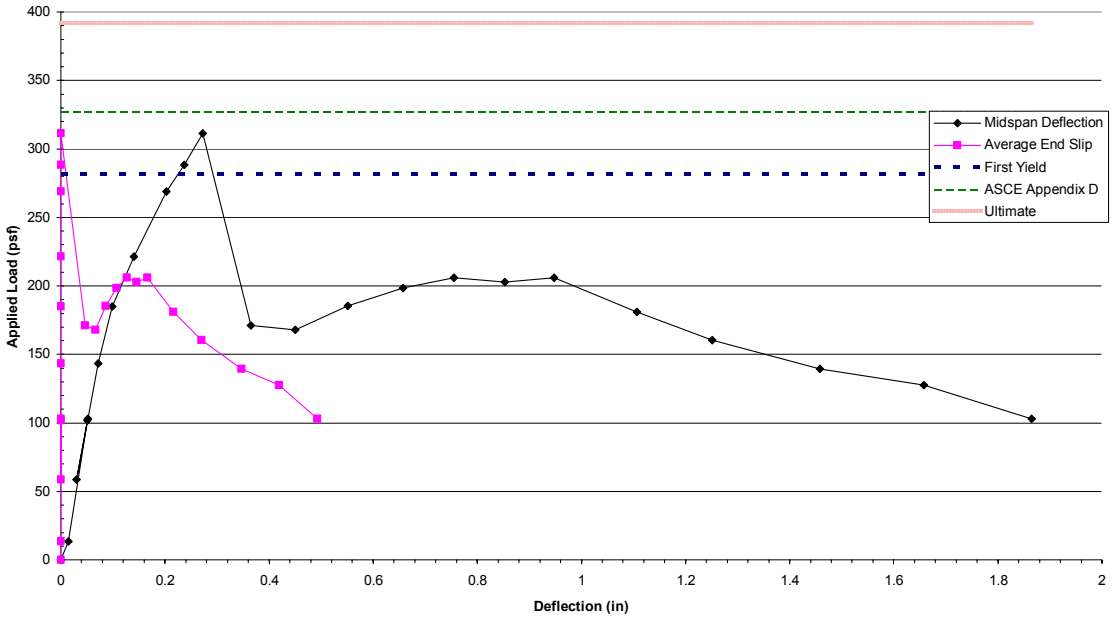

Figure A-19: Applied load versus midspan deflection and average end slip for STRUX-2

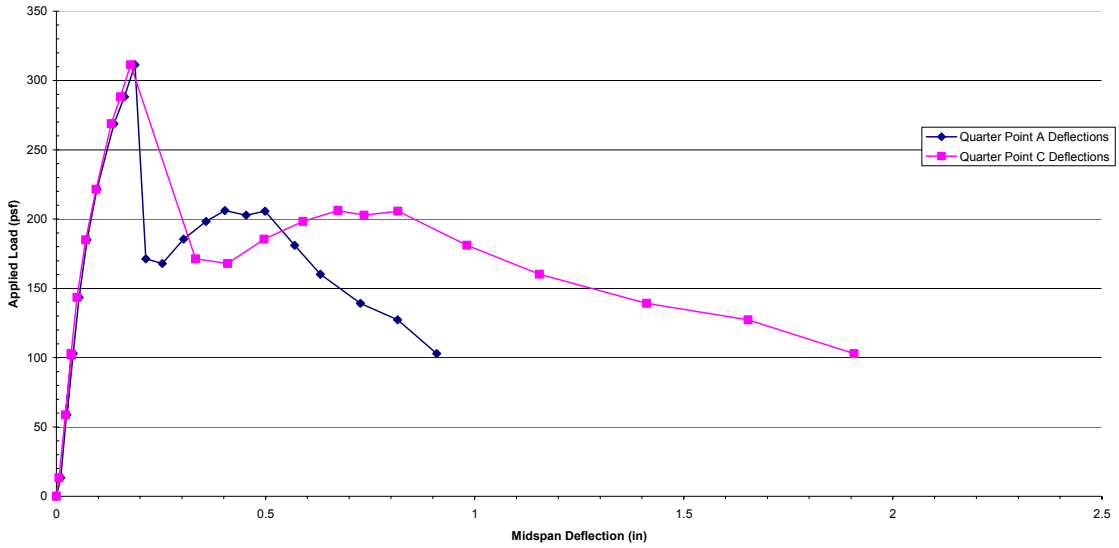

Figure A-20: Applied load versus quarter point deflections for STRUX-2

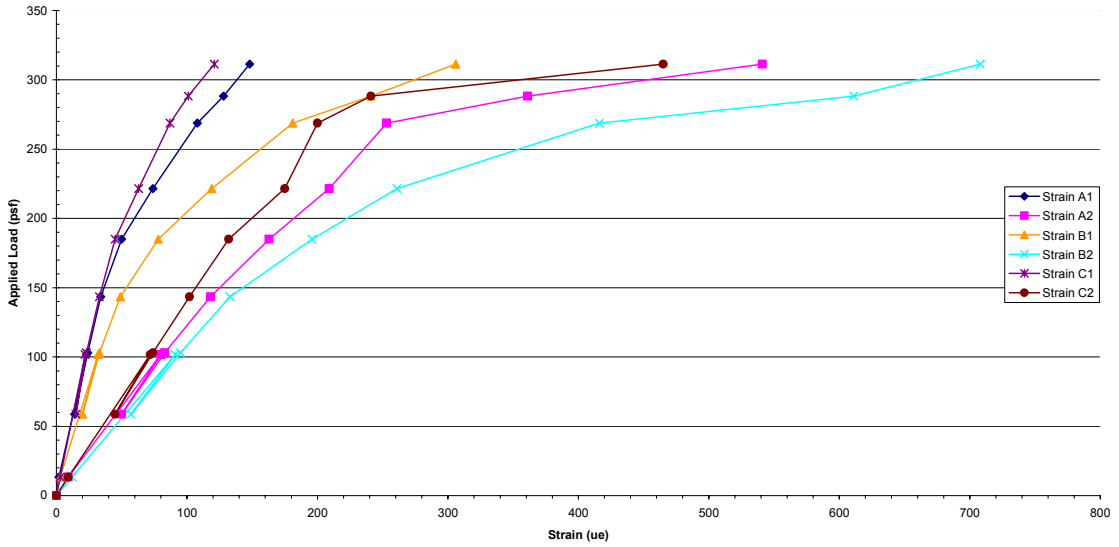

Figure A-21: Applied load versus deck strains along span for STRUX-2 up to maximum load

Test Designation: STRUX-3 Flexural Strength Test
Cast Date: 12/16/2005
Test Date: 2/6/2006

Materials and Dimensions

Composite Slab:

Width:	6 ft (2 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3300 psi
Total Depth:	4.5 in

Results

Maximum Applied Load:	316 psf
Midspan Deflection at Maximum Load:	0.272 in
Quarter A Deflection at Maximum Load:	0.176 in
Quarter B Deflection at Maximum Load:	0.194 in
End Slip at Maximum Load:	0.0002 in

Crack Patterns

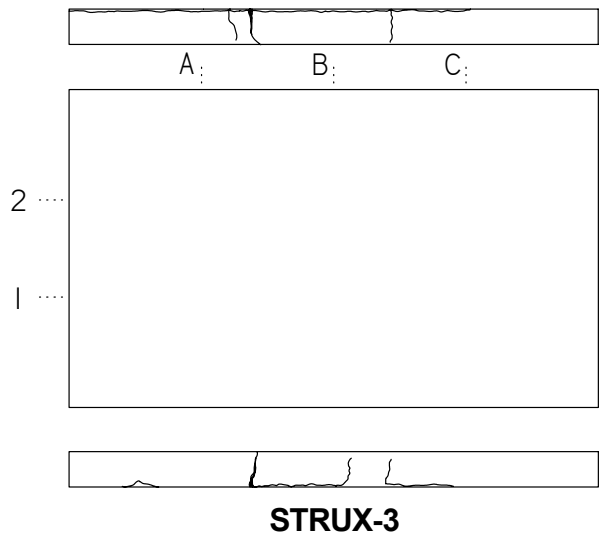

Figure A-22: Crack patterns for STRUX-3

Table A-6: Experimental results of flexural strength testing of STRUX-3

Load (psf)	0	14	57	100	18	18	58	101	145	182	233	270	289	316
Wire Pot A1	0	0.007	0.020	0.034	0.013	0.013	0.021	0.034	0.047	0.066	0.089	0.130	0.149	0.177
Wire Pot A2	0	-0.001	0.012	0.029	0.014	0.016	0.014	0.027	0.042	0.068	0.094	0.122	0.148	0.176
Wire Pot B1	0	0.007	0.029	0.050	0.015	0.014	0.028	0.049	0.078	0.105	0.142	0.198	0.239	0.276
Wire Pot B2	0	0.014	0.027	0.049	0.020	0.022	0.029	0.048	0.069	0.098	0.137	0.192	0.235	0.268
Wire Pot C1	0	0.008	0.022	0.044	0.016	0.016	0.023	0.043	0.057	0.076	0.106	0.139	0.167	0.195
Wire Pot C2	0	0.015	0.025	0.043	0.015	0.016	0.030	0.044	0.058	0.079	0.107	0.143	0.171	0.192
Strain Gage A1	0	4	13	22	7	6	14	22	33	45	60	86	104	136
Strain Gage A2	0	11	40	71	20	20	43	72	103	136	170	217	245	271
Strain Gage B1	0	3	16	30	8	7	18	31	48	79	117	179	214	256
Strain Gage B2	0	11	55	100	26	26	61	103	152	210	291	535	593	717
Strain Gage C1	0	2	11	21	6	5	12	21	31	45	63	101	126	153
Strain Gage C2	0	8	39	69	16	16	41	70	101	150	240	303	452	538
Slip 1	0	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0003	0.0003	0.0004
Slip 2	0	-0.0007	-0.0008	-0.0008	-0.0008	-0.0008	-0.0008	-0.0008	-0.0007	-0.0008	-0.0001	-0.0001	-0.0001	-0.0001
Slip 3	0	1E-04	1E-04	1E-04	0.0002	0.0002	1E-04	1E-04	1E-04	0.0002	1E-04	1E-04	1E-04	1E-04
Slip 4	0	0	0	0.0001	0	0	0	0	0	0	0.0002	0.0002	0.0001	0.0002

Note: Load is in units of psf. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

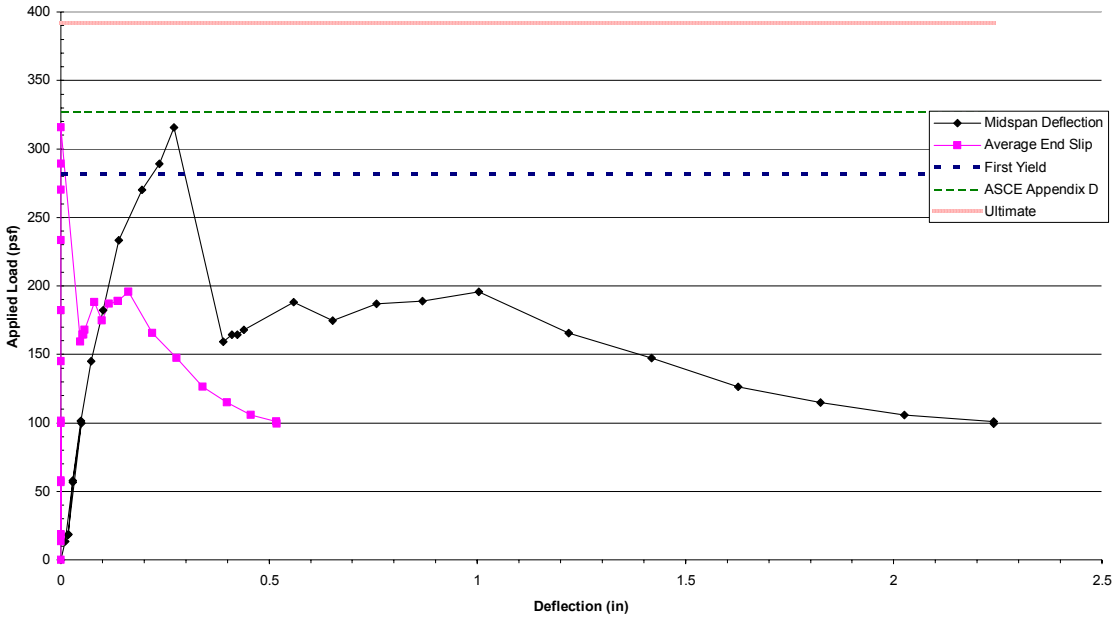

Figure A-23: Applied load versus midspan deflection and average end slip for STRUX-3

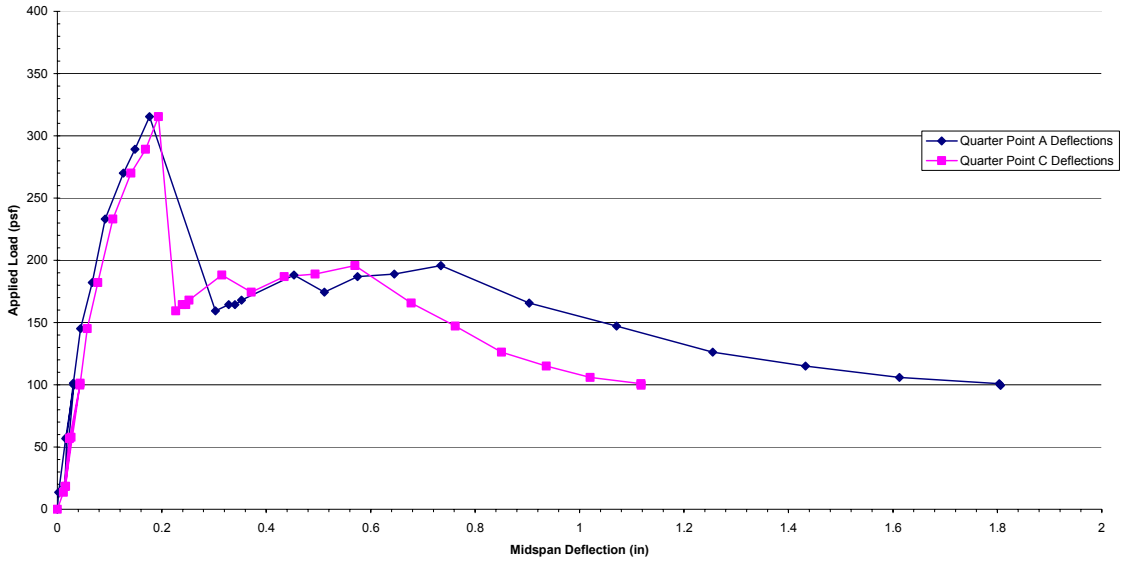

Figure A-24: Applied load versus quarter point deflections for STRUX-3

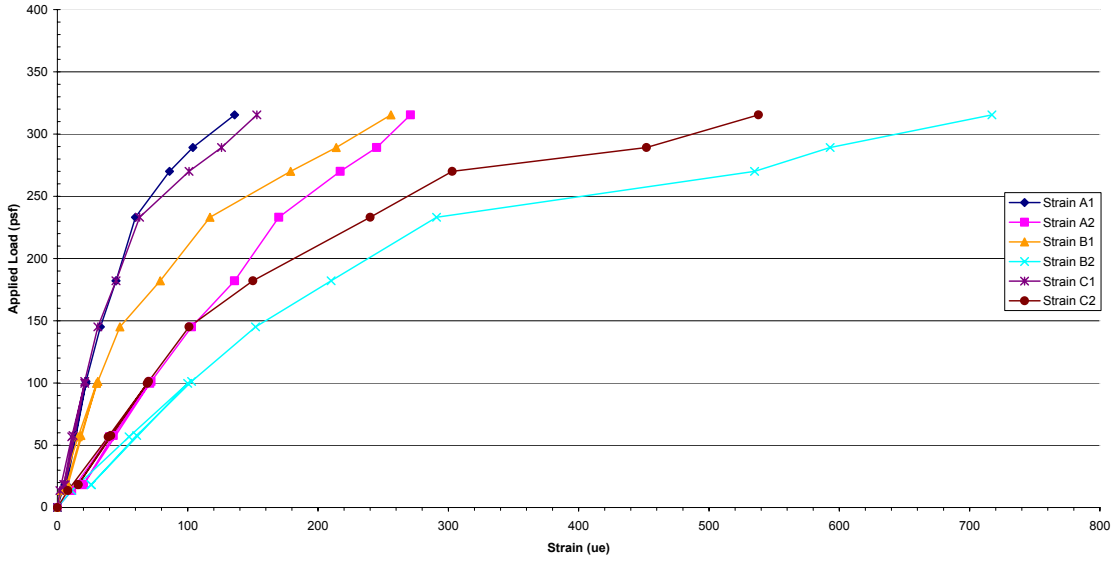

Figure A-25: Applied load versus deck strains along span for STRUX-3 up to maximum load

APPENDIX B
RESULTS OF COMPOSITE SLAB REINFORCED WITH WWF UNDER CONCENTRATED LOAD TESTS

The following section presents test results for the slab specimen reinforced with WWF that was subjected to the eleven concentrated load tests. For each test, a summary of test parameters and properties are included, as well as a diagram of the load location. Measured test data is tabulated for load, vertical displacements, horizontal end slip, and deck strains of the bottom flanges. In the tabulated test data, 'wire pot' refers to the vertical displacements and 'slip' refers to the displacement between the concrete and steel deck.

Note that the test summary may include two different values for the maximum applied load, a recorded and an unrecorded value. The recorded value corresponds to the maximum load recorded by the data acquisition system. The unrecorded load refers to the maximum load observed during the test, but not recorded. Also note that at low loads before any deflections are registered by the wire pots, the deflections have the tendency to "jump" and may show values that fluctuate between positive and negative. In the following tables, the sign convention for all wire pots is that down is positive and up is negative.

For purposes of better understanding the given test data, Figure B-1 and Figure B-2 below show the layout of all instrumentation, except for the load cell, and their respective names that were monitored during concentrated load tests. Note that 'Quarter Point A' and 'Third Point A' refer to a point L/4 and L/3 from the left support, respectively. Similarly, 'Quarter Point B' and 'Third Point B' refer to a point L/4 and L/3 from the right support, respectively.

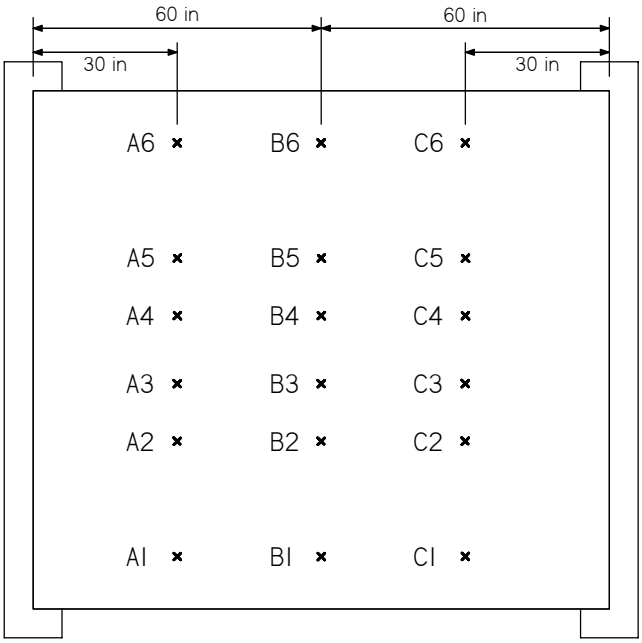

Figure B-1: Strain gage locations and designations for concentrated load tests – first slab set

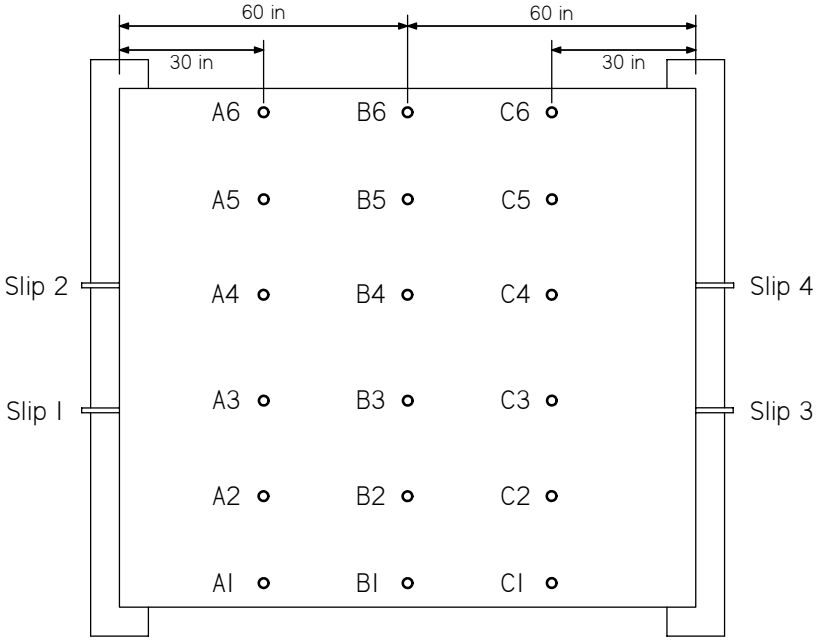

Figure B-2: Displacement transducer locations and designations for concentrated load tests – first slab set

Test Designation: WWF Concentrated Load Test 1
Concentrated Point Load at Quarter Point A
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14821 lb
Midspan Deflection at Maximum Load:	0.054 in
Quarter A Deflection at Maximum Load:	0.054 in
Quarter B Deflection at Maximum Load:	0.034 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

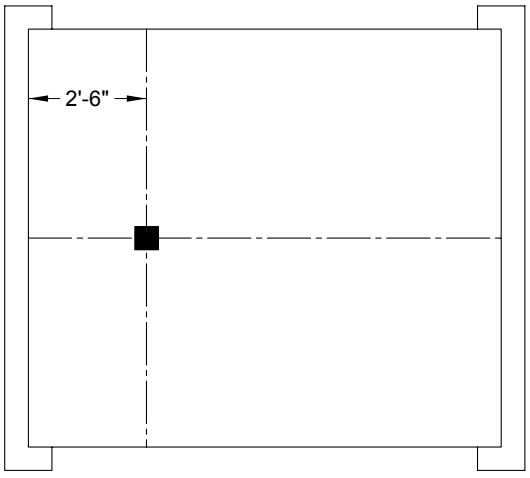

Figure B-3: Location of concentrated point load at Quarter Point A – first slab set

Table B-1: Experimental results of concentrated load Test 1 on WWF-reinforced slab

Load	0	1022	2039	3020	4017	5018	6061	7021	8002	9040	10016
Wire Pot A1	0	0.002	0.0043	0.0063	0.009	0.0124	0.017	0.0217	0.0231	0.0247	0.0261
Wire Pot A2	0	0	0.0039	0.009	0.0065	0.0142	0.0135	0.0206	0.0212	0.0251	0.0277
Wire Pot A3	0	0.0067	0.0067	0.006	0.0127	0.014	0.0207	0.0273	0.0267	0.0293	0.0346
Wire Pot A4	0	0.0013	0.0077	0.0071	0.0135	0.0129	0.0213	0.0206	0.0271	0.0278	0.0336
Wire Pot A5	0	0.0066	0.0072	0.0138	0.0125	0.0184	0.0204	0.0224	0.027	0.027	0.0349
Wire Pot A6	0	0.0007	0.0007	0.0079	0.0079	0.0132	0.0132	0.0211	0.0218	0.0264	0.0283
Wire Pot B1	0	-0.0007	-0.0007	0.0073	0.0066	0.0133	0.0139	0.0213	0.0213	0.0246	0.0279
Wire Pot B2	0	-0.0013	0.0065	0.0065	0.0123	0.0123	0.0175	0.0194	0.0188	0.0272	0.0272
Wire Pot B3	0	0.0065	0.0078	0.013	0.0136	0.0207	0.0207	0.0265	0.0272	0.0323	0.0336
Wire Pot B4	0	0.0007	0.0079	0.0079	0.0144	0.0131	0.0209	0.0209	0.0281	0.0281	0.0346
Wire Pot B5	0	0	0.0078	0.0071	0.0129	0.0136	0.02	0.0207	0.0271	0.0278	0.0336
Wire Pot B6	0	0	0.0026	0.0131	0.0131	0.0144	0.0144	0.0261	0.0287	0.0274	0.03
Wire Pot C1	0	0	0	0.002	0.0078	0.0065	0.0078	0.0136	0.0136	0.0136	0.0208
Wire Pot C2	0	-0.0007	0	0.0065	0.0058	0.0058	0.0065	0.013	0.0137	0.013	0.0208
Wire Pot C3	0	0.0099	0.0111	0.0124	0.0161	0.0148	0.0186	0.0173	0.0186	0.0186	0.0223
Wire Pot C4	0	0	0	0.0046	0.0023	0.0091	0.0114	0.0137	0.0114	0.016	0.0205
Wire Pot C5	0	0.0011	0.0034	0.0069	0.0126	0.0161	0.0195	0.0195	0.0195	0.0218	0.0218
Wire Pot C6	0	0.0037	0.0024	0.0037	0.0061	0.0135	0.0159	0.0172	0.0196	0.0233	0.0245
Strain Gage A1	0	5	11	16	22	28	34	40	46	53	60
Strain Gage A2	0	8	17	25	35	42	53	60	72	83	95
Strain Gage A3	0	14	27	39	54	66	83	99	113	127	140
Strain Gage A4	0	14	27	40	54	67	80	94	108	126	163
Strain Gage A5	0	10	18	26	35	43	52	59	68	77	86
Strain Gage A6	0	5	11	16	21	27	32	37	44	50	56
Strain Gage B1	0	6	12	15	21	26	31	37	41	46	52
Strain Gage B2	0	6	11	15	22	26	31	37	42	47	52
Strain Gage B3	0	5	10	15	19	24	31	35	40	45	50
Strain Gage B4	0	5	11	14	19	24	28	33	36	41	46
Strain Gage B5	0	5	10	14	20	25	29	33	38	42	45
Strain Gage B6	0	5	10	15	20	25	31	36	41	47	51
Strain Gage C1	0	2	5	7	10	12	14	17	20	21	24
Strain Gage C2	0	4	9	13	18	24	28	32	36	42	46
Strain Gage C3	0	3	6	8	11	15	17	18	23	25	27
Strain Gage C4	0	2	4	7	9	12	14	17	18	21	23
Strain Gage C5	0	3	5	8	11	13	15	19	20	24	25
Strain Gage C6	0	3	7	10	13	16	19	22	25	28	31
Slip 1	0	0	0	0	0	0	0	0.0001	0	0	0
Slip 2	0	-0.0001	0	0	0	0	-0.0001	0	0	-0.0001	0
Slip 3	0	0	0	0	0.0001	0	0	0	0	0	0
Slip 4	0	0	0	-0.0001	-0.0001	-0.0001	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-1: Test 1 (continued)

Load	11028	12019	13020	14011	14821
Wire Pot A1	0.0284	0.0304	0.0361	0.0395	0.0421
Wire Pot A2	0.029	0.0341	0.0348	0.0412	0.0399
Wire Pot A3	0.0406	0.0406	0.0473	0.0486	0.0553
Wire Pot A4	0.0342	0.0407	0.0478	0.0478	0.0536
Wire Pot A5	0.0343	0.0409	0.0448	0.0475	0.0521
Wire Pot A6	0.0349	0.0349	0.0422	0.0428	0.0468
Wire Pot B1	0.0286	0.0346	0.0379	0.0426	0.0419
Wire Pot B2	0.033	0.0336	0.0401	0.0394	0.0459
Wire Pot B3	0.0394	0.0407	0.0465	0.0536	0.053
Wire Pot B4	0.0346	0.0404	0.0404	0.0476	0.0554
Wire Pot B5	0.0342	0.0394	0.0413	0.0477	0.0535
Wire Pot B6	0.0417	0.0404	0.0417	0.0417	0.0547
Wire Pot C1	0.0208	0.0208	0.0273	0.0273	0.0273
Wire Pot C2	0.0195	0.0195	0.0273	0.0273	0.0267
Wire Pot C3	0.0272	0.0297	0.0371	0.0396	0.0396
Wire Pot C4	0.0183	0.0228	0.0274	0.0251	0.0274
Wire Pot C5	0.023	0.0241	0.0275	0.0321	0.0321
Wire Pot C6	0.0257	0.0257	0.0282	0.0319	0.0368
Strain Gage A1	68	76	87	97	106
Strain Gage A2	107	124	146	168	198
Strain Gage A3	152	155	152	172	210
Strain Gage A4	199	229	277	283	285
Strain Gage A5	94	102	115	124	129
Strain Gage A6	62	70	79	87	93
Strain Gage B1	57	63	68	74	79
Strain Gage B2	57	62	68	73	77
Strain Gage B3	54	59	64	67	71
Strain Gage B4	51	54	59	62	66
Strain Gage B5	50	53	56	61	63
Strain Gage B6	58	64	70	76	83
Strain Gage C1	26	30	32	35	36
Strain Gage C2	51	56	62	67	72
Strain Gage C3	31	32	35	37	39
Strain Gage C4	25	27	31	33	34
Strain Gage C5	28	30	33	35	38
Strain Gage C6	35	37	40	42	46
Slip 1	0	0	0	0	0
Slip 2	0	0	0	0	-0.0001
Slip 3	0	0	0	0	0
Slip 4	0	0	-0.0001	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: WWF Concentrated Load Test 2
Concentrated Point Load at Third Point A
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14961 lb
Midspan Deflection at Maximum Load:	0.063 in
Quarter A Deflection at Maximum Load:	0.055 in
Quarter B Deflection at Maximum Load:	0.036 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

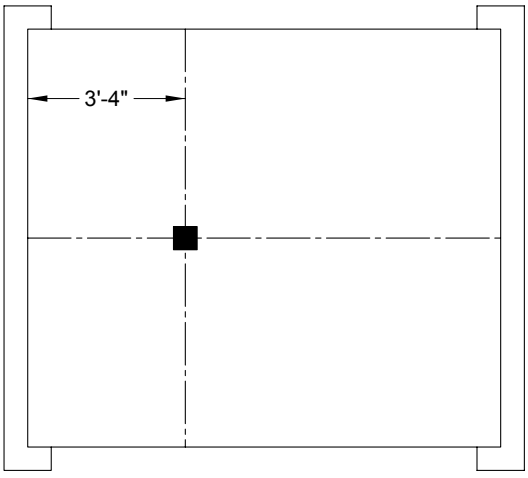

Figure B-4: Location of concentrated point load at Third Point A – first slab set

Table B-2: Experimental results of concentrated load Test 2 on WWF-reinforced slab

Load	0	1090	2024	3057	4022	5018	6051	7052	8018	9014	10031
Wire Pot A1	0	0.0014	0.0037	0.0074	0.0121	0.0184	0.0191	0.0214	0.0228	0.0255	0.0305
Wire Pot A2	0	0	0.0057	0.0077	0.0135	0.0135	0.0199	0.0218	0.027	0.0276	0.034
Wire Pot A3	0	0.0006	0.0073	0.0066	0.014	0.014	0.022	0.0213	0.0279	0.0346	0.0353
Wire Pot A4	0	0	0.0032	0.0064	0.0129	0.0135	0.0213	0.02	0.0265	0.0271	0.0336
Wire Pot A5	0	0.0007	0.0073	0.0073	0.0145	0.0132	0.0205	0.0211	0.0277	0.0324	0.0337
Wire Pot A6	0	0.0013	0	0.0065	0.0072	0.0145	0.0145	0.0197	0.0217	0.0276	0.0283
Wire Pot B1	0	0.0067	0.006	0.014	0.0133	0.02	0.02	0.0266	0.0266	0.0339	0.0413
Wire Pot B2	0	0.0051	0.0058	0.0116	0.0122	0.0187	0.0232	0.0258	0.0329	0.0323	0.0381
Wire Pot B3	0	0	0.0058	0.0103	0.0136	0.02	0.0265	0.0265	0.0329	0.0323	0.04
Wire Pot B4	0	0	-0.0006	0.0059	0.013	0.0137	0.0189	0.0261	0.0267	0.0339	0.0332
Wire Pot B5	0	-0.0007	0.0006	0.0064	0.0135	0.0129	0.0206	0.02	0.0258	0.0335	0.0335
Wire Pot B6	0	-0.0013	0.0118	0.0144	0.0144	0.0144	0.0287	0.0261	0.0287	0.0417	0.0417
Wire Pot C1	0	0	0.0007	0.0007	0.0065	0.0065	0.0104	0.0156	0.013	0.0201	0.0208
Wire Pot C2	0	-0.0013	0.0065	0.0065	0.0065	0.0118	0.0131	0.0163	0.0209	0.0215	0.028
Wire Pot C3	0	0.0012	0	0.0012	0.0037	0.0037	0.005	0.0074	0.0099	0.0161	0.0272
Wire Pot C4	0	0	0.0023	0.0046	0.0092	0.0114	0.0137	0.016	0.0137	0.0228	0.0251
Wire Pot C5	0	-0.0012	0.0023	0.0115	0.0115	0.0184	0.0195	0.0195	0.0195	0.0207	0.023
Wire Pot C6	0	0	0.0012	0.0074	0.0098	0.0135	0.0184	0.0196	0.0196	0.0221	0.0257
Strain Gage A1	0	8	15	22	29	35	42	50	58	64	72
Strain Gage A2	0	10	19	30	40	52	63	75	87	99	111
Strain Gage A3	0	13	22	32	44	54	66	78	89	101	112
Strain Gage A4	0	12	22	34	43	56	69	81	94	106	119
Strain Gage A5	0	11	18	26	34	42	51	59	66	75	84
Strain Gage A6	0	7	12	19	25	32	38	44	50	57	64
Strain Gage B1	0	8	14	21	27	34	40	47	53	60	67
Strain Gage B2	0	8	16	23	31	37	45	52	59	67	75
Strain Gage B3	0	10	17	24	31	38	45	52	60	66	73
Strain Gage B4	0	8	13	21	27	34	40	46	52	60	66
Strain Gage B5	0	8	14	21	27	33	40	47	53	59	65
Strain Gage B6	0	8	15	22	29	36	42	50	57	63	71
Strain Gage C1	0	4	8	12	14	18	22	25	29	32	35
Strain Gage C2	0	7	12	20	25	32	38	44	52	58	66
Strain Gage C3	0	4	9	12	15	18	23	26	29	33	37
Strain Gage C4	0	3	7	10	13	17	20	23	26	30	33
Strain Gage C5	0	4	8	11	14	18	21	25	27	30	35
Strain Gage C6	0	3	8	12	17	20	25	29	33	37	42
Slip 1	0	0	0	0.0001	0	0	0	0	0	0	0
Slip 2	0	0	0	-0.0001	0	0	0	0	0	-0.0001	-0.0001
Slip 3	0	0	0	-0.0001	0	0	0	0	0	0	-0.0001
Slip 4	0	-1E-04	0	0	0	-1E-04	-1E-04	0	0	-1E-04	-1E-04

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-2: Test 2 (continued)

Load	11059	12024	13036	13954	14961
Wire Pot A1	0.0331	0.0375	0.0395	0.0428	0.0459
Wire Pot A2	0.0347	0.0405	0.0482	0.0482	0.054
Wire Pot A3	0.0419	0.0419	0.0493	0.0559	0.0566
Wire Pot A4	0.04	0.0407	0.0465	0.0465	0.0542
Wire Pot A5	0.0416	0.0423	0.0489	0.0489	0.0535
Wire Pot A6	0.0355	0.0349	0.0421	0.0421	0.0494
Wire Pot B1	0.0413	0.0486	0.0466	0.0552	0.0606
Wire Pot B2	0.0387	0.0452	0.0517	0.0523	0.0594
Wire Pot B3	0.0465	0.0471	0.053	0.0607	0.0665
Wire Pot B4	0.0397	0.0469	0.0463	0.0534	0.0599
Wire Pot B5	0.04	0.04	0.0464	0.0535	0.0554
Wire Pot B6	0.0417	0.0547	0.0547	0.0534	0.0691
Wire Pot C1	0.0273	0.0273	0.0279	0.0344	0.0337
Wire Pot C2	0.0267	0.0274	0.0313	0.0333	0.0404
Wire Pot C3	0.0285	0.0309	0.0309	0.0322	0.0322
Wire Pot C4	0.0251	0.0342	0.0342	0.0342	0.0388
Wire Pot C5	0.031	0.0321	0.0356	0.039	0.0413
Wire Pot C6	0.0306	0.0343	0.0343	0.038	0.0429
Strain Gage A1	80	88	98	112	126
Strain Gage A2	123	136	150	166	182
Strain Gage A3	124	136	147	167	199
Strain Gage A4	130	142	151	158	163
Strain Gage A5	92	101	111	118	128
Strain Gage A6	71	79	85	93	102
Strain Gage B1	74	81	88	96	103
Strain Gage B2	82	91	99	107	115
Strain Gage B3	81	87	94	101	106
Strain Gage B4	72	78	86	90	96
Strain Gage B5	71	77	80	82	84
Strain Gage B6	78	87	94	105	114
Strain Gage C1	40	42	45	50	54
Strain Gage C2	73	83	94	105	115
Strain Gage C3	41	45	48	53	55
Strain Gage C4	36	39	43	46	48
Strain Gage C5	38	42	45	48	53
Strain Gage C6	46	50	54	58	61
Slip 1	0	0	0	0	0
Slip 2	0	0	0	0	0
Slip 3	-0.0001	0	-0.0001	0	0
Slip 4	-1E-04	-1E-04	0	-1E-04	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: WWF Concentrated Load Test 3
Concentrated Point Load at Third Point B
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14920 lb
Midspan Deflection at Maximum Load:	0.069 in
Quarter A Deflection at Maximum Load:	0.043 in
Quarter B Deflection at Maximum Load:	0.059 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

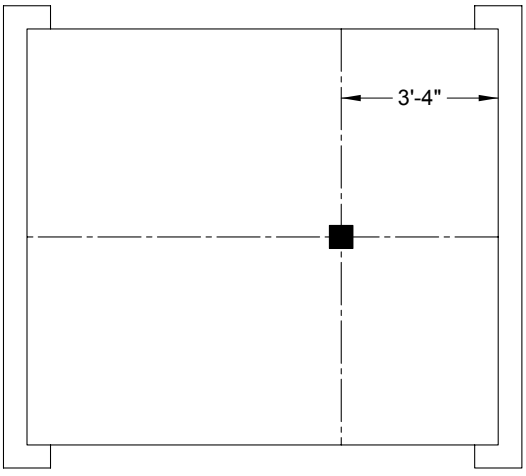

Figure B-5: Location of concentrated point load at Third Point B – first slab set

Table B-3: Experimental results of concentrated load Test 3 on WWF-reinforced slab

Load	0	1079	2055	3051	4006	5044	6139	7016	8059	9092	10062
Wire Pot A1	0	0.002	0.0036	0.0057	0.01	0.0154	0.018	0.0187	0.0204	0.0217	0.0234
Wire Pot A2	0	0.0052	0.0071	0.0071	0.0142	0.0135	0.0174	0.0212	0.0206	0.0277	0.0277
Wire Pot A3	0	0.0027	0.01	0.008	0.0073	0.014	0.014	0.0227	0.0227	0.0306	0.028
Wire Pot A4	0	0.0007	0.0058	0.0071	0.0078	0.0142	0.0149	0.0207	0.0213	0.0246	0.0278
Wire Pot A5	0	0.0013	0.0013	0.0013	0.0073	0.0079	0.0152	0.0152	0.0158	0.0218	0.0218
Wire Pot A6	0	0.0006	0	0.0072	0.0059	0.0138	0.0138	0.0145	0.021	0.0204	0.0276
Wire Pot B1	0	0.006	0.0113	0.0126	0.0186	0.0199	0.0266	0.0259	0.0339	0.0339	0.0406
Wire Pot B2	0	-0.0013	0.0052	0.0058	0.0116	0.0129	0.0194	0.0233	0.0265	0.0336	0.0323
Wire Pot B3	0	0.0058	0.0058	0.0122	0.018	0.0187	0.0258	0.0322	0.0335	0.04	0.0452
Wire Pot B4	0	0.0007	0.0065	0.0059	0.0137	0.0202	0.0209	0.0267	0.0345	0.0332	0.0404
Wire Pot B5	0	0.0013	0.0071	0.0071	0.0136	0.0149	0.0207	0.0278	0.0284	0.0348	0.0336
Wire Pot B6	0	-0.0013	0.0039	0.0039	0.0026	0.0196	0.0183	0.017	0.0261	0.0313	0.0326
Wire Pot C1	0	0	0	0.0071	0.0071	0.0149	0.0129	0.022	0.0201	0.0278	0.0337
Wire Pot C2	0	0.0085	0.0085	0.0144	0.0157	0.0209	0.0215	0.0287	0.0293	0.0359	0.0359
Wire Pot C3	0	-0.0012	0.0012	0.005	0.0062	0.0099	0.0235	0.0247	0.0272	0.0297	0.0322
Wire Pot C4	0	0.0023	0.0092	0.0069	0.0137	0.0183	0.0251	0.0251	0.0297	0.0274	0.0342
Wire Pot C5	0	0.0046	0.0115	0.0184	0.0173	0.0207	0.0207	0.0242	0.0276	0.0322	0.0368
Wire Pot C6	0	0.0049	0.0098	0.0098	0.0147	0.0172	0.0196	0.0209	0.0258	0.0307	0.0343
Strain Gage A1	0	6	10	13	17	22	25	29	33	38	42
Strain Gage A2	0	4	9	12	17	21	26	31	36	42	46
Strain Gage A3	0	5	8	12	17	20	26	29	34	38	42
Strain Gage A4	0	5	8	12	15	20	24	27	31	35	40
Strain Gage A5	0	3	7	10	13	17	20	24	27	30	34
Strain Gage A6	0	3	8	11	14	18	22	25	28	33	36
Strain Gage B1	0	8	13	19	25	32	39	45	52	59	65
Strain Gage B2	0	10	16	24	30	39	46	53	61	68	76
Strain Gage B3	0	9	16	22	29	36	44	51	58	64	71
Strain Gage B4	0	8	15	22	28	35	41	47	54	61	67
Strain Gage B5	0	8	14	21	27	33	39	44	51	57	62
Strain Gage B6	0	7	13	21	26	34	42	49	55	63	71
Strain Gage C1	0	7	12	18	23	29	35	40	47	54	61
Strain Gage C2	0	15	31	47	63	80	100	124	152	181	214
Strain Gage C3	0	12	23	32	42	51	62	72	81	95	119
Strain Gage C4	0	10	19	27	36	45	54	59	67	73	79
Strain Gage C5	0	8	13	19	24	30	36	42	49	55	62
Strain Gage C6	0	12	20	30	40	49	61	71	83	108	129
Slip 1	0	0	0	0	0	0	0	0	0	0	-1E-04
Slip 2	0	0	0	0	0	0	0	0.0001	0	0	0
Slip 3	0	0	0	0	0	-0.0001	0	0	0	0	-0.0001
Slip 4	0	0	-1E-04	0	-1E-04	0	-1E-04	0	-1E-04	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-3: Test 3 (continued)

Load	11048	11588	13005	14053	14920
Wire Pot A1	0.0254	0.0301	0.0341	0.0368	0.0384
Wire Pot A2	0.0322	0.0341	0.0347	0.0412	0.0431
Wire Pot A3	0.0273	0.0353	0.036	0.0446	0.044
Wire Pot A4	0.0272	0.0343	0.0349	0.0401	0.0414
Wire Pot A5	0.0297	0.029	0.035	0.0356	0.0422
Wire Pot A6	0.0276	0.0349	0.0349	0.0421	0.0421
Wire Pot B1	0.0479	0.0479	0.0545	0.0619	0.0632
Wire Pot B2	0.0394	0.0459	0.0465	0.053	0.0595
Wire Pot B3	0.0503	0.0529	0.0594	0.0658	0.0716
Wire Pot B4	0.0476	0.0476	0.0528	0.0612	0.0664
Wire Pot B5	0.0407	0.0477	0.0477	0.0548	0.0619
Wire Pot B6	0.0313	0.0456	0.0456	0.0613	0.0587
Wire Pot C1	0.0337	0.0402	0.0415	0.0466	0.0473
Wire Pot C2	0.043	0.0476	0.0496	0.0567	0.0619
Wire Pot C3	0.0346	0.0371	0.047	0.0507	0.0594
Wire Pot C4	0.0411	0.0479	0.0502	0.0548	0.0593
Wire Pot C5	0.0425	0.046	0.0494	0.0551	0.062
Wire Pot C6	0.0368	0.0393	0.0442	0.0491	0.0552
Strain Gage A1	48	50	57	62	66
Strain Gage A2	52	56	61	66	69
Strain Gage A3	47	50	54	59	62
Strain Gage A4	43	45	50	54	58
Strain Gage A5	38	39	43	46	49
Strain Gage A6	40	42	48	52	56
Strain Gage B1	73	78	90	101	110
Strain Gage B2	83	88	96	102	108
Strain Gage B3	77	79	85	88	91
Strain Gage B4	72	75	81	82	85
Strain Gage B5	68	70	78	84	90
Strain Gage B6	78	83	96	107	117
Strain Gage C1	69	73	86	99	108
Strain Gage C2	243	259	288	300	309
Strain Gage C3	146	167	250	282	298
Strain Gage C4	83	83	87	88	88
Strain Gage C5	70	74	86	99	109
Strain Gage C6	149	167	195	213	226
Slip 1	0	0	0.0001	0	0
Slip 2	0.0001	0.0001	0	0	0
Slip 3	0	-0.0001	0	-0.0001	0
Slip 4	0	-1E-04	-1E-04	-1E-04	-1E-04

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: WWF Concentrated Load Test 4
Concentrated Point Load at Quarter Point B
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15003 lb
Midspan Deflection at Maximum Load:	0.049 in
Quarter A Deflection at Maximum Load:	0.028 in
Quarter B Deflection at Maximum Load:	0.050 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

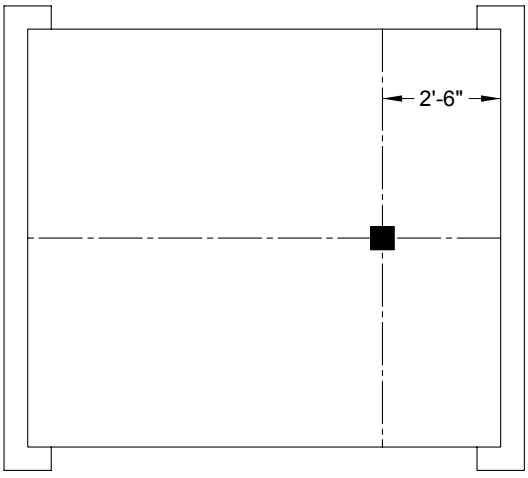

Figure B-6: Location of concentrated point load at Quarter Point B – first slab set

Table B-4: Experimental results of concentrated load Test 4 on WWF-reinforced slab

Load	0	1022	2029	3057	4048	5080	6134	7016	8049	9019	10031
Wire Pot A1	0	0.0004	0.0017	0.0044	0.0074	0.0117	0.0158	0.0161	0.0171	0.0184	0.0191
Wire Pot A2	0	0	0	0.0006	0.0077	0.0071	0.0064	0.0129	0.0122	0.0129	0.0193
Wire Pot A3	0	0	0	0.002	0	0.008	0.0073	0.0106	0.0133	0.0146	0.0173
Wire Pot A4	0	0	0	0.0006	0	0.0077	0.0064	0.0071	0.0142	0.0129	0.0129
Wire Pot A5	0	0.0007	0.0007	0.0053	0.0073	0.0079	0.0086	0.0145	0.0132	0.0152	0.0211
Wire Pot A6	0	0.0013	0.0066	0.0059	0.0059	0.0106	0.0125	0.0139	0.0139	0.0204	0.0198
Wire Pot B1	0	0.0046	0.0073	0.008	0.0146	0.0139	0.0219	0.0213	0.0279	0.0279	0.0359
Wire Pot B2	0	0.0071	0.0071	0.011	0.0142	0.0194	0.0207	0.0259	0.0272	0.0336	0.0336
Wire Pot B3	0	0.0006	0.0064	0.0064	0.0122	0.0122	0.02	0.0258	0.0258	0.0335	0.0329
Wire Pot B4	0	0.0006	0	0.0065	0.0065	0.0123	0.0117	0.0208	0.0202	0.0267	0.0332
Wire Pot B5	0	0.0032	0.0019	0.0051	0.0096	0.0096	0.0161	0.0161	0.0225	0.0219	0.0303
Wire Pot B6	0	-0.0013	0	0	0.0026	0.0144	0.0131	0.0144	0.0118	0.0261	0.0287
Wire Pot C1	0	0.0013	0.0065	0.0072	0.0149	0.0137	0.0214	0.0208	0.0273	0.0286	0.035
Wire Pot C2	0	-0.0006	0.0072	0.0065	0.0144	0.0124	0.0209	0.0202	0.0267	0.028	0.0339
Wire Pot C3	0	0.0012	0	0.0025	0.0111	0.021	0.0235	0.0223	0.026	0.0309	0.0309
Wire Pot C4	0	0	0.0023	0.0046	0.0092	0.0114	0.0206	0.0228	0.0228	0.0251	0.0342
Wire Pot C5	0	0.0069	0.0092	0.0127	0.0127	0.015	0.0173	0.0219	0.0276	0.0299	0.0322
Wire Pot C6	0	0.0037	0.0049	0.0086	0.0135	0.0147	0.0159	0.0184	0.0208	0.0257	0.0306
Strain Gage A1	0	2	5	8	12	14	16	20	23	25	28
Strain Gage A2	0	3	5	8	10	14	17	20	23	27	30
Strain Gage A3	0	2	5	8	9	13	15	18	21	24	27
Strain Gage A4	0	3	5	7	11	13	15	18	21	24	27
Strain Gage A5	0	3	6	8	10	13	15	16	19	21	24
Strain Gage A6	0	2	5	7	9	11	14	16	19	22	25
Strain Gage B1	0	4	10	14	20	25	29	35	40	45	51
Strain Gage B2	0	5	10	14	20	24	28	33	39	43	48
Strain Gage B3	0	5	9	14	18	22	26	31	35	38	42
Strain Gage B4	0	4	9	13	17	21	25	28	32	37	41
Strain Gage B5	0	4	10	13	17	21	24	29	34	37	41
Strain Gage B6	0	6	12	16	22	26	33	37	43	49	56
Strain Gage C1	0	5	11	16	22	28	34	38	45	52	57
Strain Gage C2	0	17	34	54	73	92	113	131	151	171	192
Strain Gage C3	0	17	37	58	81	103	126	146	168	194	222
Strain Gage C4	0	12	24	34	44	54	63	72	83	92	102
Strain Gage C5	0	4	11	15	21	27	33	39	44	51	56
Strain Gage C6	0	12	23	34	46	58	73	84	97	112	125
Slip 1	0	0	0	-0.0001	0	0.0001	-0.0001	0	0	-0.0001	0
Slip 2	0	0	-0.0001	0	0	-0.0001	-0.0001	-0.0002	0	-0.0001	0
Slip 3	0	0	0.0001	0	0.0001	0	0	0	0	0	0
Slip 4	0	0	0	0	0	0	0	1E-04	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-4: Test 4 (continued)

Load	11048	12055	13025	13975	15003
Wire Pot A1	0.0208	0.0224	0.0241	0.0275	0.0308
Wire Pot A2	0.0212	0.0206	0.0238	0.0264	0.027
Wire Pot A3	0.022	0.0213	0.022	0.0273	0.0279
Wire Pot A4	0.02	0.0194	0.02	0.0265	0.0278
Wire Pot A5	0.0205	0.0224	0.029	0.0284	0.0317
Wire Pot A6	0.0257	0.0277	0.027	0.033	0.0349
Wire Pot B1	0.0359	0.0432	0.0432	0.0499	0.0499
Wire Pot B2	0.0401	0.0407	0.0478	0.0478	0.0556
Wire Pot B3	0.0406	0.04	0.0477	0.0542	0.0523
Wire Pot B4	0.0338	0.0403	0.0397	0.0469	0.0456
Wire Pot B5	0.029	0.0367	0.0367	0.0425	0.0432
Wire Pot B6	0.0274	0.0274	0.0404	0.043	0.043
Wire Pot C1	0.035	0.0422	0.0422	0.0422	0.0486
Wire Pot C2	0.0333	0.0411	0.0411	0.0483	0.0483
Wire Pot C3	0.0334	0.0359	0.0445	0.0482	0.0495
Wire Pot C4	0.0342	0.0365	0.0434	0.0457	0.0502
Wire Pot C5	0.0368	0.0391	0.0414	0.046	0.0494
Wire Pot C6	0.0318	0.0331	0.0355	0.0404	0.0429
Strain Gage A1	33	35	38	41	45
Strain Gage A2	33	37	41	45	47
Strain Gage A3	31	33	36	39	42
Strain Gage A4	29	32	35	38	40
Strain Gage A5	26	28	30	33	35
Strain Gage A6	27	30	33	36	38
Strain Gage B1	57	63	68	74	80
Strain Gage B2	53	57	64	68	73
Strain Gage B3	47	51	55	60	63
Strain Gage B4	44	49	52	56	60
Strain Gage B5	45	50	52	58	63
Strain Gage B6	61	67	72	78	85
Strain Gage C1	63	69	76	83	90
Strain Gage C2	213	236	258	280	268
Strain Gage C3	256	297	343	397	366
Strain Gage C4	113	124	134	150	252
Strain Gage C5	62	68	75	81	89
Strain Gage C6	139	154	167	183	201
Slip 1	0	0	0	0	-0.0001
Slip 2	-0.0001	0	0	-0.0001	0
Slip 3	0.0001	0	0	0.0001	0
Slip 4	0	1E-04	1E-04	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: WWF Concentrated Load Test 5
Transverse Line Load at Quarter Point B
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15023 lb
Midspan Deflection at Maximum Load:	0.054 in
Quarter A Deflection at Maximum Load:	0.034 in
Quarter B Deflection at Maximum Load:	0.055 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

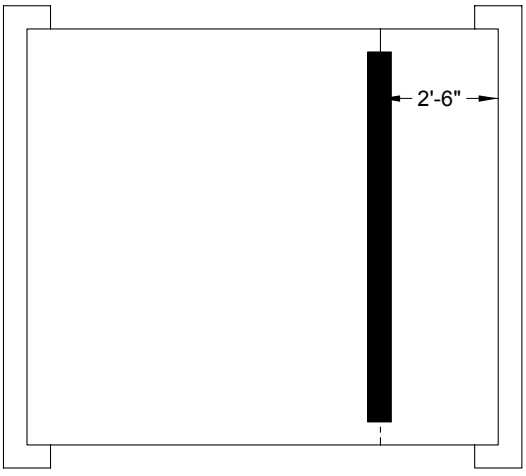

Figure B-7: Location of transverse line load at Quarter Point B – first slab set

Table B-5: Experimental results of concentrated load Test 5 on WWF-reinforced slab

Load	0	1111	2024	3051	4011	5070	6082	7073	8049	9107	10202
Wire Pot A1	0	0.0014	0.0034	0.0077	0.0111	0.0161	0.0171	0.0184	0.0198	0.0214	0.0231
Wire Pot A2	0	0.0019	0.0019	0.0038	0.009	0.009	0.0103	0.016	0.0154	0.0167	0.0231
Wire Pot A3	0	0.0007	0.0007	0.0087	0.008	0.0073	0.0147	0.0133	0.0153	0.0207	0.022
Wire Pot A4	0	-0.0006	-0.0006	0.0058	0.0058	0.0058	0.0136	0.0129	0.0129	0.02	0.02
Wire Pot A5	0	-0.0006	0	-0.0006	0.0046	0.0066	0.0066	0.0139	0.0139	0.0132	0.0205
Wire Pot A6	0	0.0019	0.0006	0.0072	0.0079	0.0072	0.0145	0.0151	0.0151	0.0217	0.0224
Wire Pot B1	0	0.006	0.0073	0.014	0.0146	0.022	0.0273	0.0273	0.0353	0.0353	0.0419
Wire Pot B2	0	0.0013	0.0071	0.0103	0.0129	0.0206	0.0213	0.0284	0.0271	0.0329	0.0329
Wire Pot B3	0	0.0013	0.0091	0.0084	0.0142	0.0213	0.0226	0.0297	0.0284	0.0349	0.0342
Wire Pot B4	0	0.0006	0	0.0078	0.011	0.0156	0.0214	0.0208	0.028	0.0273	0.0338
Wire Pot B5	0	0	-0.0006	0.0065	0.0065	0.0136	0.0142	0.02	0.0207	0.0278	0.0342
Wire Pot B6	0	-0.0013	0	-0.0013	0.0157	0.0157	0.0157	0.0248	0.0287	0.03	0.03
Wire Pot C1	0	-0.0007	0.0071	0.0071	0.0142	0.0136	0.0214	0.0272	0.0272	0.035	0.0343
Wire Pot C2	0	0.0065	0.0059	0.0131	0.0124	0.0196	0.0202	0.0267	0.0274	0.0359	0.0359
Wire Pot C3	0	0.0012	0.0012	0.0049	0.0173	0.0198	0.0235	0.0235	0.0247	0.0284	0.0309
Wire Pot C4	0	0.0045	0.0091	0.0114	0.016	0.0205	0.0251	0.0296	0.0296	0.0388	0.041
Wire Pot C5	0	0.008	0.008	0.0092	0.0115	0.0138	0.0195	0.023	0.0287	0.031	0.0356
Wire Pot C6	0	0.0025	0.0061	0.0123	0.0135	0.0147	0.0184	0.0257	0.0282	0.027	0.0331
Strain Gage A1	0	3	5	9	13	15	19	21	24	28	32
Strain Gage A2	0	3	7	9	13	17	21	25	29	33	38
Strain Gage A3	0	5	7	10	13	16	19	23	26	29	33
Strain Gage A4	0	3	6	9	11	15	17	21	23	26	29
Strain Gage A5	0	2	5	7	10	11	14	16	19	22	24
Strain Gage A6	0	2	4	7	9	12	15	17	20	22	25
Strain Gage B1	0	8	12	17	22	28	32	38	43	49	55
Strain Gage B2	0	6	12	17	21	27	33	38	42	49	54
Strain Gage B3	0	8	12	18	21	26	32	37	41	46	52
Strain Gage B4	0	5	8	14	17	22	26	30	34	39	43
Strain Gage B5	0	6	11	13	17	21	26	29	33	38	41
Strain Gage B6	0	6	11	16	22	28	33	40	45	51	58
Strain Gage C1	0	9	16	24	30	38	46	53	60	68	77
Strain Gage C2	0	16	31	46	63	80	95	112	128	146	164
Strain Gage C3	0	16	29	46	61	79	96	114	131	150	169
Strain Gage C4	0	17	33	53	73	97	120	144	167	192	221
Strain Gage C5	0	8	13	19	26	31	39	45	52	59	67
Strain Gage C6	0	15	29	45	59	75	91	107	121	138	156
Slip 1	0	0	0.0001	0	0	0	0	0	0	0	0
Slip 2	0	-0.0001	0	0	0	0	-0.0001	0	0	0	0
Slip 3	0	0	0	0	0	0	0	0	0.0001	0.0001	0
Slip 4	0	0	0	0	0	0	1E-04	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-5: Test 5 (continued)

Load	11038	12107	13036	14032	15023
Wire Pot A1	0.0248	0.0285	0.0321	0.0355	0.0358
Wire Pot A2	0.0225	0.0231	0.0296	0.0289	0.0296
Wire Pot A3	0.02	0.0273	0.0286	0.028	0.0346
Wire Pot A4	0.0194	0.0272	0.0265	0.0272	0.033
Wire Pot A5	0.0205	0.0205	0.0271	0.0271	0.0264
Wire Pot A6	0.0296	0.0289	0.0283	0.0362	0.0362
Wire Pot B1	0.0426	0.0486	0.0493	0.0552	0.0559
Wire Pot B2	0.0413	0.0413	0.0471	0.0465	0.0542
Wire Pot B3	0.0426	0.0478	0.0472	0.0543	0.0549
Wire Pot B4	0.0338	0.0416	0.0469	0.0469	0.054
Wire Pot B5	0.0342	0.0407	0.0394	0.0477	0.0477
Wire Pot B6	0.043	0.043	0.043	0.0417	0.0573
Wire Pot C1	0.0415	0.0408	0.0479	0.0479	0.0551
Wire Pot C2	0.0417	0.0404	0.0483	0.0476	0.0548
Wire Pot C3	0.0321	0.0396	0.0457	0.0482	0.0507
Wire Pot C4	0.0433	0.0433	0.0479	0.057	0.0593
Wire Pot C5	0.039	0.0436	0.0459	0.0517	0.0528
Wire Pot C6	0.0368	0.0368	0.0417	0.0441	0.049
Strain Gage A1	35	38	41	44	48
Strain Gage A2	42	46	49	54	59
Strain Gage A3	37	40	44	47	51
Strain Gage A4	32	35	38	41	44
Strain Gage A5	26	29	31	34	36
Strain Gage A6	27	31	33	37	40
Strain Gage B1	60	66	72	76	83
Strain Gage B2	59	66	70	76	81
Strain Gage B3	56	62	65	70	76
Strain Gage B4	46	51	54	59	62
Strain Gage B5	45	49	53	58	62
Strain Gage B6	63	70	75	82	88
Strain Gage C1	83	91	98	107	117
Strain Gage C2	179	198	214	232	253
Strain Gage C3	186	205	224	245	271
Strain Gage C4	244	278	309	357	367
Strain Gage C5	72	80	87	94	102
Strain Gage C6	169	188	204	226	234
Slip 1	0	0	0	0	-1E-04
Slip 2	0	0	0	-0.0001	0
Slip 3	0.0001	0.0001	-0.0001	-0.0001	0
Slip 4	0	0	1E-04	0	1E-04

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: WWF Concentrated Load Test 6
Transverse Line Load at Quarter Point A
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15080 lb
Midspan Deflection at Maximum Load:	0.054 in
Quarter A Deflection at Maximum Load:	0.056 in
Quarter B Deflection at Maximum Load:	0.028 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

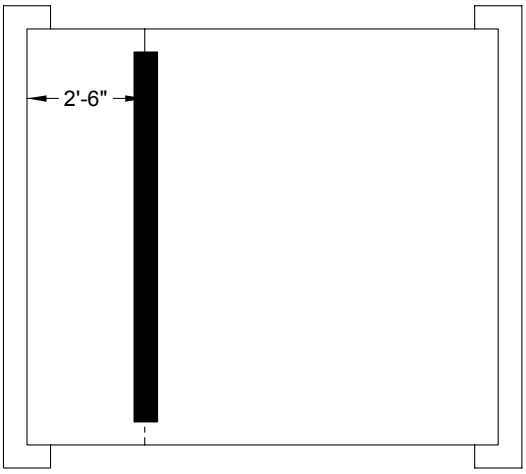

Figure B-8: Location of transverse line load at Quarter Point A – first slab set

Table B-6: Experimental results of concentrated load Test 6 on WWF-reinforced slab

Load	0	1111	2055	3005	4032	5003	6046	6990	8033	9107	10021
Wire Pot A1	0	0.0013	0.0044	0.009	0.0144	0.0164	0.0184	0.0201	0.0221	0.0248	0.0291
Wire Pot A2	0	0.0007	0.0007	0.0071	0.0058	0.0135	0.0142	0.0212	0.0212	0.027	0.0283
Wire Pot A3	0	0.0007	0.0067	0.0074	0.0127	0.0134	0.0207	0.0227	0.028	0.0273	0.0353
Wire Pot A4	0	-0.0006	0.0039	0.0058	0.0129	0.0136	0.0201	0.0201	0.0278	0.0272	0.0336
Wire Pot A5	0	0.0059	0.0059	0.0138	0.0145	0.0191	0.0204	0.027	0.027	0.0343	0.0336
Wire Pot A6	0	0	-0.0007	0.0065	0.0072	0.0151	0.0131	0.0197	0.0204	0.027	0.0276
Wire Pot B1	0	0.0067	0.0067	0.0133	0.0127	0.0207	0.0207	0.0267	0.0273	0.0333	0.034
Wire Pot B2	0	0.0064	0.0064	0.011	0.0142	0.0161	0.02	0.0245	0.0265	0.0336	0.0342
Wire Pot B3	0	0.0007	0.0065	0.0065	0.0123	0.0207	0.02	0.0265	0.0265	0.0342	0.0323
Wire Pot B4	0	0.0013	0.002	0.0078	0.0078	0.0143	0.0202	0.0215	0.028	0.0287	0.0345
Wire Pot B5	0	0.0007	0.0007	0.0058	0.0065	0.0142	0.0142	0.0213	0.0252	0.0278	0.0329
Wire Pot B6	0	-0.0013	0.0026	-0.0013	0.0144	0.0131	0.0144	0.0131	0.0248	0.0287	0.0274
Wire Pot C1	0	-0.0019	0.0052	0.0046	0.0052	0.0111	0.0124	0.0117	0.0195	0.0188	0.0175
Wire Pot C2	0	0.0006	0.0039	0.0052	0.0071	0.0071	0.0137	0.015	0.0137	0.0208	0.0176
Wire Pot C3	0	0	0	0.0025	0.0037	0.0049	0.0074	0.0173	0.021	0.0235	0.0222
Wire Pot C4	0	0.0023	0	0.0023	0.0046	0.0046	0.0137	0.016	0.0114	0.0137	0.0205
Wire Pot C5	0	0.0023	0.0046	0.0069	0.0069	0.0092	0.0115	0.0092	0.0126	0.0138	0.0184
Wire Pot C6	0	-0.0012	0.0025	0.0037	0.0074	0.0123	0.0123	0.0147	0.0147	0.0172	0.0196
Strain Gage A1	0	8	14	20	28	36	43	51	58	67	74
Strain Gage A2	0	13	24	36	49	64	77	90	104	119	131
Strain Gage A3	0	14	26	39	52	68	82	96	112	129	142
Strain Gage A4	0	13	24	36	49	62	76	89	103	117	129
Strain Gage A5	0	10	16	25	33	42	51	60	69	78	87
Strain Gage A6	0	6	12	19	25	31	37	44	50	57	62
Strain Gage B1	0	6	10	14	20	24	29	34	40	46	50
Strain Gage B2	0	6	11	16	21	25	30	35	40	45	49
Strain Gage B3	0	5	10	14	19	23	28	32	36	42	46
Strain Gage B4	0	6	10	13	18	23	27	32	37	40	44
Strain Gage B5	0	6	10	13	17	21	26	28	33	38	41
Strain Gage B6	0	6	13	16	22	28	34	39	44	51	55
Strain Gage C1	0	2	5	8	10	12	15	17	20	23	25
Strain Gage C2	0	6	9	14	20	25	31	35	40	46	51
Strain Gage C3	0	3	7	10	14	18	22	27	31	35	39
Strain Gage C4	0	4	7	9	13	14	17	21	24	26	29
Strain Gage C5	0	4	6	8	11	13	16	18	21	24	27
Strain Gage C6	0	4	8	11	14	19	22	25	29	33	37
Slip 1	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0	-0.0001
Slip 2	0	0	0	0	0	0	0	0	0	-0.0001	-0.0001
Slip 3	0	-0.0001	-0.0001	0	-0.0001	-0.0001	-0.0001	0	0	-0.0001	-0.0001
Slip 4	0	0	0	0	0	0	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-6: Test 6 (continued)

Load	11012	12076	12984	14037	15080
Wire Pot A1	0.0338	0.0358	0.0378	0.0405	0.0455
Wire Pot A2	0.0341	0.0335	0.0405	0.0405	0.0489
Wire Pot A3	0.0353	0.0433	0.0427	0.0493	0.0567
Wire Pot A4	0.0343	0.0407	0.0407	0.0472	0.0549
Wire Pot A5	0.0383	0.0416	0.0475	0.0475	0.0548
Wire Pot A6	0.0336	0.0349	0.0415	0.0421	0.048
Wire Pot B1	0.042	0.0406	0.048	0.0486	0.0559
Wire Pot B2	0.0381	0.0407	0.0465	0.0478	0.0549
Wire Pot B3	0.0407	0.0426	0.0465	0.053	0.0536
Wire Pot B4	0.0345	0.0417	0.0423	0.0482	0.0547
Wire Pot B5	0.0342	0.0413	0.0407	0.0477	0.049
Wire Pot B6	0.0365	0.0417	0.0404	0.0404	0.0534
Wire Pot C1	0.026	0.0247	0.0266	0.0318	0.037
Wire Pot C2	0.0208	0.0273	0.0267	0.028	0.0345
Wire Pot C3	0.0247	0.026	0.026	0.0284	0.0309
Wire Pot C4	0.0183	0.0228	0.0274	0.0297	0.0251
Wire Pot C5	0.0207	0.0252	0.0252	0.0275	0.031
Wire Pot C6	0.0258	0.027	0.027	0.0294	0.0331
Strain Gage A1	82	90	99	107	115
Strain Gage A2	145	159	175	190	230
Strain Gage A3	158	175	191	207	227
Strain Gage A4	143	159	172	187	203
Strain Gage A5	94	104	114	124	133
Strain Gage A6	70	75	83	89	97
Strain Gage B1	56	62	66	72	78
Strain Gage B2	53	60	65	69	74
Strain Gage B3	51	55	60	64	69
Strain Gage B4	49	54	57	62	65
Strain Gage B5	45	49	53	58	61
Strain Gage B6	62	68	73	79	85
Strain Gage C1	29	30	33	36	37
Strain Gage C2	57	63	67	72	78
Strain Gage C3	44	48	51	57	60
Strain Gage C4	34	37	40	44	48
Strain Gage C5	29	33	35	38	41
Strain Gage C6	41	46	49	52	56
Slip 1	0	-0.0001	-0.0001	-0.0001	-0.0001
Slip 2	0	0	0	0	0
Slip 3	-0.0001	0	0	-0.0001	0
Slip 4	0	1E-04	1E-04	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: WWF Concentrated Load Test 7
Longitudinal Line Load at Right Side
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14997 lb
Midspan Deflection at Maximum Load:	0.030 in
Quarter A Deflection at Maximum Load:	0.021 in
Quarter B Deflection at Maximum Load:	0.029 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

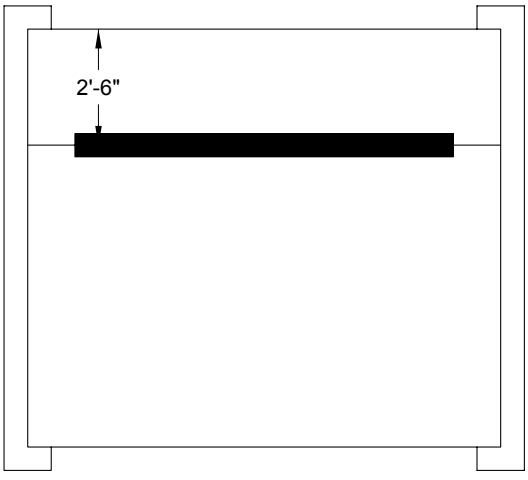

Figure B-9: Location of longitudinal line load at Right Side – first slab set

Table B-7: Experimental results of concentrated load Test 7 on WWF-reinforced slab

Load	0	986	2039	3051	4079	4997	6139	7042	8049	9014	10140
Wire Pot A1	0	0	-0.001	-0.0014	-0.002	-0.0027	-0.003	-0.003	-0.0024	-0.0027	-0.003
Wire Pot A2	0	-0.0006	-0.0013	-0.0013	-0.0013	0	-0.0019	-0.0013	0	-0.0013	-0.0006
Wire Pot A3	0	-0.0007	-0.0007	-0.0007	-0.0013	-0.0013	0	-0.0013	0.002	0.0047	0.0053
Wire Pot A4	0	0.0006	0	0.0013	0.0013	0.0077	0.0071	0.0077	0.0135	0.0142	0.0155
Wire Pot A5	0	0.0007	0.0086	0.006	0.0146	0.0146	0.0205	0.0205	0.0284	0.0284	0.035
Wire Pot A6	0	-0.0014	0.0079	0.0065	0.0151	0.0131	0.021	0.0243	0.027	0.0349	0.0342
Wire Pot B1	0	-0.0014	-0.002	-0.0007	-0.0007	-0.002	-0.0007	0	-0.0014	-0.0014	-0.0014
Wire Pot B2	0	0.0006	0.0006	0.0006	0	0.0006	0.0006	0	0.0013	0.0051	0.0071
Wire Pot B3	0	0	-0.0006	0	0	0.0065	0.0065	0.0071	0.0071	0.0097	0.0129
Wire Pot B4	0	0	0.0007	-0.0013	0.0059	0.0078	0.0059	0.0137	0.0137	0.0137	0.0209
Wire Pot B5	0	0.0013	0	0.0078	0.0097	0.0142	0.0149	0.0213	0.0213	0.0284	0.0278
Wire Pot B6	0	0.0013	0	0.0144	0.0157	0.0144	0.0274	0.0287	0.03	0.0391	0.0417
Wire Pot C1	0	-0.0013	-0.0007	-0.0007	-0.002	0	-0.0007	-0.0013	-0.0013	-0.0013	-0.002
Wire Pot C2	0	0	0.0006	0	0.0006	0	0.0006	-0.0007	0	-0.0007	0
Wire Pot C3	0	0.0013	0	0	0.0013	0.0025	0	0.005	0.005	0.005	0.0075
Wire Pot C4	0	0.0023	0.0046	0.0069	0.0092	0.0115	0.0137	0.0206	0.0183	0.016	0.0229
Wire Pot C5	0	0.0046	0.0069	0.008	0.0103	0.0103	0.0149	0.0195	0.0218	0.0264	0.0287
Wire Pot C6	0	0.0025	0.0062	0.0111	0.0123	0.0172	0.0245	0.027	0.027	0.0319	0.0356
Strain Gage A1	0	0	1	0	1	2	3	3	5	6	8
Strain Gage A2	0	1	3	5	6	8	10	12	14	15	19
Strain Gage A3	0	2	5	6	9	11	13	15	17	19	24
Strain Gage A4	0	3	6	7	10	12	14	17	20	22	27
Strain Gage A5	0	2	4	6	7	8	11	12	13	15	19
Strain Gage A6	0	2	5	7	9	10	12	14	18	22	25
Strain Gage B1	0	1	3	3	4	4	7	8	9	11	12
Strain Gage B2	0	1	3	5	6	9	10	13	13	15	19
Strain Gage B3	0	3	5	7	9	9	12	15	17	19	23
Strain Gage B4	0	2	3	6	7	9	11	12	14	18	22
Strain Gage B5	0	2	3	5	7	9	11	11	14	16	21
Strain Gage B6	0	2	4	7	8	10	12	15	19	23	29
Strain Gage C1	0	0	1	1	3	4	5	6	8	9	10
Strain Gage C2	0	3	5	8	11	15	19	21	25	30	36
Strain Gage C3	0	3	6	9	12	15	19	23	26	30	37
Strain Gage C4	0	4	6	9	12	14	18	21	25	28	35
Strain Gage C5	0	3	7	9	13	15	20	23	27	31	36
Strain Gage C6	0	2	6	9	12	16	20	24	29	33	39
Slip 1	0	0	0	0	0	0	0	0	0	0	0
Slip 2	0	0	0	0	0	0	0	0	0	-0.0001	0
Slip 3	0	-0.0001	-0.0001	0	-0.0001	0	-0.0001	0	-0.0001	0	-0.0001
Slip 4	0	0	0	0	0	-0.0001	0	-0.0001	-0.0001	-0.0001	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-7: Test 7 (continued)

Load	11074	12091	13036	13965	14997
Wire Pot A1	-0.0034	-0.003	-0.003	-0.0034	-0.0034
Wire Pot A2	-0.0006	-0.0013	-0.0013	-0.0013	-0.0006
Wire Pot A3	0.0047	0.0067	0.0127	0.012	0.012
Wire Pot A4	0.0207	0.0207	0.0213	0.0278	0.0291
Wire Pot A5	0.0344	0.0403	0.0443	0.0476	0.0482
Wire Pot A6	0.0415	0.0421	0.0474	0.0553	0.0559
Wire Pot B1	0	-0.0014	-0.0007	-0.002	-0.0014
Wire Pot B2	0.0077	0.0071	0.0071	0.0103	0.0142
Wire Pot B3	0.0123	0.0194	0.02	0.0207	0.0252
Wire Pot B4	0.0202	0.028	0.0267	0.0339	0.0339
Wire Pot B5	0.0361	0.0413	0.0407	0.0484	0.0555
Wire Pot B6	0.0391	0.0547	0.0534	0.056	0.0678
Wire Pot C1	-0.0013	-0.0007	-0.0013	0	0
Wire Pot C2	0	0.0065	0.0071	0.0071	0.0065
Wire Pot C3	0.0087	0.0174	0.0198	0.0248	0.0235
Wire Pot C4	0.0274	0.0297	0.0297	0.032	0.0343
Wire Pot C5	0.031	0.0344	0.039	0.0425	0.0471
Wire Pot C6	0.0405	0.0454	0.0503	0.0515	0.0613
Strain Gage A1	9	12	14	16	19
Strain Gage A2	23	26	30	35	39
Strain Gage A3	27	32	36	39	44
Strain Gage A4	30	34	39	42	47
Strain Gage A5	22	26	29	32	37
Strain Gage A6	30	35	40	45	50
Strain Gage B1	15	19	21	24	28
Strain Gage B2	22	27	31	34	39
Strain Gage B3	27	32	37	40	46
Strain Gage B4	26	31	37	42	49
Strain Gage B5	26	31	38	45	53
Strain Gage B6	35	44	52	60	70
Strain Gage C1	12	15	17	19	23
Strain Gage C2	41	48	55	61	69
Strain Gage C3	42	48	54	61	67
Strain Gage C4	40	47	54	60	68
Strain Gage C5	41	48	53	60	67
Strain Gage C6	46	53	60	66	74
Slip 1	0	0	0	0	0
Slip 2	0	0	-0.0001	0	0
Slip 3	0	-0.0001	-0.0001	0	-0.0001
Slip 4	0	0	0	-0.0001	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: WWF Concentrated Load Test 8
Longitudinal Line Load at Left Side
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15044 lb
Midspan Deflection at Maximum Load:	0.044 in
Quarter A Deflection at Maximum Load:	0.032 in
Quarter B Deflection at Maximum Load:	0.029 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

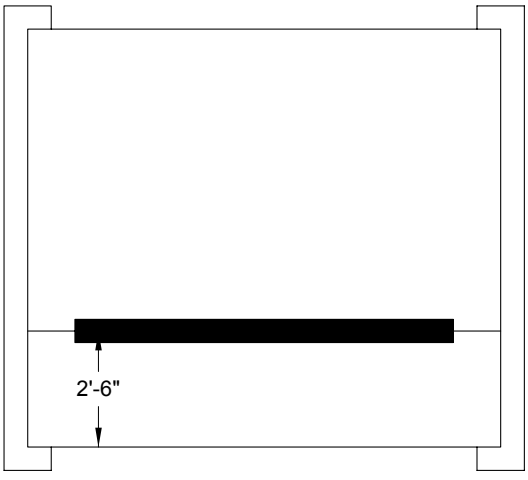

Figure B-10: Location of longitudinal line load at Left Side – first slab set

Table B-8: Experimental results of concentrated load Test 8 on WWF-reinforced slab

Load	0	1022	2029	3015	3996	5080	6155	7047	8033	9118	10073
Wire Pot A1	0	0.0054	0.0141	0.0174	0.0214	0.0285	0.0342	0.0375	0.0412	0.0469	0.0525
Wire Pot A2	0	0.0032	0.0096	0.0167	0.0161	0.0231	0.0302	0.0296	0.036	0.0379	0.0444
Wire Pot A3	0	0.002	0.0007	0.008	0.0074	0.014	0.0134	0.022	0.022	0.028	0.0287
Wire Pot A4	0	0	0.0007	0.0007	0.0013	0.0058	0.0084	0.0078	0.0071	0.0136	0.0149
Wire Pot A5	0	-0.002	-0.0013	-0.0013	-0.0006	-0.0013	-0.002	-0.0026	0.0027	0.0053	0.0053
Wire Pot A6	0	-0.0006	-0.0033	-0.0079	-0.0079	-0.0072	-0.0072	-0.0066	-0.0072	-0.0072	-0.0059
Wire Pot B1	0	0.0073	0.0133	0.0213	0.0286	0.0346	0.0426	0.0479	0.0552	0.0612	0.0626
Wire Pot B2	0	0.0071	0.0142	0.02	0.0213	0.0271	0.0342	0.0394	0.0407	0.0471	0.0536
Wire Pot B3	0	0.0007	0.0078	0.0142	0.0136	0.02	0.02	0.0271	0.0278	0.0336	0.0349
Wire Pot B4	0	0	0	0	0.0065	0.0059	0.0065	0.013	0.0143	0.013	0.0195
Wire Pot B5	0	-0.0007	-0.0013	-0.0013	0.0006	-0.0007	-0.0007	0.0006	0	0.0064	0.0058
Wire Pot B6	0	-0.0013	0	0.0013	0	-0.0013	0	0.0013	0.0013	0	0
Wire Pot C1	0	0.0032	0.0097	0.0168	0.0233	0.0291	0.0311	0.0369	0.0434	0.0434	0.0499
Wire Pot C2	0	0.0065	0.0065	0.0144	0.0209	0.0196	0.0274	0.028	0.0339	0.0417	0.0417
Wire Pot C3	0	0.0013	0.005	0.0062	0.0099	0.0186	0.0223	0.0248	0.0248	0.0273	0.0273
Wire Pot C4	0	0	-0.0023	0	0.0045	0.0091	0.0114	0.0068	0.0068	0.0137	0.0137
Wire Pot C5	0	0	-0.0023	-0.0011	0.0012	0.0046	0.0046	0.0046	0.0069	0.0069	0.0081
Wire Pot C6	0	0	0.0013	0	0	-0.0024	-0.0012	0	0	0	-0.0012
Strain Gage A1	0	8	17	25	36	45	55	64	74	87	96
Strain Gage A2	0	9	19	30	40	52	65	74	87	99	110
Strain Gage A3	0	7	14	21	28	35	43	51	57	66	73
Strain Gage A4	0	5	11	16	21	27	31	37	43	49	54
Strain Gage A5	0	4	6	9	13	15	19	22	26	28	32
Strain Gage A6	0	3	3	6	8	11	12	14	16	19	21
Strain Gage B1	0	5	12	17	23	28	36	41	48	55	61
Strain Gage B2	0	5	9	14	17	23	28	32	37	42	47
Strain Gage B3	0	6	11	15	19	25	29	33	38	44	49
Strain Gage B4	0	4	9	12	17	21	25	28	33	37	40
Strain Gage B5	0	3	7	9	13	16	19	22	25	27	31
Strain Gage B6	0	3	5	8	11	13	15	19	21	25	28
Strain Gage C1	0	4	8	12	16	20	25	29	34	39	43
Strain Gage C2	0	7	13	21	28	35	43	50	57	66	72
Strain Gage C3	0	5	11	15	22	27	33	39	44	51	57
Strain Gage C4	0	4	8	11	13	17	21	24	28	32	36
Strain Gage C5	0	2	2	4	5	8	9	10	12	15	16
Strain Gage C6	0	4	6	10	13	18	21	25	28	33	36
Slip 1	0	0	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0	0	0
Slip 2	0	0.0001	0	0.0001	0.0001	0.0001	-0.0001	0.0001	0.0001	0	0.0001
Slip 3	0	0	0	0	0	0	0	0	0	-0.0001	0
Slip 4	0	0	0	0	0	0	-1E-04	0	0.0001	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-8: Test 8 (continued)

Load	11105	12071	13083	14131	15044
Wire Pot A1	0.0566	0.0612	0.0653	0.0699	0.0723
Wire Pot A2	0.0495	0.0514	0.0566	0.0572	0.0649
Wire Pot A3	0.0293	0.036	0.0367	0.042	0.0433
Wire Pot A4	0.0142	0.0181	0.022	0.0213	0.0213
Wire Pot A5	0.0053	0.0046	0.0053	0.0053	0.0119
Wire Pot A6	-0.0072	-0.0066	-0.0059	-0.0072	-0.0066
Wire Pot B1	0.0699	0.0779	0.0765	0.0852	0.0912
Wire Pot B2	0.0549	0.0614	0.0639	0.0672	0.0749
Wire Pot B3	0.0407	0.0426	0.0471	0.0536	0.0543
Wire Pot B4	0.0202	0.0202	0.0267	0.0267	0.0332
Wire Pot B5	0.0064	0.0064	0.0071	0.0135	0.0135
Wire Pot B6	0	0.0013	-0.0013	-0.0013	0
Wire Pot C1	0.0577	0.057	0.0648	0.0641	0.0713
Wire Pot C2	0.047	0.0476	0.0535	0.0554	0.0548
Wire Pot C3	0.0297	0.0297	0.0322	0.0347	0.0347
Wire Pot C4	0.0159	0.0205	0.0205	0.0251	0.0228
Wire Pot C5	0.0069	0.0069	0.0069	0.0081	0.0069
Wire Pot C6	-0.0012	-0.0024	-0.0024	0	-0.0012
Strain Gage A1	109	121	136	152	165
Strain Gage A2	123	136	150	163	180
Strain Gage A3	82	90	99	107	116
Strain Gage A4	61	66	72	78	84
Strain Gage A5	36	39	42	46	49
Strain Gage A6	23	26	28	30	34
Strain Gage B1	69	75	82	90	96
Strain Gage B2	53	56	63	67	72
Strain Gage B3	53	57	63	67	72
Strain Gage B4	45	49	53	58	61
Strain Gage B5	33	36	40	43	46
Strain Gage B6	32	34	38	42	45
Strain Gage C1	48	53	59	63	70
Strain Gage C2	81	88	96	104	111
Strain Gage C3	63	70	76	82	88
Strain Gage C4	40	44	49	53	58
Strain Gage C5	17	20	21	24	27
Strain Gage C6	40	45	49	52	57
Slip 1	-0.0001	-0.0001	0	-0.0001	-0.0001
Slip 2	0.0001	0	0.0001	0.0001	0
Slip 3	0	-0.0001	-0.0001	0	-0.0001
Slip 4	0	-1E-04	-1E-04	-1E-04	-1E-04

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: WWF Concentrated Load Test 9
Longitudinal Line Load at Midspan
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15132 lb
Midspan Deflection at Maximum Load:	0.036 in
Quarter A Deflection at Maximum Load:	0.028 in
Quarter B Deflection at Maximum Load:	0.027 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

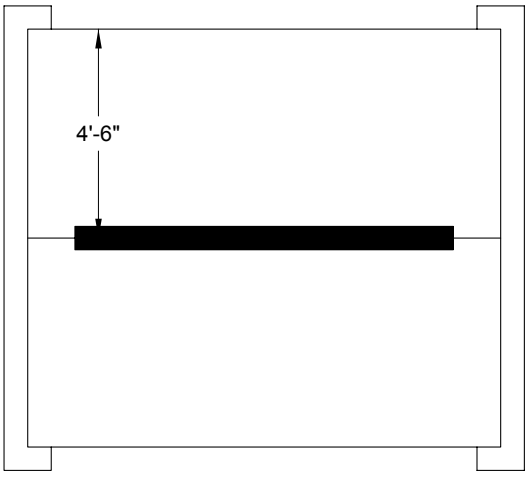

Figure B-11: Location of longitudinal line load at Midspan – first slab set

Table B-9: Experimental results of concentrated load Test 9 on WWF-reinforced slab

Load	0	1121	2029	3041	4001	5018	6077	7089	8049	9009	10073
Wire Pot A1	0	-0.0003	0.0004	0.0017	0.0027	0.0047	0.0074	0.0107	0.0138	0.0154	0.0164
Wire Pot A2	0	0.0032	0.0032	0.0032	0.0032	0.0038	0.009	0.0109	0.0096	0.0167	0.0167
Wire Pot A3	0	-0.0007	0.0013	-0.002	0.0013	0.0067	0.0087	0.0067	0.0147	0.014	0.0133
Wire Pot A4	0	-0.0006	0	0.0007	-0.0006	0.0039	0.0071	0.0065	0.0084	0.0136	0.0136
Wire Pot A5	0	0	0.0007	0	0.0086	0.0073	0.0073	0.0066	0.0139	0.0139	0.0139
Wire Pot A6	0	-0.0006	0.0007	0.0007	0.0013	0.002	0.0007	0.0086	0.0086	0.0086	0.0145
Wire Pot B1	0	0.002	0.008	0.008	0.0086	0.0086	0.0159	0.0153	0.0153	0.0226	0.0226
Wire Pot B2	0	-0.0013	0.0071	0.0071	0.0078	0.0071	0.0142	0.0142	0.0142	0.0207	0.0213
Wire Pot B3	0	0.0006	-0.0007	0.0071	0.0071	0.0071	0.0129	0.0135	0.0135	0.0193	0.0193
Wire Pot B4	0	-0.0007	-0.0013	-0.0013	-0.0013	0.0058	0.0058	0.0052	0.0123	0.0123	0.0188
Wire Pot B5	0	0	0	0	-0.0007	0	0.0064	0.0077	0.0064	0.0135	0.0142
Wire Pot B6	0	0	0	0	0	0	0	0	0.0157	0.0144	0.0131
Wire Pot C1	0	-0.0006	0.0026	0.0026	0.0026	0.002	0.0098	0.0085	0.0091	0.0098	0.0162
Wire Pot C2	0	0.0007	0.0013	0.0072	0.0085	0.0072	0.0078	0.0144	0.0157	0.015	0.0209
Wire Pot C3	0	0	0.0013	-0.0012	0.0013	0.0013	0.005	0.0087	0.0174	0.0198	0.0223
Wire Pot C4	0	0.0022	0.0022	0.0068	0.0045	0.0068	0.0114	0.0114	0.0159	0.0159	0.0205
Wire Pot C5	0	-0.0023	0.0012	0.0058	0.0069	0.0081	0.0081	0.0081	0.0092	0.0081	0.0104
Wire Pot C6	0	0	0.0013	0.0037	0.0037	0.0074	0.0098	0.0123	0.0147	0.0135	0.0147
Strain Gage A1	0	2	4	5	6	9	11	14	19	22	26
Strain Gage A2	0	2	3	7	9	12	15	21	26	32	39
Strain Gage A3	0	0	3	5	7	10	14	18	23	29	37
Strain Gage A4	0	2	4	6	8	11	14	19	23	29	35
Strain Gage A5	0	2	4	6	8	10	13	17	19	23	29
Strain Gage A6	0	2	3	5	6	8	11	14	17	20	23
Strain Gage B1	0	2	3	4	7	9	11	14	16	21	24
Strain Gage B2	0	2	3	5	5	9	11	13	16	19	24
Strain Gage B3	0	1	3	4	6	9	10	13	15	19	23
Strain Gage B4	0	1	2	4	5	7	9	11	14	17	21
Strain Gage B5	0	2	4	6	7	9	10	12	14	17	21
Strain Gage B6	0	2	4	6	7	10	13	15	19	23	26
Strain Gage C1	0	2	4	5	7	9	11	13	15	18	21
Strain Gage C2	0	5	8	12	16	21	25	32	36	42	48
Strain Gage C3	0	2	4	8	11	13	17	21	25	29	36
Strain Gage C4	0	2	3	5	7	9	12	16	19	23	26
Strain Gage C5	0	2	4	5	7	10	12	13	15	18	20
Strain Gage C6	0	2	5	8	11	12	17	21	24	29	34
Slip 1	0	-0.0001	-0.0001	-0.0001	-0.0001	0	-0.0001	-0.0001	0	0	0
Slip 2	0	0	0	0.0001	0	0	0	0	-0.0001	0.0001	0
Slip 3	0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Slip 4	0	0	0	0	0	0	0.0001	0	0	0	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-9: Test 9 (continued)

Load	11028	12034	13041	14027	15132
Wire Pot A1	0.0178	0.0191	0.0208	0.0221	0.0238
Wire Pot A2	0.016	0.0231	0.0244	0.0238	0.0283
Wire Pot A3	0.0207	0.0207	0.0227	0.0293	0.028
Wire Pot A4	0.02	0.02	0.0207	0.0272	0.0278
Wire Pot A5	0.0205	0.0212	0.0251	0.0284	0.0291
Wire Pot A6	0.0145	0.0152	0.0218	0.0224	0.0218
Wire Pot B1	0.0239	0.0293	0.0299	0.0366	0.0359
Wire Pot B2	0.0252	0.0272	0.0278	0.0343	0.0356
Wire Pot B3	0.0264	0.0258	0.0329	0.0335	0.0393
Wire Pot B4	0.0188	0.026	0.0254	0.0325	0.0325
Wire Pot B5	0.0206	0.0193	0.0271	0.0277	0.0361
Wire Pot B6	0.0144	0.0131	0.0287	0.0274	0.0261
Wire Pot C1	0.0156	0.0156	0.024	0.0227	0.024
Wire Pot C2	0.0209	0.0202	0.028	0.0274	0.028
Wire Pot C3	0.0235	0.0211	0.0248	0.026	0.0273
Wire Pot C4	0.0205	0.0228	0.0251	0.0296	0.0273
Wire Pot C5	0.015	0.0207	0.023	0.0241	0.0264
Wire Pot C6	0.016	0.0184	0.0209	0.0258	0.0282
Strain Gage A1	29	36	40	46	51
Strain Gage A2	46	53	60	68	78
Strain Gage A3	44	51	59	66	75
Strain Gage A4	42	49	56	63	69
Strain Gage A5	32	38	43	48	53
Strain Gage A6	26	31	35	39	44
Strain Gage B1	28	33	37	43	48
Strain Gage B2	27	32	37	42	48
Strain Gage B3	26	31	37	42	50
Strain Gage B4	25	28	35	39	47
Strain Gage B5	24	28	32	37	41
Strain Gage B6	31	36	41	46	52
Strain Gage C1	23	27	30	34	38
Strain Gage C2	55	62	70	78	88
Strain Gage C3	40	46	52	58	66
Strain Gage C4	30	35	41	47	53
Strain Gage C5	23	27	30	33	37
Strain Gage C6	38	43	50	54	61
Slip 1	-0.0001	-0.0001	0	-0.0001	-0.0001
Slip 2	0	0	0	0	0
Slip 3	0.0002	0.0002	0.0002	0.0001	0.0001
Slip 4	0	0	0	0.0001	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: WWF Concentrated Load Test 10
Transverse Line Load at Midspan
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W1.4/W1.4 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	13819 lb
Midspan Deflection at Maximum Load:	0.110 in
Quarter A Deflection at Maximum Load:	0.076 in
Quarter B Deflection at Maximum Load:	0.072 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

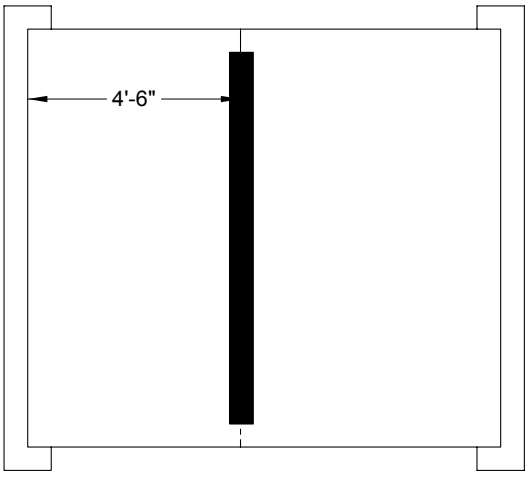

Figure B-12: Location of transverse line load at Midspan – first slab set

Table B-10: Experimental results of concentrated load Test 10 on WWF-reinforced slab

Load	0	1074	2008	3015	4017	5039	6009	7042	8049	9045	10062
Wire Pot A1	0	0.0044	0.0067	0.0134	0.0171	0.0197	0.0214	0.0241	0.0314	0.0371	0.0405
Wire Pot A2	0	0.0051	0.0057	0.0128	0.0128	0.0186	0.0199	0.0263	0.0328	0.0385	0.0385
Wire Pot A3	0	0.002	0.0067	0.0067	0.014	0.0147	0.0207	0.0246	0.0286	0.0326	0.0433
Wire Pot A4	0	0.0064	0.0071	0.0064	0.0135	0.0168	0.02	0.0265	0.0265	0.0329	0.0407
Wire Pot A5	0	0	-0.0007	0.0059	0.0059	0.0132	0.0184	0.0191	0.0277	0.0343	0.0343
Wire Pot A6	0	0.0046	0.006	0.006	0.0126	0.0119	0.0198	0.0198	0.0264	0.0336	0.0415
Wire Pot B1	0	0.0087	0.016	0.016	0.0227	0.03	0.03	0.0366	0.044	0.0506	0.0586
Wire Pot B2	0	0.0071	0.0071	0.0136	0.0194	0.0246	0.0265	0.0336	0.0394	0.0485	0.0549
Wire Pot B3	0	0.0058	0.0064	0.0122	0.0213	0.0251	0.0271	0.0329	0.0452	0.0529	0.06
Wire Pot B4	0	0.0058	0.0052	0.0123	0.0169	0.0195	0.0254	0.0332	0.0403	0.0462	0.0527
Wire Pot B5	0	-0.0006	0.0065	0.0071	0.0136	0.0207	0.0265	0.0277	0.0342	0.04	0.0484
Wire Pot B6	0	0	-0.0013	0.0144	0.0144	0.0144	0.0274	0.0274	0.0417	0.0417	0.0534
Wire Pot C1	0	0.0013	0.0098	0.0085	0.0149	0.0143	0.0214	0.0285	0.0292	0.0357	0.0428
Wire Pot C2	0	0.0059	0.0065	0.0124	0.0131	0.0202	0.0209	0.0267	0.0326	0.0378	0.0404
Wire Pot C3	0	0.0025	0.0038	0.0075	0.0174	0.0223	0.0248	0.0248	0.0285	0.031	0.0396
Wire Pot C4	0	0.0115	0.0069	0.0092	0.0115	0.016	0.0229	0.0297	0.032	0.0365	0.0388
Wire Pot C5	0	0.0046	0.0057	0.0069	0.008	0.0092	0.0161	0.0207	0.0264	0.0321	0.0367
Wire Pot C6	0	0.0037	0.0049	0.0147	0.0135	0.0147	0.0184	0.027	0.0294	0.0319	0.0368
Strain Gage A1	0	7	14	20	26	34	40	49	58	68	79
Strain Gage A2	0	9	16	24	33	43	51	62	74	89	102
Strain Gage A3	0	8	15	22	29	37	44	53	63	74	86
Strain Gage A4	0	6	13	19	26	32	39	46	55	65	73
Strain Gage A5	0	7	13	17	22	26	32	38	46	53	61
Strain Gage A6	0	5	11	15	22	27	33	38	47	55	62
Strain Gage B1	0	10	17	26	35	44	51	62	74	87	100
Strain Gage B2	0	13	21	31	42	53	65	75	91	107	127
Strain Gage B3	0	14	25	38	49	63	75	89	106	122	138
Strain Gage B4	0	16	28	40	54	67	79	95	113	130	141
Strain Gage B5	0	11	19	27	37	45	54	65	77	89	121
Strain Gage B6	0	10	18	26	36	44	53	64	76	89	103
Strain Gage C1	0	8	12	18	24	29	35	41	50	59	66
Strain Gage C2	0	13	23	36	48	59	72	85	103	120	138
Strain Gage C3	0	10	17	27	37	47	57	68	81	95	109
Strain Gage C4	0	7	13	20	26	34	42	51	63	75	87
Strain Gage C5	0	6	11	17	21	27	33	40	47	55	64
Strain Gage C6	0	9	15	24	31	40	48	58	70	83	94
Slip 1	0	0	0.0001	0.0001	0	0.0001	0	0.0001	0.0001	0.0001	0
Slip 2	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001	-0.0001
Slip 3	0	-0.0001	-0.0001	-0.0001	0	-0.0001	-0.0001	0	-0.0001	-0.0001	0
Slip 4	0	-0.0001	-0.0001	-0.0001	-0.0001	0	0	-0.0001	0	0	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-10: Test 10 (continued)

Load	11002	11915	12932	13819	11806
Wire Pot A1	0.0462	0.0535	0.0619	0.0736	0.1114
Wire Pot A2	0.0463	0.0533	0.0591	0.0739	0.1151
Wire Pot A3	0.0486	0.0493	0.0613	0.0773	0.1252
Wire Pot A4	0.0465	0.0549	0.0594	0.0743	0.1221
Wire Pot A5	0.0402	0.0475	0.0554	0.0686	0.124
Wire Pot A6	0.0409	0.0475	0.0593	0.0685	0.1515
Wire Pot B1	0.0639	0.0739	0.0859	0.1072	0.1997
Wire Pot B2	0.0608	0.0679	0.0808	0.1015	0.1964
Wire Pot B3	0.0665	0.0723	0.0852	0.113	0.2195
Wire Pot B4	0.0592	0.0736	0.0866	0.1074	0.2221
Wire Pot B5	0.0548	0.0684	0.0742	0.1025	0.218
Wire Pot B6	0.056	0.0691	0.0808	0.0951	0.2202
Wire Pot C1	0.0493	0.0564	0.0629	0.0765	0.1238
Wire Pot C2	0.047	0.0535	0.0619	0.0743	0.1167
Wire Pot C3	0.0446	0.052	0.0631	0.0705	0.1188
Wire Pot C4	0.048	0.0457	0.0616	0.073	0.1232
Wire Pot C5	0.0425	0.0494	0.0597	0.0689	0.1171
Wire Pot C6	0.0441	0.0527	0.0576	0.0699	0.1263
Strain Gage A1	89	101	114	131	125
Strain Gage A2	114	125	138	148	117
Strain Gage A3	95	103	113	117	269
Strain Gage A4	81	87	96	102	256
Strain Gage A5	67	74	82	87	222
Strain Gage A6	71	80	90	102	185
Strain Gage B1	114	132	177	276	770
Strain Gage B2	150	294	459	505	967
Strain Gage B3	142	389	481	561	741
Strain Gage B4	158	375	464	524	761
Strain Gage B5	167	394	483	561	680
Strain Gage B6	119	145	174	223	510
Strain Gage C1	75	84	95	106	455
Strain Gage C2	155	169	188	204	452
Strain Gage C3	122	132	145	155	112
Strain Gage C4	99	108	119	126	92
Strain Gage C5	72	81	91	103	72
Strain Gage C6	106	116	128	138	99
Slip 1	0	0.0001	0.0001	0	0.0126
Slip 2	-0.0001	-0.0001	-0.0001	-0.0001	0.0122
Slip 3	-0.0001	-0.0001	-0.0001	-0.0001	0
Slip 4	-0.0001	0	-0.0001	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

*Slab reached 15,000 lb, but cracked and dropped to 11,806 lb. The reading at 13,819 lb was the last measurement taken before this initial crack.

Test Designation: WWF Concentrated Load Test 11
Concentrated Point Load at Midspan
Cast Date: 12/16/2005
Test Date: 3/28/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	6 x 6 W2.1/W2.1 WWF

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	5200 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14977 lb
Midspan Deflection at Maximum Load:	0.393 in
Quarter A Deflection at Maximum Load:	0.226 in
Quarter B Deflection at Maximum Load:	0.203 in
End Slip at Maximum Load:	0.0459 in
Maximum Applied Load (Unrecorded):	15500 lb

Diagram of Load Location

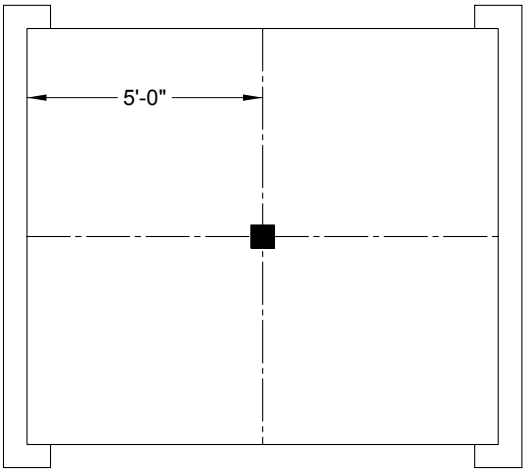

Figure B-13: Location of concentrated point load at Midspan – first slab set

Table B-11: Experimental results of concentrated load Test 11 on WWF-reinforced slab

Load	0	1002	2252	2984	4001	5023	6077	7109	8007	9081	9990
Wire Pot A1	0	0.0044	0.0094	0.0137	0.0227	0.0314	0.0405	0.0472	0.0559	0.0629	0.0706
Wire Pot A2	0	0	0.0071	0.0148	0.0206	0.0283	0.0412	0.0489	0.0547	0.0688	0.0746
Wire Pot A3	0	0.0014	0.0074	0.0147	0.0227	0.036	0.044	0.0587	0.064	0.074	0.086
Wire Pot A4	0	-0.0006	0.0071	0.0136	0.0207	0.0265	0.0407	0.0472	0.0607	0.0704	0.0814
Wire Pot A5	0	0.006	0.0132	0.0211	0.0271	0.0363	0.0475	0.0614	0.0687	0.0819	0.0891
Wire Pot A6	0	0.0013	0.0086	0.0152	0.0283	0.0362	0.0494	0.0645	0.0777	0.0909	0.1054
Wire Pot B1	0	0.006	0.0206	0.0279	0.0412	0.0559	0.0705	0.0911	0.1051	0.1191	0.1337
Wire Pot B2	0	0.0065	0.0149	0.0213	0.0343	0.0543	0.0685	0.0885	0.1021	0.1157	0.1286
Wire Pot B3	0	0.0064	0.0187	0.0271	0.04	0.0594	0.0787	0.0994	0.1143	0.1323	0.1472
Wire Pot B4	0	0.0013	0.0156	0.0273	0.041	0.0605	0.0749	0.0951	0.1152	0.1354	0.1478
Wire Pot B5	0	0.0007	0.0129	0.0207	0.04	0.0548	0.0748	0.0877	0.109	0.1296	0.1419
Wire Pot B6	0	0	0.0131	0.0287	0.0404	0.0534	0.0678	0.0964	0.1121	0.1251	0.1355
Wire Pot C1	0	0.0071	0.0142	0.0201	0.0285	0.0415	0.0479	0.0609	0.0738	0.0887	0.0952
Wire Pot C2	0	0.0072	0.0157	0.0183	0.028	0.0346	0.0483	0.0561	0.0698	0.0769	0.0828
Wire Pot C3	0	0.0012	0.0062	0.0173	0.0222	0.0346	0.0396	0.0507	0.0581	0.073	0.0779
Wire Pot C4	0	0.0069	0.0137	0.0137	0.0251	0.032	0.0457	0.0525	0.0616	0.073	0.0845
Wire Pot C5	0	0.0046	0.0138	0.0196	0.0287	0.0356	0.046	0.0586	0.0701	0.0747	0.0838
Wire Pot C6	0	0.0012	0.0086	0.0159	0.022	0.0318	0.0429	0.0502	0.0637	0.0698	0.0797
Strain Gage A1	0	7	17	21	28	35	42	50	57	66	73
Strain Gage A2	0	7	15	19	25	32	39	46	53	61	67
Strain Gage A3	0	10	31	48	72	96	119	142	161	185	203
Strain Gage A4	0	11	32	46	68	89	109	130	146	168	187
Strain Gage A5	0	10	30	42	58	72	86	100	113	127	140
Strain Gage A6	0	7	17	24	34	46	57	67	80	96	111
Strain Gage B1	0	19	49	71	105	141	179	215	249	287	318
Strain Gage B2	0	31	91	128	183	238	293	347	393	447	491
Strain Gage B3	0	27	81	116	173	233	290	343	390	442	485
Strain Gage B4	0	29	81	118	175	233	290	342	387	438	480
Strain Gage B5	0	23	60	84	122	157	193	227	256	289	317
Strain Gage B6	0	16	46	65	93	123	153	181	207	234	256
Strain Gage C1	0	8	22	29	41	54	67	78	90	107	119
Strain Gage C2	0	8	20	31	59	93	122	150	176	207	231
Strain Gage C3	0	9	18	25	34	43	53	62	70	80	88
Strain Gage C4	0	7	14	19	24	32	38	47	54	63	69
Strain Gage C5	0	5	13	16	22	27	32	39	42	49	54
Strain Gage C6	0	8	17	24	31	38	46	55	63	72	80
Slip 1	0	-0.0001	0	0	0.0004	0.0012	0.0023	0.0038	0.0054	0.0069	0.008
Slip 2	0	0	0.0001	0.0003	0.0009	0.002	0.0034	0.0049	0.0066	0.0081	0.0093
Slip 3	0	0.0001	0.0001	0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Slip 4	0	1E-04	1E-04	1E-04	0	1E-04	1E-04	0	1E-04	1E-04	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table B-11: Test 11 (continued)

Load	11012	11910	12693	14037	14977
Wire Pot A1	0.0803	0.091	0.1067	0.1348	0.1722
Wire Pot A2	0.0817	0.0958	0.1126	0.1434	0.1846
Wire Pot A3	0.092	0.1066	0.1259	0.1679	0.2225
Wire Pot A4	0.0937	0.1079	0.1292	0.1764	0.2294
Wire Pot A5	0.1017	0.1182	0.1432	0.1855	0.2541
Wire Pot A6	0.1199	0.133	0.1673	0.2173	0.2944
Wire Pot B1	0.1544	0.1757	0.2036	0.2689	0.3521
Wire Pot B2	0.1505	0.1699	0.2035	0.2649	0.3592
Wire Pot B3	0.1666	0.1937	0.2331	0.306	0.399
Wire Pot B4	0.1693	0.196	0.2299	0.2957	0.3875
Wire Pot B5	0.1632	0.1844	0.2238	0.285	0.3766
Wire Pot B6	0.1655	0.1785	0.2202	0.288	0.3818
Wire Pot C1	0.1095	0.1231	0.1503	0.1969	0.2643
Wire Pot C2	0.0971	0.1108	0.131	0.1715	0.2314
Wire Pot C3	0.0915	0.1039	0.1237	0.1583	0.2028
Wire Pot C4	0.0936	0.1073	0.1164	0.1552	0.2031
Wire Pot C5	0.0907	0.1034	0.1194	0.1493	0.2009
Wire Pot C6	0.0944	0.0993	0.1213	0.152	0.1973
Strain Gage A1	81	88	97	107	116
Strain Gage A2	74	82	88	95	96
Strain Gage A3	227	247	271	315	373
Strain Gage A4	207	226	249	301	356
Strain Gage A5	155	172	194	231	275
Strain Gage A6	129	148	174	226	289
Strain Gage B1	358	401	464	560	693
Strain Gage B2	549	614	704	883	1140
Strain Gage B3	538	593	702	900	1245
Strain Gage B4	530	580	659	796	1003
Strain Gage B5	355	397	457	579	736
Strain Gage B6	286	318	356	438	555
Strain Gage C1	136	155	181	227	305
Strain Gage C2	260	288	332	404	497
Strain Gage C3	97	105	112	120	123
Strain Gage C4	77	84	90	99	101
Strain Gage C5	60	64	69	77	81
Strain Gage C6	88	95	103	114	121
Slip 1	0.0099	0.0128	0.0189	0.0291	0.0443
Slip 2	0.0115	0.0143	0.0202	0.031	0.0474
Slip 3	0.0001	0.0001	0.0001	0	0
Slip 4	1E-04	1E-04	1E-04	1E-04	1E-04

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.
*Slab reached 15,500 lb and then failed completely.

APPENDIX C
RESULTS OF COMPOSITE SLAB REINFORCED WITH STRUX 90/40 UNDER CONCENTRATED LOAD TESTS

The following section presents test results for the slab specimen reinforced with STRUX 90/40 synthetic macro fibers that was subjected to the eleven concentrated load tests. For each test, a summary of test parameters and properties are included. Refer to Appendix B for diagrams of load locations for the first set of concentrated load tests. Measured test data is tabulated for load, vertical displacements, horizontal end slip, and deck strains of the bottom flanges. In the tabulated test data, 'wire pot' refers to the vertical displacements and 'slip' refers to the displacement between the concrete and steel deck.

Note that the test summary may include two different values for the maximum applied load, a recorded and an unrecorded value. The recorded value corresponds to the maximum load recorded by the data acquisition system. The unrecorded load refers to the maximum load observed during the test, but not recorded. Also note that at low loads before any deflections are registered by the wire pots, the deflections have the tendency to "jump" and may show values that fluctuate between positive and negative. In the following tables, the sign convention for all wire pots is that down is positive and up is negative.

For purposes of better understanding the given test data, refer to Figure B-1 and Figure B-2 in Appendix B to see the layout of all instrumentation, except for the load cell, and their respective names that were monitored during concentrated load tests. Note that 'Quarter Point A' and 'Third Point A' refer to a point L/4 and L/3 from the left support, respectively. Similarly, 'Quarter Point B' and 'Third Point B' refer to a point L/4 and L/3 from the right support, respectively.

Test Designation: STRUX Concentrated Load Test 1
Concentrated Point Load at Quarter Point A
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	13882 lb
Midspan Deflection at Maximum Load:	0.067 in
Quarter A Deflection at Maximum Load:	0.073 in
Quarter B Deflection at Maximum Load:	0.037 in
End Slip at Maximum Load:	0.0000 in

Table C-1: Experimental results of concentrated load Test 1 on STRUX-reinforced slab

Load (lbs)	0	576	986	1510	2024	2501	3057	3518	4006	4525	5013
Wire Pot A1	0	-0.0007	0.0006	0.002	0.0053	0.007	0.0087	0.01	0.0107	0.0117	0.013
Wire Pot A2	0	-0.0013	0	0.0064	0.0058	0.0064	0.0122	0.0129	0.0129	0.0135	0.0193
Wire Pot A3	0	0.0007	0	0.0014	0.0074	0.006	0.0074	0.014	0.014	0.014	0.0207
Wire Pot A4	0	0	0.0013	0.0058	0.0071	0.0064	0.0135	0.0142	0.0148	0.0207	0.0213
Wire Pot A5	0	0	-0.0007	-0.0007	0.0066	0.0066	0.0059	0.0145	0.0138	0.0132	0.0198
Wire Pot A6	0	-0.0007	0.0046	0.0059	0.0046	0.0105	0.0118	0.0112	0.0112	0.0191	0.0184
Wire Pot B1	0	0.0007	0.0074	0.008	0.0094	0.008	0.0127	0.0153	0.016	0.016	0.0153
Wire Pot B2	0	-0.0013	-0.0006	0.0071	0.0065	0.0071	0.0136	0.0129	0.0129	0.0155	0.02
Wire Pot B3	0	0.0007	0.0078	0.0065	0.0078	0.011	0.0129	0.0129	0.0162	0.02	0.0213
Wire Pot B4	0	0	0.0013	0	0.0072	0.0072	0.0085	0.0137	0.015	0.015	0.0222
Wire Pot B5	0	0.0058	0.0052	0.0058	0.0058	0.0129	0.0129	0.0129	0.0187	0.0194	0.02
Wire Pot B6	0	0.0013	0.0013	0	0.0013	0.0013	-0.0013	0	0.0103	0.0129	0.0155
Wire Pot C1	0	0.0006	0.0052	0.0071	0.0065	0.0071	0.0058	0.0071	0.0149	0.0136	0.0136
Wire Pot C2	0	0.0007	0	0	-0.0006	0.0026	0.0059	0.0065	0.0072	0.0065	0.0078
Wire Pot C3	0	0.0013	-0.0012	0.0013	0.0025	0.0025	0.0062	0.0062	0.0075	0.0075	0.0075
Wire Pot C4	0	-0.0023	0.0022	0.0045	0.0022	0.0045	0.0045	0.0068	0.0137	0.0114	0.0137
Wire Pot C5	0	0.0012	0.0023	0	0.0046	0.0046	0.0058	0.0058	0.0058	0.0069	0.0058
Wire Pot C6	0	0.0012	0.0024	0.0024	0.0049	0.0036	0.0061	0.0073	0.0073	0.0098	0.0098
Strain Gage A1	0	3	6	9	12	15	18	21	23	26	29
Strain Gage A2	0	6	10	15	20	25	30	35	38	44	49
Strain Gage A3	0	10	15	23	31	38	46	53	60	68	75
Strain Gage A4	0	10	15	23	30	38	46	53	61	68	75
Strain Gage A5	0	8	12	17	23	28	34	38	43	49	54
Strain Gage A6	0	5	7	11	14	17	20	24	27	30	32
Strain Gage B1	0	3	7	10	13	15	19	22	24	26	30
Strain Gage B2	0	4	5	9	11	14	18	20	22	25	27
Strain Gage B3	0	5	7	10	12	16	18	21	24	27	30
Strain Gage B4	0	4	7	10	12	14	18	20	24	25	29
Strain Gage B5	0	5	8	11	15	18	22	24	29	31	35
Strain Gage B6	0	3	6	9	11	13	16	19	22	25	26
Strain Gage C1	0	2	3	4	6	6	8	10	12	12	14
Strain Gage C2	0	2	2	4	5	7	9	10	10	12	13
Strain Gage C3	0	1	3	5	6	7	9	10	12	13	15
Strain Gage C4	0	3	4	4	6	8	8	11	13	13	15
Strain Gage C5	0	2	4	6	7	9	12	12	14	16	18
Strain Gage C6	0	2	3	4	6	9	10	12	13	15	16
Slip 1	0	0	0	0	-1E-04	0	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04
Slip 2	0	0	0	0	0	0	0	0	0	0	0
Slip 3	0	0	0.0001	0.0001	0	0.0001	0	0	0	0	0
Slip 4	0	0	-0.0001	-0.0001	-0.0001	-0.0002	-0.0001	-0.0002	-0.0001	-0.0001	-0.0002

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-1: Test 1 (continued)

Load (lbs)	5527	6015	6523	7052	7530	8044	8500	9040	9476	10026	10514
Wire Pot A1	0.014	0.0157	0.0187	0.0224	0.0241	0.0251	0.0261	0.0274	0.0284	0.0297	0.0307
Wire Pot A2	0.0193	0.0199	0.027	0.0257	0.0257	0.027	0.0328	0.0328	0.0341	0.0412	0.0399
Wire Pot A3	0.0207	0.0214	0.028	0.028	0.028	0.0287	0.0353	0.0347	0.0353	0.0427	0.0427
Wire Pot A4	0.0213	0.0245	0.0278	0.0278	0.031	0.0342	0.0349	0.0342	0.0413	0.042	0.0433
Wire Pot A5	0.0204	0.0204	0.0204	0.027	0.0264	0.027	0.029	0.033	0.0349	0.0343	0.0409
Wire Pot A6	0.0191	0.0191	0.0257	0.025	0.025	0.0316	0.0323	0.0329	0.0329	0.0395	0.0395
Wire Pot B1	0.022	0.0233	0.022	0.026	0.0293	0.03	0.0306	0.0386	0.038	0.038	0.0373
Wire Pot B2	0.0194	0.0194	0.0265	0.0272	0.0265	0.0336	0.033	0.0323	0.0388	0.0407	0.0394
Wire Pot B3	0.02	0.0278	0.0278	0.0271	0.0342	0.0336	0.0336	0.042	0.0407	0.0407	0.0478
Wire Pot B4	0.0215	0.0215	0.0274	0.0287	0.028	0.0345	0.0345	0.0358	0.0417	0.041	0.041
Wire Pot B5	0.0194	0.0271	0.0264	0.0264	0.0329	0.0342	0.0348	0.0406	0.0406	0.0406	0.0419
Wire Pot B6	0.0155	0.0129	0.0142	0.0129	0.0142	0.0272	0.0285	0.0298	0.0272	0.0285	0.0285
Wire Pot C1	0.0136	0.0136	0.0207	0.0201	0.0207	0.0201	0.0207	0.0266	0.0272	0.0266	0.0259
Wire Pot C2	0.0157	0.0131	0.0137	0.0137	0.0137	0.0196	0.0196	0.0209	0.0215	0.0215	0.028
Wire Pot C3	0.0099	0.0136	0.0186	0.0198	0.0223	0.0198	0.0223	0.0211	0.0235	0.0248	0.0273
Wire Pot C4	0.0137	0.0137	0.0159	0.0182	0.0182	0.0205	0.0159	0.0251	0.0273	0.0228	0.0251
Wire Pot C5	0.0081	0.0081	0.0138	0.015	0.0184	0.0173	0.0184	0.0207	0.0207	0.0299	0.0333
Wire Pot C6	0.0122	0.0147	0.0171	0.0196	0.0196	0.0196	0.0208	0.022	0.0245	0.0245	0.0257
Strain Gage A1	32	35	38	42	44	47	50	54	58	63	66
Strain Gage A2	54	58	64	69	73	80	84	92	107	119	150
Strain Gage A3	84	92	101	109	117	125	165	250	261	286	305
Strain Gage A4	84	91	98	108	116	124	130	143	154	172	182
Strain Gage A5	60	65	71	76	82	87	92	98	100	102	106
Strain Gage A6	36	40	42	46	48	52	54	58	61	66	68
Strain Gage B1	32	36	39	42	45	48	50	54	57	59	63
Strain Gage B2	31	33	37	39	42	45	47	51	53	55	59
Strain Gage B3	32	35	39	42	45	47	50	53	54	57	60
Strain Gage B4	31	34	37	39	43	45	47	50	52	56	58
Strain Gage B5	38	42	45	49	53	56	58	63	66	70	73
Strain Gage B6	30	33	35	38	41	43	46	49	51	55	58
Strain Gage C1	16	18	20	21	24	26	26	29	31	32	34
Strain Gage C2	14	16	18	19	20	22	23	24	25	27	28
Strain Gage C3	16	18	20	20	22	24	25	26	28	30	31
Strain Gage C4	16	17	20	21	22	24	25	27	27	29	29
Strain Gage C5	20	22	22	24	25	27	29	31	33	34	36
Strain Gage C6	18	20	21	23	25	26	28	29	29	32	35
Slip 1	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04	-0.0002	-0.0004	-0.0003	-0.0003	-0.0004
Slip 2	0	0.0001	0	0	0	0	0	0	0	0	0
Slip 3	0	0	0	0	0.0001	0	0	0	0	0	0
Slip 4	-0.0001	-0.0002	-0.0001	-0.0001	-0.0001	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-1: Test 1 (continued)

Load (lbs)	10996	11474	12034	12455	12968	13280	13882
Wire Pot A1	0.0321	0.0338	0.0368	0.0401	0.0431	0.0451	0.0481
Wire Pot A2	0.0412	0.047	0.0463	0.047	0.054	0.054	0.0598
Wire Pot A3	0.046	0.0487	0.05	0.056	0.0633	0.0627	0.0693
Wire Pot A4	0.0478	0.0478	0.0555	0.0549	0.0626	0.0685	0.0762
Wire Pot A5	0.0409	0.0409	0.0481	0.0481	0.0554	0.0554	0.0627
Wire Pot A6	0.0408	0.0461	0.0474	0.0467	0.054	0.0533	0.0612
Wire Pot B1	0.044	0.0446	0.0446	0.0526	0.0513	0.0513	0.0566
Wire Pot B2	0.0452	0.0472	0.0472	0.0543	0.053	0.0595	0.0601
Wire Pot B3	0.0484	0.0484	0.0543	0.0543	0.062	0.0601	0.0665
Wire Pot B4	0.0482	0.0489	0.0476	0.0547	0.056	0.0606	0.0677
Wire Pot B5	0.0471	0.0471	0.0542	0.0542	0.0555	0.0613	0.0626
Wire Pot B6	0.0401	0.0401	0.0414	0.0414	0.0401	0.0453	0.0543
Wire Pot C1	0.0337	0.0337	0.033	0.033	0.0337	0.0415	0.0395
Wire Pot C2	0.0287	0.028	0.028	0.0333	0.0365	0.0359	0.0352
Wire Pot C3	0.026	0.0285	0.0334	0.0347	0.0347	0.0359	0.0396
Wire Pot C4	0.0273	0.0342	0.0342	0.0319	0.0342	0.0387	0.0342
Wire Pot C5	0.0333	0.0414	0.0414	0.0414	0.0437	0.0448	0.046
Wire Pot C6	0.0269	0.0306	0.0318	0.0343	0.0355	0.0367	0.0392
Strain Gage A1	71	75	82	89	99	111	126
Strain Gage A2	177	200	224	242	263	233	229
Strain Gage A3	330	340	360	335	353	399	427
Strain Gage A4	336	386	342	333	349	380	386
Strain Gage A5	113	113	119	179	247	343	343
Strain Gage A6	73	79	84	91	100	114	136
Strain Gage B1	68	71	75	80	85	88	94
Strain Gage B2	61	64	68	69	72	73	76
Strain Gage B3	61	64	66	66	67	65	66
Strain Gage B4	59	62	63	62	64	62	62
Strain Gage B5	76	79	83	84	87	89	91
Strain Gage B6	62	65	69	73	76	82	86
Strain Gage C1	37	39	42	44	46	48	50
Strain Gage C2	29	31	33	34	35	36	37
Strain Gage C3	32	34	35	36	37	36	38
Strain Gage C4	32	33	35	35	37	37	38
Strain Gage C5	38	40	41	43	45	47	49
Strain Gage C6	36	37	39	40	41	43	44
Slip 1	-0.0004	-0.0003	-0.0003	-0.0004	-0.0003	-0.0003	-1E-04
Slip 2	0	0	0	0	0	0	0
Slip 3	0	0	0	0	0	0	0
Slip 4	-0.0001	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 2
Concentrated Point Load at Third Point A
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15008 lb
Midspan Deflection at Maximum Load:	0.085 in
Quarter A Deflection at Maximum Load:	0.083 in
Quarter B Deflection at Maximum Load:	0.051 in
End Slip at Maximum Load:	0.0005 in

Table C-2: Experimental results of concentrated load Test 2 on STRUX-reinforced slab

Load	0	529	986	1500	2003	2522	2885	3565	4074	4515	5257
Wire Pot A1	0	0.0006	0.0013	0.0013	0.0026	0.0036	0.0053	0.0073	0.0097	0.0137	0.018
Wire Pot A2	0	0.0007	0.0013	0.0032	0.0077	0.0084	0.0103	0.0135	0.0155	0.0167	0.0219
Wire Pot A3	0	0.0067	0.0073	0.008	0.0147	0.0147	0.014	0.0207	0.0213	0.02	0.028
Wire Pot A4	0	0	-0.0006	0	0.0071	0.0058	0.0065	0.0142	0.0136	0.0201	0.0207
Wire Pot A5	0	0	0.006	0.0066	0.0073	0.0139	0.0145	0.0132	0.0205	0.0205	0.0231
Wire Pot A6	0	0.0027	0.0033	0.0092	0.0092	0.002	0.0172	0.0165	0.0165	0.0237	0.0237
Wire Pot B1	0	0.0007	0.0027	0.0033	0.0033	0.01	0.01	0.01	0.0166	0.016	0.0246
Wire Pot B2	0	0.0013	0.0078	0.0065	0.0071	0.0136	0.0142	0.0188	0.0207	0.0201	0.0278
Wire Pot B3	0	-0.0013	-0.0013	0.0058	0.0058	0.0052	0.0123	0.0123	0.0181	0.0207	0.0258
Wire Pot B4	0	0	-0.0006	0.0065	0.0059	0.0137	0.0124	0.013	0.0195	0.0202	0.0261
Wire Pot B5	0	0	0	0.0077	0.0077	0.0071	0.0142	0.0142	0.0206	0.0213	0.0206
Wire Pot B6	0	0	0.0013	0	0.0129	0.0116	0.0116	0.0129	0.0129	0.0129	0.0259
Wire Pot C1	0	-0.0006	0.0026	0.0026	0.0026	0.0026	0.0078	0.0085	0.0091	0.0098	0.0162
Wire Pot C2	0	-0.0013	-0.0007	-0.0007	0.0058	0.0052	0.0078	0.0065	0.0137	0.0143	0.0137
Wire Pot C3	0	0	0.0037	0.0049	0.0074	0.0074	0.0099	0.0099	0.0111	0.0123	0.0136
Wire Pot C4	0	0	0.0045	0.0045	0.0091	0.0091	0.0091	0.0068	0.0114	0.0182	0.0182
Wire Pot C5	0	0.0012	0.0012	0	-0.0011	0	-0.0011	0.0012	0.0069	0.0104	0.0138
Wire Pot C6	0	0.0013	0.0025	0.0013	0.0037	0.005	0.0062	0.0086	0.0123	0.0148	0.0184
Strain Gage A1	0	5	7	11	14	18	23	27	32	36	41
Strain Gage A2	0	7	11	16	23	28	34	42	48	54	64
Strain Gage A3	0	9	16	26	35	45	53	67	78	88	103
Strain Gage A4	0	9	15	23	32	40	48	60	70	78	92
Strain Gage A5	0	6	11	19	25	35	40	52	60	68	81
Strain Gage A6	0	5	9	12	15	20	24	30	35	38	45
Strain Gage B1	0	5	9	12	16	20	25	29	33	37	43
Strain Gage B2	0	3	8	12	15	19	23	28	33	35	42
Strain Gage B3	0	5	10	14	17	21	25	30	34	38	44
Strain Gage B4	0	6	9	13	17	20	25	30	34	37	43
Strain Gage B5	0	6	10	15	20	25	29	36	40	44	52
Strain Gage B6	0	5	9	12	15	19	23	28	32	36	40
Strain Gage C1	0	2	4	7	8	11	13	15	18	21	25
Strain Gage C2	0	3	4	6	8	9	12	15	17	19	21
Strain Gage C3	0	2	4	6	8	10	12	15	17	18	22
Strain Gage C4	0	2	5	7	8	10	12	15	17	19	22
Strain Gage C5	0	4	6	8	11	13	16	19	20	23	26
Strain Gage C6	0	3	4	7	10	13	15	18	19	21	25
Slip 1	0	0	0.0001	0	0	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Slip 2	0	0	0	0	0	0.0001	0	0.0001	0	0	0
Slip 3	0	0	0	0	0	0	0	0	0	0	0
Slip 4	0	0	0	0	0	0.0001	0.0001	0.0001	0	0.0001	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-2: Test 2 (continued)

Load	5594	6025	6513	7026	7509	8023	8578	8993	9533	10047	10524
Wire Pot A1	0.0184	0.0194	0.0207	0.0217	0.0247	0.0274	0.0311	0.0331	0.0341	0.0354	0.0368
Wire Pot A2	0.0212	0.0283	0.0283	0.0283	0.0354	0.0354	0.0348	0.0405	0.0418	0.0418	0.0489
Wire Pot A3	0.028	0.0346	0.036	0.0353	0.042	0.042	0.0413	0.0493	0.0486	0.0553	0.056
Wire Pot A4	0.0226	0.0278	0.0272	0.0336	0.0343	0.0343	0.0401	0.0401	0.0446	0.0472	0.0478
Wire Pot A5	0.0264	0.0284	0.0271	0.0343	0.035	0.035	0.0409	0.0409	0.0409	0.0482	0.0475
Wire Pot A6	0.0244	0.0323	0.0303	0.0323	0.0376	0.0376	0.0382	0.0448	0.0448	0.0461	0.0481
Wire Pot B1	0.0246	0.024	0.028	0.0306	0.0313	0.0366	0.0373	0.0379	0.0459	0.0459	0.0459
Wire Pot B2	0.0265	0.0297	0.0343	0.0343	0.042	0.0414	0.0414	0.0472	0.0478	0.0485	0.0536
Wire Pot B3	0.0245	0.0252	0.0316	0.0323	0.0381	0.0387	0.0446	0.0452	0.0439	0.0517	0.0517
Wire Pot B4	0.0267	0.0261	0.0319	0.0332	0.0397	0.0404	0.0469	0.0469	0.0469	0.0528	0.0534
Wire Pot B5	0.0277	0.0271	0.0271	0.0329	0.0341	0.0412	0.0412	0.0412	0.047	0.047	0.0483
Wire Pot B6	0.0284	0.0259	0.0271	0.0284	0.0401	0.0401	0.0401	0.0401	0.0414	0.0414	0.0543
Wire Pot C1	0.0156	0.0156	0.0162	0.0227	0.0234	0.0227	0.0234	0.0292	0.0298	0.0298	0.037
Wire Pot C2	0.0137	0.0202	0.0208	0.0208	0.0182	0.0267	0.026	0.026	0.028	0.0339	0.0332
Wire Pot C3	0.016	0.0173	0.0235	0.0222	0.0222	0.0247	0.0259	0.0272	0.0284	0.0297	0.0358
Wire Pot C4	0.0182	0.0205	0.0228	0.0251	0.0182	0.0228	0.0251	0.0274	0.0296	0.0274	0.0388
Wire Pot C5	0.0161	0.0184	0.0219	0.0241	0.0253	0.0264	0.031	0.0322	0.0345	0.0391	0.0414
Wire Pot C6	0.0197	0.0209	0.0197	0.0221	0.0209	0.0233	0.0258	0.0295	0.0331	0.0356	0.0356
Strain Gage A1	44	48	52	57	60	65	69	73	78	83	86
Strain Gage A2	68	72	78	85	92	98	105	111	118	125	131
Strain Gage A3	111	119	130	141	151	160	172	182	191	201	211
Strain Gage A4	99	107	115	126	134	144	155	161	172	180	190
Strain Gage A5	88	97	105	115	123	132	143	152	161	171	180
Strain Gage A6	47	53	56	61	65	70	75	79	83	87	92
Strain Gage B1	46	49	53	57	61	65	69	73	78	81	86
Strain Gage B2	43	48	51	55	59	63	67	70	75	78	83
Strain Gage B3	46	49	53	57	60	65	68	72	76	81	83
Strain Gage B4	45	48	52	55	59	63	68	71	74	78	82
Strain Gage B5	55	59	63	69	73	77	82	86	91	96	99
Strain Gage B6	44	47	50	54	58	62	65	69	73	77	81
Strain Gage C1	25	28	30	33	36	38	41	43	46	48	51
Strain Gage C2	23	24	26	28	30	31	34	35	37	39	41
Strain Gage C3	23	24	27	28	30	33	35	37	38	41	43
Strain Gage C4	23	25	27	29	31	32	35	37	38	40	42
Strain Gage C5	27	29	32	34	37	38	41	43	45	48	49
Strain Gage C6	27	28	32	33	35	37	41	42	45	47	49
Slip 1	0.0001	0.0002	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0005
Slip 2	0	0	0.0001	0	0	0	0	0.0001	0	0.0001	0.0001
Slip 3	0	0	0	0	0	0	0.0001	0	0	0	0
Slip 4	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0	0.0001	0.0001	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-2: Test 2 (continued)

Load	11069	11619	12024	12532	12984	13534	13960	14504	15008
Wire Pot A1	0.0384	0.0401	0.0424	0.0448	0.0481	0.0511	0.0525	0.0555	0.0578
Wire Pot A2	0.0483	0.0489	0.0553	0.056	0.0553	0.0618	0.0624	0.0682	0.0695
Wire Pot A3	0.056	0.0626	0.0633	0.0699	0.0706	0.0693	0.0773	0.0846	0.0846
Wire Pot A4	0.0543	0.0543	0.0595	0.0614	0.0614	0.0679	0.0679	0.0756	0.0808
Wire Pot A5	0.0482	0.0555	0.0548	0.0548	0.0621	0.0614	0.0693	0.0693	0.0759
Wire Pot A6	0.0521	0.0527	0.0527	0.0593	0.0586	0.0586	0.0665	0.0665	0.0731
Wire Pot B1	0.0519	0.0519	0.0532	0.0592	0.0599	0.0666	0.0659	0.0725	0.0732
Wire Pot B2	0.0549	0.0614	0.062	0.0614	0.0679	0.0692	0.0756	0.0763	0.0814
Wire Pot B3	0.0542	0.0588	0.0588	0.0652	0.0652	0.0704	0.071	0.0781	0.0839
Wire Pot B4	0.0599	0.0606	0.0612	0.0677	0.0671	0.0736	0.0749	0.0795	0.0866
Wire Pot B5	0.0561	0.0548	0.0625	0.0625	0.0619	0.069	0.0683	0.0761	0.0761
Wire Pot B6	0.0543	0.053	0.0543	0.053	0.053	0.0673	0.0673	0.0686	0.0686
Wire Pot C1	0.0357	0.0376	0.0363	0.0447	0.0441	0.0435	0.0435	0.0506	0.0499
Wire Pot C2	0.0332	0.0339	0.0417	0.0404	0.0397	0.0469	0.0469	0.0469	0.0495
Wire Pot C3	0.0395	0.0445	0.0445	0.0433	0.0457	0.0482	0.0494	0.0519	0.0544
Wire Pot C4	0.0365	0.0365	0.041	0.0433	0.0433	0.041	0.0502	0.0502	0.0479
Wire Pot C5	0.0437	0.0471	0.0471	0.0494	0.0494	0.0506	0.0517	0.0563	0.0574
Wire Pot C6	0.0356	0.0356	0.0393	0.0405	0.038	0.043	0.0454	0.0528	0.0528
Strain Gage A1	92	97	101	106	112	117	124	131	133
Strain Gage A2	138	145	150	157	163	170	178	190	198
Strain Gage A3	221	231	239	248	256	267	276	278	294
Strain Gage A4	198	208	216	224	233	244	279	306	322
Strain Gage A5	190	200	208	218	227	238	251	266	278
Strain Gage A6	97	102	107	112	117	125	133	142	150
Strain Gage B1	90	96	100	104	110	115	121	125	131
Strain Gage B2	88	91	95	99	104	108	114	124	130
Strain Gage B3	88	91	95	99	102	106	110	112	116
Strain Gage B4	86	89	93	97	99	103	105	108	109
Strain Gage B5	103	106	109	112	115	119	122	127	131
Strain Gage B6	86	90	94	99	103	107	113	121	127
Strain Gage C1	54	56	60	61	65	68	70	72	75
Strain Gage C2	44	46	47	49	50	53	54	56	58
Strain Gage C3	45	47	48	50	52	54	55	58	60
Strain Gage C4	44	47	48	50	52	53	55	56	59
Strain Gage C5	52	55	57	60	62	63	66	69	71
Strain Gage C6	51	54	55	57	59	61	63	65	67
Slip 1	0.0006	0.0006	0.0007	0.0007	0.0007	0.0007	0.0008	0.0009	0.0009
Slip 2	0	0.0001	0	0	0	0	0	0	0
Slip 3	0	0	0	0	0	0	0	0	0
Slip 4	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 3
Concentrated Point Load at Third Point B
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	13311 lb
Midspan Deflection at Maximum Load:	0.085 in
Quarter A Deflection at Maximum Load:	0.051 in
Quarter B Deflection at Maximum Load:	0.075 in
End Slip at Maximum Load:	0.0000 in

Table C-3: Experimental results of concentrated load Test 3 on STRUX-reinforced slab

Load	0	571	996	1510	2013	2512	3041	3482	4027	4541	5034
Wire Pot A1	0	0	-0.0004	0.0006	0.0016	0.0023	0.0033	0.0047	0.0067	0.01	0.0123
Wire Pot A2	0	0	0	0.007	0.0077	0.007	0.007	0.0141	0.0148	0.0141	0.016
Wire Pot A3	0	0.0006	0	-0.0007	0.006	0.008	0.0066	0.0073	0.0133	0.014	0.0133
Wire Pot A4	0	0	0	0.0032	0.0065	0.0065	0.0058	0.0058	0.0136	0.0136	0.0136
Wire Pot A5	0	0	-0.0006	0	0.0007	0.0007	0.008	0.0066	0.0073	0.0106	0.0139
Wire Pot A6	0	0.0027	0.0059	0.0066	0.0079	0.0073	0.0139	0.0152	0.0132	0.0145	0.0204
Wire Pot B1	0	-0.0014	0	0.0046	0.0066	0.0066	0.006	0.0146	0.0146	0.0166	0.0199
Wire Pot B2	0	0.0006	0.0006	0.0039	0.0071	0.0071	0.0129	0.0136	0.0142	0.0213	0.0213
Wire Pot B3	0	0.0071	0.0071	0.0071	0.0103	0.0142	0.0135	0.02	0.02	0.0226	0.0271
Wire Pot B4	0	0.0019	0.0019	0.0019	0.0091	0.0084	0.0084	0.0169	0.0162	0.0195	0.0228
Wire Pot B5	0	0.0065	0.0071	0.0065	0.0078	0.0142	0.0142	0.0142	0.0213	0.0207	0.0278
Wire Pot B6	0	0	0	0.0129	0.0129	0.0142	0.0129	0.0142	0.0129	0.0285	0.0259
Wire Pot C1	0	0.0007	0	0.0007	0.0078	0.0078	0.0078	0.0137	0.013	0.0124	0.0149
Wire Pot C2	0	0.0045	0.0065	0.0071	0.0058	0.0071	0.0137	0.0143	0.0143	0.0215	0.0195
Wire Pot C3	0	0.0012	0	0.0012	0.0037	0.0062	0.0062	0.005	0.0124	0.0148	0.0161
Wire Pot C4	0	0.0023	0	0.0046	0.0069	0.0023	0.0114	0.0114	0.0137	0.0205	0.0251
Wire Pot C5	0	-0.0023	-0.0023	0	-0.0012	0.0011	0.0069	0.0092	0.0115	0.0138	0.0172
Wire Pot C6	0	0.0012	0	0.0025	0.0049	0.0062	0.0098	0.0135	0.0135	0.016	0.0184
Strain Gage A1	0	3	4	7	9	10	13	15	17	20	22
Strain Gage A2	0	2	4	6	8	10	13	15	19	20	22
Strain Gage A3	0	3	5	8	11	14	17	19	23	27	29
Strain Gage A4	0	2	5	7	9	12	15	18	22	24	27
Strain Gage A5	0	4	7	9	11	14	17	19	23	25	29
Strain Gage A6	0	3	4	7	9	11	14	15	18	21	22
Strain Gage B1	0	5	8	12	15	19	23	26	30	35	38
Strain Gage B2	0	6	9	13	17	21	24	28	34	38	42
Strain Gage B3	0	5	9	13	17	22	26	30	35	40	42
Strain Gage B4	0	5	9	12	17	21	25	29	34	38	42
Strain Gage B5	0	6	11	15	20	23	29	33	38	42	46
Strain Gage B6	0	5	8	12	15	18	23	25	30	33	36
Strain Gage C1	0	4	6	10	13	18	22	26	31	35	39
Strain Gage C2	0	6	10	14	18	23	27	31	36	41	46
Strain Gage C3	0	8	12	16	23	28	34	39	45	50	56
Strain Gage C4	0	7	11	16	21	26	32	37	43	48	54
Strain Gage C5	0	4	8	12	16	20	24	27	34	38	41
Strain Gage C6	0	6	11	15	21	27	32	36	42	48	53
Slip 1	0	0	-0.0001	0	0	0	0	0	0	0	0
Slip 2	0	0	0.0001	0	0	0	0	0	0	0.0001	0
Slip 3	0	0	0	0.0001	0	0	0	0	0	0	0.0001
Slip 4	0	-1E-04	0	0	0	0	-1E-04	0	0	0	-1E-04

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-3: Test 3 (continued)

Load	5527	6025	6508	7047	7530	8059	8511	9004	9517	10031	10509
Wire Pot A1	0.0154	0.016	0.0174	0.0187	0.019	0.0207	0.023	0.0271	0.0294	0.0307	0.0321
Wire Pot A2	0.0205	0.0205	0.0212	0.027	0.0263	0.0276	0.0289	0.0341	0.0353	0.0347	0.0411
Wire Pot A3	0.0146	0.0213	0.0213	0.0206	0.0206	0.0273	0.0286	0.0273	0.0273	0.0346	0.0353
Wire Pot A4	0.0168	0.02	0.02	0.0207	0.0252	0.0278	0.0265	0.0265	0.0343	0.0343	0.0336
Wire Pot A5	0.0139	0.0132	0.0185	0.0212	0.0218	0.0205	0.0251	0.0271	0.0284	0.0271	0.035
Wire Pot A6	0.0198	0.0218	0.0211	0.0277	0.0277	0.0277	0.0283	0.0349	0.0349	0.0356	0.0343
Wire Pot B1	0.0199	0.0246	0.0273	0.0273	0.0346	0.0339	0.0352	0.0412	0.0412	0.0432	0.0492
Wire Pot B2	0.0226	0.0271	0.0291	0.0284	0.0355	0.0342	0.04	0.0426	0.042	0.0484	0.0478
Wire Pot B3	0.0264	0.0335	0.0335	0.0406	0.0406	0.0406	0.0458	0.0471	0.0523	0.0529	0.062
Wire Pot B4	0.0228	0.0293	0.0299	0.0325	0.0358	0.0364	0.0429	0.0429	0.0495	0.0495	0.0495
Wire Pot B5	0.0271	0.0278	0.0355	0.0348	0.0342	0.04	0.0413	0.0477	0.0477	0.0477	0.0548
Wire Pot B6	0.0246	0.0272	0.0259	0.0297	0.0388	0.0414	0.0401	0.0388	0.0401	0.053	0.0543
Wire Pot C1	0.0208	0.0208	0.0201	0.0273	0.0273	0.0273	0.0337	0.0344	0.035	0.0415	0.0409
Wire Pot C2	0.0215	0.0273	0.0286	0.0286	0.0345	0.0345	0.0352	0.0423	0.0423	0.0417	0.0475
Wire Pot C3	0.0161	0.0198	0.0223	0.021	0.026	0.0346	0.0383	0.0383	0.0383	0.0408	0.0458
Wire Pot C4	0.0251	0.0297	0.0274	0.0251	0.0365	0.0365	0.0319	0.0388	0.0434	0.0411	0.0525
Wire Pot C5	0.0207	0.0252	0.0264	0.031	0.0333	0.039	0.0413	0.0436	0.0448	0.0471	0.0505
Wire Pot C6	0.016	0.0184	0.0184	0.0245	0.0294	0.0307	0.0331	0.0331	0.0343	0.0368	0.038
Strain Gage A1	24	25	26	30	32	34	37	39	42	44	46
Strain Gage A2	25	28	29	31	34	37	40	42	44	47	49
Strain Gage A3	33	36	41	44	48	52	56	60	63	66	70
Strain Gage A4	31	35	38	42	44	49	53	56	61	64	68
Strain Gage A5	32	35	38	42	46	49	52	56	60	63	67
Strain Gage A6	25	27	30	32	35	37	39	43	45	47	50
Strain Gage B1	42	45	49	53	57	61	65	69	73	78	82
Strain Gage B2	45	49	54	59	62	67	70	75	79	84	87
Strain Gage B3	47	51	56	60	65	69	72	76	80	83	85
Strain Gage B4	46	50	54	59	62	67	71	75	77	82	85
Strain Gage B5	51	55	59	64	69	73	77	81	85	91	95
Strain Gage B6	40	44	47	51	55	59	63	66	71	74	78
Strain Gage C1	43	48	52	57	61	66	70	75	80	85	91
Strain Gage C2	50	55	58	65	68	73	79	83	89	95	102
Strain Gage C3	61	67	72	77	83	87	92	98	102	102	101
Strain Gage C4	59	64	70	76	81	87	93	99	104	109	114
Strain Gage C5	46	49	53	58	61	66	72	76	80	85	91
Strain Gage C6	58	63	68	72	77	81	83	85	86	87	91
Slip 1	0	-0.0001	0	0	0	0.0001	0	0	-0.0001	0.0001	0.0001
Slip 2	0	0	0	0	0	0	0	0	0	0.0001	0
Slip 3	0	0	0	0	0	0.0001	0	0	0	0	0.0001
Slip 4	0	0	-1E-04	-1E-04	-1E-04	-1E-04	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-3: Test 3 (continued)

Load	11028	11437	11993	12481	12942	13311
Wire Pot A1	0.0334	0.0351	0.0368	0.0384	0.0414	0.0471
Wire Pot A2	0.0411	0.0411	0.0482	0.0482	0.0482	0.0546
Wire Pot A3	0.0353	0.0426	0.0419	0.0419	0.0486	0.0486
Wire Pot A4	0.0368	0.0388	0.042	0.0465	0.0485	0.0543
Wire Pot A5	0.035	0.035	0.041	0.041	0.0423	0.0482
Wire Pot A6	0.0409	0.0422	0.0448	0.0494	0.0501	0.056
Wire Pot B1	0.0492	0.0559	0.0559	0.0625	0.0665	0.0772
Wire Pot B2	0.0543	0.0549	0.0614	0.0614	0.0659	0.0756
Wire Pot B3	0.06	0.0665	0.0665	0.0736	0.0794	0.0871
Wire Pot B4	0.0566	0.0566	0.0625	0.0697	0.071	0.0827
Wire Pot B5	0.0555	0.06	0.0619	0.0684	0.0755	0.0813
Wire Pot B6	0.0543	0.0556	0.0582	0.0699	0.0673	0.0815
Wire Pot C1	0.0415	0.0486	0.048	0.0551	0.0564	0.0674
Wire Pot C2	0.0482	0.0521	0.0541	0.0593	0.0625	0.071
Wire Pot C3	0.047	0.0507	0.052	0.0569	0.0668	0.073
Wire Pot C4	0.0456	0.0548	0.057	0.0639	0.0616	0.0776
Wire Pot C5	0.0516	0.0528	0.0597	0.0654	0.0666	0.0781
Wire Pot C6	0.0417	0.0491	0.0503	0.0515	0.0552	0.065
Strain Gage A1	49	50	54	57	59	61
Strain Gage A2	52	54	56	58	59	60
Strain Gage A3	74	76	79	81	83	84
Strain Gage A4	71	73	77	80	82	81
Strain Gage A5	72	74	78	82	86	87
Strain Gage A6	53	56	59	63	66	67
Strain Gage B1	88	93	100	107	112	122
Strain Gage B2	91	95	100	102	104	106
Strain Gage B3	88	88	89	90	88	87
Strain Gage B4	85	85	87	88	89	85
Strain Gage B5	99	102	106	110	115	114
Strain Gage B6	85	91	96	103	111	121
Strain Gage C1	97	105	113	124	135	231
Strain Gage C2	109	110	111	114	107	384
Strain Gage C3	103	103	294	325	341	363
Strain Gage C4	111	104	111	280	295	307
Strain Gage C5	97	103	111	120	131	181
Strain Gage C6	119	199	278	313	312	384
Slip 1	0	-0.0001	-0.0001	-0.0001	-0.0001	0
Slip 2	0	0	0	0	0	0
Slip 3	0	0	0	0	0	0
Slip 4	0	-1E-04	-1E-04	-1E-04	-1E-04	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 4
Concentrated Point Load at Quarter Point B
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15008 lb
Midspan Deflection at Maximum Load:	0.077 in
Quarter A Deflection at Maximum Load:	0.045 in
Quarter B Deflection at Maximum Load:	0.074 in
End Slip at Maximum Load:	0.0000 in

Table C-4: Experimental results of concentrated load Test 4 on STRUX-reinforced slab

Load	0	509	1043	1541	2013	2579	3020	3534	4043	4504	5060
Wire Pot A1	0	0	0.0003	0.0007	0.001	0.0023	0.003	0.004	0.0067	0.0087	0.012
Wire Pot A2	0	-0.0012	-0.0012	-0.0012	0	0.0026	0.0065	0.0078	0.0058	0.0065	0.0135
Wire Pot A3	0	-0.0007	-0.0007	0.0073	0.0073	0.0066	0.0066	0.0066	0.0133	0.014	0.014
Wire Pot A4	0	0	0	0.0013	0.0007	0	0.0007	0.0078	0.0071	0.0071	0.0071
Wire Pot A5	0	0.0013	0.0006	0.0013	0.0072	0.0079	0.0066	0.0092	0.0079	0.0151	0.0165
Wire Pot A6	0	0	0.0013	-0.0006	0.0046	0.0066	0.0073	0.0073	0.0066	0.0132	0.0145
Wire Pot B1	0	0.0014	0.0047	0.0054	0.0074	0.0087	0.0087	0.0153	0.0153	0.0147	0.0213
Wire Pot B2	0	0	0	0.0065	0.0071	0.0065	0.0097	0.0129	0.0129	0.0142	0.0201
Wire Pot B3	0	0.0032	0.0065	0.0058	0.0065	0.0136	0.0142	0.02	0.0207	0.02	0.0271
Wire Pot B4	0	0	0	0	-0.0007	0.0065	0.0071	0.013	0.0143	0.0136	0.0208
Wire Pot B5	0	0	0.0065	0.0071	0.0071	0.0142	0.0142	0.0136	0.0207	0.0213	0.0213
Wire Pot B6	0	0.0026	0	0.0013	0.0013	0	0.0155	0.0155	0.0155	0.0168	0.0142
Wire Pot C1	0	0.0007	0.0072	0.0065	0.0072	0.0072	0.0149	0.0156	0.013	0.0136	0.0201
Wire Pot C2	0	0.0006	0.0019	0.0019	0.0032	0.0058	0.0091	0.0084	0.0091	0.0156	0.0169
Wire Pot C3	0	0	0	0	0.0037	0.0074	0.0099	0.0111	0.0124	0.0136	0.0161
Wire Pot C4	0	0	0	0.0069	0.0023	0.0069	0.0069	0.0092	0.0137	0.0137	0.0114
Wire Pot C5	0	0	0.0023	0.0046	0.0057	0.0092	0.0092	0.0149	0.0195	0.0207	0.0229
Wire Pot C6	0	0.0012	0.0061	0.0061	0.0098	0.0098	0.0122	0.0122	0.0122	0.0159	0.022
Strain Gage A1	0	2	4	4	6	8	9	12	12	14	16
Strain Gage A2	0	2	4	5	7	8	10	11	12	13	15
Strain Gage A3	0	2	4	5	8	11	12	14	16	19	21
Strain Gage A4	0	3	5	6	8	10	12	14	16	18	20
Strain Gage A5	0	2	4	5	8	8	11	12	15	16	18
Strain Gage A6	0	3	5	6	8	9	11	12	14	16	17
Strain Gage B1	0	4	7	10	12	16	19	22	25	28	30
Strain Gage B2	0	2	7	10	11	15	17	20	23	26	28
Strain Gage B3	0	3	7	9	12	14	18	19	22	25	27
Strain Gage B4	0	3	5	8	10	14	15	18	20	23	25
Strain Gage B5	0	3	7	10	13	16	20	22	25	28	31
Strain Gage B6	0	5	6	10	12	15	18	22	24	27	30
Strain Gage C1	0	4	8	12	16	21	26	32	38	43	50
Strain Gage C2	0	7	13	19	25	33	40	48	57	67	76
Strain Gage C3	0	10	17	25	32	40	48	56	66	75	84
Strain Gage C4	0	8	15	22	30	37	44	52	61	68	78
Strain Gage C5	0	5	10	14	19	23	28	32	38	42	48
Strain Gage C6	0	7	13	19	25	33	40	48	56	65	73
Slip 1	0	0	0	-0.0001	0	-0.0001	-0.0001	0	-0.0001	0	0
Slip 2	0	0	0	0	0	0	-0.0001	0	0	-0.0001	-0.0001
Slip 3	0	0	-0.0001	0	0	-0.0001	0	0	-0.0001	0	-0.0001
Slip 4	0	0.0001	0.0001	0.0001	0	0.0001	0	0.0001	0.0001	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-4: Test 4 (continued)

Load	5501	6040	6482	7021	7551	8168	8511	9004	9507	10062	10488
Wire Pot A1	0.0134	0.0147	0.0154	0.0164	0.0174	0.0184	0.0187	0.0201	0.0231	0.0261	0.0281
Wire Pot A2	0.0129	0.0129	0.0142	0.0148	0.02	0.0206	0.02	0.02	0.0271	0.0264	0.0271
Wire Pot A3	0.0133	0.0166	0.022	0.0213	0.0206	0.0206	0.0279	0.0279	0.0279	0.0279	0.0319
Wire Pot A4	0.0091	0.0136	0.0142	0.0136	0.0142	0.0207	0.0201	0.0207	0.0201	0.0265	0.0278
Wire Pot A5	0.0145	0.0158	0.0198	0.0211	0.0231	0.0217	0.0211	0.0283	0.0283	0.0283	0.0283
Wire Pot A6	0.0139	0.0145	0.0185	0.0191	0.0204	0.0198	0.0204	0.0277	0.0283	0.0277	0.0283
Wire Pot B1	0.0213	0.022	0.022	0.0293	0.0273	0.0346	0.0353	0.0346	0.0346	0.0413	0.0433
Wire Pot B2	0.0194	0.0226	0.0272	0.0265	0.0272	0.0336	0.0343	0.0323	0.0401	0.0401	0.0452
Wire Pot B3	0.0271	0.0265	0.0336	0.0317	0.04	0.0407	0.0394	0.0471	0.0465	0.053	0.0536
Wire Pot B4	0.0208	0.0201	0.0273	0.028	0.0338	0.0338	0.0338	0.0403	0.0403	0.041	0.0475
Wire Pot B5	0.0271	0.0278	0.0271	0.0342	0.0342	0.0419	0.0407	0.04	0.0484	0.0471	0.0465
Wire Pot B6	0.0181	0.0311	0.0285	0.0298	0.0298	0.0298	0.0285	0.0427	0.0414	0.0427	0.0427
Wire Pot C1	0.0201	0.0195	0.0266	0.0292	0.0279	0.0337	0.0337	0.0337	0.0409	0.0409	0.0402
Wire Pot C2	0.0163	0.0234	0.0234	0.0221	0.0286	0.0299	0.0299	0.0365	0.0371	0.0371	0.0449
Wire Pot C3	0.0186	0.026	0.0285	0.0309	0.0334	0.0334	0.0371	0.0408	0.0421	0.0445	0.0458
Wire Pot C4	0.0251	0.0206	0.0206	0.0297	0.0297	0.0342	0.0388	0.0365	0.0411	0.0411	0.0434
Wire Pot C5	0.0275	0.031	0.0356	0.039	0.0413	0.0425	0.0448	0.0448	0.0459	0.0482	0.0528
Wire Pot C6	0.0245	0.0257	0.0269	0.0269	0.0269	0.0306	0.0318	0.0367	0.0417	0.0453	0.0453
Strain Gage A1	17	18	20	22	24	25	26	28	29	32	33
Strain Gage A2	16	19	20	21	23	26	26	28	30	32	33
Strain Gage A3	22	25	27	29	32	35	38	39	41	44	46
Strain Gage A4	22	24	26	29	32	35	36	38	41	44	46
Strain Gage A5	20	22	24	27	29	32	34	37	39	41	44
Strain Gage A6	19	21	23	25	27	29	30	32	34	36	38
Strain Gage B1	34	37	40	44	47	51	53	56	60	64	67
Strain Gage B2	30	33	36	39	42	45	47	51	53	56	59
Strain Gage B3	28	31	34	37	39	40	42	45	47	50	52
Strain Gage B4	27	30	32	34	36	39	41	43	46	48	49
Strain Gage B5	33	38	40	43	46	49	51	54	58	61	63
Strain Gage B6	33	37	39	42	47	50	53	57	60	63	66
Strain Gage C1	55	62	68	73	81	89	92	99	104	110	117
Strain Gage C2	86	96	105	116	126	139	145	156	166	178	191
Strain Gage C3	94	104	113	123	134	146	152	163	173	185	201
Strain Gage C4	86	95	102	112	120	132	138	148	155	166	181
Strain Gage C5	52	58	61	68	73	80	83	88	94	99	105
Strain Gage C6	82	92	101	111	121	133	140	149	160	170	185
Slip 1	-0.0001	-0.0001	-0.0001	0	-0.0001	-0.0001	0	-0.0001	-0.0001	0	-0.0001
Slip 2	0	0	0	-0.0001	0	0	0	0	-0.0001	-0.0001	-0.0001
Slip 3	0	-0.0001	0	-0.0001	0	-0.0001	-0.0001	-0.0002	0	0	-0.0001
Slip 4	0	0	0	0	0.0001	0	0	0	0	0	-1E-04

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-4: Test 4 (continued)

Load	11079	11505	12024	12481	12989	13482	14043	14478	15008
Wire Pot A1	0.0298	0.0311	0.0321	0.0328	0.0338	0.0348	0.0365	0.0371	0.0405
Wire Pot A2	0.0271	0.0328	0.0322	0.0328	0.0348	0.0399	0.0399	0.0399	0.0412
Wire Pot A3	0.0346	0.0346	0.0353	0.0353	0.0433	0.0419	0.0419	0.0433	0.0493
Wire Pot A4	0.0278	0.0278	0.031	0.0356	0.0343	0.0349	0.0407	0.0401	0.0414
Wire Pot A5	0.0356	0.0349	0.0349	0.0356	0.0356	0.0415	0.0422	0.0415	0.0429
Wire Pot A6	0.0343	0.0349	0.0349	0.0356	0.0369	0.0415	0.0422	0.0415	0.0415
Wire Pot B1	0.0426	0.0493	0.0493	0.0506	0.0573	0.0573	0.0626	0.0646	0.0639
Wire Pot B2	0.0465	0.0472	0.0524	0.0543	0.0549	0.0608	0.062	0.0653	0.0672
Wire Pot B3	0.0523	0.0581	0.0594	0.0665	0.0659	0.0652	0.073	0.0723	0.0801
Wire Pot B4	0.0469	0.0534	0.0547	0.0534	0.0605	0.0599	0.0677	0.0677	0.0729
Wire Pot B5	0.0548	0.0542	0.0542	0.0619	0.0613	0.0677	0.0684	0.0684	0.0735
Wire Pot B6	0.044	0.0427	0.0569	0.0569	0.0569	0.0556	0.0531	0.0595	0.0699
Wire Pot C1	0.0409	0.0473	0.048	0.0486	0.0551	0.0545	0.0545	0.0616	0.0609
Wire Pot C2	0.0436	0.0443	0.0508	0.0515	0.0508	0.058	0.0573	0.0645	0.0645
Wire Pot C3	0.0483	0.0495	0.0557	0.0582	0.0606	0.0643	0.0693	0.0755	0.0779
Wire Pot C4	0.0479	0.0502	0.0525	0.0593	0.0548	0.0571	0.0639	0.0639	0.0707
Wire Pot C5	0.0562	0.0608	0.0608	0.0631	0.0677	0.0689	0.0712	0.0746	0.0781
Wire Pot C6	0.0466	0.0466	0.0466	0.0515	0.0564	0.0564	0.0564	0.0613	0.0588
Strain Gage A1	35	37	38	40	42	43	45	47	49
Strain Gage A2	36	36	38	40	42	43	45	47	48
Strain Gage A3	50	52	55	56	61	62	65	67	69
Strain Gage A4	48	51	54	56	58	60	63	66	69
Strain Gage A5	46	49	51	54	57	58	61	64	65
Strain Gage A6	40	42	44	46	47	50	52	54	55
Strain Gage B1	71	74	77	80	85	88	94	97	101
Strain Gage B2	62	64	67	70	73	75	78	79	83
Strain Gage B3	55	56	58	61	63	65	66	68	69
Strain Gage B4	53	55	57	59	61	61	64	65	66
Strain Gage B5	67	69	72	74	78	81	83	85	88
Strain Gage B6	70	73	76	79	84	87	91	94	97
Strain Gage C1	124	130	136	143	150	161	174	187	212
Strain Gage C2	204	214	226	239	251	272	292	309	327
Strain Gage C3	213	224	236	232	247	268	286	305	331
Strain Gage C4	193	200	211	216	226	246	268	284	309
Strain Gage C5	111	116	121	126	132	139	147	153	165
Strain Gage C6	196	207	219	231	243	258	280	286	280
Slip 1	0	-0.0001	0	0	-0.0001	-0.0001	-0.0001	-0.0001	0
Slip 2	0	-0.0001	0	0	0.0001	0	0	-0.0001	-0.0001
Slip 3	-0.0001	0	0	0	-0.0001	-0.0001	-0.0002	-0.0006	-0.0007
Slip 4	0	0	-1E-04	0	0.0001	-1E-04	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 5
Transverse Line Load at Quarter Point B
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14001 lb
Midspan Deflection at Maximum Load:	0.079 in
Quarter A Deflection at Maximum Load:	0.046 in
Quarter B Deflection at Maximum Load:	0.084 in
End Slip at Maximum Load:	0.0009 in

Table C-5: Experimental results of concentrated load Test 5 on STRUX-reinforced slab

Load	0	1069	2019	3010	4027	5070	5994	7058	8033	9081	10026
Wire Pot A1	0	0	0.002	0.0061	0.0131	0.0148	0.0164	0.0198	0.0268	0.0295	0.0318
Wire Pot A2	0	0.0007	0.0071	0.0077	0.0148	0.0148	0.0219	0.0212	0.0283	0.0296	0.036
Wire Pot A3	0	0.0067	0.006	0.0074	0.0134	0.0147	0.0207	0.0214	0.028	0.028	0.0353
Wire Pot A4	0	0.0007	-0.0006	0.0007	0.0065	0.011	0.0136	0.0136	0.02	0.0213	0.0272
Wire Pot A5	0	0	0.0073	0.0073	0.0139	0.0145	0.0205	0.0205	0.0277	0.029	0.0323
Wire Pot A6	0	0.0013	0.0072	0.0072	0.0145	0.0138	0.0211	0.0217	0.0277	0.029	0.0362
Wire Pot B1	0	0.0027	0.0027	0.01	0.018	0.0233	0.0319	0.0319	0.0386	0.0446	0.0519
Wire Pot B2	0	0.0084	0.0084	0.0148	0.0213	0.0284	0.0284	0.0342	0.042	0.0491	0.0484
Wire Pot B3	0	0.0007	0.0071	0.0149	0.0142	0.0226	0.0265	0.0329	0.0407	0.0433	0.0471
Wire Pot B4	0	-0.0013	0.0065	0.0137	0.0137	0.0202	0.0261	0.0339	0.0404	0.041	0.0469
Wire Pot B5	0	0.0032	0.0103	0.0161	0.0161	0.0238	0.0303	0.0374	0.0367	0.0425	0.0503
Wire Pot B6	0	0	0.0026	0.0129	0.0129	0.0272	0.0272	0.0272	0.0427	0.0414	0.0427
Wire Pot C1	0	-0.0007	0.0065	0.0142	0.0194	0.0207	0.0259	0.0337	0.0408	0.0473	0.0473
Wire Pot C2	0	0.0013	0.0072	0.0144	0.015	0.0209	0.0274	0.0346	0.0346	0.043	0.0489
Wire Pot C3	0	0.0025	0.0086	0.0086	0.0173	0.0235	0.0297	0.0346	0.0408	0.0445	0.0457
Wire Pot C4	0	0	0.0092	0.016	0.0229	0.0229	0.032	0.0365	0.0434	0.0434	0.048
Wire Pot C5	0	0.0023	0.008	0.0172	0.0252	0.0333	0.0379	0.0413	0.0459	0.0539	0.0608
Wire Pot C6	0	0.0074	0.011	0.0123	0.0221	0.0257	0.0294	0.0368	0.0429	0.0466	0.049
Strain Gage A1	0	3	6	10	13	16	18	22	25	28	32
Strain Gage A2	0	4	8	11	15	19	22	26	29	33	36
Strain Gage A3	0	4	9	14	19	25	29	33	39	45	50
Strain Gage A4	0	5	9	12	18	22	26	32	36	42	47
Strain Gage A5	0	4	8	11	15	19	23	28	33	38	42
Strain Gage A6	0	4	8	10	12	17	19	24	27	31	34
Strain Gage B1	0	6	12	19	25	31	38	44	50	57	63
Strain Gage B2	0	8	13	20	26	32	39	45	50	57	62
Strain Gage B3	0	7	13	20	25	31	37	43	48	55	59
Strain Gage B4	0	6	11	16	22	27	32	36	40	46	49
Strain Gage B5	0	8	13	18	24	29	35	41	45	51	57
Strain Gage B6	0	6	12	19	25	31	37	43	51	57	63
Strain Gage C1	0	12	25	38	55	71	84	100	113	128	141
Strain Gage C2	0	13	25	43	62	83	101	123	145	167	188
Strain Gage C3	0	15	29	44	62	80	98	117	136	157	174
Strain Gage C4	0	18	31	49	66	86	103	123	142	163	180
Strain Gage C5	0	13	23	35	48	60	72	85	97	110	121
Strain Gage C6	0	18	33	52	73	93	112	135	156	178	198
Slip 1	0	0	0	0.0001	0.0001	0	0.0001	0	0	0	0
Slip 2	0	0	-0.0001	-0.0001	0	0	0	-0.0001	0	0	0
Slip 3	0	0.0001	0	0	0	0.0001	0.0001	0	0.0001	0.0001	0.0001
Slip 4	0	0	0	0	0	0	0	0	0	0	-1E-04

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-5: Test 5 (continued)

Load	11157	12050	12828	14001
Wire Pot A1	0.0342	0.0372	0.0439	0.0512
Wire Pot A2	0.0347	0.0412	0.0412	0.054
Wire Pot A3	0.0347	0.042	0.042	0.0507
Wire Pot A4	0.0272	0.0349	0.0343	0.0414
Wire Pot A5	0.0337	0.035	0.0409	0.0495
Wire Pot A6	0.0349	0.0428	0.0428	0.0501
Wire Pot B1	0.0532	0.0586	0.0732	0.0879
Wire Pot B2	0.0555	0.062	0.0685	0.0827
Wire Pot B3	0.0536	0.0601	0.0659	0.0788
Wire Pot B4	0.0541	0.0599	0.0671	0.0795
Wire Pot B5	0.0567	0.0574	0.0638	0.078
Wire Pot B6	0.0556	0.0543	0.0673	0.0673
Wire Pot C1	0.0538	0.0615	0.0751	0.0978
Wire Pot C2	0.0535	0.0548	0.0691	0.0893
Wire Pot C3	0.0569	0.0569	0.0717	0.0878
Wire Pot C4	0.0525	0.0594	0.0708	0.0799
Wire Pot C5	0.0666	0.0712	0.0781	0.0895
Wire Pot C6	0.0564	0.0576	0.0613	0.0748
Strain Gage A1	36	38	38	40
Strain Gage A2	41	45	46	51
Strain Gage A3	55	61	66	72
Strain Gage A4	52	58	63	72
Strain Gage A5	49	53	60	67
Strain Gage A6	39	42	47	52
Strain Gage B1	72	77	70	69
Strain Gage B2	69	74	77	79
Strain Gage B3	66	70	77	82
Strain Gage B4	55	60	68	78
Strain Gage B5	63	68	78	90
Strain Gage B6	72	77	86	98
Strain Gage C1	156	172	298	402
Strain Gage C2	213	235	308	365
Strain Gage C3	197	215	269	358
Strain Gage C4	204	222	264	340
Strain Gage C5	134	144	159	202
Strain Gage C6	222	242	275	346
Slip 1	0	0	0.0001	0
Slip 2	0	0	-0.0001	0
Slip 3	0.0001	0.0001	0.0003	0.0017
Slip 4	0	0	0	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 6
Transverse Line Load at Quarter Point A
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14997 lb
Midspan Deflection at Maximum Load:	0.078 in
Quarter A Deflection at Maximum Load:	0.076 in
Quarter B Deflection at Maximum Load:	0.055 in
End Slip at Maximum Load:	0.0007 in

Table C-6: Experimental results of concentrated load Test 6 on STRUX-reinforced slab

Load	0	1028	2024	3046	4017	4951	6082	7021	8028	9076	10057
Wire Pot A1	0	0.0087	0.013	0.0231	0.0278	0.0314	0.0398	0.0442	0.0488	0.0525	0.0569
Wire Pot A2	0	0.0071	0.0148	0.0161	0.0212	0.0283	0.0347	0.0405	0.0405	0.0482	0.0547
Wire Pot A3	0	0.0073	0.0066	0.014	0.0206	0.0213	0.0273	0.0353	0.0413	0.0413	0.0486
Wire Pot A4	0	0.0071	0.0104	0.0136	0.0207	0.0207	0.0272	0.0343	0.0381	0.0414	0.0478
Wire Pot A5	0	0.0066	0.0119	0.0139	0.0205	0.0277	0.0337	0.0343	0.0409	0.0475	0.0482
Wire Pot A6	0	0.0059	0.0125	0.0217	0.0283	0.0342	0.0415	0.0487	0.0553	0.0606	0.0619
Wire Pot B1	0	0.006	0.0133	0.02	0.028	0.034	0.0413	0.048	0.0539	0.0559	0.0626
Wire Pot B2	0	0.0052	0.0136	0.02	0.0252	0.0252	0.033	0.0394	0.0459	0.0523	0.0588
Wire Pot B3	0	0.0013	0.0071	0.0142	0.0206	0.0206	0.0271	0.0348	0.04	0.0477	0.0536
Wire Pot B4	0	0.0026	0.0091	0.0084	0.0162	0.0215	0.0286	0.0293	0.0358	0.0429	0.0488
Wire Pot B5	0	0.0071	0.0141	0.0206	0.0264	0.0277	0.0341	0.0412	0.0477	0.0515	0.0541
Wire Pot B6	0	0.0026	0.0142	0.0142	0.0272	0.0272	0.0414	0.044	0.044	0.0556	0.0556
Wire Pot C1	0	0.0065	0.011	0.0136	0.0201	0.0266	0.0285	0.033	0.0408	0.0473	0.0473
Wire Pot C2	0	0	0.0078	0.0144	0.0144	0.0202	0.0209	0.028	0.0333	0.0326	0.0404
Wire Pot C3	0	-0.0025	0.0124	0.0099	0.0124	0.0149	0.0198	0.0223	0.0272	0.0309	0.0371
Wire Pot C4	0	0.0046	0.0046	0.0069	0.0115	0.0115	0.016	0.0183	0.0229	0.0274	0.0297
Wire Pot C5	0	0.008	0.0126	0.0161	0.0218	0.0241	0.0252	0.031	0.0379	0.0413	0.0436
Wire Pot C6	0	0.0061	0.0086	0.011	0.0171	0.0245	0.0269	0.0294	0.0367	0.0417	0.0417
Strain Gage A1	0	13	24	37	49	58	70	79	91	101	113
Strain Gage A2	0	11	21	32	43	54	68	80	94	109	122
Strain Gage A3	0	13	27	41	57	73	94	114	133	156	176
Strain Gage A4	0	12	24	38	51	67	85	101	120	139	157
Strain Gage A5	0	12	24	36	49	63	80	93	111	129	146
Strain Gage A6	0	12	25	37	48	58	71	81	94	106	121
Strain Gage B1	0	7	12	18	24	30	37	42	49	56	62
Strain Gage B2	0	7	13	19	25	31	38	42	47	53	59
Strain Gage B3	0	8	15	22	28	34	41	46	52	58	62
Strain Gage B4	0	7	15	23	29	36	43	48	53	60	65
Strain Gage B5	0	7	14	23	30	36	44	50	57	64	71
Strain Gage B6	0	6	12	17	24	30	36	43	49	56	62
Strain Gage C1	0	9	17	26	36	45	56	68	80	94	107
Strain Gage C2	0	5	10	16	22	31	42	54	67	80	91
Strain Gage C3	0	4	10	16	21	28	36	44	52	63	72
Strain Gage C4	0	5	10	16	24	30	38	47	56	66	75
Strain Gage C5	0	5	9	13	18	22	28	32	39	45	50
Strain Gage C6	0	7	12	18	25	31	41	48	57	68	77
Slip 1	0	0	0	0.0002	0.0001	0.0001	0.0002	0.0002	0.0003	0.0004	0.0005
Slip 2	0	0	-0.0001	-0.0001	0	0	0	-0.0001	-0.0001	0	0
Slip 3	0	0	0	0	0	0	0.0001	0.0001	0.0001	0.0002	0.0003
Slip 4	0	-0.0001	-0.0001	0	0	-0.0001	-0.0001	-0.0001	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-6: Test 6 (continued)

Load	11028	12024	13041	14017	14997
Wire Pot A1	0.0629	0.0679	0.0736	0.0773	0.0803
Wire Pot A2	0.0572	0.0617	0.0695	0.0753	0.0823
Wire Pot A3	0.0559	0.0559	0.0633	0.0706	0.0779
Wire Pot A4	0.0549	0.0543	0.0607	0.0679	0.0743
Wire Pot A5	0.0554	0.062	0.062	0.07	0.0752
Wire Pot A6	0.0691	0.0764	0.0757	0.0843	0.0895
Wire Pot B1	0.0699	0.0759	0.0832	0.0879	0.0912
Wire Pot B2	0.0601	0.0672	0.0743	0.0801	0.0866
Wire Pot B3	0.0536	0.0613	0.0678	0.0736	0.08
Wire Pot B4	0.056	0.056	0.0625	0.0703	0.0755
Wire Pot B5	0.0619	0.067	0.0748	0.0754	0.0825
Wire Pot B6	0.0699	0.0686	0.0815	0.0828	0.0828
Wire Pot C1	0.0538	0.0609	0.068	0.068	0.0745
Wire Pot C2	0.045	0.047	0.0548	0.0619	0.0613
Wire Pot C3	0.0396	0.0408	0.0483	0.0557	0.0594
Wire Pot C4	0.0343	0.0343	0.0411	0.048	0.0502
Wire Pot C5	0.0505	0.0562	0.0597	0.0631	0.0677
Wire Pot C6	0.0441	0.0502	0.0564	0.06	0.0649
Strain Gage A1	123	243	250	275	296
Strain Gage A2	137	152	173	192	210
Strain Gage A3	198	222	250	276	303
Strain Gage A4	175	194	218	239	265
Strain Gage A5	163	183	204	225	249
Strain Gage A6	137	159	181	203	230
Strain Gage B1	68	74	80	85	92
Strain Gage B2	64	69	74	81	86
Strain Gage B3	67	73	78	83	88
Strain Gage B4	70	76	82	88	94
Strain Gage B5	77	85	91	98	106
Strain Gage B6	69	75	81	87	93
Strain Gage C1	120	134	148	161	174
Strain Gage C2	103	115	128	139	151
Strain Gage C3	81	91	101	111	122
Strain Gage C4	83	93	103	113	124
Strain Gage C5	56	62	68	74	81
Strain Gage C6	87	97	109	118	130
Slip 1	0.0006	0.0007	0.0008	0.0009	0.001
Slip 2	-0.0001	0	0	0	0
Slip 3	0.0004	0.0005	0.0007	0.0009	0.0011
Slip 4	0	0	0.0002	0.0002	0.0002

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 7
Longitudinal Line Load at Right Side
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15044 lb
Midspan Deflection at Maximum Load:	0.031 in
Quarter A Deflection at Maximum Load:	0.027 in
Quarter B Deflection at Maximum Load:	0.022 in
End Slip at Maximum Load:	0.0003 in

Table C-7: Experimental results of concentrated load Test 7 on STRUX-reinforced slab

Load	0	1064	2024	3046	4027	5096	6030	7042	8044	9035	10031
Wire Pot A1	0	-0.004	-0.0063	-0.0073	-0.0087	-0.011	-0.013	-0.0143	-0.0157	-0.016	-0.017
Wire Pot A2	0	0	-0.0058	-0.0071	-0.0071	-0.0071	-0.0064	-0.0071	-0.0071	-0.0071	-0.0071
Wire Pot A3	0	0	0.0007	-0.0007	0.0007	0.008	0.0073	0.0067	0.0053	0.0073	0.0067
Wire Pot A4	0	0.0065	0.0078	0.0142	0.0155	0.0136	0.0207	0.02	0.0207	0.0272	0.0272
Wire Pot A5	0	0.0066	0.0145	0.0185	0.0211	0.0284	0.0284	0.035	0.0337	0.0422	0.0422
Wire Pot A6	0	0.0073	0.0132	0.0277	0.0323	0.0349	0.0415	0.0441	0.0481	0.0494	0.056
Wire Pot B1	0	0	-0.0073	-0.0073	-0.014	-0.014	-0.014	-0.014	-0.014	-0.0133	-0.0146
Wire Pot B2	0	-0.0007	-0.0007	-0.0071	-0.0065	-0.0058	-0.0065	-0.0071	-0.0065	-0.0071	-0.0078
Wire Pot B3	0	0.0007	0.0007	0	0	-0.0006	0	-0.0006	0.0065	0.0065	0.0084
Wire Pot B4	0	0.0072	0.0072	0.0137	0.015	0.0215	0.0209	0.0215	0.0274	0.0274	0.0274
Wire Pot B5	0	0.0058	0.0135	0.0193	0.0258	0.027	0.0335	0.0335	0.0406	0.0406	0.0477
Wire Pot B6	0	0	0.0155	0.0272	0.0298	0.0401	0.0414	0.0401	0.0518	0.0531	0.0543
Wire Pot C1	0	-0.0006	-0.0071	-0.0071	-0.0142	-0.0136	-0.0136	-0.0142	-0.0129	-0.0142	-0.0136
Wire Pot C2	0	0.0006	-0.0026	-0.0066	-0.0052	-0.0059	-0.0066	-0.0079	-0.0066	-0.0059	-0.0066
Wire Pot C3	0	-0.0013	-0.0013	-0.0013	-0.0013	0.0012	0.0037	0.0037	0.0086	0.0086	0.0111
Wire Pot C4	0	0.0023	0.0069	0.0115	0.0137	0.0137	0.0183	0.0206	0.0206	0.0229	0.0251
Wire Pot C5	0	0.0149	0.023	0.0252	0.0287	0.0367	0.0402	0.0448	0.0482	0.0517	0.0539
Wire Pot C6	0	0.0073	0.0159	0.0232	0.0294	0.0343	0.0367	0.0404	0.0453	0.049	0.0539
Strain Gage A1	0	1	0	0	0	-2	-3	-3	-3	-1	0
Strain Gage A2	0	1	3	4	6	8	9	11	13	16	17
Strain Gage A3	0	3	8	10	14	18	22	26	30	35	40
Strain Gage A4	0	6	10	14	19	22	25	31	36	41	47
Strain Gage A5	0	3	6	7	10	13	15	19	21	25	29
Strain Gage A6	0	7	11	16	18	24	27	31	36	41	46
Strain Gage B1	0	0	1	2	3	4	5	7	8	9	11
Strain Gage B2	0	2	3	4	7	8	9	10	12	13	16
Strain Gage B3	0	2	4	5	8	9	11	13	14	16	19
Strain Gage B4	0	2	3	5	6	9	10	11	14	14	16
Strain Gage B5	0	1	2	5	5	7	9	11	13	14	16
Strain Gage B6	0	1	2	4	5	8	10	12	14	16	19
Strain Gage C1	0	-9	-19	-27	-34	-39	-42	-45	-47	-47	-47
Strain Gage C2	0	1	3	6	8	10	13	15	19	23	27
Strain Gage C3	0	2	4	6	10	13	15	18	22	26	30
Strain Gage C4	0	3	6	9	12	14	17	20	24	28	32
Strain Gage C5	0	16	28	37	43	50	54	58	62	66	70
Strain Gage C6	0	2	3	6	8	10	13	17	20	26	29
Slip 1	0	0.0001	0.0001	0	0	0	0	-1E-04	-1E-04	-1E-04	-1E-04
Slip 2	0	0	-0.0001	0	0	-0.0001	0	-0.0001	-0.0001	-0.0001	0
Slip 3	0	0	0	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 4	0	0	0	0.0001	0.0001	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-7: Test 7 (continued)

Load	11069	12164	13098	14027	15044
Wire Pot A1	-0.017	-0.017	-0.0167	-0.0167	-0.017
Wire Pot A2	-0.0071	-0.0077	-0.0071	-0.0064	-0.0071
Wire Pot A3	0.0147	0.014	0.014	0.014	0.0133
Wire Pot A4	0.0272	0.0336	0.0343	0.0349	0.0401
Wire Pot A5	0.0416	0.0488	0.0495	0.0535	0.0548
Wire Pot A6	0.0553	0.0626	0.0626	0.0698	0.0692
Wire Pot B1	-0.014	-0.0133	-0.0126	-0.014	-0.014
Wire Pot B2	-0.0065	-0.0026	-0.0007	0.0006	0
Wire Pot B3	0.0065	0.0142	0.0136	0.0136	0.0194
Wire Pot B4	0.0339	0.0345	0.041	0.0404	0.0417
Wire Pot B5	0.0477	0.0541	0.0548	0.0606	0.0612
Wire Pot B6	0.0556	0.0673	0.066	0.0686	0.0686
Wire Pot C1	-0.0142	-0.0136	-0.0136	-0.0149	-0.0136
Wire Pot C2	-0.0059	-0.0066	-0.0072	-0.0066	-0.0059
Wire Pot C3	0.0136	0.0148	0.0111	0.0136	0.0148
Wire Pot C4	0.0229	0.0251	0.0343	0.0343	0.0297
Wire Pot C5	0.0585	0.0608	0.0631	0.0689	0.07
Wire Pot C6	0.0576	0.06	0.0625	0.0661	0.0698
Strain Gage A1	1	1	1	-55	-55
Strain Gage A2	19	22	25	27	31
Strain Gage A3	46	51	56	62	69
Strain Gage A4	52	60	65	72	80
Strain Gage A5	34	38	44	50	56
Strain Gage A6	51	58	64	71	79
Strain Gage B1	13	14	15	17	19
Strain Gage B2	17	20	21	23	26
Strain Gage B3	20	23	24	27	29
Strain Gage B4	19	20	22	24	27
Strain Gage B5	17	21	22	24	28
Strain Gage B6	22	25	28	30	35
Strain Gage C1	-46	-43	-41	-39	-36
Strain Gage C2	32	38	45	52	60
Strain Gage C3	34	39	45	50	58
Strain Gage C4	38	43	48	54	61
Strain Gage C5	74	79	85	89	94
Strain Gage C6	36	42	48	55	61
Slip 1	0	-1E-04	-1E-04	-1E-04	-1E-04
Slip 2	-0.0001	0	0	0	0
Slip 3	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 4	0.0003	0.0004	0.0005	0.0005	0.0006

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 8
Longitudinal Line Load at Left Side
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15044 lb
Midspan Deflection at Maximum Load:	0.027 in
Quarter A Deflection at Maximum Load:	0.026 in
Quarter B Deflection at Maximum Load:	0.027 in
End Slip at Maximum Load:	0.0003 in

Table C-8: Experimental results of concentrated load Test 8 on STRUX-reinforced slab

Load	0	981	1998	3005	4017	4966	6020	7032	8090	9056	10042
Wire Pot A1	0	0.0067	0.0127	0.0231	0.0271	0.0314	0.0385	0.0421	0.0445	0.0482	0.0502
Wire Pot A2	0	0.007	0.0122	0.0135	0.0205	0.0263	0.027	0.0334	0.0328	0.0398	0.0411
Wire Pot A3	0	0.008	0.0074	0.0074	0.0154	0.0154	0.022	0.022	0.022	0.0267	0.0287
Wire Pot A4	0	-0.0013	-0.0013	-0.0007	0	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013
Wire Pot A5	0	-0.0014	0	-0.008	-0.0066	-0.0093	-0.0066	-0.008	-0.008	-0.0073	-0.0073
Wire Pot A6	0	-0.002	-0.0066	-0.0132	-0.0132	-0.0138	-0.0145	-0.0132	-0.0165	-0.0158	-0.0178
Wire Pot B1	0	0.008	0.022	0.0287	0.036	0.0426	0.0433	0.05	0.0559	0.0566	0.0626
Wire Pot B2	0	0.0064	0.0135	0.02	0.0265	0.0271	0.0336	0.0342	0.0407	0.0433	0.0471
Wire Pot B3	0	-0.0013	0.0025	0.0032	0.0116	0.0109	0.0109	0.02	0.0187	0.0245	0.0238
Wire Pot B4	0	0	-0.0007	-0.0007	0.0019	0.0019	0.0026	0.0019	0.0019	0.0091	0.0091
Wire Pot B5	0	0.0007	0	0.0013	-0.0051	-0.0058	-0.0058	-0.0071	-0.0058	-0.0058	-0.0064
Wire Pot B6	0	0.0013	-0.0117	-0.0104	-0.0104	-0.0117	-0.013	-0.0117	-0.0156	-0.0156	-0.0156
Wire Pot C1	0	0.0078	0.0214	0.0273	0.0344	0.0409	0.0486	0.0486	0.0551	0.0622	0.0616
Wire Pot C2	0	0.0072	0.0144	0.0215	0.0222	0.0287	0.0339	0.0359	0.0424	0.0417	0.0417
Wire Pot C3	0	0.0012	0.0123	0.0136	0.0148	0.016	0.0185	0.0222	0.0259	0.0247	0.0272
Wire Pot C4	0	0	-0.0023	-0.0023	0	0	0.0023	0.0091	0.0046	0.0023	0.0069
Wire Pot C5	0	-0.0046	-0.0069	-0.0092	-0.0126	-0.0115	-0.0115	-0.0115	-0.0126	-0.0115	-0.0126
Wire Pot C6	0	-0.0061	-0.0086	-0.0098	-0.011	-0.0147	-0.0159	-0.0171	-0.0171	-0.0184	-0.0159
Strain Gage A1	0	2	4	6	10	13	16	21	26	30	37
Strain Gage A2	0	2	5	6	9	11	14	16	18	22	24
Strain Gage A3	0	3	7	11	14	17	22	26	30	34	39
Strain Gage A4	0	4	6	8	11	12	15	19	22	26	29
Strain Gage A5	0	1	2	3	4	6	8	11	13	13	17
Strain Gage A6	0	-1	-2	-3	-4	-5	-5	-4	-3	-2	0
Strain Gage B1	0	1	3	5	6	8	11	12	16	18	21
Strain Gage B2	0	1	2	2	5	6	9	10	11	13	14
Strain Gage B3	0	2	4	5	7	8	11	13	15	16	18
Strain Gage B4	0	2	4	6	7	7	10	12	13	15	17
Strain Gage B5	0	1	3	4	5	7	8	9	13	14	16
Strain Gage B6	0	0	1	2	2	5	5	6	9	10	11
Strain Gage C1	0	27	51	71	84	93	102	110	119	126	135
Strain Gage C2	0	2	5	8	11	14	18	24	31	38	46
Strain Gage C3	0	3	6	9	12	15	19	21	27	31	37
Strain Gage C4	0	3	6	8	11	14	17	21	25	30	34
Strain Gage C5	0	-5	-12	-22	-26	-30	-30	-30	-31	-30	-29
Strain Gage C6	0	1	3	6	8	11	13	15	19	23	25
Slip 1	0	0.0001	0.0001	0.0001	0.0001	0.0002	0.0003	0.0002	0.0003	0.0003	0.0003
Slip 2	0	0	-0.0001	-0.0001	-0.0001	0	0	0	-0.0001	-0.0001	0
Slip 3	0	0	0	0	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003
Slip 4	0	0	0	0	-1E-04	0	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-8: Test 8 (continued)

Load	11085	12045	13036	14006	15044
Wire Pot A1	0.0532	0.0562	0.0605	0.0642	0.0686
Wire Pot A2	0.0475	0.0469	0.0469	0.0553	0.0546
Wire Pot A3	0.0287	0.0287	0.036	0.036	0.038
Wire Pot A4	0.0071	0.0084	0.0077	0.0077	0.0148
Wire Pot A5	-0.0066	-0.0066	-0.0073	-0.0073	-0.0027
Wire Pot A6	-0.0178	-0.0178	-0.0185	-0.0191	-0.0178
Wire Pot B1	0.0633	0.0713	0.0706	0.0779	0.0852
Wire Pot B2	0.0478	0.0542	0.0536	0.0607	0.0652
Wire Pot B3	0.029	0.0316	0.031	0.0381	0.0393
Wire Pot B4	0.0091	0.0084	0.0156	0.0156	0.0149
Wire Pot B5	0.0007	0	0.0007	0.0007	0
Wire Pot B6	-0.0168	-0.0181	-0.0156	-0.0156	-0.0143
Wire Pot C1	0.07	0.0694	0.0758	0.0752	0.0817
Wire Pot C2	0.0496	0.0483	0.0554	0.0548	0.0626
Wire Pot C3	0.0297	0.0297	0.0358	0.0383	0.0408
Wire Pot C4	0.0137	0.0137	0.0114	0.0091	0.0137
Wire Pot C5	-0.0103	-0.0092	-0.0046	-0.0035	-0.0046
Wire Pot C6	-0.0184	-0.0171	-0.0171	-0.0159	-0.0147
Strain Gage A1	43	48	55	64	72
Strain Gage A2	29	31	36	41	46
Strain Gage A3	43	49	54	60	68
Strain Gage A4	33	37	41	47	53
Strain Gage A5	20	23	25	31	34
Strain Gage A6	0	3	5	6	9
Strain Gage B1	23	25	29	32	35
Strain Gage B2	17	19	20	23	25
Strain Gage B3	20	21	25	26	29
Strain Gage B4	19	21	23	25	28
Strain Gage B5	18	20	21	24	27
Strain Gage B6	13	14	16	18	20
Strain Gage C1	142	150	160	171	181
Strain Gage C2	54	63	73	81	91
Strain Gage C3	42	47	54	61	68
Strain Gage C4	39	44	48	54	62
Strain Gage C5	-28	-29	-26	-25	-22
Strain Gage C6	30	33	39	44	50
Slip 1	0.0004	0.0004	0.0004	0.0005	0.0005
Slip 2	-0.0001	0	0	-0.0001	-0.0001
Slip 3	0.0004	0.0004	0.0004	0.0004	0.0005
Slip 4	0.0001	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 9
Longitudinal Line Load at Midspan
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15080 lb
Midspan Deflection at Maximum Load:	0.041 in
Quarter A Deflection at Maximum Load:	0.033 in
Quarter B Deflection at Maximum Load:	0.034 in
End Slip at Maximum Load:	0.0004 in

Table C-9: Experimental results of concentrated load Test 9 on STRUX-reinforced slab

Load	0	1022	2013	3015	4136	5054	6129	7011	8023	9133	10130
Wire Pot A1	0	-0.0006	-0.0003	0.0024	0.0061	0.0084	0.0104	0.0114	0.0131	0.0141	0.0151
Wire Pot A2	0	0.0013	0.0019	0.0019	0.0064	0.009	0.009	0.0103	0.0161	0.0154	0.0154
Wire Pot A3	0	-0.0007	-0.0013	0.0067	0.0053	0.0053	0.0133	0.0133	0.0127	0.0207	0.0193
Wire Pot A4	0	-0.0013	-0.0007	0.0064	0.0071	0.0058	0.0122	0.0129	0.0129	0.0193	0.0193
Wire Pot A5	0	0.0007	-0.0007	0.0013	0.0059	0.0079	0.0073	0.0073	0.0152	0.0145	0.0145
Wire Pot A6	0	0.0007	0.0007	0.0007	0.002	0.0066	0.0086	0.0066	0.0072	0.0138	0.0132
Wire Pot B1	0	0.0007	0	0	0.0067	0.008	0.0087	0.0146	0.014	0.0133	0.022
Wire Pot B2	0	0.0013	0.0007	0.0084	0.0071	0.0084	0.0149	0.0149	0.0162	0.0213	0.0213
Wire Pot B3	0	0	0.0058	0.0078	0.0129	0.0136	0.0123	0.0194	0.0194	0.0187	0.0265
Wire Pot B4	0	0.0006	0.0045	0.0071	0.0084	0.0117	0.0149	0.0143	0.0201	0.0221	0.0208
Wire Pot B5	0	-0.0019	0	0.0058	0.0058	0.0058	0.0129	0.0136	0.0129	0.02	0.02
Wire Pot B6	0	0.0013	0.0013	0	0	0.0013	0	0	0.0155	0.0142	0.0142
Wire Pot C1	0	-0.0013	0	0.0045	0.0065	0.0065	0.0091	0.0129	0.0129	0.0136	0.0194
Wire Pot C2	0	0	0	0	0.0065	0.0059	0.0065	0.0072	0.0131	0.0144	0.0144
Wire Pot C3	0	0	0.0012	0.0074	0.0124	0.0124	0.0148	0.0148	0.0161	0.0198	0.0223
Wire Pot C4	0	0	0.0046	0.0069	0.0069	0.0092	0.0137	0.0137	0.016	0.0229	0.0206
Wire Pot C5	0	0.0046	0.0069	0.0092	0.015	0.0173	0.0196	0.0219	0.0219	0.0253	0.0276
Wire Pot C6	0	0	0.0012	0.0049	0.0037	0.0061	0.0061	0.0061	0.0086	0.0098	0.011
Strain Gage A1	0	3	4	8	12	16	19	24	27	32	36
Strain Gage A2	0	2	2	6	8	9	11	13	16	19	21
Strain Gage A3	0	2	5	7	11	13	18	20	25	28	34
Strain Gage A4	0	1	4	6	10	12	15	19	23	27	32
Strain Gage A5	0	1	3	5	7	10	12	14	17	20	23
Strain Gage A6	0	3	6	8	11	14	19	21	25	29	32
Strain Gage B1	0	0	2	4	6	8	9	10	12	14	15
Strain Gage B2	0	0	2	3	4	6	7	8	9	11	12
Strain Gage B3	0	0	1	2	4	5	6	6	9	10	11
Strain Gage B4	0	0	1	3	3	4	6	6	7	11	11
Strain Gage B5	0	1	2	3	6	7	8	10	11	12	14
Strain Gage B6	0	2	4	5	7	8	9	12	13	14	16
Strain Gage C1	0	7	15	22	29	35	41	46	52	60	67
Strain Gage C2	0	1	3	6	8	11	13	16	21	25	31
Strain Gage C3	0	0	2	5	7	9	12	13	17	20	25
Strain Gage C4	0	2	3	6	8	11	13	16	18	22	25
Strain Gage C5	0	3	7	11	14	18	22	25	28	33	37
Strain Gage C6	0	3	5	7	10	12	14	17	20	24	27
Slip 1	0	0	0	0	0	0	0	0	0	0	0
Slip 2	0	-0.0001	-0.0002	-0.0001	-0.0001	0	-0.0001	-0.0001	-0.0001	-0.0001	0
Slip 3	0	0	0	0	0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
Slip 4	0	0	0	0	0	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-9: Test 9 (continued)

Load	11069	12060	13077	14089	15080
Wire Pot A1	0.0158	0.0198	0.0234	0.0261	0.0281
Wire Pot A2	0.0219	0.0219	0.0264	0.0296	0.0283
Wire Pot A3	0.02	0.0266	0.0266	0.0346	0.034
Wire Pot A4	0.0181	0.0265	0.0258	0.0329	0.0329
Wire Pot A5	0.0191	0.0211	0.0218	0.0284	0.0271
Wire Pot A6	0.0132	0.0211	0.0217	0.0211	0.0277
Wire Pot B1	0.0213	0.0213	0.028	0.0286	0.0359
Wire Pot B2	0.0226	0.0272	0.0278	0.0343	0.0349
Wire Pot B3	0.0252	0.0329	0.0336	0.0388	0.0413
Wire Pot B4	0.028	0.0273	0.0338	0.0338	0.041
Wire Pot B5	0.0187	0.0265	0.0265	0.0335	0.0335
Wire Pot B6	0.0155	0.0168	0.0246	0.0272	0.0298
Wire Pot C1	0.0194	0.0207	0.0272	0.0259	0.0337
Wire Pot C2	0.0209	0.0215	0.0254	0.0274	0.0267
Wire Pot C3	0.0247	0.0285	0.0272	0.0297	0.0346
Wire Pot C4	0.0206	0.0251	0.0274	0.0274	0.0343
Wire Pot C5	0.0287	0.0299	0.031	0.0368	0.0414
Wire Pot C6	0.0159	0.0221	0.0233	0.0233	0.0257
Strain Gage A1	40	45	51	57	64
Strain Gage A2	24	28	34	40	46
Strain Gage A3	39	45	54	65	76
Strain Gage A4	38	45	54	64	75
Strain Gage A5	27	33	41	49	57
Strain Gage A6	36	41	46	52	57
Strain Gage B1	17	20	23	26	30
Strain Gage B2	14	17	20	23	26
Strain Gage B3	13	15	18	21	25
Strain Gage B4	12	14	17	20	22
Strain Gage B5	15	18	22	26	29
Strain Gage B6	19	21	25	27	31
Strain Gage C1	73	82	90	99	110
Strain Gage C2	37	44	54	63	73
Strain Gage C3	29	35	41	49	58
Strain Gage C4	29	34	40	47	53
Strain Gage C5	40	44	49	54	60
Strain Gage C6	31	36	42	49	56
Slip 1	0	0.0001	0.0001	0.0002	0.0002
Slip 2	0	-0.0001	-0.0001	-0.0001	-0.0001
Slip 3	0.0002	0.0002	0.0002	0.0003	0.0003
Slip 4	0.0003	0.0003	0.0003	0.0004	0.0004

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 10
Transverse Line Load at Midspan
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14001 lb
Midspan Deflection at Maximum Load:	0.126 in
Quarter A Deflection at Maximum Load:	0.086 in
Quarter B Deflection at Maximum Load:	0.110 in
End Slip at Maximum Load:	0.0064 in

Table C-10: Experimental results of concentrated load Test 10 on STRUX-reinforced slab

Load	0	1028	2045	3005	4017	5034	6004	6990	8007	8983	10005
Wire Pot A1	0	0.0094	0.0148	0.0238	0.0295	0.0352	0.0435	0.0489	0.0552	0.0629	0.0716
Wire Pot A2	0	0.0057	0.0141	0.0199	0.0263	0.034	0.0398	0.0475	0.0546	0.0604	0.0675
Wire Pot A3	0	0.0067	0.0073	0.014	0.022	0.028	0.0346	0.0366	0.042	0.048	0.056
Wire Pot A4	0	0.0071	0.0064	0.0135	0.02	0.0271	0.0329	0.04	0.0478	0.0517	0.0542
Wire Pot A5	0	0.0013	0.0073	0.0132	0.0211	0.0271	0.035	0.0422	0.0475	0.0548	0.062
Wire Pot A6	0	0.0079	0.0158	0.023	0.0283	0.0356	0.0428	0.05	0.0566	0.0639	0.0705
Wire Pot B1	0	0.0067	0.022	0.028	0.0353	0.0493	0.0553	0.0666	0.0759	0.0839	0.0979
Wire Pot B2	0	0.0065	0.0123	0.0233	0.0336	0.0407	0.0472	0.0595	0.0666	0.0737	0.0866
Wire Pot B3	0	0.0071	0.0142	0.0232	0.0329	0.04	0.0477	0.06	0.0671	0.0762	0.0858
Wire Pot B4	0	0.0065	0.013	0.0202	0.0267	0.0397	0.0476	0.0534	0.0606	0.0736	0.0808
Wire Pot B5	0	0.0071	0.0136	0.0252	0.0348	0.0407	0.0471	0.0619	0.0684	0.0748	0.089
Wire Pot B6	0	0	0.0142	0.0259	0.0388	0.0401	0.0543	0.0673	0.0673	0.0828	0.0958
Wire Pot C1	0	0.0065	0.0136	0.0273	0.0337	0.048	0.0538	0.0603	0.0745	0.081	0.0953
Wire Pot C2	0	0.0026	0.0137	0.0196	0.0274	0.0346	0.0398	0.0548	0.0613	0.0685	0.0828
Wire Pot C3	0	0.0025	0.0124	0.0173	0.026	0.0297	0.0408	0.0445	0.0582	0.0631	0.0742
Wire Pot C4	0	0.0091	0.0137	0.0137	0.0205	0.0319	0.0387	0.041	0.0502	0.0593	0.0638
Wire Pot C5	0	0.0103	0.0207	0.0252	0.031	0.0425	0.0505	0.062	0.0666	0.0758	0.0849
Wire Pot C6	0	0.0122	0.0147	0.0282	0.0318	0.0429	0.0478	0.0576	0.0649	0.0735	0.0821
Strain Gage A1	0	7	18	28	38	48	58	68	77	87	97
Strain Gage A2	0	10	18	26	35	44	53	63	72	81	92
Strain Gage A3	0	13	25	38	52	65	78	91	103	117	130
Strain Gage A4	0	12	24	37	49	64	77	91	103	117	131
Strain Gage A5	0	11	22	34	45	60	73	85	101	115	130
Strain Gage A6	0	11	21	32	40	51	60	70	79	89	97
Strain Gage B1	0	16	29	42	54	65	76	88	100	110	122
Strain Gage B2	0	12	23	35	46	56	68	78	90	102	113
Strain Gage B3	0	13	26	36	49	62	74	87	100	115	127
Strain Gage B4	0	13	24	37	49	64	79	94	109	125	140
Strain Gage B5	0	14	26	38	51	65	78	93	107	121	135
Strain Gage B6	0	16	32	45	59	72	85	97	111	135	161
Strain Gage C1	0	24	48	72	100	131	159	187	217	245	273
Strain Gage C2	0	13	33	56	83	109	134	158	183	208	232
Strain Gage C3	0	12	27	45	66	87	110	131	155	177	198
Strain Gage C4	0	12	28	45	67	88	108	130	153	173	192
Strain Gage C5	0	14	25	38	52	66	80	95	110	127	143
Strain Gage C6	0	14	29	47	69	93	115	138	164	187	212
Slip 1	0	0	0	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0003	0.0003
Slip 2	0	0	0	-0.0001	0	0	-0.0001	0	0	0	-0.0001
Slip 3	0	0	0	0.0001	0.0003	0.0006	0.001	0.0015	0.0021	0.0029	0.0035
Slip 4	0	0.0001	0.0001	0.0001	0.0002	0.0003	0.0004	0.0007	0.0011	0.0014	0.0019

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-10: Test 10 (continued)

Load	10986	12013	12994	14001
Wire Pot A1	0.0773	0.081	0.0903	0.0974
Wire Pot A2	0.0752	0.081	0.0881	0.0958
Wire Pot A3	0.0613	0.0699	0.0766	0.0839
Wire Pot A4	0.0607	0.0678	0.0743	0.0872
Wire Pot A5	0.0667	0.0766	0.0825	0.0884
Wire Pot A6	0.0784	0.0843	0.0922	0.1001
Wire Pot B1	0.1052	0.1198	0.1265	0.1398
Wire Pot B2	0.0943	0.1079	0.1157	0.1286
Wire Pot B3	0.093	0.1065	0.113	0.1265
Wire Pot B4	0.0945	0.101	0.1146	0.1257
Wire Pot B5	0.0961	0.109	0.1174	0.1322
Wire Pot B6	0.11	0.1113	0.1229	0.1359
Wire Pot C1	0.1018	0.116	0.1231	0.1341
Wire Pot C2	0.09	0.0958	0.1108	0.1226
Wire Pot C3	0.0817	0.0928	0.099	0.1151
Wire Pot C4	0.0684	0.0867	0.0912	0.1049
Wire Pot C5	0.0941	0.101	0.1091	0.1194
Wire Pot C6	0.0919	0.1005	0.1127	0.1226
Strain Gage A1	107	116	125	135
Strain Gage A2	99	110	119	127
Strain Gage A3	143	157	169	182
Strain Gage A4	144	158	171	184
Strain Gage A5	143	157	171	183
Strain Gage A6	106	114	122	130
Strain Gage B1	133	183	247	284
Strain Gage B2	125	139	185	217
Strain Gage B3	141	156	238	300
Strain Gage B4	151	168	188	273
Strain Gage B5	149	167	194	236
Strain Gage B6	191	237	269	306
Strain Gage C1	301	332	363	404
Strain Gage C2	258	288	319	352
Strain Gage C3	220	245	267	291
Strain Gage C4	212	233	254	271
Strain Gage C5	159	176	193	217
Strain Gage C6	236	260	288	315
Slip 1	0.0004	0.0005	0.0005	0.0006
Slip 2	-0.0001	-0.0001	0	0
Slip 3	0.0043	0.0052	0.0062	0.0079
Slip 4	0.0023	0.0029	0.0036	0.0048

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Test Designation: STRUX Concentrated Load Test 11
Concentrated Point Load at Midspan
Cast Date: 12/16/2005
Test Date: 4/18/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	10 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	3800 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	11993 lb
Midspan Deflection at Maximum Load:	0.213 in
Quarter A Deflection at Maximum Load:	0.124 in
Quarter B Deflection at Maximum Load:	0.210 in
End Slip at Maximum Load:	0.0295 in
Maximum Applied Load (Unrecorded):	12200 lb

Table C-11: Experimental results of concentrated load Test 11 on STRUX-reinforced slab

Load	0	535	1095	1552	1982	2475	3088	3518	4011	4499	5008
Wire Pot A1	0	-0.0003	0.0007	0.0037	0.006	0.0084	0.0107	0.0124	0.0144	0.0184	0.0237
Wire Pot A2	0	0.0038	0.0013	0.0077	0.0083	0.0077	0.0161	0.0141	0.0218	0.0225	0.0283
Wire Pot A3	0	0.008	0.0067	0.008	0.0154	0.0147	0.0214	0.022	0.0287	0.0287	0.0353
Wire Pot A4	0	-0.002	0.0045	0.0064	0.0058	0.0116	0.0129	0.0187	0.0187	0.0258	0.0329
Wire Pot A5	0	0	0	0.0027	0.006	0.0093	0.0139	0.0192	0.0211	0.0271	0.0277
Wire Pot A6	0	0.0007	0.0014	0.0079	0.0079	0.0139	0.0152	0.0218	0.0224	0.0297	0.035
Wire Pot B1	0	-0.0007	0.006	0.0053	0.0093	0.0133	0.0199	0.0213	0.0273	0.0339	0.0412
Wire Pot B2	0	0.002	0.002	0.0091	0.0078	0.0155	0.022	0.0213	0.0285	0.0356	0.042
Wire Pot B3	0	0.0013	0.0019	0.0084	0.0084	0.0149	0.0207	0.0291	0.0355	0.0426	0.0484
Wire Pot B4	0	-0.0007	0.0058	0.0123	0.0123	0.0201	0.0273	0.0338	0.0403	0.0462	0.054
Wire Pot B5	0	0.0071	0.0064	0.0142	0.0142	0.0213	0.0271	0.0335	0.0412	0.0477	0.0548
Wire Pot B6	0	-0.0013	-0.0013	0.0116	0.0116	0.0116	0.0259	0.0259	0.0401	0.0414	0.0543
Wire Pot C1	0	0.0026	0.0072	0.0078	0.013	0.0169	0.0201	0.0266	0.0344	0.0409	0.0473
Wire Pot C2	0	0	0.0065	0.0072	0.0072	0.0131	0.0196	0.0202	0.028	0.0333	0.0411
Wire Pot C3	0	0.0025	0.0037	0.0111	0.0136	0.0161	0.021	0.026	0.0322	0.0371	0.0408
Wire Pot C4	0	0	0.0068	0.0046	0.0114	0.0091	0.0205	0.0228	0.0296	0.0342	0.0433
Wire Pot C5	0	0.0012	0.0046	0.0092	0.0138	0.0184	0.0253	0.0299	0.0333	0.0425	0.046
Wire Pot C6	0	0.0025	0.0037	0.0098	0.0098	0.0184	0.0221	0.0282	0.0343	0.0405	0.0466
Strain Gage A1	0	4	8	12	14	19	21	25	29	34	39
Strain Gage A2	0	4	8	11	14	18	23	27	31	36	41
Strain Gage A3	0	6	12	17	22	28	37	42	49	55	62
Strain Gage A4	0	6	11	16	22	27	35	41	48	55	61
Strain Gage A5	0	5	11	15	20	25	35	39	45	53	60
Strain Gage A6	0	5	9	14	19	24	30	34	39	44	49
Strain Gage B1	0	7	13	18	25	31	40	47	54	61	70
Strain Gage B2	0	8	14	20	26	33	44	51	58	66	75
Strain Gage B3	0	13	24	35	46	60	76	89	101	115	129
Strain Gage B4	0	11	23	34	48	63	82	95	111	128	145
Strain Gage B5	0	8	15	21	27	35	43	50	57	64	73
Strain Gage B6	0	8	12	17	21	26	33	38	43	48	54
Strain Gage C1	0	11	23	32	43	56	74	87	105	125	150
Strain Gage C2	0	9	20	31	45	62	86	105	128	152	174
Strain Gage C3	0	7	13	20	27	37	51	63	77	93	108
Strain Gage C4	0	7	11	19	25	33	46	55	67	80	92
Strain Gage C5	0	6	12	16	22	27	35	42	50	59	69
Strain Gage C6	0	7	15	24	32	43	59	71	84	101	117
Slip 1	0	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	0.0002	0.0002	0.0002
Slip 2	0	0	0	0	0	0	0	0	0	-0.0001	0
Slip 3	0	0	0	0	0.0001	0.0002	0.0003	0.0004	0.0009	0.0014	0.0023
Slip 4	0	0	0	-1E-04	-0.0002	0.0001	0.0003	0.0005	0.0009	0.0015	0.0023

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-11: Test 11 (continued)

Load	5501	6004	6487	7016	7499	7987	8500	8993	9507	9995	10426
Wire Pot A1	0.0271	0.0308	0.0338	0.0375	0.0421	0.0485	0.0525	0.0559	0.0582	0.0599	0.0629
Wire Pot A2	0.0347	0.036	0.0424	0.0489	0.0495	0.0566	0.063	0.063	0.0694	0.0765	0.0759
Wire Pot A3	0.0433	0.0427	0.0493	0.058	0.0633	0.0647	0.07	0.0773	0.084	0.0913	0.0913
Wire Pot A4	0.0329	0.04	0.0465	0.0536	0.0536	0.06	0.0672	0.073	0.0801	0.0872	0.0936
Wire Pot A5	0.035	0.0409	0.0482	0.0475	0.0555	0.0614	0.068	0.0746	0.0753	0.0825	0.0891
Wire Pot A6	0.0415	0.0429	0.0501	0.0567	0.0633	0.0639	0.0699	0.0771	0.0778	0.085	0.0909
Wire Pot B1	0.0486	0.0545	0.0612	0.0685	0.0765	0.0845	0.0898	0.0965	0.1018	0.1045	0.1191
Wire Pot B2	0.0491	0.0562	0.0627	0.0704	0.0763	0.0827	0.0898	0.1021	0.1099	0.1176	0.1241
Wire Pot B3	0.0543	0.062	0.0691	0.0814	0.0878	0.0956	0.1078	0.115	0.1279	0.1408	0.1485
Wire Pot B4	0.0599	0.067	0.0801	0.0872	0.1009	0.1081	0.1139	0.1283	0.138	0.1472	0.1615
Wire Pot B5	0.0619	0.0683	0.0819	0.0883	0.0961	0.109	0.116	0.1225	0.136	0.1438	0.158
Wire Pot B6	0.066	0.066	0.0789	0.0815	0.0932	0.1074	0.1087	0.123	0.1359	0.1333	0.1475
Wire Pot C1	0.0538	0.0622	0.0674	0.0817	0.0881	0.094	0.1089	0.1154	0.1231	0.1296	0.1432
Wire Pot C2	0.0476	0.0554	0.0685	0.0763	0.0835	0.0971	0.105	0.1115	0.1252	0.1317	0.146
Wire Pot C3	0.0544	0.0619	0.0668	0.0829	0.0891	0.1014	0.1051	0.1113	0.1324	0.1373	0.1509
Wire Pot C4	0.0479	0.0547	0.0661	0.0753	0.0821	0.0935	0.1026	0.1163	0.1346	0.1391	0.1483
Wire Pot C5	0.0528	0.0609	0.0701	0.0815	0.0907	0.0965	0.1045	0.1148	0.1229	0.1332	0.1435
Wire Pot C6	0.0552	0.0662	0.0736	0.0809	0.0895	0.1018	0.1042	0.1153	0.1189	0.13	0.1373
Strain Gage A1	44	50	53	58	62	67	71	76	82	86	91
Strain Gage A2	44	48	54	58	63	66	71	76	81	84	87
Strain Gage A3	68	76	82	89	96	103	110	116	123	129	133
Strain Gage A4	68	75	82	88	96	102	108	114	117	120	122
Strain Gage A5	66	73	80	87	95	101	109	116	124	130	136
Strain Gage A6	55	59	64	69	74	79	82	87	93	98	103
Strain Gage B1	78	86	93	102	110	118	127	135	144	154	164
Strain Gage B2	82	90	98	106	115	123	131	141	157	172	191
Strain Gage B3	142	155	169	181	193	207	219	225	205	202	219
Strain Gage B4	159	177	194	211	228	247	267	292	314	347	371
Strain Gage B5	81	89	96	105	114	121	129	139	152	166	183
Strain Gage B6	59	64	71	77	82	87	94	101	110	117	126
Strain Gage C1	175	202	229	255	279	303	326	351	382	408	437
Strain Gage C2	196	218	241	262	283	305	324	346	367	389	410
Strain Gage C3	125	141	157	175	192	211	228	248	270	292	313
Strain Gage C4	106	120	135	151	166	182	197	213	230	243	258
Strain Gage C5	80	92	105	117	129	141	152	165	179	192	207
Strain Gage C6	135	154	173	193	210	229	247	267	290	309	331
Slip 1	0.0002	1E-04	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0004	0.0003	0.0003
Slip 2	-0.0001	0	0	0	0	0	0	0	0	0	0
Slip 3	0.0034	0.0047	0.0061	0.0075	0.009	0.0104	0.0118	0.0133	0.015	0.0166	0.0188
Slip 4	0.0034	0.0047	0.0062	0.0075	0.009	0.0105	0.0118	0.0133	0.0151	0.0167	0.0187

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

Table C-11: Test 11 (continued)

Load	11033	11495	11993	10062
Wire Pot A1	0.0686	0.0732	0.0793	0.2913
Wire Pot A2	0.0836	0.0952	0.1042	0.254
Wire Pot A3	0.106	0.1119	0.1266	0.2592
Wire Pot A4	0.1008	0.1143	0.1208	0.2565
Wire Pot A5	0.0964	0.103	0.1175	0.2488
Wire Pot A6	0.0982	0.1048	0.1133	0.2793
Wire Pot B1	0.1258	0.1397	0.1544	0.3155
Wire Pot B2	0.137	0.1506	0.1699	0.3805
Wire Pot B3	0.166	0.1821	0.2066	0.4688
Wire Pot B4	0.1752	0.1947	0.2195	0.5048
Wire Pot B5	0.1696	0.1883	0.2083	0.4636
Wire Pot B6	0.1605	0.1747	0.189	0.4479
Wire Pot C1	0.1568	0.1769	0.195	0.2793
Wire Pot C2	0.1591	0.1734	0.193	0.2901
Wire Pot C3	0.1658	0.1856	0.2103	0.3278
Wire Pot C4	0.162	0.1871	0.2099	0.333
Wire Pot C5	0.155	0.1734	0.1918	0.302
Wire Pot C6	0.152	0.168	0.1876	0.2771
Strain Gage A1	96	97	98	268
Strain Gage A2	92	95	98	437
Strain Gage A3	141	144	145	242
Strain Gage A4	124	127	125	274
Strain Gage A5	143	150	152	275
Strain Gage A6	108	114	120	251
Strain Gage B1	177	173	192	345
Strain Gage B2	213	233	291	476
Strain Gage B3	266	297	366	736
Strain Gage B4	326	334	382	1734
Strain Gage B5	208	243	442	1083
Strain Gage B6	138	165	200	556
Strain Gage C1	477	521	578	500
Strain Gage C2	444	477	515	315
Strain Gage C3	340	370	398	406
Strain Gage C4	272	296	319	336
Strain Gage C5	227	249	272	224
Strain Gage C6	362	393	417	388
Slip 1	0.0004	0.0004	0.0004	0.0287
Slip 2	0	0	0	0.0179
Slip 3	0.0217	0.0256	0.0297	0.0477
Slip 4	0.0216	0.0253	0.0293	0.0467

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches.

*****Reached 12200 lb and then failed. After cracking, more load was applied but would not go above 11500 lb.

APPENDIX D
RESULTS OF ADDITIONAL COMPOSITE SLAB 1 REINFORCED WITH STRUX 90/40 UNDER CONCENTRATED LOAD TESTS

The following section presents test results for the first of the additional two slab specimens reinforced with STRUX 90/40 synthetic macro fibers that was subjected to the eleven concentrated load tests. Two additional composite slabs reinforced with STRUX were cast due to the poor test results gathered from the original fiber-reinforced slab subjected to concentrated load tests. The reasons for their construction are described in better detail in Section 4.6

For each test, a summary of test parameters and properties are included, as well as a diagram of the load location. Measured test data is tabulated for load, vertical displacements, horizontal end slip, and deck strains of the bottom flanges. In the tabulated test data, 'wire pot' refers to the vertical displacements and 'slip' refers to the displacement between the concrete and steel deck.

Note that at low loads before any deflections are registered by the wire pots, the deflections have the tendency to "jump" and may show values that fluctuate between positive and negative. In the following tables, the sign convention for all wire pots is that down is positive and up is negative.

For purposes of better understanding the given test data, Figure D-1 and Figure D-2 below show the layout of all instrumentation, except for the load cell, and their respective names that were monitored during concentrated load tests. Note that 'Quarter Point A' and 'Third Point A' refer to a point L/4 and L/3 from the left support, respectively. Similarly, 'Quarter Point B' and 'Third Point B' refer to a point L/4 and L/3 from the right support, respectively.

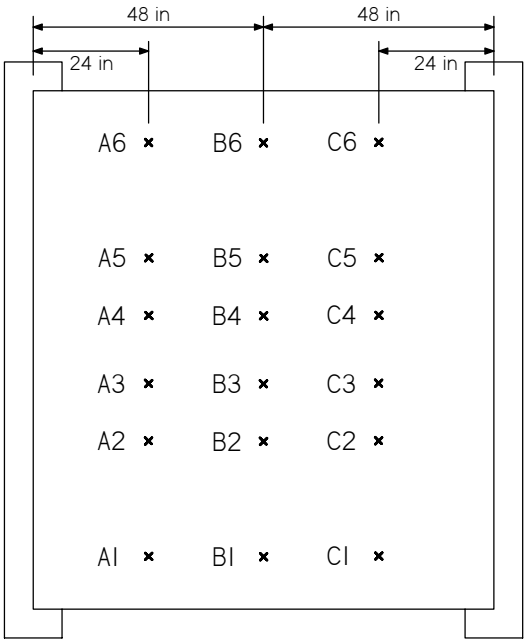

Figure D-1: Strain gage locations and designations for concentrated load tests – recast slab set

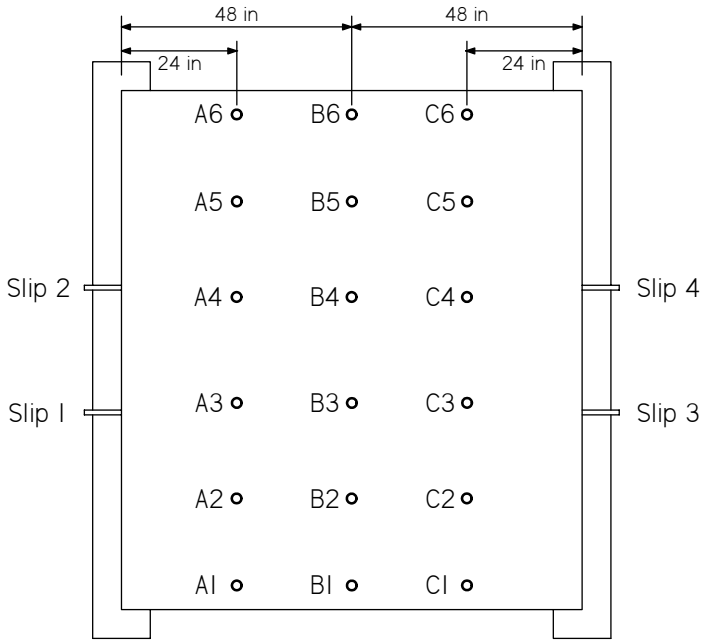

Figure D-2: Displacement transducer locations and designations for concentrated load tests – recast slab set

Test Designation: STRUX Concentrated Load Test 1 – Recast Slab 1
Concentrated Point Load at Quarter Point A
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14992 lb
Midspan Deflection at Maximum Load:	0.031 in
Quarter A Deflection at Maximum Load:	0.034 in
Quarter B Deflection at Maximum Load:	0.020 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

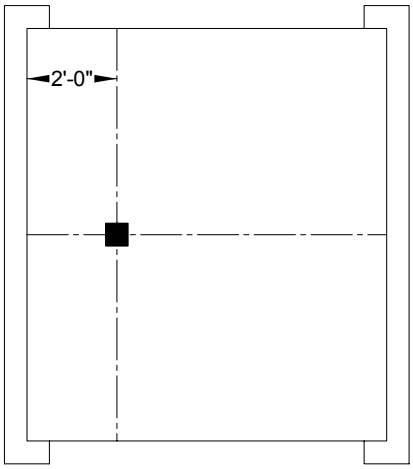

Figure D-3: Location of concentrated point load at Quarter Point A – second slab set

Table D-1: Experimental results of concentrated load Test 1 on recast STRUX-reinforced slab 1

Load (lbs)	0	568	984	1492	1995	2492	3000	3508	3989	4497	4989
Wire Pot A1	0	0.0013	0.0013	0.0019	0.0006	0.0013	0.0006	0.0006	0.0013	0.0032	0.0071
Wire Pot A2	0	0.0006	0.0013	0.0013	0.0013	0	0.0006	0.0006	0.0013	0	0.0084
Wire Pot A3	0	0.0013	0.0013	0.0013	0.0086	0.0086	0.008	0.0093	0.008	0.0093	0.0147
Wire Pot A4	0	0.0003	0.0014	0.002	0.003	0.004	0.0054	0.006	0.0074	0.008	0.008
Wire Pot A5	0	0.0007	0.0007	0.0013	0.002	0	0.0007	0.0007	0.002	0.0013	-0.0007
Wire Pot A6	0	0.0006	0.0013	0.0006	0.0006	0.0006	0	0.0006	0.0013	-0.0007	0.0019
Wire Pot B1	0	-0.0007	-0.0013	-0.0013	-0.0013	-0.0013	-0.0007	0.0006	0.0039	0.0065	0.0065
Wire Pot B2	0	0	-0.0007	0	-0.0007	0	0	0.0006	0	0.0013	0.0006
Wire Pot B3	0	0	0	-0.0013	0	0.0078	0.0143	0.0143	0.0104	0.0143	0.0117
Wire Pot B4	0	-0.0006	-0.0013	0	0	-0.0006	-0.0006	-0.0019	-0.0013	0.0059	0.0072
Wire Pot B5	0	-0.0012	0.0013	0	-0.0012	-0.0012	0	-0.0012	0.0013	0.0013	0.0025
Wire Pot B6	0	0	0	-0.0014	0	0	0	0.0006	0.002	0.008	0.0073
Wire Pot C1	0	-0.0006	-0.0006	-0.0006	0	-0.0006	-0.0006	-0.0013	-0.0006	-0.0006	-0.0006
Wire Pot C2	0	-0.0023	0.0069	-0.0023	0.0023	0.0023	0.0046	-0.0023	0.0046	0.0023	0.0069
Wire Pot C3	0	-0.0011	-0.0011	0.0012	0.0023	0	0.0023	0.0046	0.0035	0.0046	0.0035
Wire Pot C4	0	0	0.0023	0	-0.0046	0	0.0023	-0.0023	0.0023	0.0023	0
Wire Pot C5	0	0	-0.0024	0	0	0	0	0.0023	0	0	0
Wire Pot C6	0	0	-0.0012	-0.0012	0	-0.0012	-0.0012	0	-0.0012	-0.0012	0
Strain Gage A1	0	2	3	4	7	10	12	12	15	16	18
Strain Gage A2	0	4	6	9	14	17	20	25	28	32	36
Strain Gage A3	0	8	14	22	30	39	49	60	70	82	93
Strain Gage A4	0	8	12	19	26	37	46	57	68	78	91
Strain Gage A5	0	4	8	12	15	18	22	26	30	34	37
Strain Gage A6	0	2	4	5	7	9	11	13	16	17	19
Strain Gage B1	0	2	4	7	9	11	13	15	17	20	22
Strain Gage B2	0	3	5	8	9	11	14	16	19	21	23
Strain Gage B3	0	3	5	6	9	12	14	17	19	21	24
Strain Gage B4	0	2	4	6	9	11	12	15	17	19	21
Strain Gage B5	0	2	5	8	11	14	16	19	22	25	28
Strain Gage B6	0	2	4	5	8	9	11	13	16	18	21
Strain Gage C1	0	2	2	3	5	7	7	8	10	11	11
Strain Gage C2	0	1	3	2	3	5	5	7	7	8	10
Strain Gage C3	0	0	1	2	3	4	5	6	7	8	9
Strain Gage C4	0	0	1	1	3	4	5	6	6	7	8
Strain Gage C5	0	1	2	3	5	6	6	8	9	10	12
Strain Gage C6	0	0	2	2	3	4	5	6	7	8	9
Slip 1	0	0.0000	-0.0001	0.0000	0.0000	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0.0000
Slip 2	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000
Slip 3	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0003	-0.0001	-0.0001	-0.0001	-0.0001	0.0000
Slip 4	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	-0.0001	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*Wire Pot A5 and Wire Pot C4 were not registering correctly during testing – their results can be ignored.

Table D-1: Test 1 (continued)

Load (lbs)	5486	5989	6524	7048	7491	7988	8534	9004	9512	9999	10566
Wire Pot A1	0.0071	0.0078	0.0078	0.0078	0.0071	0.0078	0.0078	0.0084	0.0078	0.0084	0.0155
Wire Pot A2	0.0084	0.0084	0.0078	0.0078	0.0078	0.0071	0.0149	0.0143	0.0155	0.0149	0.0155
Wire Pot A3	0.016	0.0153	0.0153	0.0147	0.0153	0.0233	0.0227	0.0227	0.0227	0.024	0.0233
Wire Pot A4	0.0084	0.0097	0.0104	0.0114	0.0131	0.0144	0.0164	0.0174	0.0197	0.0201	0.0211
Wire Pot A5	0.0013	0.0013	0.0013	0.002	0.002	0.0013	0.0007	0.0007	0	0.0013	0.0007
Wire Pot A6	0.0013	0	0.0006	-0.0007	0.0006	0.0019	0.0013	0.0019	0.0071	0.0084	0.0078
Wire Pot B1	0.0052	0.0052	0.0058	0.0071	0.0052	0.0052	0.0058	0.0052	0.0052	0.0052	0.0103
Wire Pot B2	0.0084	0.0071	0.0064	0.0077	0.0077	0.0064	0.0084	0.0142	0.0129	0.0155	0.0142
Wire Pot B3	0.0117	0.013	0.013	0.013	0.0117	0.0117	0.0195	0.026	0.026	0.0273	0.0273
Wire Pot B4	0.0059	0.0059	0.0065	0.0124	0.0137	0.0124	0.0124	0.013	0.013	0.0195	0.0208
Wire Pot B5	0.0025	0.0037	0.0049	0.0049	0.0098	0.0086	0.0098	0.011	0.0123	0.0135	0.0159
Wire Pot B6	0.0066	0.0066	0.0066	0.0066	0.0073	0.014	0.0133	0.014	0.014	0.0133	0.0133
Wire Pot C1	-0.0006	-0.0006	-0.0006	-0.0019	-0.0006	-0.0006	0.0019	0.0065	0.0058	0.0058	0.0058
Wire Pot C2	0.0069	0.0092	0.0023	0.0046	0.0069	0.0046	0.0046	0.0023	0.0069	0.0023	0.0069
Wire Pot C3	0.0058	0.0046	0.0081	0.0069	0.0069	0.0092	0.0103	0.0081	0.0103	0.0115	0.0115
Wire Pot C4	0	-0.0023	0	0.0023	0.0023	0	0.0023	0.0023	0.0023	0	0.0092
Wire Pot C5	-0.0024	-0.0024	0.0023	-0.0024	0.0023	0.0069	0.0069	0.0069	0.0093	0.0093	0.0093
Wire Pot C6	0	0.0012	-0.0024	0.0012	-0.0012	-0.0012	0.0012	0.0035	0.0035	0.0047	0.0047
Strain Gage A1	20	22	24	26	29	31	33	34	37	38	41
Strain Gage A2	41	45	50	55	58	63	67	72	76	81	85
Strain Gage A3	105	118	130	143	153	166	180	191	202	216	230
Strain Gage A4	102	115	126	139	150	162	175	187	197	210	224
Strain Gage A5	42	46	49	55	59	62	68	71	76	80	85
Strain Gage A6	21	22	25	27	29	31	34	35	38	38	41
Strain Gage B1	25	26	29	31	34	37	39	41	44	46	49
Strain Gage B2	25	28	30	33	35	37	40	42	44	47	50
Strain Gage B3	25	27	31	33	35	37	40	42	45	47	51
Strain Gage B4	23	24	29	30	32	35	38	39	42	44	46
Strain Gage B5	31	34	37	41	44	47	50	54	57	59	64
Strain Gage B6	22	25	27	29	32	34	36	39	41	43	45
Strain Gage C1	13	14	14	17	17	18	20	21	22	23	25
Strain Gage C2	10	14	12	13	15	15	17	18	19	20	20
Strain Gage C3	10	11	12	13	15	16	17	18	18	20	21
Strain Gage C4	10	10	11	13	13	15	16	16	17	18	20
Strain Gage C5	12	14	15	16	17	19	20	21	22	23	25
Strain Gage C6	10	12	12	14	14	16	17	18	19	20	21
Slip 1	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	0.0000	0.0000	-0.0001	-0.0001
Slip 2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000
Slip 3	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 4	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	-0.0001	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*Wire Pot A5 and Wire Pot C4 were not registering correctly during testing – their results can be ignored.

Table D-1: Test 1 (continued)

Load (lbs)	11020	11479	12003	12511	13003	13517	14014	14495	14992
Wire Pot A1	0.0142	0.0155	0.0142	0.0149	0.0142	0.0142	0.0149	0.0149	0.0149
Wire Pot A2	0.0155	0.0155	0.0155	0.0175	0.022	0.0227	0.0207	0.022	0.022
Wire Pot A3	0.03	0.03	0.03	0.03	0.0307	0.0294	0.038	0.038	0.0374
Wire Pot A4	0.0231	0.0251	0.0254	0.0264	0.0268	0.0281	0.0294	0.0294	0.0304
Wire Pot A5	0.002	0	0.0013	0.0007	0.0007	0.0013	0.0007	0.002	0.0013
Wire Pot A6	0.0084	0.0084	0.0091	0.0071	0.0084	0.0091	0.0137	0.0143	0.0143
Wire Pot B1	0.0123	0.0123	0.0123	0.0123	0.0123	0.0142	0.0142	0.0123	0.0168
Wire Pot B2	0.0155	0.0142	0.0142	0.0206	0.0193	0.0193	0.02	0.02	0.0206
Wire Pot B3	0.0286	0.026	0.026	0.0273	0.0247	0.0247	0.0273	0.0273	0.0363
Wire Pot B4	0.0208	0.0195	0.0195	0.0202	0.0267	0.0273	0.028	0.0273	0.026
Wire Pot B5	0.0159	0.0159	0.0172	0.0172	0.0172	0.0208	0.0208	0.022	0.022
Wire Pot B6	0.014	0.0133	0.02	0.0206	0.02	0.0206	0.02	0.02	0.0206
Wire Pot C1	0.0065	0.0058	0.0071	0.0058	0.0052	0.0071	0.0071	0.0065	0.0058
Wire Pot C2	0.0116	0.0116	0.0139	0.0116	0.0116	0.0139	0.0116	0.0162	0.0116
Wire Pot C3	0.0126	0.0126	0.0126	0.0149	0.0161	0.0161	0.0172	0.0172	0.0195
Wire Pot C4	0.0046	0.0046	0.0069	0.0069	0.0069	0.0092	0.0069	0.0046	0.0069
Wire Pot C5	0.0093	0.0093	0.0093	0.0093	0.0069	0.0116	0.0139	0.0139	0.0139
Wire Pot C6	0.0059	0.0047	0.0083	0.0071	0.0071	0.0071	0.0083	0.0095	0.0095
Strain Gage A1	42	45	47	49	52	54	56	58	60
Strain Gage A2	90	94	99	103	108	113	118	124	130
Strain Gage A3	241	253	268	280	294	310	315	324	333
Strain Gage A4	234	245	260	271	283	292	284	289	302
Strain Gage A5	89	93	98	101	106	111	115	121	123
Strain Gage A6	43	45	47	51	52	54	56	59	62
Strain Gage B1	51	53	56	58	61	63	66	69	71
Strain Gage B2	52	55	57	60	62	64	67	69	71
Strain Gage B3	52	54	56	59	62	64	66	69	71
Strain Gage B4	47	50	52	54	56	59	60	62	65
Strain Gage B5	67	69	72	76	79	82	86	88	93
Strain Gage B6	48	49	52	54	58	60	62	64	68
Strain Gage C1	25	27	28	29	30	31	32	34	35
Strain Gage C2	21	23	24	25	26	28	28	29	30
Strain Gage C3	21	22	23	24	26	27	28	28	30
Strain Gage C4	20	20	23	22	24	25	25	27	27
Strain Gage C5	25	26	28	30	30	31	33	34	35
Strain Gage C6	22	23	23	25	26	26	28	29	30
Slip 1	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	0.0000	0.0000
Slip 4	0.0000	0.0000	-0.0001	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*Wire Pot A5 and Wire Pot C4 were not registering correctly during testing – their results can be ignored.

Test Designation: STRUX Concentrated Load Test 2 – Recast Slab 1
Concentrated Point Load at Third Point A
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14975 lb
Midspan Deflection at Maximum Load:	0.030 in
Quarter A Deflection at Maximum Load:	0.039 in
Quarter B Deflection at Maximum Load:	0.023 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

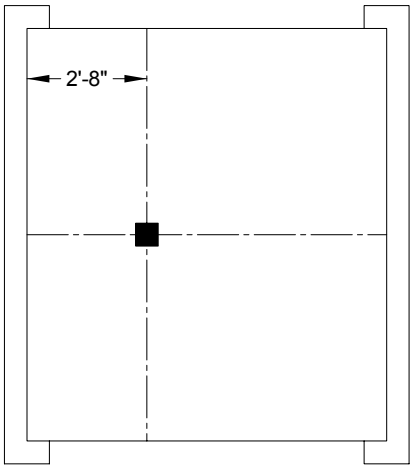

Figure D-4: Location of concentrated point load at Third Point A – second slab set

Table D-2: Experimental results of concentrated load Test 2 on recast STRUX-reinforced slab 1

Load	0	519	978	1529	2016	2502	2989	3475	4010	4496	4999
Wire Pot A1	0	0.0007	0.0007	0.0007	0	0.0007	0	0	0.0007	0.0013	0.0007
Wire Pot A2	0	0.0007	0.0007	0	-0.0006	0	0.0039	0.0078	0.0085	0.0085	0.0085
Wire Pot A3	0	-0.0007	0.0006	0.004	0.0046	0.004	0.004	0.0033	0.0066	0.012	0.0113
Wire Pot A4	0	-0.0007	0.0003	0.0007	0.0024	0.0037	0.0047	0.005	0.0067	0.007	0.0077
Wire Pot A5	0	0.0013	0.0013	0.0013	0.002	0.0013	0.0007	0.0013	0.002	0.002	0.002
Wire Pot A6	0	-0.0013	-0.0007	-0.002	-0.002	-0.002	-0.0013	-0.0007	-0.0007	-0.0007	-0.0013
Wire Pot B1	0	0	0.0006	0.0013	0.0032	0.0019	0.0006	0.0019	0.0006	0.0006	0.0006
Wire Pot B2	0	0	0	0.0013	0.0033	0.0033	0.0039	0.0045	0.0039	0.0045	0.0045
Wire Pot B3	0	-0.0026	0.0026	-0.0026	0	0	-0.0026	0	0	0	-0.0013
Wire Pot B4	0	-0.0006	-0.0013	-0.0013	-0.0006	-0.0013	-0.0006	-0.0006	-0.0013	0.0026	0.0052
Wire Pot B5	0	-0.0012	0	0	0	-0.0012	-0.0012	0	0.0024	0.0024	0.0024
Wire Pot B6	0	0	0.0007	0.0007	0	0.0014	0.002	0.0067	0.0074	0.0074	0.008
Wire Pot C1	0	0.0006	0.0012	0.0006	0.0006	0.0006	0.0012	0.0006	0.0012	0.0006	0.0006
Wire Pot C2	0	-0.0046	-0.0046	0.0046	-0.0023	-0.0023	-0.0023	-0.0046	-0.0023	-0.0023	-0.0046
Wire Pot C3	0	0	0.0012	0.0012	0	0.0034	0.0023	0.0034	0.0046	0.0046	0.0057
Wire Pot C4	0	-0.0023	0.0023	-0.0023	0	-0.0023	0	0	-0.0023	0.0023	0.0023
Wire Pot C5	0	0.0023	0.0023	0.0023	-0.007	-0.0023	-0.0047	-0.007	-0.0047	-0.0093	0
Wire Pot C6	0	0.0012	0	0.0024	0	0	0	0	-0.0012	0	0.0012
Strain Gage A1	0	2	3	6	9	10	13	15	17	20	21
Strain Gage A2	0	4	7	10	14	18	21	26	31	34	37
Strain Gage A3	0	6	12	18	24	31	38	45	53	62	69
Strain Gage A4	0	6	11	18	23	28	35	41	49	57	65
Strain Gage A5	0	4	8	12	16	19	22	26	30	35	38
Strain Gage A6	0	3	4	7	9	12	13	16	18	20	22
Strain Gage B1	0	4	6	9	12	15	17	20	23	26	30
Strain Gage B2	0	3	7	10	13	17	20	23	26	30	33
Strain Gage B3	0	5	8	12	15	19	22	26	30	33	37
Strain Gage B4	0	4	7	11	14	16	20	23	27	30	33
Strain Gage B5	0	5	8	12	16	21	23	29	33	38	42
Strain Gage B6	0	3	5	8	12	14	16	18	21	25	27
Strain Gage C1	0	1	2	4	4	6	7	9	10	12	13
Strain Gage C2	0	3	3	5	7	8	9	11	12	13	15
Strain Gage C3	0	2	3	4	6	7	8	10	12	13	14
Strain Gage C4	0	1	2	4	5	6	7	9	10	12	13
Strain Gage C5	0	1	3	12	6	8	9	11	12	14	16
Strain Gage C6	0	2	3	5	6	6	8	10	11	12	13
Slip 1	0	-0.0001	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	-0.0001	0.0000	0.0000
Slip 2	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	-0.0001
Slip 3	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 4	0	0.0000	0.0000	-0.0001	0.0000	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*Wire Pot A5, Wire Pot A6, and Wire Pot C4 were not registering correctly during testing – their results can be ignored.

Table D-2: Test 2 (continued)

Load	5480	5982	6490	6993	7506	7977	8490	8998	9538	10003	10522
Wire Pot A1	0.0013	0.0013	0	0.0007	0.0078	0.0078	0.0072	0.0085	0.0065	0.0078	0.0085
Wire Pot A2	0.0072	0.0085	0.0072	0.0078	0.0149	0.0143	0.0143	0.0143	0.0143	0.0149	0.0149
Wire Pot A3	0.0113	0.0113	0.0113	0.0187	0.0187	0.0193	0.0193	0.018	0.022	0.026	0.0267
Wire Pot A4	0.0084	0.0094	0.012	0.0134	0.0137	0.0164	0.0177	0.0194	0.0204	0.0231	0.0237
Wire Pot A5	0.0007	0.0013	0	0.0007	0.002	0.002	0.0007	0.0007	0.0013	0.0007	0.0013
Wire Pot A6	-0.0026	-0.0026	-0.0026	-0.0026	-0.0026	-0.002	-0.002	-0.0007	-0.0013	-0.0013	-0.0007
Wire Pot B1	0.0039	0.0026	0.0071	0.0097	0.011	0.009	0.011	0.0116	0.0103	0.0123	0.0181
Wire Pot B2	0.0084	0.011	0.011	0.011	0.0103	0.011	0.0174	0.0162	0.0168	0.0168	0.0174
Wire Pot B3	-0.0026	0	0.0013	0.0078	0.013	0.013	0.013	0.0143	0.0156	0.0104	0.013
Wire Pot B4	0.0046	0.0065	0.0065	0.0137	0.0117	0.0117	0.0117	0.0117	0.0202	0.0208	0.0202
Wire Pot B5	0.0061	0.0061	0.0085	0.0098	0.011	0.0134	0.0134	0.0147	0.0171	0.0196	0.0196
Wire Pot B6	0.0074	0.0074	0.014	0.0154	0.0147	0.0134	0.0147	0.014	0.0214	0.0214	0.0207
Wire Pot C1	0.0012	0.0012	0.0019	0.0006	0.0006	0.0006	0.0012	0.0006	0	0.0006	0.0006
Wire Pot C2	-0.0023	0	0	-0.0023	0	0	0	0.0046	0.0023	0.007	0.0046
Wire Pot C3	0.0069	0.008	0.0103	0.008	0.0092	0.0103	0.0115	0.0149	0.0126	0.016	0.016
Wire Pot C4	0	0.0046	0.0023	0.0046	0.0023	0.0046	0.0069	0.0069	0.0069	0.0092	0.0046
Wire Pot C5	0	0	0.0023	0.0023	0.0023	0.0046	0.0046	0	0.0023	0.007	0.0093
Wire Pot C6	0	0.0012	0.0048	0.0036	0.0024	0.0048	0.0059	0.0036	0.0083	0.0071	0.0071
Strain Gage A1	23	26	29	31	33	34	38	39	42	44	46
Strain Gage A2	41	46	50	53	58	62	67	71	75	79	84
Strain Gage A3	77	86	95	104	112	122	131	140	148	156	165
Strain Gage A4	72	80	89	97	107	114	122	132	141	148	155
Strain Gage A5	42	46	51	54	58	62	67	71	76	80	84
Strain Gage A6	24	26	29	31	34	36	38	41	42	46	48
Strain Gage B1	31	34	38	40	44	46	49	51	55	58	62
Strain Gage B2	36	40	42	46	50	53	58	60	64	67	71
Strain Gage B3	40	44	48	52	56	59	63	67	71	73	77
Strain Gage B4	36	40	43	47	50	53	57	61	65	67	71
Strain Gage B5	45	50	54	59	63	67	72	76	82	86	90
Strain Gage B6	30	33	36	38	41	43	47	50	53	55	60
Strain Gage C1	14	16	19	20	21	22	24	26	27	30	31
Strain Gage C2	16	18	19	21	22	23	25	26	27	30	32
Strain Gage C3	16	18	20	20	22	23	25	26	28	29	31
Strain Gage C4	14	16	18	19	20	21	23	24	25	27	28
Strain Gage C5	18	20	21	22	24	25	28	29	32	33	34
Strain Gage C6	15	16	18	20	21	21	23	24	26	27	29
Slip 1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 2	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 3	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000
Slip 4	0.0000	-0.0001	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	-0.0001	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*Wire Pot A5, Wire Pot A6, and Wire Pot C4 were not registering correctly during testing – their results can be ignored.

Table D-2: Test 2 (continued)

Load	10987	11506	11970	12478	12970	13478	13992	14478	14975
Wire Pot A1	0.0078	0.0085	0.0149	0.013	0.0156	0.0149	0.0143	0.0123	0.0143
Wire Pot A2	0.0182	0.0208	0.0221	0.0221	0.0221	0.0214	0.0227	0.0266	0.0279
Wire Pot A3	0.026	0.026	0.026	0.034	0.034	0.0334	0.0334	0.038	0.0407
Wire Pot A4	0.0254	0.0258	0.0271	0.0278	0.0291	0.0301	0.0324	0.0371	0.0368
Wire Pot A5	0.0007	0.0013	0.002	0.002	0.0007	0.0007	0.0026	0.0073	0.0086
Wire Pot A6	0.0006	0.0058	0.0058	0.0052	0.0045	0.0058	0.0045	0.0045	0.0045
Wire Pot B1	0.0181	0.0155	0.0155	0.0155	0.0155	0.022	0.0226	0.0226	0.0226
Wire Pot B2	0.0187	0.0181	0.0181	0.0239	0.0245	0.0252	0.0252	0.0239	0.031
Wire Pot B3	0.013	0.013	0.0208	0.026	0.0273	0.0273	0.026	0.026	0.026
Wire Pot B4	0.0202	0.0202	0.026	0.026	0.0247	0.026	0.0339	0.0332	0.0339
Wire Pot B5	0.0208	0.022	0.0232	0.0257	0.0269	0.0257	0.0269	0.0293	0.0318
Wire Pot B6	0.0207	0.0214	0.0214	0.0247	0.0287	0.028	0.0287	0.0287	0.028
Wire Pot C1	0.0012	0	0.0012	0.0077	0.0071	0.0084	0.0084	0.0071	0.0077
Wire Pot C2	0.007	0.007	0.0046	0.007	0.007	0.007	0.0116	0.0116	0.0116
Wire Pot C3	0.0149	0.0183	0.0195	0.0206	0.0206	0.0206	0.0206	0.0218	0.0229
Wire Pot C4	0.0069	0.0069	0.0069	0.0161	0.0138	0.0138	0.0138	0.0161	0.0161
Wire Pot C5	0.0116	0.0093	0.0139	0.0093	0.0093	0.0139	0.0116	0.0093	0.0163
Wire Pot C6	0.0095	0.0083	0.0107	0.0107	0.0131	0.0143	0.0143	0.0119	0.0167
Strain Gage A1	49	51	54	56	60	62	68	71	75
Strain Gage A2	89	93	99	106	109	114	119	121	126
Strain Gage A3	172	181	186	192	199	201	199	202	205
Strain Gage A4	162	164	164	167	172	176	176	199	211
Strain Gage A5	88	94	99	103	107	112	115	119	123
Strain Gage A6	50	53	56	60	62	65	68	72	76
Strain Gage B1	65	68	71	75	79	83	88	93	97
Strain Gage B2	75	79	82	87	89	94	98	101	104
Strain Gage B3	80	83	85	88	90	92	93	94	95
Strain Gage B4	74	77	78	81	84	86	89	91	92
Strain Gage B5	95	101	105	110	115	117	121	126	130
Strain Gage B6	62	65	69	72	75	80	85	89	93
Strain Gage C1	32	34	36	38	40	40	43	46	47
Strain Gage C2	32	33	35	38	38	40	41	42	43
Strain Gage C3	32	34	35	37	38	39	39	41	42
Strain Gage C4	30	31	32	32	34	35	36	37	39
Strain Gage C5	36	37	39	40	42	43	45	46	49
Strain Gage C6	30	33	33	35	36	39	40	41	43
Slip 1	0.0000	-0.0001	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	0.0000	-0.0001
Slip 2	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 3	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	-0.0001
Slip 4	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	-0.0002

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*Wire Pot A5, Wire Pot A6, and Wire Pot C4 were not registering correctly during testing – their results can be ignored.

Test Designation: STRUX Concentrated Load Test 3 – Recast Slab 1
Concentrated Point Load at Third Point B
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14975 lb
Midspan Deflection at Maximum Load:	0.028 in
Quarter A Deflection at Maximum Load:	0.023 in
Quarter B Deflection at Maximum Load:	0.039 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

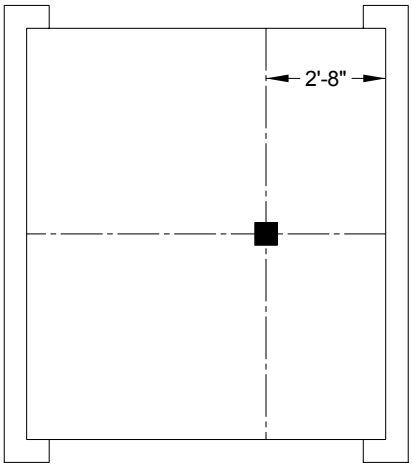

Figure D-5: Location of concentrated point load at Third Point B – second slab set

Table D-3: Experimental results of concentrated load Test 3 on recast STRUX-reinforced slab 1

Load	0	513	1054	1519	2048	2529	3005	3497	4026	4507	5010
Wire Pot A1	0	-0.0007	0	0.0006	-0.0007	0	0	-0.0013	0	0	-0.0007
Wire Pot A2	0	0.002	0.002	0.0013	0.0007	0.0007	-0.0006	0.002	0.0052	0.0039	0.0052
Wire Pot A3	0	-0.0013	0.0007	0	-0.0007	-0.0007	-0.0007	-0.0013	0	-0.0007	0.0007
Wire Pot A4	0	-0.0004	-0.0007	0.0003	0.0006	0.0017	0.0027	0.0033	0.0047	0.005	0.0053
Wire Pot A5	0	-0.0013	-0.0013	-0.0006	0	-0.0006	-0.0006	0	-0.0013	-0.0013	-0.0013
Wire Pot A6	0	0.0019	0.0013	0.0013	0.0006	0.0026	0	0.0013	0.0019	0	0.0006
Wire Pot B1	0	0	0	-0.0013	-0.0006	-0.0006	-0.0006	-0.0013	-0.0006	-0.0006	0
Wire Pot B2	0	0.0006	0	-0.002	-0.002	-0.0007	0.0006	-0.0013	0	0.0064	0.0064
Wire Pot B3	0	0	0.0013	0.0013	0	0	0	0	0.0013	0	0
Wire Pot B4	0	0	-0.0013	-0.0013	-0.0007	-0.0007	-0.0013	0.0006	0.0026	0.0026	0.0026
Wire Pot B5	0	0	-0.0012	-0.0024	-0.0012	-0.0024	-0.0012	-0.0024	-0.0012	0.0013	0
Wire Pot B6	0	0	-0.0007	-0.0007	0.0013	0.0006	0.0073	0.0073	0.0066	0.0073	0.0073
Wire Pot C1	0	0.0007	0.0007	0	0	0	0.0019	0.0007	0	0	0.0019
Wire Pot C2	0	-0.0046	-0.0046	-0.0023	-0.0046	-0.0046	-0.0023	-0.0023	-0.0069	-0.0046	-0.0023
Wire Pot C3	0	0.0011	0.0023	0.0023	0.0046	0.0034	0.0057	0.0069	0.0069	0.0069	0.0103
Wire Pot C4	0	0	0	-0.0023	-0.0023	0	0.0023	0.0023	0	0	0.0023
Wire Pot C5	0	0	-0.007	-0.007	-0.007	-0.0046	-0.007	-0.0023	0.0023	0.0023	0.0023
Wire Pot C6	0	0.0012	0.0012	0	0	0	0	0	0	0.0012	0.0012
Strain Gage A1	0	1	3	4	6	7	8	9	12	13	15
Strain Gage A2	0	2	4	3	7	8	9	9	12	13	14
Strain Gage A3	0	2	4	5	6	8	10	11	13	15	17
Strain Gage A4	0	3	4	5	7	8	9	12	13	15	16
Strain Gage A5	0	1	2	4	6	7	8	10	11	13	14
Strain Gage A6	0	1	4	4	6	8	9	10	12	14	15
Strain Gage B1	0	4	6	10	12	14	16	20	23	26	29
Strain Gage B2	0	3	7	10	13	16	20	22	27	30	32
Strain Gage B3	0	6	9	12	17	21	24	28	32	37	40
Strain Gage B4	0	4	8	11	15	18	21	24	28	31	35
Strain Gage B5	0	6	9	13	17	22	24	29	33	37	41
Strain Gage B6	0	3	6	9	11	14	16	19	22	24	27
Strain Gage C1	0	3	6	8	10	12	15	17	19	22	25
Strain Gage C2	0	5	10	13	15	19	23	26	30	34	37
Strain Gage C3	0	6	12	17	21	27	32	36	42	48	54
Strain Gage C4	0	5	10	15	20	24	29	33	39	43	48
Strain Gage C5	0	4	8	12	17	20	24	28	32	37	40
Strain Gage C6	0	2	5	7	8	10	13	15	17	19	21
Slip 1	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 2	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 4	0	0.0000	0.0000	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*Wire Pot A5 and Wire Pot C4 were not registering correctly during testing – their results can be ignored.

Table D-3: Test 3 (continued)

Load	5491	5993	6496	7004	7517	7998	8522	9003	9630	10009	10495
Wire Pot A1	-0.0007	0	0	0.0006	-0.0007	0.0013	0.0006	0.0026	0.0071	0.0078	0.0065
Wire Pot A2	0.0046	0.0052	0.0052	0.0046	0.0046	0.0052	0.0046	0.0072	0.0117	0.0117	0.0117
Wire Pot A3	0.006	0.0067	0.0067	0.006	0.0073	0.0067	0.0067	0.0073	0.014	0.014	0.014
Wire Pot A4	0.006	0.006	0.007	0.007	0.0083	0.0087	0.0107	0.0113	0.0123	0.0137	0.015
Wire Pot A5	0	-0.0013	0	-0.0013	0	-0.0006	0	-0.0013	-0.0006	-0.0006	-0.0006
Wire Pot A6	0.0006	0.0013	0.0006	0.0006	0.0006	0.0006	0.0019	0.0013	0.0013	0.0013	0.0013
Wire Pot B1	0	0.0046	0.0052	0.0065	0.0065	0.0084	0.0071	0.0071	0.0104	0.0117	0.013
Wire Pot B2	0.0071	0.0064	0.0071	0.0058	0.0071	0.0129	0.0142	0.0135	0.0122	0.0122	0.0129
Wire Pot B3	0.0013	-0.0013	0.0091	0.013	0.0143	0.013	0.0143	0.0156	0.013	0.0143	0.0078
Wire Pot B4	0.0026	0.0052	0.0097	0.0091	0.0097	0.0104	0.013	0.0162	0.0169	0.0156	0.0156
Wire Pot B5	0.0037	0.0061	0.0049	0.0061	0.0061	0.0074	0.0123	0.0135	0.0159	0.0135	0.0147
Wire Pot B6	0.0073	0.014	0.0146	0.0146	0.014	0.0146	0.014	0.0173	0.02	0.0206	0.0206
Wire Pot C1	-0.0006	0.0007	0.0007	0.0013	0	0.0007	0.0026	0.0058	0.0065	0.0045	0.0071
Wire Pot C2	-0.0069	0	-0.0023	0.0046	0.0046	0.0046	0.0023	0.0023	0.0046	0.0023	0.007
Wire Pot C3	0.0103	0.0126	0.0126	0.016	0.0172	0.0183	0.0206	0.0218	0.0229	0.0218	0.0229
Wire Pot C4	0	0	0.0046	0	0.0023	0.0023	0.0046	0.0023	0	0.0046	0.0069
Wire Pot C5	0	-0.0023	0.0023	0.0023	0.0023	0.0047	0.0093	0.0093	0.007	0.0093	0.0116
Wire Pot C6	0.0024	0.0036	0.0036	0.0048	0.0059	0.0071	0.0071	0.0083	0.0095	0.0095	0.0107
Strain Gage A1	15	17	18	20	22	23	25	25	28	29	30
Strain Gage A2	16	17	18	20	21	23	24	27	28	29	30
Strain Gage A3	18	20	22	23	24	27	30	30	33	34	36
Strain Gage A4	18	20	22	23	25	27	29	30	33	35	37
Strain Gage A5	16	17	19	20	21	23	25	25	28	28	30
Strain Gage A6	16	18	20	20	22	24	25	27	29	30	31
Strain Gage B1	31	34	38	40	44	47	50	52	57	59	62
Strain Gage B2	37	40	43	46	51	53	57	60	64	67	70
Strain Gage B3	43	46	49	55	58	62	65	69	73	76	80
Strain Gage B4	38	41	45	48	52	55	58	62	67	70	71
Strain Gage B5	45	49	54	58	62	67	72	75	81	84	88
Strain Gage B6	30	32	36	39	42	45	48	50	54	56	59
Strain Gage C1	26	28	30	34	35	38	41	43	47	49	50
Strain Gage C2	42	45	50	53	57	62	66	70	76	78	82
Strain Gage C3	60	64	70	76	82	87	94	100	106	111	116
Strain Gage C4	52	57	62	68	73	78	82	88	95	98	102
Strain Gage C5	44	49	53	58	62	67	72	75	80	84	88
Strain Gage C6	23	26	28	30	32	34	37	38	43	44	45
Slip 1	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001
Slip 2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 4	-0.0001	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*Wire Pot A5 and Wire Pot C4 were not registering correctly during testing – their results can be ignored.

Table D-3: Test 3 (continued)

Load	11003	11511	12003	12511	12997	13494	13981	14489	14975
Wire Pot A1	0.0065	0.0071	0.0071	0.0071	0.0071	0.0071	0.0078	0.0129	0.0142
Wire Pot A2	0.0117	0.0117	0.013	0.0117	0.0117	0.0124	0.0188	0.0188	0.0188
Wire Pot A3	0.0154	0.0147	0.014	0.0134	0.02	0.0214	0.0207	0.0207	0.0214
Wire Pot A4	0.0164	0.0174	0.0184	0.019	0.02	0.0224	0.023	0.024	0.0251
Wire Pot A5	0	-0.002	-0.0013	-0.0006	-0.0006	0	-0.0006	-0.0006	-0.0006
Wire Pot A6	0.0026	0.0032	0.0065	0.0071	0.0078	0.0071	0.0078	0.0084	0.0071
Wire Pot B1	0.0123	0.0136	0.0136	0.0123	0.0265	0.0278	0.0259	0.0272	0.0259
Wire Pot B2	0.02	0.018	0.02	0.0187	0.02	0.02	0.0206	0.0251	0.0271
Wire Pot B3	0.0169	0.0221	0.0286	0.0273	0.0299	0.0273	0.0286	0.026	0.026
Wire Pot B4	0.0234	0.0234	0.0227	0.0234	0.0286	0.0299	0.0299	0.0299	0.0305
Wire Pot B5	0.0159	0.0147	0.0208	0.0208	0.0208	0.0208	0.0233	0.0233	0.0269
Wire Pot B6	0.022	0.0213	0.0206	0.028	0.028	0.028	0.028	0.028	0.028
Wire Pot C1	0.0065	0.0071	0.0065	0.0058	0.0078	0.0078	0.0143	0.0143	0.0143
Wire Pot C2	0.0139	0.0093	0.0116	0.0093	0.0093	0.0116	0.0116	0.0162	0.0186
Wire Pot C3	0.0286	0.0263	0.0263	0.0263	0.0275	0.0286	0.0298	0.0344	0.0389
Wire Pot C4	0.0046	0.0069	0.0046	0.0092	0.0138	0.0115	0.0138	0.0115	0.0161
Wire Pot C5	0.014	0.014	0.014	0.014	0.0163	0.0163	0.014	0.0163	0.0232
Wire Pot C6	0.0119	0.0131	0.0143	0.0131	0.0155	0.0167	0.0155	0.0179	0.0179
Strain Gage A1	32	34	35	37	38	41	42	43	46
Strain Gage A2	31	33	35	37	37	38	40	41	42
Strain Gage A3	38	40	41	44	44	46	49	50	50
Strain Gage A4	39	41	43	45	46	47	48	51	51
Strain Gage A5	31	33	35	36	37	38	40	41	42
Strain Gage A6	32	34	36	38	39	41	44	45	46
Strain Gage B1	65	68	71	75	80	82	86	90	96
Strain Gage B2	75	78	81	84	88	92	96	99	104
Strain Gage B3	83	86	89	93	95	98	99	100	95
Strain Gage B4	76	79	81	84	81	82	85	85	85
Strain Gage B5	92	98	102	106	112	116	122	126	131
Strain Gage B6	62	65	69	72	76	79	83	88	93
Strain Gage C1	54	56	59	63	66	69	73	76	83
Strain Gage C2	87	92	97	101	109	114	120	131	139
Strain Gage C3	122	129	134	139	144	145	138	136	180
Strain Gage C4	109	114	119	123	118	120	124	129	130
Strain Gage C5	92	96	100	105	112	116	118	122	127
Strain Gage C6	48	50	53	55	59	61	65	68	73
Slip 1	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 2	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001
Slip 4	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	0.0000	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*Wire Pot A5 and Wire Pot C4 were not registering correctly during testing – their results can be ignored.

Test Designation: STRUX Concentrated Load Test 4 – Recast Slab 1
Concentrated Point Load at Quarter Point B
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15007 lb
Midspan Deflection at Maximum Load:	0.033 in
Quarter A Deflection at Maximum Load:	0.021 in
Quarter B Deflection at Maximum Load:	0.037 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

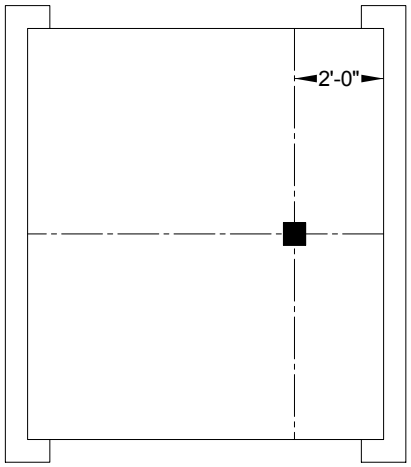

Figure D-6: Location of concentrated point load at Quarter Point B – second slab set

Table D-4: Experimental results of concentrated load Test 4 on recast STRUX-reinforced slab 1

Load	0	508	1000	1502	2005	2524	3064	3594	4021	4518	4993
Wire Pot A1	0	0	0.0006	0.0013	0.0013	0.0006	0.0019	0.0013	0.0019	0	0.0019
Wire Pot A2	0	-0.0006	0.0007	0.0007	0.0007	0.0013	0.0013	0.0013	0.0007	0.0007	0.0007
Wire Pot A3	0	-0.0013	-0.0006	0	0.0007	0	0.0007	0.0007	0.0007	0	0.0034
Wire Pot A4	0	-0.0003	0.001	0.0014	0.0024	0.0027	0.0037	0.0037	0.004	0.0047	0.0057
Wire Pot A5	0	0	0.0014	0.0014	0	0.008	0.0067	0.0087	0.0073	0.008	0.0067
Wire Pot A6	0	0.0007	0.0007	0	-0.0006	0	0	0	0.0007	0	0
Wire Pot B1	0	0	0.0006	0.0013	0.0019	0	0.0019	0.0006	0.0006	0.0039	0.0071
Wire Pot B2	0	0	0	0.0006	0.0019	0.0013	0.0006	0.0006	0.0013	0.0013	0.0032
Wire Pot B3	0	0.0013	0.0026	0.0026	0.0013	0.0065	0.0091	0.0117	0.0091	0.0078	0.0091
Wire Pot B4	0	-0.0013	-0.0013	-0.0007	0	0.0032	0.0032	0.0026	0.0039	0.0026	0.0026
Wire Pot B5	0	0.0012	0	0	0.0012	0.0012	0.0012	0.0012	0.0012	0.0024	0.0037
Wire Pot B6	0	0.0013	0	0	0	-0.0007	0	0.008	0.0066	0.0066	0.0073
Wire Pot C1	0	0.0006	-0.0006	-0.0006	0	0	-0.0013	-0.0006	-0.0006	0	-0.0006
Wire Pot C2	0	0.0046	0	0.0023	-0.0023	0	0.0023	0.0023	0.0023	0.0023	0
Wire Pot C3	0	0.0034	0.0022	0.0057	0.0057	0.0068	0.0091	0.0103	0.0125	0.0137	0.0137
Wire Pot C4	0	-0.0024	0.0012	-0.0012	0.0024	-0.0012	0	0	0	0	0
Wire Pot C5	0	0.0023	0	-0.0023	0	0.0046	0.007	0.007	0.0046	0.007	0.0093
Wire Pot C6	0	0	0.0012	0.0012	0.0012	0.0024	0.0048	0.006	0.0048	0.0048	0.006
Strain Gage A1	0	0	0	3	3	5	6	6	8	9	9
Strain Gage A2	0	0	1	3	4	5	6	7	8	9	10
Strain Gage A3	0	1	3	4	5	6	8	8	9	11	12
Strain Gage A4	0	0	2	2	4	6	7	8	8	10	10
Strain Gage A5	0	1	3	3	5	6	8	8	10	11	12
Strain Gage A6	0	1	1	3	4	6	6	8	9	10	11
Strain Gage B1	0	2	3	6	9	11	14	17	18	20	23
Strain Gage B2	0	2	4	6	9	12	13	17	19	21	23
Strain Gage B3	0	3	6	8	11	13	16	19	21	22	25
Strain Gage B4	0	3	4	7	10	12	14	16	18	20	22
Strain Gage B5	0	4	6	10	13	16	20	23	26	28	31
Strain Gage B6	0	3	5	8	10	12	14	17	19	21	22
Strain Gage C1	0	3	4	7	8	11	14	16	18	20	22
Strain Gage C2	0	4	7	12	16	20	25	28	32	36	40
Strain Gage C3	0	7	14	20	25	33	41	48	54	62	69
Strain Gage C4	0	7	13	19	23	30	36	42	47	54	59
Strain Gage C5	0	4	9	12	16	21	24	29	32	36	40
Strain Gage C6	0	2	3	5	7	9	11	13	16	16	19
Slip 1	0	0.0000	-0.0001	-0.0002	0.0000	-0.0002	-0.0001	-0.0001	-0.0001	-0.0001	0.0000
Slip 2	0	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
Slip 3	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002	-0.0001	-0.0002	-0.0002	-0.0001
Slip 4	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

* Wire Pot C4 was not registering correctly during testing – their results can be ignored.

Table D-4: Test 4 (continued)

Load	5496	5993	6506	6998	7517	8020	8495	9003	9544	10003	10527
Wire Pot A1	0.0013	0.0006	0.0006	0.0006	0.0019	0.0006	0.0006	0.0019	0.0006	0.0039	0.0091
Wire Pot A2	0.0007	0.002	0.0007	0.0007	0.0007	0.0007	0.0013	0.0013	0.0013	0.0013	0.0026
Wire Pot A3	0.0074	0.0074	0.0074	0.0074	0.0074	0.008	0.0074	0.0074	0.0074	0.0114	0.0147
Wire Pot A4	0.0067	0.0074	0.0077	0.0087	0.0084	0.009	0.0094	0.0097	0.0107	0.0114	0.0117
Wire Pot A5	0.0073	0.008	0.0133	0.016	0.0133	0.0146	0.016	0.0146	0.0146	0.0153	0.0146
Wire Pot A6	0	0.0046	0.0072	0.0065	0.0072	0.0065	0.0065	0.0065	0.0072	0.0065	0.0072
Wire Pot B1	0.0084	0.009	0.0077	0.009	0.0077	0.0071	0.009	0.0077	0.0136	0.0129	0.0155
Wire Pot B2	0.0083	0.0083	0.0083	0.0071	0.0077	0.0071	0.0071	0.0135	0.0154	0.0154	0.0142
Wire Pot B3	0.0078	0.0104	0.0104	0.0065	0.0078	0.0078	0.0065	0.0195	0.0234	0.0234	0.0234
Wire Pot B4	0.0091	0.0091	0.0091	0.0097	0.0091	0.0169	0.0156	0.0162	0.0169	0.0156	0.0208
Wire Pot B5	0.0049	0.0037	0.0061	0.0073	0.0098	0.011	0.0122	0.0134	0.0147	0.0171	0.0183
Wire Pot B6	0.0066	0.008	0.0066	0.014	0.0146	0.0146	0.014	0.0126	0.014	0.014	0.0153
Wire Pot C1	0.0006	0.0019	0.0019	0.0026	0.0026	0.0019	0.0026	0.0019	0.0026	0.0019	0.0026
Wire Pot C2	0.0069	0.0069	0.0116	0.0162	0.0092	0.0092	0.0116	0.0069	0.0139	0.0116	0.0139
Wire Pot C3	0.016	0.0171	0.0171	0.0194	0.0183	0.0206	0.0217	0.0229	0.0217	0.0229	0.0263
Wire Pot C4	0	-0.0024	0	-0.0012	0	-0.0012	0	0	-0.0012	-0.0012	0.0012
Wire Pot C5	0.0116	0.0139	0.0163	0.0163	0.0163	0.0163	0.0139	0.0186	0.0163	0.0186	0.0232
Wire Pot C6	0.0083	0.0095	0.0083	0.0107	0.0107	0.0131	0.0143	0.0143	0.0155	0.0167	0.0167
Strain Gage A1	12	13	13	14	16	18	17	19	20	21	22
Strain Gage A2	11	11	14	14	16	15	17	18	19	20	21
Strain Gage A3	13	14	16	18	19	20	21	22	23	24	26
Strain Gage A4	13	14	15	16	17	18	19	22	23	23	25
Strain Gage A5	13	14	14	15	17	19	19	20	20	21	22
Strain Gage A6	13	14	16	16	17	19	20	21	22	23	24
Strain Gage B1	25	28	30	33	35	39	41	44	47	48	51
Strain Gage B2	26	29	30	34	36	39	41	43	47	48	52
Strain Gage B3	27	29	31	34	35	38	40	41	44	45	48
Strain Gage B4	23	25	27	29	31	33	35	37	39	41	44
Strain Gage B5	35	37	41	44	47	50	54	57	61	63	66
Strain Gage B6	25	27	30	32	35	37	39	42	45	47	50
Strain Gage C1	25	26	29	33	35	36	39	41	43	46	48
Strain Gage C2	44	48	53	57	62	66	70	75	79	83	88
Strain Gage C3	77	85	92	101	108	116	123	130	140	146	154
Strain Gage C4	64	71	77	83	89	95	99	107	112	119	125
Strain Gage C5	44	48	53	57	62	65	70	74	79	82	88
Strain Gage C6	22	23	26	27	30	31	34	36	38	40	43
Slip 1	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 2	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001	-0.0001
Slip 4	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	-0.0001	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

* Wire Pot C4 was not registering correctly during testing – its results can be ignored.

Table D-4: Test 4 (continued)

Load	10992	11538	12024	12489	12997	13500	13991	14510	15007
Wire Pot A1	0.0078	0.0078	0.0078	0.0084	0.0084	0.0078	0.0078	0.0078	0.0078
Wire Pot A2	0.0091	0.0078	0.0072	0.0072	0.0091	0.0078	0.0072	0.0091	0.0078
Wire Pot A3	0.0141	0.0134	0.0141	0.0154	0.0147	0.0134	0.0147	0.0134	0.0214
Wire Pot A4	0.0114	0.0127	0.0137	0.0147	0.0157	0.0167	0.0174	0.0181	0.0201
Wire Pot A5	0.0186	0.0213	0.0213	0.0219	0.0213	0.0213	0.0226	0.0219	0.0213
Wire Pot A6	0.0065	0.0144	0.0137	0.0137	0.0144	0.0137	0.0144	0.0131	0.0137
Wire Pot B1	0.0136	0.0161	0.0142	0.0136	0.0136	0.0149	0.02	0.0213	0.0207
Wire Pot B2	0.0135	0.0154	0.0174	0.0206	0.0212	0.0212	0.0219	0.0206	0.02
Wire Pot B3	0.0234	0.0221	0.0208	0.0221	0.0234	0.0234	0.0234	0.0221	0.0351
Wire Pot B4	0.0234	0.0227	0.0234	0.0234	0.0234	0.0292	0.0299	0.0305	0.0312
Wire Pot B5	0.0183	0.0208	0.0208	0.0208	0.0232	0.0244	0.0257	0.0269	0.0281
Wire Pot B6	0.0213	0.0213	0.0206	0.0206	0.0206	0.0213	0.022	0.0226	0.0273
Wire Pot C1	0.0013	0.0026	0.0084	0.0091	0.0091	0.0097	0.0091	0.0097	0.0091
Wire Pot C2	0.0185	0.0185	0.0139	0.0162	0.0162	0.0139	0.0185	0.0232	0.0208
Wire Pot C3	0.0274	0.0297	0.0309	0.0355	0.0366	0.0355	0.0343	0.0355	0.0366
Wire Pot C4	-0.0012	0	0	-0.0024	0.0024	-0.0012	-0.0012	-0.0012	-0.0012
Wire Pot C5	0.0186	0.0209	0.0232	0.0209	0.0209	0.0279	0.0279	0.0255	0.0255
Wire Pot C6	0.0167	0.0167	0.0179	0.0179	0.0179	0.0203	0.0203	0.0215	0.0215
Strain Gage A1	25	26	26	28	29	29	32	33	33
Strain Gage A2	22	23	24	26	26	28	28	29	31
Strain Gage A3	28	29	31	31	33	35	36	37	38
Strain Gage A4	25	28	28	30	31	33	34	36	37
Strain Gage A5	24	25	26	26	28	28	30	31	32
Strain Gage A6	25	26	28	29	30	31	33	35	35
Strain Gage B1	53	56	59	61	64	67	70	72	75
Strain Gage B2	54	56	59	61	63	66	68	71	74
Strain Gage B3	50	53	55	57	59	61	62	64	65
Strain Gage B4	45	47	48	50	52	54	56	58	57
Strain Gage B5	69	73	76	80	82	85	88	91	94
Strain Gage B6	52	55	57	60	62	65	66	70	73
Strain Gage C1	51	53	56	58	61	63	65	68	72
Strain Gage C2	92	97	102	106	110	115	119	123	130
Strain Gage C3	162	170	178	184	192	198	206	214	229
Strain Gage C4	131	137	143	149	157	169	183	204	383
Strain Gage C5	91	97	101	105	109	114	120	123	134
Strain Gage C6	45	47	49	51	54	56	58	60	63
Slip 1	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 2	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	-0.0001	-0.0001	-0.0002	-0.0002	-0.0002	-0.0002	-0.0001	-0.0002	-0.0001
Slip 4	-0.0001	-0.0001	0.0000	0.0000	0.0000	-0.0001	0.0000	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

* Wire Pot C4 was not registering correctly during testing – its results can be ignored.

Test Designation: STRUX Concentrated Load Test 5 – Recast Slab 1
Transverse Line Load at Quarter Point B
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15013 lb
Midspan Deflection at Maximum Load:	0.027 in
Quarter A Deflection at Maximum Load:	0.015 in
Quarter B Deflection at Maximum Load:	0.035 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

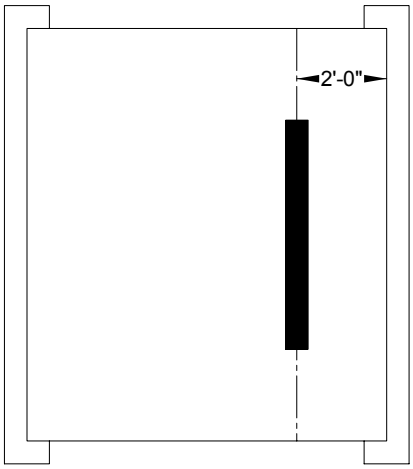

Figure D-7: Location of transverse line load at Quarter Point B – second slab set

Table D-5: Experimental results of concentrated load Test 5 on recast STRUX-reinforced slab 1

Load	0	1005	2021	3016	4064	5015	6047	7026	8009	9025	10014
Wire Pot A1	0	-0.0007	-0.0007	-0.0013	-0.0007	-0.0007	0	-0.0007	0	-0.0013	0.0006
Wire Pot A2	0	0.0006	0	0	0.0026	0.0071	0.0071	0.0065	0.0071	0.0071	0.0078
Wire Pot A3	0	-0.0014	-0.0007	-0.002	-0.0014	-0.0014	0.006	0.0053	0.0066	0.0066	0.0066
Wire Pot A4	0	0	0.0013	0.002	0.003	0.0054	0.0064	0.0074	0.0087	0.009	0.0097
Wire Pot A5	0	0.0007	-0.0007	-0.0007	-0.0013	-0.0007	0	-0.0007	0.0073	0.006	0.0053
Wire Pot A6	0	0	0	0	0.0013	0	0	0.0019	0.0006	0.0006	0.0006
Wire Pot B1	0	0	0	0	-0.0007	0.0052	0.0071	0.0071	0.0065	0.011	0.0136
Wire Pot B2	0	0.0013	0.0013	0	0.0007	0	0.0078	0.0071	0.0078	0.009	0.0142
Wire Pot B3	0	0.0013	0.0013	0.0078	0.013	0.013	0.0143	0.013	0.013	0.013	0.0247
Wire Pot B4	0	0	-0.0007	0.0006	0.0013	-0.0007	0.0071	0.0071	0.0071	0.0136	0.0136
Wire Pot B5	0	-0.0012	0.0012	0.0012	0	0.0024	0.0049	0.0073	0.0134	0.0134	0.0147
Wire Pot B6	0	-0.0013	-0.0007	0.006	0.0067	0.0073	0.008	0.0153	0.0133	0.016	0.0193
Wire Pot C1	0	-0.0012	-0.0006	-0.0012	-0.0006	0.0033	0.0059	0.0039	0.0059	0.0059	0.0065
Wire Pot C2	0	-0.0046	-0.0046	-0.0023	-0.0069	-0.0046	0	0.0024	0.0047	0.0047	0.0093
Wire Pot C3	0	0.0034	0.0046	0.008	0.0103	0.016	0.0172	0.0195	0.0195	0.0218	0.0229
Wire Pot C4	0	0.0012	0.0073	0.0109	0.0109	0.0133	0.0121	0.0145	0.0145	0.0182	0.0218
Wire Pot C5	0	0	0.0046	0	0.0046	0.0093	0.007	0.0116	0.0116	0.0139	0.0186
Wire Pot C6	0	0.0012	0.0012	0.0036	0.0036	0.0047	0.0095	0.0095	0.0107	0.0131	0.0143
Strain Gage A1	0	1	4	6	8	9	12	14	16	19	21
Strain Gage A2	0	1	3	5	7	10	11	12	15	17	19
Strain Gage A3	0	3	5	8	11	13	15	18	20	23	26
Strain Gage A4	0	3	4	7	10	12	14	17	19	21	24
Strain Gage A5	0	1	3	6	8	9	12	13	16	17	19
Strain Gage A6	0	1	4	5	7	10	12	14	17	18	20
Strain Gage B1	0	5	9	14	18	23	28	32	36	42	47
Strain Gage B2	0	4	8	12	17	21	25	30	34	39	42
Strain Gage B3	0	5	10	14	19	23	28	32	35	39	44
Strain Gage B4	0	5	9	13	19	22	26	31	33	38	41
Strain Gage B5	0	5	12	16	22	27	33	38	43	50	55
Strain Gage B6	0	4	7	12	17	20	26	30	34	39	43
Strain Gage C1	0	5	10	15	20	24	29	34	39	43	48
Strain Gage C2	0	10	19	28	38	46	56	66	75	84	94
Strain Gage C3	0	11	23	34	48	60	73	86	100	113	127
Strain Gage C4	0	13	25	41	58	76	95	113	132	150	169
Strain Gage C5	0	10	18	24	33	41	50	58	67	76	84
Strain Gage C6	0	5	9	13	18	22	26	31	36	40	45
Slip 1	0	0	0	0	0	0	0	0	0	0	0
Slip 2	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0	-0.0001	-0.0001	0
Slip 3	0	-0.0001	0	0	0	0	0	-0.0001	-0.0001	0	0
Slip 4	0	0	0	0	0	0	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

* Wire Pot A6 was not registering correctly during testing – its results can be ignored.

Table D-5: Test 5 (continued)

Load	11019	12046	13013	14029	15013
Wire Pot A1	0.0052	0.0071	0.0065	0.0071	0.0071
Wire Pot A2	0.0097	0.0142	0.0142	0.0149	0.0142
Wire Pot A3	0.014	0.0133	0.0127	0.0133	0.012
Wire Pot A4	0.01	0.012	0.0137	0.0147	0.0174
Wire Pot A5	0.006	0.0066	0.0126	0.0146	0.012
Wire Pot A6	0	0	0.0006	0.0006	0.0006
Wire Pot B1	0.0129	0.0129	0.0181	0.0194	0.0213
Wire Pot B2	0.0136	0.0123	0.02	0.0207	0.0207
Wire Pot B3	0.0273	0.026	0.026	0.0247	0.0273
Wire Pot B4	0.0143	0.0201	0.0201	0.0201	0.0273
Wire Pot B5	0.0208	0.022	0.0232	0.0244	0.0257
Wire Pot B6	0.0207	0.02	0.0207	0.0273	0.0287
Wire Pot C1	0.0065	0.013	0.013	0.0137	0.0137
Wire Pot C2	0.0093	0.0093	0.0116	0.014	0.0163
Wire Pot C3	0.0252	0.0286	0.0298	0.0298	0.0332
Wire Pot C4	0.0255	0.0291	0.0315	0.034	0.0364
Wire Pot C5	0.0209	0.0209	0.0232	0.0186	0.0209
Wire Pot C6	0.0143	0.0179	0.0167	0.0203	0.0215
Strain Gage A1	23	25	28	30	31
Strain Gage A2	21	23	25	28	29
Strain Gage A3	27	30	35	36	40
Strain Gage A4	26	30	32	36	37
Strain Gage A5	22	24	27	28	31
Strain Gage A6	23	24	26	29	32
Strain Gage B1	52	58	63	67	73
Strain Gage B2	48	51	56	61	65
Strain Gage B3	49	54	56	61	65
Strain Gage B4	46	49	53	57	61
Strain Gage B5	61	67	72	78	86
Strain Gage B6	48	53	58	62	67
Strain Gage C1	53	58	64	69	74
Strain Gage C2	103	113	123	133	146
Strain Gage C3	140	154	166	181	193
Strain Gage C4	190	208	227	248	267
Strain Gage C5	94	103	112	121	132
Strain Gage C6	48	54	58	64	68
Slip 1	0	0	0	0.0001	0
Slip 2	-0.0001	0	-0.0001	0	-0.0001
Slip 3	-0.0001	-0.0001	0	0	-0.0001
Slip 4	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

* Wire Pot A6 was not registering correctly during testing – its results can be ignored.

Test Designation: STRUX Concentrated Load Test 6 – Recast Slab 1
Transverse Line Load at Quarter Point A
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15013 lb
Midspan Deflection at Maximum Load:	0.027 in
Quarter A Deflection at Maximum Load:	0.035 in
Quarter B Deflection at Maximum Load:	0.019 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

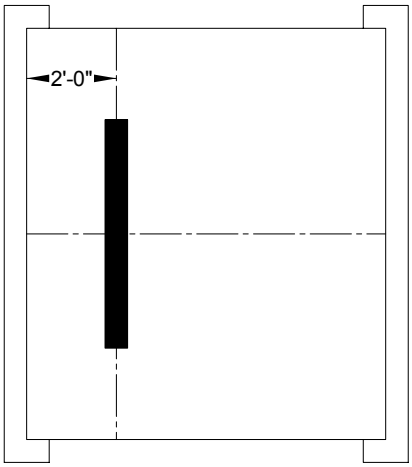

Figure D-8: Location of transverse line load at Quarter Point A – second slab set

Table D-6: Experimental results of concentrated load Test 6 on recast STRUX-reinforced slab 1

Load	0	1027	2010	3005	4005	5010	6010	7015	8020	9014	10009
Wire Pot A1	0	-0.0006	-0.0006	-0.0006	0	0	0.0072	0.0065	0.0065	0.0065	0.0117
Wire Pot A2	0	0	0.0006	0.0071	0.0084	0.0078	0.0071	0.0136	0.0149	0.0136	0.0136
Wire Pot A3	0	0	-0.0007	0.0067	0.0067	0.0067	0.0147	0.0147	0.0147	0.0207	0.0214
Wire Pot A4	0	0.0014	0.0037	0.0064	0.0074	0.0094	0.0111	0.0134	0.0164	0.0201	0.0218
Wire Pot A5	0	0.002	0.0013	0.0013	0.0073	0.008	0.0073	0.008	0.014	0.014	0.014
Wire Pot A6	0	0	-0.0007	0	0.0006	0.0006	0	0.0006	0	0.0071	0.0071
Wire Pot B1	0	-0.0013	0.0026	0.0026	0.0059	0.0059	0.0065	0.0071	0.0097	0.0123	0.0123
Wire Pot B2	0	-0.002	-0.0007	0	-0.0013	0.0006	0.0038	0.0058	0.0071	0.0116	0.0122
Wire Pot B3	0	0.0013	0	0.0104	0.0143	0.013	0.013	0.0143	0.0156	0.0169	0.0286
Wire Pot B4	0	-0.0013	-0.0013	0.0026	0.0013	0.0013	0.0091	0.0091	0.015	0.0143	0.015
Wire Pot B5	0	-0.0024	-0.0024	0	-0.0012	0.0037	0.0037	0.0074	0.0098	0.0123	0.0172
Wire Pot B6	0	0	0	0	0.0073	0.0073	0.0073	0.0133	0.0133	0.014	0.014
Wire Pot C1	0	-0.0006	-0.0006	0	-0.0006	-0.0006	-0.0006	0	0.0033	0.0072	0.0052
Wire Pot C2	0	0	0	0.0046	0	-0.0023	0	0	0.0046	0.0069	0.0069
Wire Pot C3	0	0.0023	0.0011	0.0023	0.0046	0.0057	0.008	0.0103	0.0126	0.0149	0.016
Wire Pot C4	0	0.0012	0.0012	0.0024	0.0048	0.0073	0.0073	0.0073	0.0073	0.0109	0.0097
Wire Pot C5	0	0	0.0024	0.0024	0.0024	0.0024	0.007	0.0047	0.007	0.0093	0.0093
Wire Pot C6	0	-0.0024	-0.0024	-0.0024	0.0012	0.0012	0.0012	0.0023	0.0059	0.0059	0.0071
Strain Gage A1	0	5	9	13	18	21	26	30	35	40	44
Strain Gage A2	0	9	17	25	33	43	52	60	70	81	90
Strain Gage A3	0	16	33	51	71	93	114	136	157	179	199
Strain Gage A4	0	15	29	45	62	80	98	117	134	154	170
Strain Gage A5	0	8	16	24	32	40	48	57	66	76	83
Strain Gage A6	0	5	9	13	18	21	26	29	34	39	43
Strain Gage B1	0	5	10	14	19	24	29	34	40	44	50
Strain Gage B2	0	6	10	15	20	23	29	34	38	43	48
Strain Gage B3	0	6	11	14	20	24	28	32	37	41	46
Strain Gage B4	0	5	9	13	19	22	26	30	34	39	43
Strain Gage B5	0	6	12	18	23	30	36	42	47	54	60
Strain Gage B6	0	5	9	14	19	23	28	33	37	42	47
Strain Gage C1	0	2	5	5	9	11	14	17	18	21	22
Strain Gage C2	0	2	4	5	8	10	13	14	17	19	21
Strain Gage C3	0	3	5	6	8	11	13	15	17	19	21
Strain Gage C4	0	2	4	7	9	11	14	16	20	22	24
Strain Gage C5	0	2	5	7	9	12	14	16	19	21	22
Strain Gage C6	0	2	5	6	8	11	13	14	16	19	21
Slip 1	0	0	0	0	0	0	0	0	0	0	0.0001
Slip 2	0	0	0	-0.0001	-0.0001	0	0	0	0	0	0
Slip 3	0	0	0	0	0	0	0	0	0	0	0
Slip 4	0	0	-1E-04	0	0	0	-1E-04	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table D-6: Test 6 (continued)

Load	11025	12035	13013	14029	15013
Wire Pot A1	0.013	0.013	0.0136	0.0208	0.0201
Wire Pot A2	0.022	0.0207	0.0207	0.0207	0.0279
Wire Pot A3	0.0207	0.0287	0.028	0.0294	0.0361
Wire Pot A4	0.0248	0.0268	0.0295	0.0311	0.0328
Wire Pot A5	0.0219	0.0219	0.0219	0.0219	0.0286
Wire Pot A6	0.0071	0.0071	0.0058	0.0143	0.0137
Wire Pot B1	0.0136	0.0201	0.0214	0.022	0.0233
Wire Pot B2	0.0135	0.0193	0.0206	0.0206	0.02
Wire Pot B3	0.0273	0.026	0.0247	0.0247	0.0247
Wire Pot B4	0.0228	0.0215	0.0221	0.028	0.0286
Wire Pot B5	0.0159	0.0196	0.022	0.0233	0.0257
Wire Pot B6	0.022	0.0213	0.0213	0.026	0.0273
Wire Pot C1	0.0065	0.0059	0.0072	0.0065	0.0078
Wire Pot C2	0.0069	0.0116	0.0139	0.0162	0.0162
Wire Pot C3	0.0149	0.0172	0.0183	0.0183	0.0218
Wire Pot C4	0.0109	0.0109	0.0109	0.0146	0.017
Wire Pot C5	0.007	0.0093	0.0117	0.014	0.0163
Wire Pot C6	0.0083	0.0107	0.0131	0.0119	0.0143
Strain Gage A1	49	54	58	64	69
Strain Gage A2	100	109	118	131	141
Strain Gage A3	222	246	266	291	313
Strain Gage A4	190	209	227	250	267
Strain Gage A5	93	103	110	117	124
Strain Gage A6	48	52	58	62	67
Strain Gage B1	55	61	65	73	78
Strain Gage B2	53	58	62	68	72
Strain Gage B3	51	55	58	63	67
Strain Gage B4	46	50	55	59	62
Strain Gage B5	66	72	78	84	89
Strain Gage B6	52	58	62	67	72
Strain Gage C1	26	28	31	34	35
Strain Gage C2	22	25	28	30	32
Strain Gage C3	23	25	28	30	32
Strain Gage C4	28	32	34	38	41
Strain Gage C5	24	27	30	32	34
Strain Gage C6	23	25	27	30	32
Slip 1	0	0	0	0	0
Slip 2	0	-0.0001	0	0	0
Slip 3	0	0	0	0.0001	0
Slip 4	-1E-04	-1E-04	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 7 – Recast Slab 1
Longitudinal Line Load at Right Side
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14997 lb
Midspan Deflection at Maximum Load:	0.036 in
Quarter A Deflection at Maximum Load:	0.028 in
Quarter B Deflection at Maximum Load:	0.028 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

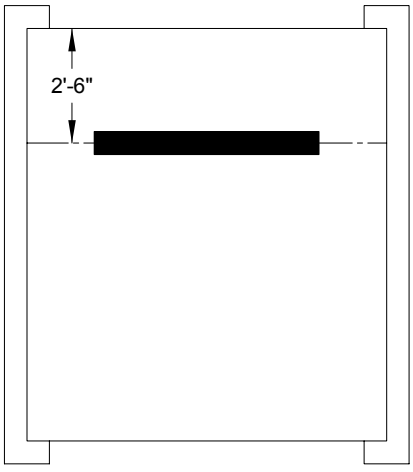

Figure D-9: Location of longitudinal line load at Right Side – second slab set

Table D-7: Experimental results of concentrated load Test 7 on recast STRUX-reinforced slab 1

Load	0	1016	2010	3026	4037	5015	5999	7036	8014	9025	10030
Wire Pot A1	0	-0.0006	-0.0006	-0.0006	0.0007	-0.0006	0	0.0013	0.0007	0.0007	-0.0006
Wire Pot A2	0	0	0.0013	-0.0007	0	-0.0007	0	0	0.0006	-0.0007	0
Wire Pot A3	0	0	0.0013	0.0013	0	0.0086	0.008	0.0073	0.008	0.0073	0.01
Wire Pot A4	0	0.0007	0.0037	0.006	0.007	0.0084	0.0114	0.0141	0.0174	0.0194	0.0231
Wire Pot A5	0	0.0006	0.0079	0.0066	0.0139	0.0146	0.0205	0.0199	0.0278	0.0278	0.0351
Wire Pot A6	0	0	-0.0019	-0.0006	0	0.0007	0.0052	0.0124	0.0118	0.019	0.0261
Wire Pot B1	0	0.0007	0	0.0007	0.0007	0.0039	0.0033	0.0046	0.0046	0.0033	0.0026
Wire Pot B2	0	0.0007	0	-0.0006	0.0013	-0.0006	0	-0.0006	0	-0.0013	0
Wire Pot B3	0	0.0013	0.0013	0.0013	0.0104	0.0143	0.0143	0.0143	0.0117	0.013	0.0169
Wire Pot B4	0	0	0	0	0.0065	0.0071	0.0149	0.0143	0.0208	0.0201	0.0273
Wire Pot B5	0	-0.0024	0.0025	0.0098	0.0159	0.0208	0.0245	0.0294	0.0306	0.0379	0.044
Wire Pot B6	0	0.0073	0.0147	0.016	0.0213	0.0287	0.034	0.0413	0.048	0.0513	0.056
Wire Pot C1	0	0	0.0006	0.0012	0	0.0006	0.0006	0	0	0.0006	0
Wire Pot C2	0	0.0023	0	0.0023	0	0.0046	0	0	0	0	0.0023
Wire Pot C3	0	0.0023	0.0034	0.0057	0.0057	0.0057	0.008	0.0103	0.0149	0.0149	0.0137
Wire Pot C4	0	0.0024	0.0048	0.006	0.0085	0.0121	0.0109	0.0145	0.0194	0.0243	0.0267
Wire Pot C5	0	0.0023	0.007	0.0046	0.007	0.0116	0.0139	0.0186	0.0255	0.0232	0.0325
Wire Pot C6	0	0.0012	0.0071	0.0119	0.0155	0.0203	0.0239	0.0298	0.0358	0.037	0.0406
Strain Gage A1	0	2	4	6	8	10	12	14	16	17	20
Strain Gage A2	0	4	8	11	15	18	21	25	27	32	34
Strain Gage A3	0	6	13	19	26	34	41	47	53	61	68
Strain Gage A4	0	7	14	21	28	36	43	53	59	68	75
Strain Gage A5	0	6	12	19	24	30	37	44	51	56	64
Strain Gage A6	0	7	13	20	27	33	40	47	55	62	69
Strain Gage B1	0	3	6	9	13	16	19	23	26	29	32
Strain Gage B2	0	6	10	15	20	24	29	35	38	43	48
Strain Gage B3	0	8	16	22	31	37	43	50	56	63	70
Strain Gage B4	0	10	20	27	36	44	53	62	69	76	86
Strain Gage B5	0	14	26	40	51	65	78	92	104	119	132
Strain Gage B6	0	12	24	35	47	60	71	85	97	110	124
Strain Gage C1	0	1	3	4	8	10	12	14	17	19	21
Strain Gage C2	0	4	7	11	14	18	22	26	29	33	37
Strain Gage C3	0	6	10	15	21	24	30	36	41	46	53
Strain Gage C4	0	8	15	23	32	40	49	57	66	75	83
Strain Gage C5	0	7	14	19	27	33	40	48	55	62	69
Strain Gage C6	0	7	14	21	29	35	44	51	59	68	75
Slip 1	0	0	0	0	0.0001	0	0	0	0	0	-0.0001
Slip 2	0	-0.0002	-0.0002	-1E-04	-1E-04	-1E-04	-0.0002	-0.0002	-1E-04	-0.0002	-0.0002
Slip 3	0	0	0	0	0	0	0	0	0	0	0
Slip 4	0	0	0	0	0	0	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table D-7: Test 7 (continued)

Load	11030	12008	12997	14062	14997
Wire Pot A1	-0.0006	-0.0013	0.0007	0	0.0007
Wire Pot A2	0.0006	0.0026	0.0071	0.0065	0.0065
Wire Pot A3	0.0153	0.0147	0.0153	0.0147	0.022
Wire Pot A4	0.0248	0.0264	0.0284	0.0308	0.0341
Wire Pot A5	0.0358	0.0418	0.0424	0.0484	0.0484
Wire Pot A6	0.0268	0.0333	0.032	0.0405	0.0385
Wire Pot B1	0.0026	0	0.0026	0	0.0013
Wire Pot B2	-0.0006	0.0007	-0.0006	0.0058	0.0065
Wire Pot B3	0.013	0.026	0.0286	0.026	0.0286
Wire Pot B4	0.0266	0.0338	0.0345	0.041	0.0442
Wire Pot B5	0.0477	0.055	0.0562	0.0599	0.0672
Wire Pot B6	0.0653	0.0626	0.07	0.0766	0.084
Wire Pot C1	0.0006	0.0006	-0.0007	0.0006	0
Wire Pot C2	0	0.0023	-0.0023	0	0
Wire Pot C3	0.0172	0.0172	0.0183	0.0218	0.0229
Wire Pot C4	0.0267	0.0279	0.0291	0.0315	0.0328
Wire Pot C5	0.0348	0.0302	0.0395	0.0418	0.0465
Wire Pot C6	0.0454	0.0477	0.0501	0.0561	0.0597
Strain Gage A1	22	25	26	29	32
Strain Gage A2	38	41	46	49	54
Strain Gage A3	76	83	90	100	107
Strain Gage A4	84	92	99	108	116
Strain Gage A5	70	77	82	89	95
Strain Gage A6	77	83	90	95	101
Strain Gage B1	36	40	44	48	53
Strain Gage B2	53	58	62	70	75
Strain Gage B3	77	82	91	102	109
Strain Gage B4	94	103	115	131	144
Strain Gage B5	145	150	147	150	154
Strain Gage B6	137	148	161	188	227
Strain Gage C1	23	26	28	32	35
Strain Gage C2	41	44	48	54	58
Strain Gage C3	59	64	70	80	85
Strain Gage C4	93	102	110	121	131
Strain Gage C5	77	83	88	92	98
Strain Gage C6	83	91	99	106	111
Slip 1	0	0	0	-0.0001	0
Slip 2	-0.0002	-0.0002	-0.0002	-1E-04	-0.0002
Slip 3	0	0	0	0	-0.0001
Slip 4	0	0	0	-0.0001	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 8 – Recast Slab 1
Longitudinal Line Load at Left Side
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15002 lb
Midspan Deflection at Maximum Load:	0.029 in
Quarter A Deflection at Maximum Load:	0.021 in
Quarter B Deflection at Maximum Load:	0.020 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

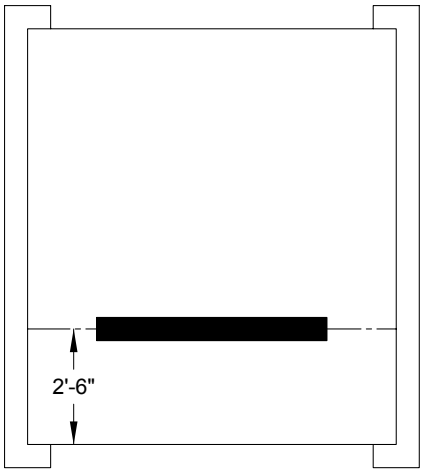

Figure D-10: Location of longitudinal line load at Left Side – second slab set

Table D-8: Experimental results of concentrated load Test 8 on recast STRUX-reinforced slab 1

Load	0	1189	2021	3037	4015	5015	6145	7015	8009	9025	10052
Wire Pot A1	0	0.0026	0.0065	0.013	0.0123	0.0201	0.0195	0.0266	0.0266	0.0272	0.0324
Wire Pot A2	0	-0.0013	0.002	0.0059	0.0065	0.0123	0.013	0.0195	0.0195	0.0201	0.026
Wire Pot A3	0	-0.0006	0	0.0074	0.006	0.0074	0.0074	0.0141	0.0141	0.0147	0.0167
Wire Pot A4	0	0	0	0.0003	0.0027	0.003	0.0047	0.0053	0.0067	0.0067	0.0073
Wire Pot A5	0	0.0019	0.0013	0.0006	-0.0014	0.0019	0	0.0006	0.0019	0.0006	0
Wire Pot A6	0	0.0007	0.0013	0	0.0026	0.0007	0.0007	0.0013	0.0007	0.0013	0
Wire Pot B1	0	0.0072	0.0156	0.0162	0.0188	0.0259	0.0285	0.0343	0.0336	0.042	0.0408
Wire Pot B2	0	0.0058	0.0045	0.0123	0.0129	0.02	0.0206	0.0245	0.0271	0.0271	0.0335
Wire Pot B3	0	0.0013	0.0052	0.0156	0.0143	0.0169	0.0156	0.0169	0.0156	0.0312	0.0286
Wire Pot B4	0	0.0013	0.0006	0.0006	0.0006	0	0	0.0039	0.0065	0.0065	0.0071
Wire Pot B5	0	0.0012	0	-0.0012	-0.0012	-0.0024	0	-0.0012	-0.0024	-0.0012	-0.0012
Wire Pot B6	0	-0.0067	-0.0074	-0.0074	-0.0074	-0.0074	-0.0067	-0.006	-0.0074	-0.0074	-0.0074
Wire Pot C1	0	0.0032	0.0064	0.0071	0.0129	0.0136	0.02	0.02	0.0278	0.0272	0.0337
Wire Pot C2	0	-0.0023	-0.0023	0	0.0047	0.007	0.0093	0.0116	0.007	0.0186	0.0209
Wire Pot C3	0	0.0023	0.0046	0.0069	0.0103	0.0126	0.016	0.0137	0.0172	0.0183	0.0206
Wire Pot C4	0	0.0012	0.0012	0.0036	0.0024	0.0024	0.0024	0.0036	0.0036	0.0024	0.0048
Wire Pot C5	0	0	0	0	0.0023	0.0023	-0.0023	0	-0.0023	-0.0046	-0.0046
Wire Pot C6	0	0.0012	-0.0012	0.0012	0	-0.0012	-0.0012	-0.0012	-0.0012	-0.0012	0
Strain Gage A1	0	5	11	17	22	27	34	39	45	52	59
Strain Gage A2	0	8	15	21	27	35	43	50	58	65	73
Strain Gage A3	0	7	13	20	26	33	42	47	55	62	69
Strain Gage A4	0	5	10	15	19	24	30	34	40	44	50
Strain Gage A5	0	3	5	7	10	13	16	18	20	23	25
Strain Gage A6	0	1	1	4	5	7	8	9	10	13	14
Strain Gage B1	0	8	14	22	29	37	46	53	62	69	79
Strain Gage B2	0	7	12	18	22	27	32	38	42	48	54
Strain Gage B3	0	8	13	18	23	28	35	39	45	49	55
Strain Gage B4	0	5	10	14	18	23	26	31	36	40	44
Strain Gage B5	0	4	9	12	18	20	24	28	32	35	39
Strain Gage B6	0	1	4	6	8	10	13	15	18	21	23
Strain Gage C1	0	7	13	20	27	34	42	49	55	63	70
Strain Gage C2	0	10	17	26	36	44	54	63	72	80	90
Strain Gage C3	0	8	13	20	27	34	41	47	56	62	69
Strain Gage C4	0	5	9	16	21	28	34	41	47	55	61
Strain Gage C5	0	3	5	9	11	15	17	20	24	25	29
Strain Gage C6	0	1	2	3	3	6	7	8	10	12	13
Slip 1	0	0	0	0	0	0	0.0001	0	0	0	0
Slip 2	0	-0.0001	-0.0001	0	-0.0001	0	-0.0001	-0.0001	0	-0.0001	-0.0001
Slip 3	0	0	0	0.0001	0.0001	0	0.0001	0	0	0	0.0001
Slip 4	0	0	-1E-04	0	0.0001	0	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table D-8: Test 8 (continued)

Load	11003	12035	13008	14024	15002
Wire Pot A1	0.0324	0.0408	0.0408	0.0395	0.0473
Wire Pot A2	0.0266	0.0273	0.0331	0.0331	0.0344
Wire Pot A3	0.0201	0.0214	0.0214	0.0294	0.0281
Wire Pot A4	0.008	0.008	0.0103	0.012	0.013
Wire Pot A5	0.0013	0	0.0006	0.0013	0.0006
Wire Pot A6	0	0.0026	0.0013	0.0013	0.0007
Wire Pot B1	0.0479	0.0472	0.053	0.055	0.0614
Wire Pot B2	0.0316	0.0329	0.04	0.04	0.0452
Wire Pot B3	0.0299	0.0312	0.0273	0.0299	0.0428
Wire Pot B4	0.0078	0.013	0.0136	0.0149	0.0143
Wire Pot B5	-0.0012	0	0	0.0025	0.0025
Wire Pot B6	-0.008	-0.0067	-0.0067	-0.004	0
Wire Pot C1	0.0337	0.0337	0.0414	0.0414	0.0414
Wire Pot C2	0.0255	0.0255	0.0232	0.0325	0.0348
Wire Pot C3	0.024	0.0252	0.0298	0.0321	0.0321
Wire Pot C4	0.0024	0.006	0.0048	0.0072	0.0072
Wire Pot C5	-0.0046	-0.0023	0	-0.0023	-0.0023
Wire Pot C6	-0.0012	-0.0024	-0.0012	-0.0024	-0.0036
Strain Gage A1	65	71	78	84	91
Strain Gage A2	80	89	96	105	112
Strain Gage A3	76	84	92	100	106
Strain Gage A4	54	61	67	72	77
Strain Gage A5	28	31	33	36	38
Strain Gage A6	17	17	19	22	22
Strain Gage B1	87	95	102	113	121
Strain Gage B2	59	65	71	77	82
Strain Gage B3	60	67	71	77	82
Strain Gage B4	49	53	57	63	67
Strain Gage B5	43	47	50	55	58
Strain Gage B6	25	28	31	34	37
Strain Gage C1	78	87	94	102	110
Strain Gage C2	101	110	119	130	140
Strain Gage C3	76	83	90	99	106
Strain Gage C4	68	75	81	88	95
Strain Gage C5	31	35	38	41	45
Strain Gage C6	14	15	18	19	20
Slip 1	0	0	0	0	0
Slip 2	-0.0001	0	-0.0001	-0.0001	0
Slip 3	0.0001	0.0001	0	0.0001	0.0001
Slip 4	0	0.0001	0.0001	-1E-04	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 9 – Recast Slab 1
Longitudinal Line Load at Midspan
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15013 lb
Midspan Deflection at Maximum Load:	0.036 in
Quarter A Deflection at Maximum Load:	0.028 in
Quarter B Deflection at Maximum Load:	0.029 in
End Slip at Maximum Load:	0.0000 in

Diagram of Load Location

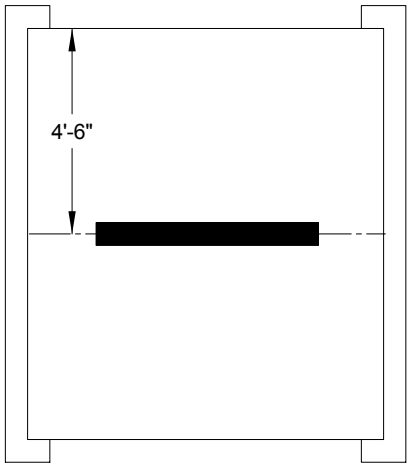

Figure D-11: Location of longitudinal line load at Midspan – second slab set

Table D-9: Experimental results of concentrated load Test 9 on recast STRUX-reinforced slab 1

Load	0	1038	2000	3010	4075	5021	6031	7063	8058	9058	10079
Wire Pot A1	0	0	0	0	-0.002	-0.0007	-0.0007	0.0058	0.0052	0.0071	0.0065
Wire Pot A2	0	0.0007	0.0007	0	0.0065	0.0072	0.0072	0.0072	0.013	0.013	0.0143
Wire Pot A3	0	0.0026	0.002	0.0073	0.0093	0.0093	0.016	0.0153	0.016	0.02	0.022
Wire Pot A4	0	0.0003	0.0027	0.0053	0.0063	0.0073	0.0087	0.011	0.0137	0.0164	0.019
Wire Pot A5	0	0	-0.0013	-0.0027	0	-0.0013	-0.0007	-0.0007	0.006	0.0066	0.0066
Wire Pot A6	0	0	0	0.0007	0	0.0007	-0.0006	0	-0.0006	-0.0006	-0.0006
Wire Pot B1	0	0	0.0006	0.0006	0.0071	0.0071	0.0065	0.0116	0.0129	0.0136	0.0162
Wire Pot B2	0	-0.0013	0.0052	0.0065	0.0071	0.0129	0.0129	0.0116	0.0181	0.0187	0.0252
Wire Pot B3	0	-0.0052	-0.0039	0.0065	0.013	0.0117	0.0091	0.0117	0.0234	0.0234	0.0247
Wire Pot B4	0	0.0013	-0.0006	-0.0006	0.0039	0.0072	0.0059	0.013	0.015	0.0208	0.0202
Wire Pot B5	0	-0.0024	-0.0024	-0.0012	0	0.0025	0.0073	0.0086	0.0122	0.0147	0.0159
Wire Pot B6	0	0	0.0027	0.0067	0.0067	0.006	0.0127	0.0133	0.012	0.0207	0.0213
Wire Pot C1	0	0	0.0013	0	0	0.0006	0	0	0.0039	0.0065	0.0065
Wire Pot C2	0	0.0023	-0.0023	0	0.0023	0.0023	0.0092	0.0069	0.0069	0.0092	0.0139
Wire Pot C3	0	0.0034	0.0057	0.0092	0.0092	0.0126	0.016	0.0183	0.0206	0.0206	0.0206
Wire Pot C4	0	-0.0012	0.0012	0	0.0012	0.0024	0.0024	0.0048	0.0085	0.0133	0.017
Wire Pot C5	0	-0.0023	0	0.0023	0.0023	0.0093	0.007	0.007	0.0046	0.0116	0.0139
Wire Pot C6	0	0	-0.0012	0	0	0	0.0024	0.0036	0.0071	0.0095	0.0107
Strain Gage A1	0	4	8	11	15	19	23	27	30	34	37
Strain Gage A2	0	5	10	15	21	26	32	37	44	50	56
Strain Gage A3	0	9	17	26	38	47	57	67	77	89	101
Strain Gage A4	0	7	15	24	34	42	52	61	71	81	92
Strain Gage A5	0	7	11	15	21	25	30	36	40	45	51
Strain Gage A6	0	4	6	9	14	17	20	24	27	31	34
Strain Gage B1	0	6	12	18	24	30	36	42	49	53	61
Strain Gage B2	0	7	13	20	27	33	39	46	53	59	65
Strain Gage B3	0	9	16	23	29	36	42	48	54	61	67
Strain Gage B4	0	8	14	21	27	32	40	45	52	57	64
Strain Gage B5	0	8	15	21	28	34	40	48	55	61	68
Strain Gage B6	0	7	11	16	22	27	33	38	43	50	56
Strain Gage C1	0	5	9	13	17	21	24	29	32	37	41
Strain Gage C2	0	7	11	17	22	28	34	39	44	52	57
Strain Gage C3	0	7	13	21	29	37	45	54	63	72	82
Strain Gage C4	0	8	17	26	38	47	59	70	81	92	104
Strain Gage C5	0	6	11	16	21	25	31	36	42	47	53
Strain Gage C6	0	3	6	10	12	16	20	22	25	29	32
Slip 1	0	0	0	0	0	0	0	0	0	0	0
Slip 2	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 3	0	0.0001	0.0001	0	0.0001	0.0001	0.0001	0	0.0001	0.0001	0
Slip 4	0	0	-0.0001	0	0	0	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

* Wire Pot A6 was not registering correctly during testing – its results can be ignored.

Table D-9: Test 9 (continued)

Load	11030	12014	13024	14019	15013
Wire Pot A1	0.0136	0.0129	0.0129	0.0123	0.0194
Wire Pot A2	0.0208	0.0201	0.0208	0.0208	0.0279
Wire Pot A3	0.0227	0.0227	0.03	0.0307	0.028
Wire Pot A4	0.0214	0.024	0.0261	0.0274	0.0287
Wire Pot A5	0.0126	0.0139	0.0139	0.0133	0.0192
Wire Pot A6	0	0	0	0.0007	0.0007
Wire Pot B1	0.02	0.0207	0.0207	0.0278	0.0284
Wire Pot B2	0.0252	0.0265	0.0323	0.0329	0.0329
Wire Pot B3	0.0247	0.026	0.0376	0.0389	0.0376
Wire Pot B4	0.0195	0.028	0.028	0.0345	0.0352
Wire Pot B5	0.0208	0.022	0.0232	0.0257	0.0269
Wire Pot B6	0.0207	0.024	0.0273	0.0287	0.0273
Wire Pot C1	0.0078	0.0117	0.0143	0.0136	0.0136
Wire Pot C2	0.0116	0.0139	0.0185	0.0185	0.0232
Wire Pot C3	0.0263	0.0286	0.0321	0.0321	0.0344
Wire Pot C4	0.0194	0.0206	0.0194	0.0243	0.0243
Wire Pot C5	0.0116	0.0139	0.0232	0.0186	0.0232
Wire Pot C6	0.0119	0.0131	0.0143	0.0167	0.0155
Strain Gage A1	42	45	50	53	56
Strain Gage A2	62	67	74	79	85
Strain Gage A3	110	122	134	144	156
Strain Gage A4	101	112	122	133	143
Strain Gage A5	56	60	66	72	76
Strain Gage A6	38	40	44	48	51
Strain Gage B1	66	71	79	85	91
Strain Gage B2	72	78	84	92	98
Strain Gage B3	73	79	85	92	98
Strain Gage B4	70	75	82	87	93
Strain Gage B5	75	82	88	95	102
Strain Gage B6	62	69	75	81	88
Strain Gage C1	45	50	54	57	60
Strain Gage C2	62	69	75	81	87
Strain Gage C3	89	98	107	116	124
Strain Gage C4	114	125	136	148	159
Strain Gage C5	57	63	68	73	79
Strain Gage C6	34	37	40	44	48
Slip 1	0	0	0	0	0
Slip 2	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 3	0	0	0	0.0001	0
Slip 4	-0.0001	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

* Wire Pot A6 was not registering correctly during testing – its results can be ignored.

Test Designation: STRUX Concentrated Load Test 10 – Recast Slab 1
Transverse Line Load at Midspan
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15045 lb
Midspan Deflection at Maximum Load:	0.055 in
Quarter A Deflection at Maximum Load:	0.035 in
Quarter B Deflection at Maximum Load:	0.032 in
End Slip at Maximum Load:	0.0001 in

Diagram of Load Location

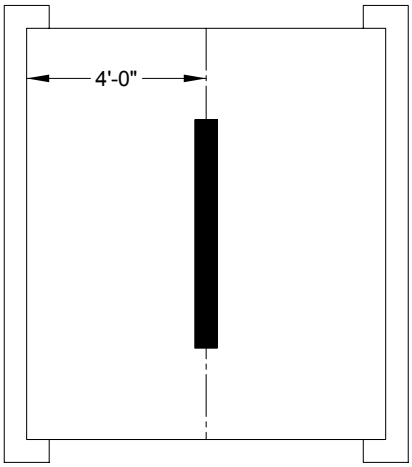

Figure D-12: Location of transverse line load at Midspan – second slab set

Table D-10: Experimental results of concentrated load Test 10 on recast STRUX-reinforced slab 1

Load	0	1135	2021	3059	4037	5042	5999	7020	8014	9020	10063
Wire Pot A1	0	-0.0013	-0.0019	-0.0013	-0.0006	-0.0013	-0.0006	0.0052	0.0059	0.0059	0.0136
Wire Pot A2	0	0	0	0	0.0085	0.0065	0.0072	0.0136	0.0136	0.013	0.0208
Wire Pot A3	0	-0.0006	-0.0006	0.008	0.0074	0.008	0.0154	0.0141	0.0141	0.0214	0.0221
Wire Pot A4	0	0.0004	0.0024	0.0051	0.0064	0.0071	0.0091	0.0124	0.0151	0.0184	0.0224
Wire Pot A5	0	-0.0006	0.0007	0	-0.0006	0.0013	0.0073	0.0073	0.008	0.0146	0.0146
Wire Pot A6	0	0	0.0006	0.0065	0.0065	0.0065	0.013	0.013	0.0124	0.0124	0.0202
Wire Pot B1	0	-0.0013	-0.002	0.0045	0.0052	0.0077	0.0129	0.0116	0.0187	0.0194	0.0232
Wire Pot B2	0	0.0007	-0.0006	0.0013	0.0071	0.0065	0.0136	0.0129	0.0213	0.0207	0.0258
Wire Pot B3	0	-0.0013	0	0.0013	0.0117	0.013	0.0156	0.0143	0.0208	0.0273	0.0286
Wire Pot B4	0	-0.002	0.0006	0.0071	0.0065	0.0143	0.0143	0.0208	0.0208	0.0266	0.0273
Wire Pot B5	0	-0.0024	-0.0024	0.0013	0.0049	0.0061	0.0098	0.0147	0.0184	0.0208	0.0257
Wire Pot B6	0	0	0.0074	0.0067	0.0074	0.0147	0.0147	0.0214	0.0234	0.022	0.028
Wire Pot C1	0	0	0	0	-0.0006	0	-0.0006	0.0013	0.0071	0.0065	0.0071
Wire Pot C2	0	-0.0023	-0.0023	0	0.0023	0	0.007	0.007	0.0116	0.0093	0.0162
Wire Pot C3	0	0.0035	0.0046	0.0069	0.0115	0.0138	0.0172	0.0184	0.0195	0.0229	0.0252
Wire Pot C4	0	0	0	0.0012	0.0048	0.0048	0.0061	0.0097	0.0158	0.0194	0.0194
Wire Pot C5	0	0	-0.0046	0.0023	0.0047	0.0047	0.0047	0.0116	0.0116	0.0116	0.0163
Wire Pot C6	0	0.0012	0.0012	0.0024	0.0048	0.006	0.0095	0.0095	0.0119	0.0143	0.0155
Strain Gage A1	0	5	9	12	17	21	25	29	34	38	43
Strain Gage A2	0	6	9	14	18	24	29	34	39	44	50
Strain Gage A3	0	7	12	19	26	31	37	46	53	60	67
Strain Gage A4	0	8	13	19	26	33	41	47	55	62	71
Strain Gage A5	0	6	8	14	18	22	27	31	37	41	45
Strain Gage A6	0	5	7	12	16	20	23	27	32	37	40
Strain Gage B1	0	9	15	22	30	37	44	52	61	67	76
Strain Gage B2	0	12	20	30	40	49	60	71	82	91	103
Strain Gage B3	0	20	33	49	64	80	96	112	132	152	181
Strain Gage B4	0	16	27	41	54	67	80	94	109	123	140
Strain Gage B5	0	13	21	32	41	50	61	72	82	92	104
Strain Gage B6	0	10	15	22	28	35	43	53	62	69	79
Strain Gage C1	0	5	9	14	19	23	28	33	38	44	49
Strain Gage C2	0	6	10	16	23	28	33	40	46	52	58
Strain Gage C3	0	6	11	17	23	30	37	43	51	57	65
Strain Gage C4	0	9	14	23	31	39	48	58	66	76	85
Strain Gage C5	0	6	11	17	22	26	32	38	43	49	54
Strain Gage C6	0	5	9	13	16	20	23	27	31	36	41
Slip 1	0	-0.0001	0	-0.0001	-0.0001	0	0	-0.0001	0	0	-0.0001
Slip 2	0	0	0	0	0	0	0	0.0001	0	0	0
Slip 3	0	0	0	0	0	-0.0001	0	0	0	-0.0001	-0.0001
Slip 4	0	0	0.0001	0	0.0001	0	0.0001	0.0001	0.0001	0.0001	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table D-10: Test 10 (continued)

Load	11041	11997	13013	14029	15045
Wire Pot A1	0.0123	0.0123	0.0201	0.0195	0.0253
Wire Pot A2	0.0214	0.0208	0.0273	0.0279	0.0292
Wire Pot A3	0.0214	0.0288	0.0288	0.0354	0.0348
Wire Pot A4	0.0241	0.0265	0.0285	0.0315	0.0351
Wire Pot A5	0.0146	0.0213	0.0213	0.0226	0.0279
Wire Pot A6	0.0202	0.0267	0.0267	0.0261	0.0333
Wire Pot B1	0.0284	0.0284	0.0349	0.0342	0.0388
Wire Pot B2	0.0258	0.0284	0.0342	0.0394	0.0406
Wire Pot B3	0.0273	0.0428	0.0428	0.0428	0.0558
Wire Pot B4	0.0325	0.041	0.041	0.0462	0.054
Wire Pot B5	0.0245	0.0294	0.0318	0.0367	0.0404
Wire Pot B6	0.028	0.0347	0.036	0.0427	0.0427
Wire Pot C1	0.013	0.0136	0.0156	0.0207	0.0201
Wire Pot C2	0.0209	0.0186	0.0209	0.0255	0.0255
Wire Pot C3	0.0287	0.0321	0.0321	0.0333	0.0367
Wire Pot C4	0.0231	0.0231	0.0243	0.0279	0.0279
Wire Pot C5	0.0186	0.0163	0.0256	0.0186	0.0232
Wire Pot C6	0.0155	0.0191	0.0191	0.0239	0.0275
Strain Gage A1	48	53	58	64	70
Strain Gage A2	54	59	64	69	72
Strain Gage A3	75	80	85	88	92
Strain Gage A4	77	82	86	92	97
Strain Gage A5	51	54	59	65	68
Strain Gage A6	44	49	54	60	66
Strain Gage B1	84	94	105	118	130
Strain Gage B2	115	131	150	161	170
Strain Gage B3	212	282	266	348	359
Strain Gage B4	237	261	283	307	328
Strain Gage B5	116	135	152	171	188
Strain Gage B6	87	98	110	123	135
Strain Gage C1	54	59	66	72	79
Strain Gage C2	64	69	75	79	83
Strain Gage C3	71	76	78	80	84
Strain Gage C4	93	98	105	111	118
Strain Gage C5	59	64	69	75	81
Strain Gage C6	44	48	55	60	64
Slip 1	-0.0001	0	-0.0001	-0.0001	-0.0001
Slip 2	-0.0001	0	0	0	0
Slip 3	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 4	0.0001	0.0001	0.0002	0.0001	0.0002

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 11 – Recast Slab 1
Concentrated Point Load at Midspan
Cast Date: 6/16/2006
Test Date: 7/17/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	20974 lb
Midspan Deflection at Maximum Load:	0.129 in
Quarter A Deflection at Maximum Load:	0.080 in
Quarter B Deflection at Maximum Load:	0.084 in
End Slip at Maximum Load:	0.0008 in

Diagram of Load Location

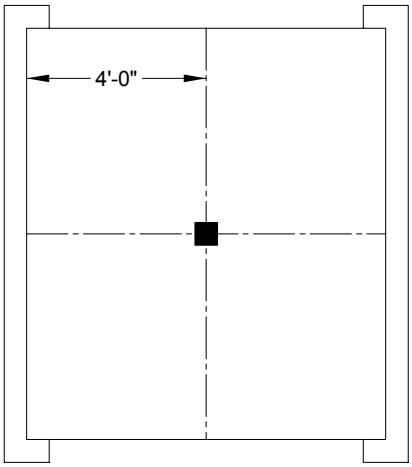

Figure D-13: Location of concentrated point load at Midspan – second slab set

Table D-11: Experimental results of concentrated load Test 11 on recast STRUX-reinforced slab 1

Load	0	519	1005	1492	2005	2518	3010	3507	4010	4507	4994
Wire Pot A1	0	0	-0.0006	0	-0.0006	0	0	0	-0.0006	0	0
Wire Pot A2	0	-0.0007	-0.0013	-0.0013	-0.0007	-0.002	0.0065	0.0065	0.0071	0.0052	0.0058
Wire Pot A3	0	0	0.0006	0	-0.0007	0.0066	0.0073	0.0073	0.0066	0.008	0.0066
Wire Pot A4	0	0.0003	0.0003	0.002	0.0034	0.0047	0.0064	0.006	0.007	0.0077	0.0087
Wire Pot A5	0	-0.0007	-0.0007	-0.0013	-0.0013	-0.0007	-0.0007	-0.0007	-0.0013	-0.0013	0.004
Wire Pot A6	0	0.0006	-0.0007	0.0013	0	0.0013	0.0013	0.0013	0.0006	0.0013	0.0006
Wire Pot B1	0	0.0013	0.0045	0.0084	0.0097	0.0078	0.0084	0.0116	0.0116	0.0162	0.0155
Wire Pot B2	0	-0.0013	-0.0013	-0.0013	0	0.0007	0.0032	0.0045	0.0052	0.0058	0.0045
Wire Pot B3	0	-0.0026	-0.0013	0.0013	-0.0013	-0.0013	-0.0013	0.0117	0.013	0.013	0.0117
Wire Pot B4	0	-0.0006	-0.0013	0	0.0007	0.002	0.0013	0.0026	0.0085	0.0085	0.0085
Wire Pot B5	0	-0.0012	0	0	0.0012	-0.0012	0.0012	0.0024	0.0049	0.0037	0.0073
Wire Pot B6	0	0	0	0	0.0093	0.0067	0.0067	0.008	0.0073	0.014	0.014
Wire Pot C1	0	-0.0013	-0.0013	-0.0007	0	0	-0.0007	-0.0007	-0.0013	-0.0007	-0.0013
Wire Pot C2	0	0.0023	0.0023	-0.0023	0	0.0023	0.0023	0	0	0.0046	0.0093
Wire Pot C3	0	0	-0.0011	0.0011	0.0034	0.0034	0.0046	0.008	0.0103	0.0114	0.0126
Wire Pot C4	0	-0.0024	-0.0024	-0.0012	-0.0024	-0.0024	0	-0.0012	0.0012	0.0012	0.0037
Wire Pot C5	0	-0.0047	-0.007	-0.0047	-0.0023	-0.0023	0.0023	0.0046	0.0046	0.0023	0
Wire Pot C6	0	0	-0.0012	-0.0012	0	0	0.0012	0.0012	0.0023	0.0035	0.0023
Strain Gage A1	0	3	4	6	8	12	13	15	17	19	21
Strain Gage A2	0	2	5	8	9	12	13	17	18	22	23
Strain Gage A3	0	3	5	8	11	14	16	20	22	25	28
Strain Gage A4	0	3	5	8	10	14	17	21	23	25	29
Strain Gage A5	0	2	4	6	8	10	13	15	17	19	20
Strain Gage A6	0	2	4	7	8	11	13	15	17	19	20
Strain Gage B1	0	4	7	11	15	17	22	26	30	34	38
Strain Gage B2	0	5	11	16	20	26	31	36	41	45	51
Strain Gage B3	0	10	17	25	34	43	52	64	74	84	96
Strain Gage B4	0	9	18	25	34	43	53	63	72	84	93
Strain Gage B5	0	6	12	17	22	26	33	38	43	48	54
Strain Gage B6	0	4	7	11	14	17	20	24	27	31	36
Strain Gage C1	0	2	4	7	10	12	15	17	19	21	24
Strain Gage C2	0	3	5	8	11	14	16	20	22	25	27
Strain Gage C3	0	3	5	7	11	13	16	19	21	22	26
Strain Gage C4	0	4	6	11	13	17	20	24	28	32	35
Strain Gage C5	0	2	6	9	10	13	16	19	21	23	25
Strain Gage C6	0	2	3	5	8	10	11	13	14	17	19
Slip 1	0	-0.0001	0	-0.0001	-0.0001	0	-0.0001	0	-0.0001	-0.0001	-0.0001
Slip 2	0	0	-0.0001	0	-0.0001	-0.0001	0	0	-0.0001	0	0
Slip 3	0	-0.0001	0	-0.0001	0	0	-0.0001	-0.0001	0	0	0
Slip 4	0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table D-11: Test 11 (continued)

Load	5507	6004	6496	7042	7571	8025	8517	9047	9544	10003	10500
Wire Pot A1	0	0.0007	0.0065	0.0078	0.0078	0.0072	0.0065	0.0091	0.0136	0.0136	0.0143
Wire Pot A2	0.0065	0.0071	0.0104	0.0129	0.0123	0.0116	0.0136	0.0123	0.0194	0.0194	0.0201
Wire Pot A3	0.0147	0.0147	0.0127	0.0133	0.014	0.0207	0.0213	0.0207	0.0227	0.0207	0.0287
Wire Pot A4	0.0094	0.0107	0.012	0.0137	0.0164	0.0177	0.0187	0.0204	0.0227	0.0237	0.0247
Wire Pot A5	0.0066	0.0066	0.006	0.0079	0.0053	0.0113	0.0139	0.0139	0.0139	0.0133	0.0133
Wire Pot A6	0.0013	0.0006	0.0006	0.0019	0	0	0	0.0006	0.0006	0.0019	0.0006
Wire Pot B1	0.0168	0.0155	0.0149	0.0181	0.0233	0.022	0.022	0.0226	0.0258	0.0304	0.0291
Wire Pot B2	0.0123	0.0136	0.0123	0.0116	0.0174	0.0187	0.0194	0.02	0.0252	0.0245	0.0252
Wire Pot B3	0.013	0.0117	0.0117	0.0156	0.0273	0.0273	0.0273	0.026	0.0273	0.026	0.0247
Wire Pot B4	0.0085	0.0163	0.0163	0.0143	0.0208	0.0221	0.0221	0.0228	0.0293	0.0293	0.0286
Wire Pot B5	0.0085	0.0098	0.0134	0.0147	0.0159	0.0196	0.0196	0.022	0.022	0.0244	0.0232
Wire Pot B6	0.014	0.014	0.014	0.0213	0.0207	0.0213	0.0207	0.0207	0.028	0.0273	0.028
Wire Pot C1	-0.0007	-0.0013	-0.0007	0.0025	0.0064	0.0058	0.0064	0.0064	0.0064	0.0097	0.0123
Wire Pot C2	0.0139	0.0069	0.0069	0.0093	0.0139	0.0116	0.0139	0.0139	0.0116	0.0162	0.0185
Wire Pot C3	0.0137	0.016	0.016	0.0172	0.0183	0.0195	0.0195	0.0195	0.0229	0.024	0.0263
Wire Pot C4	0.0037	0.0049	0.0061	0.0097	0.017	0.017	0.0146	0.017	0.017	0.0194	0.0219
Wire Pot C5	0.0023	0.0046	0.0116	0.0116	0.007	0.0116	0.0093	0.0139	0.0186	0.0163	0.0163
Wire Pot C6	0.0059	0.0059	0.0059	0.0071	0.0095	0.0083	0.0119	0.0107	0.0119	0.0143	0.0155
Strain Gage A1	24	25	29	30	33	35	37	38	42	43	47
Strain Gage A2	25	29	30	34	36	38	40	43	46	48	50
Strain Gage A3	31	34	38	41	44	47	50	54	57	61	64
Strain Gage A4	32	36	38	42	46	48	52	55	59	62	65
Strain Gage A5	23	26	28	31	33	34	37	39	41	43	46
Strain Gage A6	22	25	26	28	31	34	36	38	40	42	44
Strain Gage B1	42	47	50	55	59	63	66	72	76	80	84
Strain Gage B2	57	62	68	73	79	84	89	95	101	106	112
Strain Gage B3	106	116	129	140	151	163	173	184	195	205	217
Strain Gage B4	103	114	124	135	146	157	167	178	188	198	210
Strain Gage B5	59	66	72	77	84	88	95	103	108	114	121
Strain Gage B6	40	44	48	54	59	62	68	72	77	81	85
Strain Gage C1	26	29	32	34	37	38	41	45	47	49	52
Strain Gage C2	30	33	36	39	42	45	47	50	54	55	60
Strain Gage C3	30	33	35	39	41	44	47	50	54	56	59
Strain Gage C4	38	43	46	51	55	59	62	67	70	74	78
Strain Gage C5	29	31	34	37	40	42	43	47	50	53	55
Strain Gage C6	21	23	26	28	29	32	34	36	38	40	43
Slip 1	0	-0.0001	-0.0001	-0.0001	-0.0001	0	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001
Slip 2	0	-0.0001	0	0	-0.0001	-0.0001	-0.0001	0	0	-0.0001	-0.0001
Slip 3	0	0	0	0	0	0	0	0	0	-0.0001	-0.0001
Slip 4	0	0.0001	0	0	0.0001	0.0001	0.0001	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table D-11: Test 11 (continued)

Load	11068	11489	12019	12522	13013	13500	14002	14500	15062	15548	16029
Wire Pot A1	0.0143	0.0143	0.013	0.0195	0.0208	0.0208	0.0195	0.0201	0.0208	0.0221	0.0279
Wire Pot A2	0.0201	0.0201	0.0201	0.0227	0.0266	0.0259	0.0266	0.0266	0.0253	0.0331	0.0331
Wire Pot A3	0.0273	0.0294	0.0287	0.0287	0.028	0.036	0.0347	0.0347	0.036	0.0427	0.0427
Wire Pot A4	0.0258	0.0264	0.0278	0.0288	0.0301	0.0314	0.0328	0.0344	0.0371	0.0395	0.0395
Wire Pot A5	0.0172	0.0199	0.0199	0.0199	0.0206	0.0199	0.0279	0.0272	0.0272	0.0259	0.0272
Wire Pot A6	0.0006	0.0006	0.0013	0.0019	0.0013	0.0013	0.0013	0.0006	0.0071	0.0058	0.0071
Wire Pot B1	0.0291	0.0284	0.0304	0.0362	0.0362	0.0362	0.0368	0.0362	0.0414	0.0433	0.0426
Wire Pot B2	0.0265	0.0258	0.0329	0.0323	0.0316	0.031	0.0374	0.0381	0.0393	0.0381	0.0458
Wire Pot B3	0.0402	0.0415	0.0415	0.0415	0.0389	0.0415	0.0402	0.0545	0.0545	0.0519	0.0558
Wire Pot B4	0.0352	0.0345	0.0352	0.0378	0.0417	0.0417	0.0417	0.0482	0.0482	0.056	0.0553
Wire Pot B5	0.0269	0.0281	0.0281	0.033	0.0354	0.0342	0.0367	0.0354	0.0379	0.0428	0.0452
Wire Pot B6	0.0273	0.0287	0.0353	0.0333	0.0347	0.034	0.0387	0.042	0.0413	0.0427	0.042
Wire Pot C1	0.0123	0.0129	0.0123	0.0136	0.0123	0.02	0.0194	0.02	0.0207	0.02	0.02
Wire Pot C2	0.0209	0.0232	0.0232	0.0209	0.0232	0.0209	0.0232	0.0255	0.0255	0.0278	0.0278
Wire Pot C3	0.0275	0.0263	0.0298	0.0309	0.0309	0.0332	0.0332	0.0355	0.0344	0.0378	0.0401
Wire Pot C4	0.0207	0.0219	0.0207	0.0231	0.0231	0.0231	0.0267	0.0279	0.0292	0.0316	0.0328
Wire Pot C5	0.0163	0.0139	0.0163	0.0255	0.0232	0.0232	0.0209	0.0209	0.0302	0.0279	0.0302
Wire Pot C6	0.0155	0.0167	0.0155	0.0155	0.0167	0.0191	0.0215	0.0215	0.0274	0.0262	0.0262
Strain Gage A1	49	51	54	56	59	61	63	66	69	72	74
Strain Gage A2	53	55	58	61	64	66	70	71	75	77	79
Strain Gage A3	67	71	74	77	80	84	86	90	92	94	96
Strain Gage A4	69	72	75	79	84	86	90	93	100	103	106
Strain Gage A5	49	51	54	56	58	60	62	65	67	70	72
Strain Gage A6	47	49	51	53	56	59	60	62	67	69	72
Strain Gage B1	89	93	98	101	106	111	116	120	128	134	139
Strain Gage B2	119	124	129	136	141	146	153	160	171	177	186
Strain Gage B3	229	239	251	263	275	288	301	314	318	333	346
Strain Gage B4	222	233	244	253	265	276	287	298	318	330	343
Strain Gage B5	128	133	140	147	152	159	166	172	179	186	196
Strain Gage B6	91	94	100	104	109	114	119	124	132	138	145
Strain Gage C1	56	57	60	63	65	68	70	74	78	81	83
Strain Gage C2	62	64	68	70	74	77	80	82	86	88	91
Strain Gage C3	62	64	68	70	73	76	78	81	83	85	87
Strain Gage C4	83	85	90	93	98	101	104	108	109	113	117
Strain Gage C5	59	60	63	66	68	72	74	77	81	83	85
Strain Gage C6	45	47	50	51	53	55	58	61	65	66	70
Slip 1	-0.0002	-0.0001	-0.0001	0	-0.0001	-0.0001	0	-0.0001	-0.0001	-0.0002	-0.0001
Slip 2	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0	0	0
Slip 3	0	-0.0001	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 4	0.0001	0.0001	-1E-04	0	0	0	0	0	0	0	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table D-11: Test 11 (continued)

Load	16526	17007	17412	18002	18493	19012	19493	20001	20482	20974	15040
Wire Pot A1	0.0259	0.0266	0.0272	0.0279	0.0331	0.0344	0.0337	0.0402	0.0408	0.0467	0.068
Wire Pot A2	0.0331	0.0331	0.0331	0.0382	0.0402	0.0402	0.0428	0.0473	0.0538	0.0597	0.0869
Wire Pot A3	0.0434	0.044	0.046	0.0501	0.0501	0.0561	0.0567	0.0634	0.0681	0.0801	0.1128
Wire Pot A4	0.0408	0.0428	0.0448	0.0461	0.0485	0.0522	0.0562	0.0605	0.0662	0.0799	0.112
Wire Pot A5	0.0345	0.0338	0.0338	0.0338	0.0411	0.0411	0.0411	0.0471	0.0551	0.0664	0.0962
Wire Pot A6	0.0078	0.0071	0.0143	0.0143	0.0143	0.0137	0.0215	0.0228	0.028	0.0398	0.0672
Wire Pot B1	0.0414	0.0485	0.0491	0.0491	0.0504	0.0575	0.062	0.062	0.0685	0.084	0.1376
Wire Pot B2	0.0445	0.0452	0.0464	0.051	0.051	0.0587	0.06	0.0639	0.0755	0.0935	0.1574
Wire Pot B3	0.0545	0.0701	0.0675	0.0675	0.0649	0.0818	0.0805	0.0948	0.1078	0.1247	0.2039
Wire Pot B4	0.0566	0.0625	0.0618	0.069	0.0755	0.082	0.0827	0.0957	0.1028	0.1334	0.2238
Wire Pot B5	0.0464	0.0489	0.0538	0.055	0.0587	0.0587	0.0611	0.0672	0.0721	0.1027	0.1638
Wire Pot B6	0.0493	0.0486	0.0493	0.056	0.056	0.056	0.0633	0.0693	0.0766	0.0973	0.1546
Wire Pot C1	0.0194	0.0272	0.0265	0.0272	0.0265	0.0337	0.033	0.033	0.0408	0.0531	0.1289
Wire Pot C2	0.0278	0.0417	0.0348	0.0325	0.044	0.0417	0.0394	0.051	0.051	0.0695	0.1252
Wire Pot C3	0.0447	0.0458	0.0447	0.0504	0.0515	0.055	0.0584	0.0607	0.0687	0.087	0.1351
Wire Pot C4	0.0352	0.0377	0.0413	0.0413	0.0437	0.0437	0.0474	0.0583	0.0607	0.0802	0.1227
Wire Pot C5	0.0302	0.0302	0.0325	0.0395	0.0348	0.0395	0.0395	0.0465	0.0557	0.0627	0.1138
Wire Pot C6	0.0286	0.031	0.031	0.0322	0.0334	0.0322	0.037	0.0394	0.0442	0.0549	0.111
Strain Gage A1	77	80	83	87	91	95	101	107	114	124	93
Strain Gage A2	80	83	84	86	88	89	87	85	83	81	202
Strain Gage A3	98	98	99	100	88	84	185	225	255	246	231
Strain Gage A4	111	116	120	128	144	170	194	236	225	260	296
Strain Gage A5	73	76	76	78	79	77	78	76	75	416	329
Strain Gage A6	75	78	81	85	90	95	100	103	108	342	267
Strain Gage B1	145	155	163	175	197	223	244	264	277	299	199
Strain Gage B2	195	210	212	262	319	397	446	498	543	564	453
Strain Gage B3	365	364	378	397	419	443	449	489	515	564	679
Strain Gage B4	351	370	385	405	418	433	462	498	526	634	963
Strain Gage B5	212	298	345	375	414	448	479	498	525	523	477
Strain Gage B6	150	160	168	178	195	211	227	236	274	414	337
Strain Gage C1	87	92	95	101	106	112	116	124	131	137	339
Strain Gage C2	93	95	96	98	98	99	99	100	96	448	395
Strain Gage C3	88	88	96	105	118	230	286	286	340	301	328
Strain Gage C4	119	119	121	136	159	182	192	233	247	256	277
Strain Gage C5	88	91	92	95	95	96	97	97	96	382	308
Strain Gage C6	72	75	77	81	85	89	93	95	98	97	192
Slip 1	-0.0001	0	-0.0002	-0.0002	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 2	-0.0001	0	-0.0001	-0.0001	-0.0001	0	-0.0001	-0.0001	-0.0001	0	-0.0001
Slip 3	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0.0013	0.0248
Slip 4	0	0	0	0	0	-1E-04	0	-1E-04	0	0.0002	0.0104

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*****Reached 20974 lb and then failed. After cracking, more load was applied but would not go above 16000 lb.

APPENDIX E
RESULTS OF ADDITIONAL COMPOSITE SLAB 2 REINFORCED WITH STRUX 90/40 UNDER CONCENTRATED LOAD TESTS

The following section presents test results for the second of the additional two slab specimens reinforced with STRUX 90/40 synthetic macro fibers that was subjected to the eleven concentrated load tests. Two additional composite slabs reinforced with STRUX were cast due to the poor test results gathered from the original fiber-reinforced slab subjected to concentrated load tests. The reasons for their construction are described in better detail in Section 4.6

For each test, a summary of test parameters and properties are included. Refer to Appendix D for diagrams of load locations for the second set of concentrated load tests. Measured test data is tabulated for load, vertical displacements, horizontal end slip, and deck strains of the bottom flanges. In the tabulated test data, 'wire pot' refers to the vertical displacements and 'slip' refers to the displacement between the concrete and steel deck.

Note that at low loads before any deflections are registered by the wire pots, the deflections have the tendency to "jump" and may show values that fluctuate between positive and negative. In the following tables, the sign convention for all wire pots is that down is positive and up is negative.

For purposes of better understanding the given test data, refer to Figure D-1 and Figure D-2 in Appendix D to see the layout of all instrumentation, except for the load cell, and their respective names that were monitored during concentrated load tests. Note that 'Quarter Point A' and 'Third Point A' refer to a point L/4 and L/3 from the left support, respectively. Similarly, 'Quarter Point B' and 'Third Point B' refer to a point L/4 and L/3 from the right support, respectively.

Test Designation: STRUX Concentrated Load Test 1 – Recast Slab 2
Concentrated Point Load at Quarter Point A
Cast Date: 6/16/2006
Test Date: 7/19/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	14838 lb
Midspan Deflection at Maximum Load:	0.039 in
Quarter A Deflection at Maximum Load:	0.040 in
Quarter B Deflection at Maximum Load:	0.027 in
End Slip at Maximum Load:	0.0000 in

Table E-1: Experimental results of concentrated load Test 1 on recast STRUX-reinforced slab 2

Load (lbs)	0	508	1084	1524	2005	2518	3005	3524	4021	4513	5016
Wire Pot A1	0	0.0006	0.0013	0.0013	0.0006	0	0.0006	0.0006	0.0039	0.0084	0.0078
Wire Pot A2	0	-0.0006	0	-0.0006	0	0.0007	0.0013	0.0007	0.0013	0.002	0.0013
Wire Pot A3	0	0.0007	0.0007	0	0.0013	0.0013	0.0013	0.0087	0.008	0.008	0.008
Wire Pot A4	0	0.001	0.002	0.003	0.0047	0.006	0.0084	0.0104	0.012	0.0127	0.0147
Wire Pot A5	0	0.0025	0.0025	0.0037	0.0049	0.0062	0.0074	0.0074	0.0123	0.0135	0.0135
Wire Pot A6	0	0.0013	0	0	0	0	-0.0007	-0.0007	0.0006	0.0013	0
Wire Pot B1	0	0.0006	0.0006	0	-0.0007	0.0013	0.0006	0.0019	0.0071	0.0065	0.0065
Wire Pot B2	0	0	-0.0013	0	-0.0013	0	0.0058	0.0064	0.0058	0.0058	0.0051
Wire Pot B3	0	-0.0026	-0.0026	-0.0026	-0.0013	-0.0013	-0.0013	-0.0013	-0.0026	-0.0013	-0.0013
Wire Pot B4	0	0	0	-0.0006	0.0072	0.0079	0.0065	0.0065	0.0072	0.0124	0.0137
Wire Pot B5	0	-0.0012	0.0012	0.0012	0.0037	0.0061	0.011	0.0098	0.0098	0.0098	0.011
Wire Pot B6	0	0	0.0006	0.0006	0.0006	0.0006	0.0066	0.008	0.0073	0.008	0.0073
Wire Pot C1	0	0	-0.0006	-0.0013	-0.0006	-0.0006	0	0	-0.0013	0	-0.0019
Wire Pot C2	0	0	0.0046	0.0069	0.0093	0.0023	0.0069	0.0046	0.0069	0.0093	0.0116
Wire Pot C3	0	0	0.0011	0.0011	0.0011	0.0023	0.0034	0.0034	0.0057	0.0046	0.008
Wire Pot C4	0	0.0012	0.0024	0.0012	0.0036	0.0036	0.0085	0.0109	0.0109	0.0121	0.0134
Wire Pot C5	0	-0.0024	0	-0.0024	-0.0047	0	0.0023	0.0023	0.0069	0.0046	0.0046
Wire Pot C6	0	-0.0012	0	-0.0024	-0.0024	-0.0036	-0.0036	-0.0012	-0.0012	-0.0024	-0.0036
Strain Gage A1	0	2	5	7	8	10	12	14	16	19	21
Strain Gage A2	0	5	9	13	17	21	25	29	33	38	41
Strain Gage A3	0	8	16	22	28	34	42	49	56	64	72
Strain Gage A4	0	8	15	21	26	33	41	48	53	61	68
Strain Gage A5	0	5	10	13	18	21	26	30	36	40	45
Strain Gage A6	0	4	5	7	8	10	13	15	16	19	20
Strain Gage B1	0	3	5	8	10	12	14	17	19	21	23
Strain Gage B2	0	3	6	6	9	13	15	17	20	22	24
Strain Gage B3	0	3	5	7	10	13	15	17	19	22	24
Strain Gage B4	0	2	5	7	9	12	13	16	18	21	23
Strain Gage B5	0	4	7	10	13	15	18	21	23	26	29
Strain Gage B6	0	2	4	7	8	11	14	16	18	22	23
Strain Gage C1	0	2	2	3	4	6	7	8	9	10	12
Strain Gage C2	0	1	3	3	5	6	6	8	9	10	10
Strain Gage C3	0	1	2	3	4	5	5	7	7	9	10
Strain Gage C4	0	1	3	2	4	5	6	7	8	9	11
Strain Gage C5	0	2	3	4	5	6	7	9	9	11	11
Strain Gage C6	0	1	2	3	4	6	7	7	8	10	11
Slip 1	0	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 2	0	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	0	-0.0001	0.0000	0.0000	-0.0001	0.0000	-0.0001	0.0000	-0.0001	0.0000	-0.0001
Slip 4	0	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-1: Test 1 (continued)

Load (lbs)	5503	6031	6508	7021	7524	8010	8524	9016	9513	10016	10518
Wire Pot A1	0.0084	0.0078	0.0071	0.0078	0.0078	0.0084	0.0155	0.0136	0.0149	0.0142	0.0155
Wire Pot A2	0.0026	0.0085	0.0085	0.0091	0.0078	0.0078	0.0085	0.0149	0.0149	0.0162	0.0162
Wire Pot A3	0.0087	0.0154	0.0147	0.0154	0.0154	0.016	0.0234	0.0227	0.0214	0.0234	0.0227
Wire Pot A4	0.0164	0.0187	0.0194	0.0211	0.0224	0.0234	0.0258	0.0278	0.0291	0.0304	0.0311
Wire Pot A5	0.0135	0.0147	0.0184	0.016	0.0184	0.0196	0.0209	0.0196	0.0221	0.0221	0.0245
Wire Pot A6	0	0.0013	0.0045	0.0071	0.0065	0.0065	0.0091	0.0071	0.0071	0.0111	0.0104
Wire Pot B1	0.0065	0.0058	0.0065	0.0058	0.0103	0.0136	0.0129	0.0123	0.0129	0.0129	0.0161
Wire Pot B2	0.0058	0.0122	0.0116	0.0122	0.0122	0.0129	0.0122	0.018	0.02	0.0193	0.018
Wire Pot B3	0.0117	0.0143	0.0143	0.013	0.0143	0.0143	0.013	0.013	0.0117	0.0169	0.026
Wire Pot B4	0.0131	0.0137	0.0137	0.0196	0.0189	0.0209	0.0202	0.0202	0.0261	0.0268	0.0261
Wire Pot B5	0.0122	0.0122	0.0122	0.0122	0.0147	0.0183	0.0171	0.0208	0.0269	0.0257	0.0281
Wire Pot B6	0.0073	0.0133	0.014	0.0146	0.014	0.014	0.0133	0.0213	0.022	0.0206	0.0213
Wire Pot C1	-0.0013	0	-0.0006	0	0.0019	0.0052	0.0065	0.0058	0.0071	0.0058	0.0071
Wire Pot C2	0.0139	0.0139	0.0116	0.0162	0.0139	0.0139	0.0139	0.0162	0.0185	0.0209	0.0209
Wire Pot C3	0.0103	0.0114	0.0114	0.0126	0.0137	0.0137	0.0137	0.016	0.0183	0.016	0.0195
Wire Pot C4	0.0146	0.0146	0.0146	0.0121	0.017	0.0158	0.0182	0.0182	0.0182	0.0182	0.0194
Wire Pot C5	0.0069	0.0046	0.0069	0.0116	0.0139	0.0139	0.0186	0.0162	0.0139	0.0162	0.0162
Wire Pot C6	-0.0012	-0.0024	0	0.0035	0.0047	0.0035	0.0059	0.0071	0.0059	0.0071	0.0083
Strain Gage A1	23	25	27	29	31	34	37	38	41	44	46
Strain Gage A2	47	50	55	59	65	69	74	79	84	89	94
Strain Gage A3	79	87	94	103	112	120	130	138	148	158	165
Strain Gage A4	74	84	89	99	106	115	127	136	149	166	175
Strain Gage A5	49	54	58	63	69	74	80	85	91	95	102
Strain Gage A6	23	25	27	30	32	34	35	38	40	42	44
Strain Gage B1	25	27	30	33	35	37	40	41	44	47	50
Strain Gage B2	28	31	33	37	39	42	45	47	51	54	56
Strain Gage B3	27	29	31	33	36	38	40	43	46	48	50
Strain Gage B4	25	26	29	32	34	36	39	40	43	46	48
Strain Gage B5	32	35	37	40	44	47	49	52	55	59	61
Strain Gage B6	26	27	29	32	34	36	39	41	44	46	49
Strain Gage C1	12	15	14	17	17	19	19	20	23	24	25
Strain Gage C2	12	13	15	15	17	18	19	19	20	22	23
Strain Gage C3	10	12	13	14	16	17	18	19	20	20	22
Strain Gage C4	11	13	14	15	15	17	19	19	21	22	22
Strain Gage C5	14	15	16	17	18	20	20	21	24	24	26
Strain Gage C6	11	13	15	16	17	18	20	20	21	22	24
Slip 1	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
Slip 2	0.0000	0.0000	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	0.0000	0.0000	0.0000	-0.0001
Slip 3	0.0000	-0.0001	0.0000	-0.0001	0.0000	0.0000	-0.0001	-0.0001	0.0000	-0.0001	0.0000
Slip 4	0.0001	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001	0.0001	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-1: Test 1 (continued)

Load (lbs)	11021	11508	12016	12524	13010	13503	14010	14513	14838
Wire Pot A1	0.0155	0.0142	0.0155	0.0181	0.0214	0.0207	0.0214	0.0207	0.022
Wire Pot A2	0.0156	0.0156	0.0156	0.0182	0.0234	0.0227	0.0221	0.0221	0.0227
Wire Pot A3	0.0301	0.0294	0.0294	0.0301	0.0361	0.0361	0.0367	0.0367	0.0361
Wire Pot A4	0.0324	0.0331	0.0348	0.0351	0.0371	0.0398	0.0415	0.0421	0.0445
Wire Pot A5	0.0245	0.0245	0.0294	0.0282	0.0294	0.0331	0.0331	0.0343	0.0356
Wire Pot A6	0.013	0.0143	0.0143	0.015	0.0143	0.0137	0.015	0.0182	0.0202
Wire Pot B1	0.02	0.02	0.0194	0.02	0.0187	0.02	0.0265	0.0265	0.0271
Wire Pot B2	0.0193	0.0258	0.0264	0.0264	0.0271	0.0264	0.0258	0.0329	0.0316
Wire Pot B3	0.026	0.0273	0.0247	0.0247	0.026	0.0221	0.026	0.0312	0.0389
Wire Pot B4	0.0274	0.0307	0.0346	0.0333	0.0339	0.0333	0.0398	0.0398	0.0392
Wire Pot B5	0.0281	0.0281	0.033	0.0318	0.0318	0.033	0.0354	0.0354	0.0403
Wire Pot B6	0.022	0.0226	0.028	0.0273	0.028	0.0286	0.0286	0.028	0.036
Wire Pot C1	0.0052	0.0052	0.0058	0.0084	0.013	0.013	0.013	0.0136	0.0136
Wire Pot C2	0.0185	0.0209	0.0209	0.0209	0.0255	0.0301	0.0278	0.0301	0.0278
Wire Pot C3	0.0206	0.0217	0.0229	0.024	0.024	0.024	0.024	0.0252	0.0263
Wire Pot C4	0.0219	0.0206	0.0231	0.0231	0.0243	0.0255	0.0255	0.0267	0.0267
Wire Pot C5	0.0186	0.0186	0.0186	0.0232	0.0232	0.0186	0.0255	0.0255	0.0255
Wire Pot C6	0.0095	0.0095	0.0119	0.0119	0.0155	0.0155	0.0143	0.0143	0.0143
Strain Gage A1	49	50	54	56	61	63	66	70	72
Strain Gage A2	100	105	112	121	135	145	156	168	180
Strain Gage A3	177	199	269	375	415	423	435	449	461
Strain Gage A4	185	194	205	215	231	249	272	347	423
Strain Gage A5	109	114	121	128	136	143	149	158	165
Strain Gage A6	46	49	53	54	57	60	63	65	69
Strain Gage B1	53	56	58	61	64	67	69	73	76
Strain Gage B2	60	62	65	69	71	75	77	81	82
Strain Gage B3	52	55	57	59	60	62	65	67	67
Strain Gage B4	50	53	55	57	58	61	63	64	65
Strain Gage B5	65	68	72	74	78	80	83	87	90
Strain Gage B6	52	54	57	60	63	66	68	71	73
Strain Gage C1	26	28	29	31	32	33	35	37	37
Strain Gage C2	24	26	27	28	29	31	31	32	33
Strain Gage C3	24	23	25	26	27	28	29	30	31
Strain Gage C4	23	25	26	26	28	29	30	31	31
Strain Gage C5	27	28	30	31	33	33	34	36	37
Strain Gage C6	24	26	27	29	30	30	32	34	35
Slip 1	0.0000	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	0.0001	0.0000
Slip 2	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	-0.0001
Slip 3	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	-0.0001	0.0000
Slip 4	0.0001	0.0000	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 2 – Recast Slab 2
Concentrated Point Load at Third Point A
Cast Date: 6/16/2006
Test Date: 7/19/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15010 lb
Midspan Deflection at Maximum Load:	0.048 in
Quarter A Deflection at Maximum Load:	0.039 in
Quarter B Deflection at Maximum Load:	0.025 in
End Slip at Maximum Load:	0.0000 in

Table E-2: Experimental results of concentrated load Test 2 on recast STRUX-reinforced slab 2

Load	0	534	1110	1513	2021	2560	3047	3508	4010	4524	5010
Wire Pot A1	0	-0.0013	0	0	-0.0013	-0.0007	0	-0.0013	-0.0007	-0.0013	0.0052
Wire Pot A2	0	-0.0013	-0.0013	-0.0006	0	0	-0.0006	0.0059	0.0065	0.0059	0.0065
Wire Pot A3	0	-0.0007	0.0006	0.0006	0	0	0.0013	0	0.0066	0.008	0.0066
Wire Pot A4	0	0.001	0	0	0.001	0.0041	0.0044	0.0071	0.0077	0.0107	0.0121
Wire Pot A5	0	0.0012	-0.0024	-0.0012	-0.0012	0	0.0012	0.0037	0.0037	0.0037	0.0061
Wire Pot A6	0	-0.0006	0.0007	-0.0006	0	-0.0006	0	-0.0006	0	0	-0.0019
Wire Pot B1	0	-0.0013	0.0013	0.0006	0.0013	0.0013	0.0019	0.0019	0.0039	0.0071	0.0084
Wire Pot B2	0	0	0.0006	0.0013	0.0006	0.0025	0.0019	0	0.0071	0.0083	0.0083
Wire Pot B3	0	0	0.0013	0	0.0026	0.0065	0.0104	0.0117	0.013	0.013	0.0117
Wire Pot B4	0	0.0006	0.0006	0.0006	0.0013	0	0	0.0006	0.0013	0.0071	0.0065
Wire Pot B5	0	0	-0.0012	-0.0025	0	0.0012	0.0012	0.0024	0.0024	0.0037	0.0049
Wire Pot B6	0	0.0006	0.0033	0.0026	0.0033	0.0033	0.0026	0.0026	0.0106	0.01	0.0106
Wire Pot C1	0	-0.0012	-0.0012	-0.0012	-0.0012	0	-0.0012	-0.0019	-0.0012	-0.0006	0
Wire Pot C2	0	-0.0046	0.0023	0	-0.0046	0	-0.0023	0	0	0.0023	0
Wire Pot C3	0	-0.0011	0	0	0.0012	0.0012	0.0035	0.0046	0.0046	0.0058	0.0058
Wire Pot C4	0	-0.0024	-0.0024	-0.0012	-0.0012	-0.0024	-0.0012	-0.0012	-0.0024	-0.0024	-0.0012
Wire Pot C5	0	0	0	-0.0023	0	0.0023	0.0023	0	0.0093	0.007	0.0046
Wire Pot C6	0	0.0024	0	0.0024	0.0012	0.0024	0.0012	0.0024	0.0036	0.0048	0.0083
Strain Gage A1	0	2	5	7	9	12	14	17	20	21	23
Strain Gage A2	0	6	10	13	18	24	28	33	39	43	49
Strain Gage A3	0	9	17	23	32	43	53	62	73	86	96
Strain Gage A4	0	7	14	20	27	37	45	55	65	76	88
Strain Gage A5	0	4	10	14	18	22	28	32	38	42	48
Strain Gage A6	0	3	5	6	9	12	14	16	18	21	24
Strain Gage B1	0	3	7	9	12	16	19	21	24	28	29
Strain Gage B2	0	5	9	12	15	19	22	25	30	34	38
Strain Gage B3	0	4	8	11	14	18	21	25	28	31	34
Strain Gage B4	0	4	7	11	13	18	21	24	27	30	33
Strain Gage B5	0	5	8	12	17	20	24	28	32	36	40
Strain Gage B6	0	3	6	9	13	15	19	22	24	26	29
Strain Gage C1	0	1	3	4	7	7	8	11	13	15	16
Strain Gage C2	0	1	3	4	6	7	9	10	12	13	14
Strain Gage C3	0	2	4	5	6	8	10	11	13	14	16
Strain Gage C4	0	2	3	4	6	7	10	10	11	13	16
Strain Gage C5	0	1	3	5	6	8	10	12	13	15	17
Strain Gage C6	0	1	3	4	6	7	9	10	12	13	15
Slip 1	0	0.0000	0.0001	0.0001	0.0001	0.0000	0.0001	0.0000	0.0001	0.0001	0.0000
Slip 2	0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Slip 3	0	0.0000	0.0000	0.0000	-0.0001	0.0000	-0.0001	-0.0001	0.0000	0.0000	-0.0001
Slip 4	0	-0.0001	0.0000	0.0000	-0.0001	0.0000	-0.0001	0.0000	0.0000	-0.0001	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-2: Test 2 (continued)

Load	5524	6016	6503	7010	7503	8010	8513	9016	9513	10005	10508
Wire Pot A1	0.0058	0.0058	0.0065	0.0058	0.0065	0.0058	0.0065	0.0103	0.0129	0.0123	0.0142
Wire Pot A2	0.0072	0.0052	0.0124	0.013	0.013	0.0136	0.0136	0.013	0.0136	0.0162	0.0195
Wire Pot A3	0.008	0.014	0.0133	0.0147	0.0147	0.014	0.0213	0.0213	0.0207	0.0213	0.0213
Wire Pot A4	0.0131	0.0151	0.0164	0.0178	0.0191	0.0204	0.0218	0.0224	0.0231	0.0238	0.0255
Wire Pot A5	0.0074	0.0074	0.0098	0.0098	0.0123	0.0123	0.0135	0.0172	0.0172	0.0184	0.0196
Wire Pot A6	-0.0006	-0.0006	-0.0006	-0.0013	0	0	-0.0013	-0.0006	-0.0006	-0.0013	-0.0013
Wire Pot B1	0.009	0.009	0.0077	0.0084	0.0116	0.0142	0.0155	0.0155	0.0142	0.0142	0.0155
Wire Pot B2	0.0077	0.0077	0.0122	0.0142	0.0135	0.0142	0.0142	0.0148	0.0206	0.0206	0.0212
Wire Pot B3	0.0143	0.013	0.0143	0.0195	0.026	0.0273	0.0273	0.0286	0.026	0.0286	0.026
Wire Pot B4	0.0085	0.0071	0.0143	0.013	0.013	0.0143	0.0202	0.0195	0.0215	0.0215	0.028
Wire Pot B5	0.0049	0.0098	0.0122	0.0171	0.0171	0.0183	0.0171	0.0196	0.0196	0.022	0.022
Wire Pot B6	0.0106	0.0093	0.018	0.016	0.0166	0.0166	0.0173	0.0233	0.024	0.0233	0.0226
Wire Pot C1	-0.0012	0	-0.0012	0	0.0026	0.0052	0.0065	0.0052	0.0052	0.0065	0.0052
Wire Pot C2	0	-0.0023	0.0023	0	0.007	0.0093	0.0093	0.0093	0.007	0.007	0.0116
Wire Pot C3	0.0069	0.0092	0.0092	0.0138	0.0126	0.0138	0.0149	0.0149	0.0172	0.0161	0.0195
Wire Pot C4	0	0	0.0012	0.0036	0.0012	0.0049	0.0049	0.0061	0.0073	0.0097	0.0085
Wire Pot C5	0.0093	0.0093	0.0116	0.0093	0.0139	0.0116	0.0163	0.0139	0.0186	0.0186	0.0209
Wire Pot C6	0.0083	0.0083	0.0071	0.0083	0.0107	0.0119	0.0131	0.0143	0.0155	0.0155	0.0167
Strain Gage A1	26	30	31	34	37	40	42	45	47	50	53
Strain Gage A2	54	60	64	70	76	81	87	93	99	104	110
Strain Gage A3	107	119	130	141	154	164	176	188	201	212	222
Strain Gage A4	98	109	121	132	144	155	167	178	190	201	213
Strain Gage A5	52	58	62	67	72	78	82	88	94	99	103
Strain Gage A6	25	28	31	33	36	38	40	43	45	48	50
Strain Gage B1	33	37	39	41	44	48	51	54	58	60	64
Strain Gage B2	41	44	49	54	56	61	64	68	72	76	80
Strain Gage B3	39	42	46	49	53	55	59	63	66	70	73
Strain Gage B4	37	40	43	47	51	54	58	61	65	68	72
Strain Gage B5	45	48	53	55	60	64	68	72	77	80	85
Strain Gage B6	32	37	39	42	44	48	51	52	56	59	62
Strain Gage C1	18	20	20	22	23	25	26	28	30	32	33
Strain Gage C2	17	17	19	21	22	25	25	28	29	31	32
Strain Gage C3	18	18	20	21	23	24	26	27	29	30	32
Strain Gage C4	17	18	20	22	23	24	25	27	28	30	32
Strain Gage C5	19	21	22	23	25	27	29	31	32	34	36
Strain Gage C6	17	18	19	21	22	23	26	26	28	30	31
Slip 1	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000	0.0001	0.0000	0.0001	0.0001
Slip 2	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
Slip 3	-0.0001	0.0000	0.0000	0.0000	-0.0001	-0.0001	-0.0001	0.0000	0.0000	0.0000	-0.0001
Slip 4	-0.0001	-0.0001	-0.0001	0.0000	0.0000	0.0000	-0.0001	0.0000	-0.0001	0.0000	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-2: Test 2 (continued)

Load	11010	11508	11995	12503	12995	13503	14010	14503	15010
Wire Pot A1	0.0136	0.0123	0.0116	0.0116	0.0194	0.0207	0.0194	0.0201	0.0194
Wire Pot A2	0.0195	0.0208	0.0201	0.0208	0.0208	0.026	0.0266	0.026	0.0266
Wire Pot A3	0.0287	0.0287	0.0294	0.028	0.0314	0.0354	0.0354	0.036	0.0394
Wire Pot A4	0.0275	0.0295	0.0305	0.0321	0.0338	0.0351	0.0365	0.0382	0.0392
Wire Pot A5	0.0221	0.0221	0.0245	0.0233	0.027	0.027	0.0282	0.0306	0.0343
Wire Pot A6	0.0033	0.0059	0.0059	0.0059	0.0059	0.0065	0.0065	0.0065	0.0131
Wire Pot B1	0.022	0.0207	0.0226	0.0207	0.0213	0.0252	0.0271	0.0297	0.0278
Wire Pot B2	0.02	0.0212	0.0206	0.0193	0.0283	0.0277	0.0277	0.029	0.0354
Wire Pot B3	0.026	0.0415	0.0428	0.0389	0.0402	0.0415	0.0402	0.0389	0.0545
Wire Pot B4	0.028	0.0287	0.028	0.0339	0.0345	0.0352	0.0345	0.0417	0.0411
Wire Pot B5	0.0244	0.0269	0.0293	0.0306	0.0306	0.0318	0.033	0.033	0.0367
Wire Pot B6	0.0246	0.0306	0.0306	0.0313	0.0306	0.0306	0.0373	0.0373	0.0373
Wire Pot C1	0.0059	0.0059	0.0124	0.013	0.0124	0.0117	0.0124	0.0124	0.0124
Wire Pot C2	0.0093	0.0139	0.0139	0.0139	0.0139	0.0139	0.0116	0.0163	0.0232
Wire Pot C3	0.0229	0.0207	0.0229	0.0241	0.0252	0.0275	0.0287	0.0264	0.0298
Wire Pot C4	0.0097	0.0085	0.0146	0.0158	0.0158	0.017	0.017	0.0194	0.0206
Wire Pot C5	0.0209	0.0186	0.0232	0.0232	0.0279	0.0255	0.0279	0.0302	0.0302
Wire Pot C6	0.0167	0.0203	0.0203	0.0215	0.0227	0.0239	0.0239	0.0263	0.0263
Strain Gage A1	56	58	61	64	68	71	76	79	84
Strain Gage A2	115	122	127	134	141	148	160	168	175
Strain Gage A3	235	245	258	269	278	280	276	286	305
Strain Gage A4	225	236	250	259	271	284	301	316	332
Strain Gage A5	109	114	120	126	131	139	148	153	162
Strain Gage A6	52	55	57	60	63	65	69	73	76
Strain Gage B1	67	70	75	78	81	85	91	94	99
Strain Gage B2	84	88	92	97	102	106	110	115	119
Strain Gage B3	76	79	83	87	90	92	91	92	95
Strain Gage B4	74	78	81	85	88	91	93	96	98
Strain Gage B5	90	93	97	100	105	110	114	117	121
Strain Gage B6	64	68	72	75	79	82	87	91	96
Strain Gage C1	35	36	39	41	43	44	46	48	51
Strain Gage C2	34	35	36	38	40	42	43	45	46
Strain Gage C3	34	35	36	38	39	42	42	42	43
Strain Gage C4	33	34	36	38	39	41	41	42	43
Strain Gage C5	38	39	41	41	44	46	47	49	50
Strain Gage C6	33	34	36	38	40	41	42	45	46
Slip 1	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000
Slip 2	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
Slip 3	0.0000	0.0000	-0.0001	0.0000	-0.0001	0.0000	-0.0001	0.0000	0.0000
Slip 4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 3 – Recast Slab 2
Concentrated Point Load at Third Point B
Cast Date: 6/16/2006
Test Date: 7/19/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15031 lb
Midspan Deflection at Maximum Load:	0.068 in
Quarter A Deflection at Maximum Load:	0.037 in
Quarter B Deflection at Maximum Load:	0.066 in
End Slip at Maximum Load:	0.0000 in

Table E-3: Experimental results of concentrated load Test 3 on recast STRUX-reinforced slab 2

Load	0	524	995	1492	1995	2518	3021	3592	4031	4487	5010
Wire Pot A1	0	0	0.0013	-0.0006	0	0	0	0.0007	-0.0006	0	0.0026
Wire Pot A2	0	0.0026	0.0019	0.0019	0.0013	0.0019	0.0013	0.0058	0.0084	0.0078	0.0078
Wire Pot A3	0	-0.0007	0	0	0	-0.0007	0	0	-0.0007	0.0067	0.008
Wire Pot A4	0	0.0003	-0.0003	0	0.0003	0.0014	0.0024	0.0047	0.0054	0.0064	0.0077
Wire Pot A5	0	0	-0.0012	0.0012	-0.0024	0	0	0.0025	0.0025	0.0025	0.0049
Wire Pot A6	0	0.0007	0.0007	0.002	0	0	0.0013	-0.0006	0	0.0013	0.0013
Wire Pot B1	0	0.0006	-0.0007	0	0.0006	0.0006	0.0052	0.0065	0.0071	0.0058	0.0065
Wire Pot B2	0	0.0013	0.0007	0.002	0.0007	0.0039	0.0071	0.0058	0.0071	0.0078	0.0071
Wire Pot B3	0	0	0.0013	0.0026	0	0.0143	0.0143	0.013	0.013	0.0143	0.0156
Wire Pot B4	0	0.0006	0.0006	0.0006	0	0.0013	0.0013	0.0072	0.0065	0.0072	0.0078
Wire Pot B5	0	0.0012	0.0024	0	0.0012	0.0036	0.0036	0.0036	0.0024	0.0073	0.0097
Wire Pot B6	0	-0.0013	0	0.0007	0.0007	0	0.0067	0.0067	0.0067	0.0067	0.0134
Wire Pot C1	0	0	0	0.0012	0	0.0012	0	0.0006	0	0.0032	0.0064
Wire Pot C2	0	0.0069	0.0046	0.0046	0.0069	0.0069	0.0046	0.0046	0.0092	0.0115	0.0139
Wire Pot C3	0	-0.0023	0	-0.0012	0.0023	0.0046	0.0046	0.0091	0.0114	0.0114	0.0137
Wire Pot C4	0	-0.0012	0	0	0.0012	0.0012	0.0024	0.0024	0.0036	0.0073	0.0061
Wire Pot C5	0	-0.0023	0.0024	0.0047	0.007	0.007	0.007	0.0117	0.0117	0.0093	0.0093
Wire Pot C6	0	-0.0024	0	-0.0012	0	0.0035	0.0071	0.0071	0.0095	0.0095	0.0107
Strain Gage A1	0	2	4	6	8	9	10	13	15	16	18
Strain Gage A2	0	1	3	5	7	9	10	14	15	16	18
Strain Gage A3	0	2	4	5	7	10	11	14	16	19	21
Strain Gage A4	0	0	2	4	6	8	10	13	14	16	19
Strain Gage A5	0	1	3	5	8	8	10	13	15	17	18
Strain Gage A6	0	2	4	5	6	8	11	11	13	14	16
Strain Gage B1	0	3	7	10	13	16	19	22	25	29	32
Strain Gage B2	0	4	8	12	17	20	24	28	33	36	41
Strain Gage B3	0	6	8	13	17	20	24	29	33	36	39
Strain Gage B4	0	4	8	13	17	21	24	29	33	36	40
Strain Gage B5	0	5	10	14	18	22	26	33	35	38	43
Strain Gage B6	0	4	6	9	13	15	19	22	25	26	30
Strain Gage C1	0	3	6	8	10	13	15	18	21	23	25
Strain Gage C2	0	4	9	11	17	19	24	30	34	37	41
Strain Gage C3	0	6	12	16	21	27	32	38	43	47	53
Strain Gage C4	0	6	12	17	22	27	32	38	42	47	52
Strain Gage C5	0	5	9	14	18	21	26	31	35	40	43
Strain Gage C6	0	3	5	7	9	11	15	17	19	20	23
Slip 1	0	0.0000	-0.0001	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001
Slip 2	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	0	0.0000	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0001	0.0001	0.0000
Slip 4	0	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-3: Test 3 (continued)

Load	5497	6016	6508	7010	7503	7990	8492	8995	9508	10005	10524
Wire Pot A1	0.0065	0.0065	0.0072	0.0078	0.0072	0.0065	0.0065	0.0072	0.0072	0.0123	0.013
Wire Pot A2	0.0084	0.0078	0.0078	0.0078	0.0143	0.0149	0.0149	0.0162	0.0149	0.0149	0.0155
Wire Pot A3	0.0067	0.0073	0.0067	0.006	0.0134	0.0127	0.014	0.0134	0.0127	0.0134	0.0207
Wire Pot A4	0.0094	0.0104	0.0114	0.0127	0.0141	0.0147	0.0167	0.0174	0.0184	0.0194	0.0207
Wire Pot A5	0.0049	0.0086	0.0074	0.0074	0.0098	0.011	0.011	0.0135	0.0147	0.0172	0.0172
Wire Pot A6	0	0.0007	0	0.0007	0	0.0007	-0.0006	0	0.0007	-0.0006	0.0007
Wire Pot B1	0.0071	0.0142	0.0129	0.0129	0.0129	0.0142	0.0142	0.0168	0.0213	0.0207	0.02
Wire Pot B2	0.0142	0.0142	0.0136	0.0142	0.0136	0.0187	0.0194	0.0207	0.0219	0.0245	0.0278
Wire Pot B3	0.0143	0.0234	0.0286	0.0286	0.0299	0.0273	0.0273	0.0286	0.0273	0.0428	0.0415
Wire Pot B4	0.0143	0.015	0.0143	0.0163	0.0215	0.0195	0.0208	0.0202	0.028	0.0274	0.0339
Wire Pot B5	0.0195	0.0159	0.0183	0.0171	0.0195	0.0208	0.022	0.0244	0.0256	0.0281	0.0318
Wire Pot B6	0.0127	0.0134	0.0127	0.0154	0.0207	0.0214	0.0194	0.02	0.0274	0.028	0.0274
Wire Pot C1	0.0064	0.0077	0.0071	0.0077	0.0077	0.0064	0.0077	0.0142	0.0136	0.0149	0.0142
Wire Pot C2	0.0162	0.0139	0.0115	0.0162	0.0185	0.0208	0.0185	0.0208	0.0208	0.0278	0.0278
Wire Pot C3	0.0137	0.016	0.0183	0.0195	0.0195	0.0217	0.024	0.0252	0.0275	0.0298	0.0309
Wire Pot C4	0.0097	0.0097	0.0121	0.0134	0.0158	0.017	0.0194	0.0206	0.0231	0.0243	0.0267
Wire Pot C5	0.0163	0.0163	0.0163	0.0163	0.0233	0.021	0.0256	0.0256	0.0279	0.0302	0.0302
Wire Pot C6	0.0131	0.0143	0.0143	0.0167	0.0179	0.0179	0.0215	0.0203	0.0239	0.025	0.0274
Strain Gage A1	19	22	23	25	27	28	31	32	34	36	40
Strain Gage A2	20	22	24	26	28	30	32	35	36	40	42
Strain Gage A3	23	24	27	30	31	34	37	39	42	45	49
Strain Gage A4	21	23	26	28	31	33	36	39	42	45	50
Strain Gage A5	20	22	24	26	28	29	32	35	36	39	41
Strain Gage A6	18	20	21	23	24	26	27	30	31	32	36
Strain Gage B1	35	38	41	45	48	52	55	58	61	67	73
Strain Gage B2	44	48	52	57	60	64	69	73	77	83	90
Strain Gage B3	44	47	52	55	59	63	66	70	73	79	84
Strain Gage B4	44	47	51	55	59	63	67	71	74	79	85
Strain Gage B5	47	53	56	60	64	69	73	77	82	89	95
Strain Gage B6	33	37	39	42	46	49	52	54	59	62	68
Strain Gage C1	28	31	33	37	39	42	44	47	49	54	59
Strain Gage C2	46	50	55	60	65	69	74	79	86	92	99
Strain Gage C3	58	64	69	74	80	84	91	97	102	109	116
Strain Gage C4	58	63	69	74	80	84	90	96	102	109	118
Strain Gage C5	48	52	57	61	67	70	77	81	85	92	100
Strain Gage C6	25	28	30	32	35	38	39	42	45	48	53
Slip 1	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	-0.0001
Slip 2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000
Slip 3	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 4	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-3: Test 3 (continued)

Load	11000	11497	12010	12487	13010	13497	14000	14503	15031
Wire Pot A1	0.0143	0.0143	0.0136	0.0156	0.0201	0.0208	0.0208	0.0279	0.0266
Wire Pot A2	0.0207	0.022	0.0214	0.0227	0.0279	0.0292	0.0298	0.0292	0.035
Wire Pot A3	0.0207	0.0207	0.0207	0.0281	0.0267	0.0281	0.0347	0.0354	0.0347
Wire Pot A4	0.0221	0.0234	0.0264	0.0284	0.0304	0.0334	0.0344	0.0371	0.0385
Wire Pot A5	0.0208	0.0221	0.0221	0.0257	0.027	0.0294	0.0331	0.0331	0.0368
Wire Pot A6	0.0007	0.0007	0.0007	0.0013	0.0065	0.0078	0.0078	0.0137	0.0137
Wire Pot B1	0.0258	0.0271	0.0271	0.031	0.0349	0.0368	0.0433	0.0426	0.0485
Wire Pot B2	0.0265	0.0271	0.0336	0.0342	0.0348	0.0419	0.0406	0.0477	0.0471
Wire Pot B3	0.0428	0.0428	0.0402	0.0545	0.0571	0.0558	0.0675	0.0701	0.0701
Wire Pot B4	0.0345	0.0345	0.0404	0.0398	0.0482	0.0541	0.0554	0.0613	0.0665
Wire Pot B5	0.0318	0.033	0.0391	0.044	0.0513	0.0513	0.0513	0.0538	0.055
Wire Pot B6	0.0274	0.0347	0.0347	0.0354	0.0414	0.0414	0.0474	0.0487	0.0553
Wire Pot C1	0.0142	0.02	0.0207	0.02	0.0207	0.0278	0.0272	0.0272	0.0337
Wire Pot C2	0.0255	0.0278	0.0347	0.0324	0.0417	0.0417	0.0394	0.044	0.051
Wire Pot C3	0.0343	0.0378	0.0412	0.0447	0.0481	0.0538	0.0538	0.0641	0.0687
Wire Pot C4	0.0279	0.0316	0.0352	0.0401	0.0461	0.0486	0.0498	0.0546	0.0631
Wire Pot C5	0.0349	0.0372	0.0419	0.0395	0.0419	0.0465	0.0488	0.0512	0.0558
Wire Pot C6	0.0274	0.031	0.0334	0.0358	0.0382	0.0406	0.0454	0.0477	0.0501
Strain Gage A1	42	45	49	52	55	60	63	67	72
Strain Gage A2	46	48	51	55	58	61	64	68	71
Strain Gage A3	52	56	59	63	67	69	71	73	75
Strain Gage A4	55	59	63	66	71	73	76	80	83
Strain Gage A5	45	48	50	53	57	60	63	66	68
Strain Gage A6	38	40	44	47	51	54	57	60	65
Strain Gage B1	77	84	89	96	106	114	124	136	146
Strain Gage B2	96	103	109	116	125	132	139	146	153
Strain Gage B3	88	92	95	99	101	103	105	110	115
Strain Gage B4	88	91	94	98	102	103	108	111	116
Strain Gage B5	102	109	116	123	131	141	149	153	161
Strain Gage B6	73	78	85	91	100	107	115	126	134
Strain Gage C1	64	68	74	80	88	96	105	117	126
Strain Gage C2	109	119	133	143	160	170	181	189	197
Strain Gage C3	120	121	117	119	172	325	396	435	457
Strain Gage C4	124	131	137	142	126	180	405	425	438
Strain Gage C5	105	112	120	127	133	139	150	188	216
Strain Gage C6	57	61	67	72	79	87	95	104	113
Slip 1	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 2	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	-0.0001	-0.0001	0.0000
Slip 3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000
Slip 4	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 4 – Recast Slab 2
Concentrated Point Load at Quarter Point B
Cast Date: 6/16/2006
Test Date: 7/19/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15031 lb
Midspan Deflection at Maximum Load:	0.047 in
Quarter A Deflection at Maximum Load:	0.022 in
Quarter B Deflection at Maximum Load:	0.046 in
End Slip at Maximum Load:	0.0000 in

Table E-4: Experimental results of concentrated load Test 4 on recast STRUX-reinforced slab 2

Load	0	586	995	1503	2021	2503	3005	3524	4005	4503	5005
Wire Pot A1	0	0	-0.0007	0	-0.0007	0	0	0	0.0006	0.0032	0.0065
Wire Pot A2	0	0	0.0006	0.0006	0.0006	0.0006	0.0039	0.0078	0.0065	0.0078	0.0071
Wire Pot A3	0	0	0	0.0007	0.0014	0.0014	0.0007	0.0047	0.006	0.0067	0.0074
Wire Pot A4	0	-0.0004	0	0	0	-0.0004	0.0006	0.0027	0.003	0.0033	0.005
Wire Pot A5	0	0.0012	0.0012	0	0.0024	0.0024	0.0012	0.0024	0.0012	0.0036	0.0049
Wire Pot A6	0	0	0	-0.0007	-0.0007	0	0	0	0.0006	0.0006	0
Wire Pot B1	0	0	-0.0006	-0.0006	0.0039	0.0072	0.0059	0.0072	0.0072	0.0078	0.013
Wire Pot B2	0	0.0013	0.0026	0.0019	0.0051	0.0051	0.0051	0.0038	0.0038	0.0026	0.0096
Wire Pot B3	0	0.0052	0.0065	0.0117	0.0117	0.0091	0.0117	0.0143	0.013	0.0091	0.0117
Wire Pot B4	0	0	0	-0.0006	0	0.0007	0.0059	0.0066	0.0072	0.0059	0.0124
Wire Pot B5	0	0	0	0	0.0061	0.0049	0.0061	0.0073	0.0085	0.0147	0.0196
Wire Pot B6	0	0.0006	0	0	0.0073	0.0066	0.0073	0.008	0.0073	0.0146	0.0133
Wire Pot C1	0	0	0	-0.0019	0	0.0013	0.0039	0.0045	0.0071	0.0078	0.0065
Wire Pot C2	0	0	-0.0023	-0.0023	0.0046	-0.0023	0.0023	0.0023	0.0023	0	0
Wire Pot C3	0	-0.0022	0.0012	0.0012	0.0058	0.0081	0.0069	0.0069	0.0103	0.0126	0.0149
Wire Pot C4	0	0	-0.0012	0.0012	0.0012	0.0024	0.0036	0.0048	0.0061	0.0073	0.0097
Wire Pot C5	0	-0.0023	-0.0023	0.007	0.0024	0.0024	0.0093	0.007	0.0117	0.014	0.0117
Wire Pot C6	0	0.0024	0.0024	0.0012	0	0	0.0024	0.0036	0.0048	0.006	0.0048
Strain Gage A1	0	2	1	3	5	6	7	8	9	11	12
Strain Gage A2	0	0	2	3	5	5	7	8	9	10	11
Strain Gage A3	0	1	2	4	5	6	8	9	10	11	12
Strain Gage A4	0	1	1	3	5	5	7	8	9	10	11
Strain Gage A5	0	1	2	4	3	6	6	8	10	11	12
Strain Gage A6	0	1	3	3	4	6	7	8	10	10	11
Strain Gage B1	0	2	5	7	9	12	14	17	19	21	25
Strain Gage B2	0	3	5	8	10	13	16	19	21	22	26
Strain Gage B3	0	3	4	6	9	11	13	15	17	20	21
Strain Gage B4	0	3	5	7	10	11	13	15	18	19	21
Strain Gage B5	0	4	6	8	11	15	17	19	22	25	28
Strain Gage B6	0	2	4	7	9	11	13	15	18	21	23
Strain Gage C1	0	2	4	6	7	10	13	15	18	20	22
Strain Gage C2	0	5	8	12	17	21	24	28	35	37	41
Strain Gage C3	0	8	13	19	27	34	40	49	56	65	72
Strain Gage C4	0	9	15	21	30	37	45	53	63	72	82
Strain Gage C5	0	5	8	12	16	20	24	29	32	38	43
Strain Gage C6	0	2	3	6	7	9	12	14	16	19	20
Slip 1	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
Slip 2	0	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0000
Slip 3	0	0.0000	-0.0001	-0.0001	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000
Slip 4	0	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-4: Test 4 (continued)

Load	5503	6000	6513	7010	7497	8000	8503	8990	9503	10005	10503
Wire Pot A1	0.0071	0.0078	0.0065	0.0071	0.0065	0.0058	0.0071	0.0071	0.0058	0.0065	0.0104
Wire Pot A2	0.0071	0.0084	0.0078	0.0078	0.0078	0.0142	0.0142	0.0136	0.0149	0.0142	0.0136
Wire Pot A3	0.0074	0.0074	0.0067	0.0074	0.0074	0.0134	0.0147	0.0147	0.0147	0.0154	0.0147
Wire Pot A4	0.0063	0.0063	0.008	0.0087	0.0093	0.0113	0.0123	0.013	0.0144	0.015	0.0154
Wire Pot A5	0.0024	0.0036	0.0061	0.0049	0.0061	0.0085	0.0085	0.0122	0.0122	0.0122	0.0122
Wire Pot A6	0	0.0013	0.0006	0	0	0.0013	0	0.0006	0.0006	0	0.0013
Wire Pot B1	0.0136	0.0136	0.0123	0.0136	0.0175	0.0194	0.022	0.0201	0.0201	0.0201	0.024
Wire Pot B2	0.0109	0.0103	0.009	0.0116	0.0155	0.0187	0.018	0.0161	0.018	0.0245	0.0245
Wire Pot B3	0.0104	0.026	0.026	0.0247	0.0247	0.026	0.0195	0.0247	0.0273	0.0338	0.0377
Wire Pot B4	0.0124	0.0124	0.0137	0.0183	0.0202	0.0189	0.0196	0.0229	0.0268	0.0268	0.0248
Wire Pot B5	0.0196	0.0196	0.0196	0.022	0.0244	0.0244	0.0257	0.0281	0.0293	0.0318	0.0318
Wire Pot B6	0.0146	0.014	0.014	0.0213	0.0206	0.0206	0.0213	0.0206	0.0286	0.0286	0.028
Wire Pot C1	0.0065	0.0071	0.0084	0.0071	0.013	0.013	0.0136	0.013	0.0136	0.0156	0.0136
Wire Pot C2	0.0093	0.007	0.007	0.0093	0.0116	0.0093	0.0139	0.0186	0.0139	0.0139	0.0139
Wire Pot C3	0.0161	0.0172	0.0195	0.0195	0.0229	0.0252	0.0252	0.0275	0.0287	0.0298	0.031
Wire Pot C4	0.0109	0.0133	0.0158	0.017	0.0182	0.0218	0.0218	0.0218	0.0243	0.0267	0.0279
Wire Pot C5	0.0117	0.0186	0.021	0.0233	0.021	0.0256	0.0279	0.0279	0.0256	0.0233	0.0302
Wire Pot C6	0.0083	0.0095	0.0095	0.0119	0.0143	0.0155	0.0155	0.0167	0.0167	0.0203	0.0227
Strain Gage A1	14	14	15	17	19	20	21	22	23	24	26
Strain Gage A2	12	14	14	16	17	19	20	21	22	24	25
Strain Gage A3	13	14	16	17	18	20	22	23	24	25	27
Strain Gage A4	13	14	15	17	18	19	20	22	24	25	27
Strain Gage A5	14	14	16	17	18	19	21	22	23	25	26
Strain Gage A6	12	14	15	16	17	19	19	21	22	23	25
Strain Gage B1	27	29	33	35	38	41	43	47	49	53	56
Strain Gage B2	28	31	34	36	39	41	44	46	49	52	55
Strain Gage B3	24	26	28	30	31	34	37	38	40	43	44
Strain Gage B4	23	26	28	30	31	34	35	38	41	42	44
Strain Gage B5	31	33	36	38	42	44	48	51	54	56	60
Strain Gage B6	25	28	31	34	36	38	41	44	47	49	52
Strain Gage C1	25	27	30	33	35	38	40	43	46	48	52
Strain Gage C2	45	49	55	60	64	67	73	77	83	90	92
Strain Gage C3	82	90	99	109	116	127	136	147	157	166	177
Strain Gage C4	92	102	113	123	134	144	156	167	178	189	200
Strain Gage C5	48	53	59	63	68	75	81	86	92	97	104
Strain Gage C6	22	25	27	30	31	34	37	39	42	45	47
Slip 1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000
Slip 2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	-0.0001	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	0.0000	0.0000	-0.0001	-0.0001
Slip 4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-4: Test 4 (continued)

Load	10995	11487	12047	12492	12995	13508	14026	14487	15031
Wire Pot A1	0.0129	0.0136	0.0123	0.0142	0.0136	0.0136	0.0136	0.0136	0.0136
Wire Pot A2	0.0142	0.0142	0.0149	0.0155	0.0194	0.0207	0.0214	0.022	0.0214
Wire Pot A3	0.0147	0.0154	0.0221	0.0214	0.0227	0.0214	0.0214	0.0227	0.0221
Wire Pot A4	0.0167	0.0174	0.018	0.018	0.0184	0.019	0.0207	0.0207	0.022
Wire Pot A5	0.0147	0.0171	0.0183	0.0183	0.0171	0.0183	0.0208	0.0208	0.0208
Wire Pot A6	0	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0013
Wire Pot B1	0.0278	0.0285	0.0278	0.0272	0.0265	0.0311	0.033	0.0343	0.0336
Wire Pot B2	0.0232	0.0232	0.0251	0.0238	0.0309	0.0309	0.0309	0.0309	0.0309
Wire Pot B3	0.0377	0.0403	0.0377	0.0403	0.0377	0.0377	0.0377	0.048	0.0545
Wire Pot B4	0.0261	0.0333	0.0333	0.032	0.0339	0.0398	0.0398	0.0385	0.0385
Wire Pot B5	0.033	0.0342	0.0367	0.0354	0.0379	0.0379	0.0428	0.0464	0.0538
Wire Pot B6	0.028	0.028	0.036	0.036	0.0353	0.036	0.034	0.0346	0.0413
Wire Pot C1	0.0136	0.0201	0.0207	0.0201	0.0201	0.0201	0.0194	0.0214	0.0207
Wire Pot C2	0.0162	0.0232	0.0209	0.0209	0.0209	0.0209	0.0302	0.0278	0.0255
Wire Pot C3	0.0333	0.0367	0.0367	0.0401	0.0401	0.0447	0.0447	0.0459	0.0459
Wire Pot C4	0.0291	0.0316	0.034	0.0352	0.0413	0.0425	0.0449	0.0449	0.0461
Wire Pot C5	0.0326	0.0326	0.0326	0.0349	0.0372	0.0395	0.0419	0.0395	0.0395
Wire Pot C6	0.0251	0.0239	0.0251	0.0263	0.0275	0.0286	0.031	0.0334	0.0322
Strain Gage A1	28	29	32	32	33	35	37	38	40
Strain Gage A2	27	29	30	32	32	33	35	37	38
Strain Gage A3	28	30	30	33	34	36	38	39	41
Strain Gage A4	28	30	32	33	35	37	39	41	41
Strain Gage A5	27	28	30	31	33	34	36	36	37
Strain Gage A6	26	27	29	30	32	33	34	36	38
Strain Gage B1	58	61	65	68	72	74	76	80	83
Strain Gage B2	59	60	64	66	69	71	73	76	79
Strain Gage B3	47	48	50	53	54	56	58	60	63
Strain Gage B4	46	47	50	53	55	56	58	60	62
Strain Gage B5	62	65	70	73	74	78	82	84	88
Strain Gage B6	55	58	61	62	66	70	73	76	78
Strain Gage C1	54	57	60	63	65	69	72	75	78
Strain Gage C2	97	103	108	112	118	129	136	142	149
Strain Gage C3	188	198	210	218	229	257	274	287	305
Strain Gage C4	212	225	236	246	258	277	291	301	310
Strain Gage C5	110	117	123	128	134	144	151	157	166
Strain Gage C6	50	53	55	57	60	64	66	68	72
Slip 1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Slip 3	-0.0001	0.0000	-0.0001	-0.0001	0.0000	-0.0001	-0.0001	-0.0001	-0.0001
Slip 4	-0.0001	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	-0.0001	0.0000

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 5 – Recast Slab 2
Transverse Line Load at Quarter Point B
Cast Date: 6/16/2006
Test Date: 7/19/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15031 lb
Midspan Deflection at Maximum Load:	0.040 in
Quarter A Deflection at Maximum Load:	0.023 in
Quarter B Deflection at Maximum Load:	0.046 in
End Slip at Maximum Load:	0.0000 in

Table E-5: Experimental results of concentrated load Test 5 on recast STRUX-reinforced slab 2

Load	0	1031	2026	3079	4026	5026	6021	7042	8042	9016	10063
Wire Pot A1	0	0	-0.0013	-0.0006	-0.0006	0.0065	0.0059	0.0059	0.0065	0.0072	0.011
Wire Pot A2	0	0	0.0013	0.0065	0.0065	0.0078	0.0078	0.0058	0.0142	0.0142	0.0142
Wire Pot A3	0	0.0013	0.0013	0.0053	0.006	0.008	0.0073	0.008	0.0147	0.0154	0.0147
Wire Pot A4	0	-0.0004	0	0.0023	0.0033	0.0053	0.0073	0.009	0.0117	0.013	0.0147
Wire Pot A5	0	-0.0013	0	0.0012	0.0036	0.0061	0.0049	0.0085	0.0085	0.0085	0.0122
Wire Pot A6	0	0.0007	0	0	0.0007	0.0013	0.002	0.0013	0.0013	0.002	0.002
Wire Pot B1	0	-0.0026	0.0065	0.0046	0.0052	0.0123	0.011	0.0155	0.0181	0.0168	0.0226
Wire Pot B2	0	0.0013	0.0045	0.0039	0.0045	0.0116	0.0116	0.0174	0.0174	0.018	0.0251
Wire Pot B3	0	0.0065	0.0117	0.013	0.0143	0.0143	0.0247	0.026	0.026	0.0273	0.0286
Wire Pot B4	0	0.0006	0.0006	0.0071	0.0078	0.0137	0.0143	0.0195	0.0202	0.0208	0.028
Wire Pot B5	0	0	0.0061	0.0061	0.0098	0.0171	0.0196	0.022	0.022	0.0269	0.0294
Wire Pot B6	0	0.0006	0.0066	0.0086	0.008	0.0146	0.0146	0.0213	0.022	0.022	0.028
Wire Pot C1	0	-0.0006	0.0013	0.0046	0.0052	0.0059	0.0065	0.0124	0.0124	0.013	0.013
Wire Pot C2	0	0.0023	0	0	0	-0.0023	0.0046	0.0093	0.0139	0.0116	0.0139
Wire Pot C3	0	0.0023	0.0046	0.0092	0.0114	0.016	0.0183	0.0229	0.0252	0.0263	0.0309
Wire Pot C4	0	0.0012	0.0024	0.0048	0.0085	0.0121	0.017	0.0194	0.0242	0.023	0.0267
Wire Pot C5	0	0	0.0069	0.0069	0.0116	0.0116	0.0209	0.0209	0.0278	0.0302	0.0255
Wire Pot C6	0	-0.0012	-0.0012	0.0012	0.0035	0.0059	0.0095	0.0119	0.0131	0.0155	0.0191
Strain Gage A1	0	2	4	7	9	12	15	17	19	21	24
Strain Gage A2	0	3	5	7	9	11	14	16	19	21	24
Strain Gage A3	0	3	5	7	9	12	15	17	20	22	25
Strain Gage A4	0	2	3	5	7	10	13	16	18	21	24
Strain Gage A5	0	2	3	7	9	10	13	16	18	20	22
Strain Gage A6	0	3	5	6	10	10	14	16	18	19	24
Strain Gage B1	0	5	10	15	19	24	29	34	40	46	51
Strain Gage B2	0	4	9	15	19	22	27	32	38	42	47
Strain Gage B3	0	5	9	12	16	21	24	29	33	36	41
Strain Gage B4	0	5	8	12	16	20	24	27	31	35	38
Strain Gage B5	0	5	11	15	19	24	30	35	40	45	51
Strain Gage B6	0	5	9	14	19	23	27	32	38	42	48
Strain Gage C1	0	5	9	14	17	22	28	33	39	44	49
Strain Gage C2	0	7	16	24	32	40	48	58	68	76	86
Strain Gage C3	0	13	25	41	56	72	90	107	125	142	162
Strain Gage C4	0	13	27	43	60	79	99	119	141	162	186
Strain Gage C5	0	9	17	25	34	44	55	66	77	88	102
Strain Gage C6	0	4	8	13	17	21	25	31	35	40	46
Slip 1	0	0	0	0	0	0.0001	0.0001	0	0	0	0
Slip 2	0	0	0.0001	0.0001	0	0	0	0	0	0	0.0001
Slip 3	0	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0
Slip 4	0	-0.0001	0	0	0	-0.0001	-0.0001	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-5: Test 5 (continued)

Load	11016	12021	13021	14005	15031
Wire Pot A1	0.0123	0.013	0.013	0.0123	0.0123
Wire Pot A2	0.0136	0.0136	0.0201	0.0207	0.0201
Wire Pot A3	0.0167	0.0194	0.0227	0.0234	0.0234
Wire Pot A4	0.016	0.017	0.018	0.0197	0.0217
Wire Pot A5	0.0122	0.0159	0.0183	0.0183	0.0208
Wire Pot A6	0.0007	0.002	0.002	0.0007	0.002
Wire Pot B1	0.0252	0.0246	0.0278	0.0343	0.031
Wire Pot B2	0.0245	0.0238	0.0309	0.0309	0.0309
Wire Pot B3	0.0376	0.0389	0.0415	0.0415	0.0389
Wire Pot B4	0.0274	0.0326	0.0339	0.0378	0.0417
Wire Pot B5	0.033	0.0343	0.0367	0.0391	0.0416
Wire Pot B6	0.0293	0.028	0.036	0.0353	0.0353
Wire Pot C1	0.0195	0.0195	0.0195	0.0208	0.0266
Wire Pot C2	0.0139	0.0186	0.0162	0.0232	0.0278
Wire Pot C3	0.0344	0.0378	0.0401	0.0435	0.0447
Wire Pot C4	0.0303	0.0327	0.04	0.0437	0.0473
Wire Pot C5	0.0325	0.0348	0.0348	0.0371	0.0395
Wire Pot C6	0.0203	0.0215	0.025	0.0274	0.0286
Strain Gage A1	26	30	32	34	38
Strain Gage A2	26	29	33	34	37
Strain Gage A3	28	31	34	37	41
Strain Gage A4	27	29	33	37	39
Strain Gage A5	25	28	30	32	34
Strain Gage A6	25	27	30	32	35
Strain Gage B1	57	61	67	73	79
Strain Gage B2	52	57	62	68	72
Strain Gage B3	44	49	51	56	60
Strain Gage B4	42	45	49	53	56
Strain Gage B5	55	62	67	72	78
Strain Gage B6	52	58	64	70	75
Strain Gage C1	54	59	66	71	76
Strain Gage C2	96	105	117	126	138
Strain Gage C3	179	200	222	243	266
Strain Gage C4	208	233	260	279	297
Strain Gage C5	111	125	138	150	163
Strain Gage C6	50	56	59	65	70
Slip 1	0.0001	0.0001	0	0	0
Slip 2	0.0001	0	0	0.0001	0
Slip 3	-0.0001	-0.0001	-0.0001	-0.0001	0
Slip 4	0	0	0	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 6 – Recast Slab 2
Transverse Line Load at Quarter Point A
Cast Date: 6/16/2006
Test Date: 7/19/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15010 lb
Midspan Deflection at Maximum Load:	0.031 in
Quarter A Deflection at Maximum Load:	0.033 in
Quarter B Deflection at Maximum Load:	0.021 in
End Slip at Maximum Load:	0.0000 in

Table E-6: Experimental results of concentrated load Test 6 on recast STRUX-reinforced slab 2

Load	0	1000	2010	3016	4005	4990	6005	7010	7995	9016	10000
Wire Pot A1	0	-0.0013	-0.0006	0.0013	-0.0006	0.0059	0.0065	0.0072	0.0123	0.0143	0.013
Wire Pot A2	0	0.002	0.0039	0.0046	0.0072	0.0111	0.0111	0.0117	0.0175	0.0175	0.0175
Wire Pot A3	0	0	0.0053	0.004	0.006	0.0127	0.0127	0.0127	0.02	0.02	0.0207
Wire Pot A4	0	0	0.0003	0.0034	0.005	0.0084	0.0114	0.0141	0.0154	0.0171	0.0201
Wire Pot A5	0	-0.0012	0	0.0037	0.0049	0.0074	0.0074	0.0123	0.0123	0.0159	0.0172
Wire Pot A6	0	-0.0013	-0.0007	-0.0013	-0.0007	-0.0007	0	-0.0007	-0.0007	-0.0007	-0.0007
Wire Pot B1	0	0.0039	0.0059	0.0065	0.013	0.0143	0.0155	0.0201	0.0201	0.0265	0.0265
Wire Pot B2	0	-0.0006	-0.0006	0	0.0078	0.0071	0.0078	0.0129	0.0136	0.0116	0.0187
Wire Pot B3	0	0.0013	0.0052	0.0026	0.0052	0.0052	0.0052	0.0169	0.0182	0.0182	0.0169
Wire Pot B4	0	-0.0007	-0.0007	0.0013	0.0013	0.0019	0.0091	0.0098	0.0091	0.0163	0.0156
Wire Pot B5	0	0.0049	0.0049	0.0037	0.0061	0.0122	0.0196	0.0208	0.022	0.0232	0.0269
Wire Pot B6	0	-0.0014	-0.0007	0.006	0.006	0.0066	0.0133	0.0133	0.02	0.0193	0.0206
Wire Pot C1	0	0.0007	0	0	0.0013	0	0	0.0058	0.0078	0.0078	0.0078
Wire Pot C2	0	0	0.0023	0	0	0	0.0023	-0.0023	0.0069	0.0069	0.0069
Wire Pot C3	0	0.0011	-0.0012	0.0034	0.0034	0.0045	0.0068	0.008	0.0103	0.0114	0.0137
Wire Pot C4	0	0	-0.0012	0	0	0.0012	0.0012	0.0048	0.0061	0.0073	0.0085
Wire Pot C5	0	-0.0023	0	-0.0023	0	0.0023	0.0047	0.0023	0.007	0.0116	0.0093
Wire Pot C6	0	0	0	0.0012	0.0012	0	0.0036	0.0024	0.0071	0.0095	0.0083
Strain Gage A1	0	7	12	18	23	29	35	41	47	53	58
Strain Gage A2	0	9	19	29	40	50	61	73	83	96	108
Strain Gage A3	0	12	26	43	59	76	96	114	134	153	172
Strain Gage A4	0	14	31	51	74	96	121	146	169	195	220
Strain Gage A5	0	11	22	33	44	54	65	77	88	100	111
Strain Gage A6	0	5	9	15	19	24	29	34	39	44	48
Strain Gage B1	0	5	10	15	20	26	31	37	41	47	52
Strain Gage B2	0	6	11	16	20	26	31	36	41	47	53
Strain Gage B3	0	5	10	16	20	25	30	34	39	44	48
Strain Gage B4	0	5	10	15	19	24	28	32	37	41	45
Strain Gage B5	0	5	11	16	20	26	31	36	41	47	52
Strain Gage B6	0	5	10	14	20	24	29	34	40	44	49
Strain Gage C1	0	3	4	7	10	12	15	18	21	23	26
Strain Gage C2	0	3	5	7	10	11	13	17	18	21	22
Strain Gage C3	0	3	5	8	10	13	17	20	23	27	30
Strain Gage C4	0	3	6	9	12	14	17	20	23	27	29
Strain Gage C5	0	2	5	8	10	12	15	18	19	23	24
Strain Gage C6	0	1	4	7	8	10	13	16	18	20	22
Slip 1	0	-0.0001	0	0	0	0	0	-0.0001	0	0	0
Slip 2	0	0	0	0	0	0.0001	0	0	0	0	0
Slip 3	0	0	0	0	0	0	0	0	0	0	0
Slip 4	0	-0.0001	0	0	-0.0001	0	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-6: Test 6 (continued)

Load	11005	12005	12990	13990	15010
Wire Pot A1	0.013	0.0195	0.0201	0.0195	0.0272
Wire Pot A2	0.0247	0.0234	0.024	0.0305	0.0312
Wire Pot A3	0.028	0.028	0.028	0.0347	0.034
Wire Pot A4	0.0224	0.0254	0.0281	0.0304	0.0321
Wire Pot A5	0.0196	0.0221	0.0233	0.027	0.0306
Wire Pot A6	-0.0013	0.0006	-0.0013	-0.0013	0.0058
Wire Pot B1	0.0265	0.0343	0.033	0.0336	0.0401
Wire Pot B2	0.0187	0.0239	0.0258	0.0252	0.0323
Wire Pot B3	0.0195	0.0325	0.0338	0.0325	0.0325
Wire Pot B4	0.0222	0.0222	0.0228	0.0293	0.03
Wire Pot B5	0.0293	0.0293	0.0318	0.0354	0.0379
Wire Pot B6	0.0266	0.028	0.0273	0.032	0.034
Wire Pot C1	0.0071	0.0136	0.0136	0.0143	0.0143
Wire Pot C2	0.0093	0.0162	0.0139	0.0139	0.0162
Wire Pot C3	0.0171	0.0183	0.0171	0.0206	0.0229
Wire Pot C4	0.0109	0.0121	0.0158	0.017	0.0194
Wire Pot C5	0.0116	0.014	0.0186	0.0209	0.0209
Wire Pot C6	0.0083	0.0119	0.0107	0.0131	0.0155
Strain Gage A1	64	70	76	83	89
Strain Gage A2	120	132	144	157	171
Strain Gage A3	194	213	235	256	278
Strain Gage A4	245	269	294	320	346
Strain Gage A5	123	134	146	158	171
Strain Gage A6	54	57	62	68	72
Strain Gage B1	58	63	68	75	80
Strain Gage B2	57	62	67	73	79
Strain Gage B3	52	58	61	66	69
Strain Gage B4	48	53	57	61	65
Strain Gage B5	57	63	68	73	78
Strain Gage B6	53	59	64	70	75
Strain Gage C1	28	31	33	37	39
Strain Gage C2	24	27	30	31	34
Strain Gage C3	33	37	40	45	48
Strain Gage C4	33	36	39	43	47
Strain Gage C5	28	30	33	36	38
Strain Gage C6	24	28	30	32	35
Slip 1	0	0	0	-0.0001	0
Slip 2	0	0.0001	0	0	0
Slip 3	0	0	0	0	0
Slip 4	-0.0001	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 7 – Recast Slab 2
Longitudinal Line Load at Right Side
Cast Date: 6/16/2006
Test Date: 7/19/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15089 lb
Midspan Deflection at Maximum Load:	0.050 in
Quarter A Deflection at Maximum Load:	0.035 in
Quarter B Deflection at Maximum Load:	0.039 in
End Slip at Maximum Load:	0.0000 in

Table E-7: Experimental results of concentrated load Test 7 on recast STRUX-reinforced slab 2

Load	0	1052	2037	3021	4026	5021	6016	7021	8010	9010	10010
Wire Pot A1	0	-0.0006	0	-0.0006	0	0	0	-0.0006	-0.0013	-0.0006	0.0007
Wire Pot A2	0	-0.0013	0.0007	-0.0006	0	0	-0.0006	0	0	0	0.0007
Wire Pot A3	0	0	-0.0007	0.0047	0.006	0.0067	0.0067	0.006	0.0134	0.0147	0.014
Wire Pot A4	0	-0.0003	0.0031	0.0054	0.0097	0.0134	0.0154	0.0181	0.0221	0.0251	0.0281
Wire Pot A5	0	0.0013	0.0062	0.0111	0.016	0.0209	0.0245	0.0319	0.038	0.0356	0.0405
Wire Pot A6	0	-0.0006	-0.0006	-0.0006	-0.0006	0.0072	0.0137	0.0189	0.0202	0.0255	0.0333
Wire Pot B1	0	0	0.0007	0.0007	0	0.0007	0	0.0007	0.0013	0.0007	0
Wire Pot B2	0	0.0006	-0.0033	-0.0033	0.0019	0.0019	0.0013	0.0006	0.0013	0.0013	0.0013
Wire Pot B3	0	0.0078	0.0117	0.0143	0.0117	0.013	0.013	0.0286	0.026	0.0273	0.0273
Wire Pot B4	0	0.0006	0.0072	0.0085	0.013	0.0202	0.0254	0.0274	0.0332	0.0372	0.0404
Wire Pot B5	0	-0.0013	0.0159	0.0195	0.0244	0.0293	0.0379	0.0501	0.0513	0.0525	0.0574
Wire Pot B6	0	0.0073	0.0213	0.0293	0.0353	0.042	0.0493	0.056	0.064	0.0693	0.0786
Wire Pot C1	0	-0.0013	0	0	0	-0.0013	0	-0.0013	-0.0006	0.0006	-0.0006
Wire Pot C2	0	0.0023	0.0046	0	0.0023	0.0023	0.0023	0.0023	0.0092	0.0023	0.0092
Wire Pot C3	0	0	0.0035	0.0069	0.0069	0.0103	0.0126	0.0149	0.0149	0.0172	0.0184
Wire Pot C4	0	0	0.0024	0.0061	0.0085	0.0109	0.0158	0.0206	0.0231	0.0267	0.0303
Wire Pot C5	0	0.007	0.0117	0.0163	0.0233	0.0233	0.0326	0.0395	0.0395	0.0488	0.0488
Wire Pot C6	0	0.0035	0.0083	0.0131	0.0215	0.0298	0.0334	0.0406	0.0454	0.0489	0.0549
Strain Gage A1	0	1	4	6	8	10	14	16	18	21	23
Strain Gage A2	0	5	8	13	16	22	26	31	37	41	46
Strain Gage A3	0	6	12	18	25	32	40	48	57	66	73
Strain Gage A4	0	8	14	23	32	43	54	65	76	88	99
Strain Gage A5	0	9	16	23	30	38	46	55	63	72	82
Strain Gage A6	0	10	17	25	33	41	49	57	65	74	82
Strain Gage B1	0	3	7	9	15	18	21	24	28	33	36
Strain Gage B2	0	7	12	17	22	27	34	39	44	50	55
Strain Gage B3	0	9	17	23	31	37	44	51	58	64	70
Strain Gage B4	0	13	22	31	40	50	59	69	77	87	97
Strain Gage B5	0	17	32	45	60	74	90	106	121	139	155
Strain Gage B6	0	15	28	42	56	71	85	100	114	130	147
Strain Gage C1	0	3	4	7	9	12	15	17	20	22	25
Strain Gage C2	0	4	8	12	16	19	23	27	32	37	39
Strain Gage C3	0	5	11	18	25	33	39	48	55	64	72
Strain Gage C4	0	7	14	20	28	36	44	52	61	70	78
Strain Gage C5	0	7	13	19	26	34	42	50	58	66	75
Strain Gage C6	0	8	15	22	30	39	48	56	64	74	81
Slip 1	0	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Slip 2	0	0	0	0	0.0001	0	0	0.0001	0	0	0
Slip 3	0	0	0	0	0	0	0	0	-0.0001	0	0
Slip 4	0	0.0001	0.0001	0	0.0001	0.0001	0	0.0001	0.0001	0.0001	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-7: Test 7 (continued)

Load	11021	12094	13047	14063	15089
Wire Pot A1	0.0013	0	-0.0026	-0.0064	-0.0064
Wire Pot A2	0.0059	0.0078	0.0065	0.0072	0.0072
Wire Pot A3	0.018	0.0207	0.0207	0.02	0.0254
Wire Pot A4	0.0308	0.0331	0.0351	0.0392	0.0438
Wire Pot A5	0.0454	0.0552	0.0576	0.0601	0.0674
Wire Pot A6	0.0411	0.0477	0.0463	0.0548	0.0601
Wire Pot B1	0.0013	0.0007	0.0007	0	0
Wire Pot B2	0.0083	0.0051	0.0058	0.0071	0.0083
Wire Pot B3	0.0247	0.0415	0.0402	0.0415	0.0376
Wire Pot B4	0.0476	0.0535	0.0554	0.0613	0.0632
Wire Pot B5	0.066	0.0733	0.0807	0.0929	0.0953
Wire Pot B6	0.084	0.0913	0.098	0.106	0.112
Wire Pot C1	-0.0006	0.0006	-0.0006	-0.0013	-0.0006
Wire Pot C2	0.0046	0.0046	0.0069	0.0092	0.0139
Wire Pot C3	0.0229	0.0252	0.0264	0.0298	0.0298
Wire Pot C4	0.034	0.0413	0.0449	0.0461	0.0473
Wire Pot C5	0.0558	0.0581	0.0651	0.0674	0.0767
Wire Pot C6	0.0633	0.0681	0.074	0.0776	0.0848
Strain Gage A1	25	29	31	34	38
Strain Gage A2	53	57	63	69	75
Strain Gage A3	82	94	102	112	122
Strain Gage A4	113	126	138	150	164
Strain Gage A5	91	100	109	117	125
Strain Gage A6	91	100	106	114	120
Strain Gage B1	41	46	50	54	59
Strain Gage B2	61	67	74	81	89
Strain Gage B3	80	88	96	105	114
Strain Gage B4	108	121	133	143	153
Strain Gage B5	180	204	390	470	497
Strain Gage B6	159	167	213	361	426
Strain Gage C1	29	31	35	39	42
Strain Gage C2	44	49	54	60	64
Strain Gage C3	81	93	101	113	124
Strain Gage C4	89	100	109	121	132
Strain Gage C5	84	93	101	108	118
Strain Gage C6	91	98	104	113	118
Slip 1	0.0001	0.0001	0.0001	0.0001	0.0001
Slip 2	0	0	0	0.0001	0
Slip 3	0	0	0	0	0
Slip 4	0	0.0001	0.0001	0	0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 8 – Recast Slab 2
Longitudinal Line Load at Left Side
Cast Date: 6/16/2006
Test Date: 7/20/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15005 lb
Midspan Deflection at Maximum Load:	0.039 in
Quarter A Deflection at Maximum Load:	0.025 in
Quarter B Deflection at Maximum Load:	0.032 in
End Slip at Maximum Load:	0.0000 in

Table E-8: Experimental results of concentrated load Test 8 on recast STRUX-reinforced slab 2

Load	0	1042	2016	3010	4026	5010	6016	7026	8000	9010	10031
Wire Pot A1	0	0.0058	0.0136	0.0188	0.0265	0.0343	0.0337	0.0401	0.0479	0.0473	0.0544
Wire Pot A2	0	0.0065	0.0065	0.013	0.0201	0.0201	0.0273	0.0292	0.0344	0.039	0.0415
Wire Pot A3	0	0.0067	0.0067	0.0067	0.0154	0.014	0.0154	0.02	0.022	0.022	0.0287
Wire Pot A4	0	0.0007	-0.0003	0.0017	0.002	0.0024	0.0037	0.0047	0.006	0.0074	0.0077
Wire Pot A5	0	0.0012	0.0012	-0.0013	-0.0049	-0.0025	-0.0025	-0.0049	-0.0037	-0.0025	-0.0037
Wire Pot A6	0	0.0013	-0.0046	-0.0046	-0.0111	-0.0111	-0.0117	-0.0124	-0.0117	-0.0111	-0.0111
Wire Pot B1	0	0.0059	0.011	0.0188	0.0239	0.0323	0.0395	0.044	0.0511	0.053	0.0601
Wire Pot B2	0	0.0071	0.0142	0.0129	0.0207	0.0271	0.0329	0.0336	0.0394	0.0426	0.0452
Wire Pot B3	0	0	0.0078	0.0143	0.0143	0.0143	0.0286	0.026	0.0273	0.0286	0.0338
Wire Pot B4	0	0.0006	0.0032	0.0019	0.0013	0.0019	0.0098	0.0091	0.0098	0.0098	0.0163
Wire Pot B5	0	0	0	0.0037	0	0	0	0	0	0	0.0049
Wire Pot B6	0	-0.0006	-0.0006	-0.0013	-0.0093	-0.008	-0.0086	-0.008	-0.0086	-0.0073	-0.0086
Wire Pot C1	0	0.0071	0.011	0.0136	0.022	0.0278	0.0343	0.0356	0.0421	0.0421	0.0486
Wire Pot C2	0	0.0023	0.0069	0.0116	0.0116	0.0209	0.0278	0.0325	0.0301	0.0371	0.0417
Wire Pot C3	0	0.0034	0.0068	0.0091	0.0148	0.016	0.0171	0.0206	0.0229	0.0263	0.0332
Wire Pot C4	0	0.0024	-0.0025	0.0024	0.0036	0.0036	0.006	0.0073	0.0097	0.0097	0.0133
Wire Pot C5	0	0	0.0023	0.0023	0.0023	0	0	0	0.0023	0.0023	0.0023
Wire Pot C6	0	0	0	-0.0012	-0.0072	-0.0072	-0.0072	-0.006	-0.0084	-0.0072	-0.0084
Strain Gage A1	0	6	13	19	27	35	42	48	57	65	74
Strain Gage A2	0	10	17	27	36	47	57	67	78	88	99
Strain Gage A3	0	7	16	24	35	44	55	65	75	86	96
Strain Gage A4	0	6	11	16	23	31	39	48	56	65	75
Strain Gage A5	0	4	7	11	13	17	20	24	27	31	35
Strain Gage A6	0	1	2	4	6	6	9	10	11	13	16
Strain Gage B1	0	8	17	23	33	41	52	60	69	79	90
Strain Gage B2	0	6	10	17	22	28	34	40	47	52	60
Strain Gage B3	0	6	13	17	22	29	34	39	45	51	57
Strain Gage B4	0	4	9	14	19	23	27	31	36	40	45
Strain Gage B5	0	5	9	14	19	25	32	39	45	53	60
Strain Gage B6	0	2	5	7	9	13	15	19	22	26	30
Strain Gage C1	0	8	14	21	29	36	44	52	60	68	77
Strain Gage C2	0	8	16	23	32	39	47	57	66	75	86
Strain Gage C3	0	6	13	19	27	35	43	52	60	70	80
Strain Gage C4	0	5	10	15	20	25	33	41	47	54	62
Strain Gage C5	0	3	6	9	11	14	18	21	25	28	32
Strain Gage C6	0	1	1	3	5	8	9	11	13	15	16
Slip 1	0	0	0	0	0	0	0	-0.0001	0	0	0
Slip 2	0	0	0	-1E-04	0	0	-1E-04	-1E-04	-1E-04	-1E-04	-1E-04
Slip 3	0	0	-0.0001	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002
Slip 4	0	0	0	0	0.0001	0	0	0	0	-1E-04	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-8: Test 8 (continued)

Load	11010	12021	13016	14026	15005
Wire Pot A1	0.0544	0.0609	0.0634	0.068	0.0673
Wire Pot A2	0.0474	0.0474	0.0545	0.0545	0.0578
Wire Pot A3	0.0281	0.0294	0.0361	0.0354	0.0361
Wire Pot A4	0.01	0.0104	0.0114	0.012	0.0131
Wire Pot A5	-0.0037	-0.0025	-0.0037	-0.0049	-0.0037
Wire Pot A6	-0.0111	-0.0111	-0.0104	-0.0124	-0.0117
Wire Pot B1	0.0666	0.0724	0.073	0.0795	0.086
Wire Pot B2	0.0535	0.0535	0.06	0.0606	0.0677
Wire Pot B3	0.0402	0.0389	0.0415	0.0402	0.0558
Wire Pot B4	0.0163	0.0156	0.0163	0.0228	0.0228
Wire Pot B5	0.0073	0.0098	0.011	0.0171	0.0159
Wire Pot B6	-0.008	-0.0073	-0.008	-0.0073	-0.0073
Wire Pot C1	0.055	0.0557	0.0622	0.0615	0.0699
Wire Pot C2	0.0394	0.044	0.0464	0.051	0.0556
Wire Pot C3	0.0332	0.0366	0.0389	0.04	0.0423
Wire Pot C4	0.0145	0.0158	0.017	0.0194	0.0218
Wire Pot C5	0	0.0046	0.007	0.0046	0.007
Wire Pot C6	-0.0072	-0.006	-0.0072	-0.0072	-0.0072
Strain Gage A1	82	90	101	108	118
Strain Gage A2	110	120	132	142	153
Strain Gage A3	107	118	128	138	149
Strain Gage A4	84	91	101	109	118
Strain Gage A5	38	42	47	49	53
Strain Gage A6	17	20	20	22	24
Strain Gage B1	99	109	121	131	140
Strain Gage B2	65	72	79	85	91
Strain Gage B3	62	68	74	80	86
Strain Gage B4	49	54	58	62	67
Strain Gage B5	67	75	83	91	99
Strain Gage B6	35	38	45	48	54
Strain Gage C1	85	94	103	111	119
Strain Gage C2	94	103	114	122	132
Strain Gage C3	89	98	108	118	127
Strain Gage C4	70	77	86	93	101
Strain Gage C5	36	41	44	49	53
Strain Gage C6	19	20	23	24	27
Slip 1	-0.0001	-0.0001	0.0001	0	0
Slip 2	-0.0002	-1E-04	-0.0002	-1E-04	-0.0002
Slip 3	-0.0002	-0.0002	-0.0002	-0.0001	-0.0001
Slip 4	0	-1E-04	-1E-04	-1E-04	-1E-04

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 9 – Recast Slab 2
Longitudinal Line Load at Midspan
Cast Date: 6/16/2006
Test Date: 7/20/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15021 lb
Midspan Deflection at Maximum Load:	0.053 in
Quarter A Deflection at Maximum Load:	0.037 in
Quarter B Deflection at Maximum Load:	0.044 in
End Slip at Maximum Load:	0.0000 in

Table E-9: Experimental results of concentrated load Test 9 on recast STRUX-reinforced slab 2

Load	0	1047	2016	3005	4016	5031	6016	7026	8037	9016	10021
Wire Pot A1	0	-0.0007	-0.0013	-0.0013	-0.0013	0.0058	0.0065	0.0065	0.0071	0.0136	0.0123
Wire Pot A2	0	0.0007	0	-0.0006	0	0.0072	0.0078	0.0072	0.0072	0.0143	0.013
Wire Pot A3	0	0	0.0013	0.0006	0.0073	0.008	0.0066	0.0147	0.0147	0.0213	0.022
Wire Pot A4	0	0	0.0023	0.0053	0.0087	0.011	0.0123	0.0164	0.0197	0.0227	0.0247
Wire Pot A5	0	0.0024	0.0024	0.0061	0.0098	0.0122	0.0183	0.0196	0.0232	0.0245	0.0281
Wire Pot A6	0	0.0013	0.0007	0.002	0.0046	0.0039	0.0026	0.0098	0.0111	0.0144	0.017
Wire Pot B1	0	-0.002	0.0013	-0.0013	0.0064	0.0071	0.0103	0.0142	0.0129	0.0207	0.0213
Wire Pot B2	0	0.0019	0.0006	0.0045	0.0084	0.0097	0.0148	0.0155	0.0213	0.0219	0.0213
Wire Pot B3	0	-0.0013	0.013	0.013	0.0117	0.0117	0.0273	0.026	0.0286	0.0364	0.0415
Wire Pot B4	0	0	-0.0006	0.0052	0.0105	0.0131	0.0196	0.0196	0.0268	0.0268	0.0339
Wire Pot B5	0	0.0049	0.0147	0.0171	0.0196	0.0232	0.0281	0.0318	0.0342	0.0403	0.0526
Wire Pot B6	0	-0.002	-0.0013	0.0053	0.01	0.012	0.02	0.0193	0.0267	0.0273	0.0347
Wire Pot C1	0	0.0006	0.0006	-0.0006	0.0039	0.0071	0.0071	0.0084	0.0078	0.0136	0.0149
Wire Pot C2	0	-0.0023	0	0	0	0.0069	0.0046	0.0046	0.0116	0.0139	0.0116
Wire Pot C3	0	0.0022	0.0068	0.0091	0.0148	0.0148	0.0183	0.0229	0.024	0.0274	0.0309
Wire Pot C4	0	0.0012	0.0012	0.0036	0.0085	0.0133	0.0158	0.017	0.0206	0.0231	0.0291
Wire Pot C5	0	0.0023	0.007	0.007	0.007	0.0163	0.0163	0.0163	0.0233	0.0279	0.0325
Wire Pot C6	0	0	0.0035	0.0119	0.0167	0.0167	0.0191	0.0215	0.0227	0.0286	0.0298
Strain Gage A1	0	4	7	12	15	19	24	27	32	36	41
Strain Gage A2	0	6	12	18	25	32	39	45	53	60	67
Strain Gage A3	0	8	17	27	38	49	60	72	83	96	107
Strain Gage A4	0	8	17	27	40	52	65	78	92	105	118
Strain Gage A5	0	8	14	19	26	33	38	46	52	60	66
Strain Gage A6	0	4	8	12	15	19	23	27	32	35	39
Strain Gage B1	0	7	12	18	23	31	35	41	48	54	61
Strain Gage B2	0	8	15	22	28	36	43	51	59	66	74
Strain Gage B3	0	11	19	27	35	44	51	60	69	78	85
Strain Gage B4	0	11	19	27	36	44	51	61	69	77	85
Strain Gage B5	0	11	22	37	50	65	80	95	111	127	143
Strain Gage B6	0	6	14	21	30	41	50	61	72	85	97
Strain Gage C1	0	3	8	11	15	20	23	27	32	36	41
Strain Gage C2	0	5	10	14	19	24	29	35	40	45	52
Strain Gage C3	0	7	14	23	31	41	52	61	73	83	94
Strain Gage C4	0	7	13	23	31	41	51	62	72	83	95
Strain Gage C5	0	7	12	17	23	29	35	41	48	54	61
Strain Gage C6	0	3	8	11	15	20	23	26	31	36	39
Slip 1	0	0	0.0001	0	0	0	0	0	0	0.0001	0
Slip 2	0	-0.0001	0	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	0
Slip 3	0	-0.0001	-0.0001	-0.0001	0	0	0	-0.0001	-0.0001	0	-0.0001
Slip 4	0	-0.0001	-0.0002	-0.0002	-0.0001	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-9: Test 9 (continued)

Load	11063	12010	13021	14031	15021
Wire Pot A1	0.0136	0.0136	0.0194	0.0207	0.0201
Wire Pot A2	0.0137	0.0214	0.0214	0.0214	0.0208
Wire Pot A3	0.022	0.0287	0.0294	0.032	0.036
Wire Pot A4	0.0264	0.0297	0.0311	0.0344	0.0378
Wire Pot A5	0.0294	0.0343	0.0379	0.0404	0.0416
Wire Pot A6	0.0163	0.0209	0.0229	0.0242	0.0313
Wire Pot B1	0.0207	0.0278	0.0278	0.0271	0.0329
Wire Pot B2	0.0271	0.0297	0.0342	0.0342	0.0406
Wire Pot B3	0.0415	0.0389	0.0532	0.0545	0.0545
Wire Pot B4	0.0398	0.0392	0.0476	0.0463	0.0515
Wire Pot B5	0.0501	0.0513	0.0538	0.055	0.0538
Wire Pot B6	0.034	0.042	0.0407	0.0473	0.0473
Wire Pot C1	0.0143	0.0149	0.0207	0.0207	0.0214
Wire Pot C2	0.0232	0.0209	0.0185	0.0278	0.0301
Wire Pot C3	0.0343	0.0377	0.04	0.0412	0.0446
Wire Pot C4	0.0352	0.0388	0.0401	0.0413	0.0437
Wire Pot C5	0.0325	0.0395	0.0372	0.0442	0.0442
Wire Pot C6	0.0334	0.037	0.0382	0.0418	0.0418
Strain Gage A1	45	48	54	58	63
Strain Gage A2	75	82	91	98	105
Strain Gage A3	120	131	144	157	169
Strain Gage A4	132	146	160	174	188
Strain Gage A5	73	80	87	94	101
Strain Gage A6	43	46	51	55	59
Strain Gage B1	68	74	80	88	95
Strain Gage B2	82	89	98	106	114
Strain Gage B3	95	102	111	120	128
Strain Gage B4	94	101	111	118	127
Strain Gage B5	160	175	193	209	225
Strain Gage B6	109	120	133	147	159
Strain Gage C1	46	50	54	58	63
Strain Gage C2	57	63	69	76	80
Strain Gage C3	106	116	128	139	151
Strain Gage C4	106	118	131	142	155
Strain Gage C5	69	75	83	91	98
Strain Gage C6	44	47	52	56	59
Slip 1	0	0	-0.0001	0	0.0001
Slip 2	-0.0002	-0.0001	-0.0001	-0.0001	-0.0001
Slip 3	-0.0001	0	-0.0001	-0.0001	-0.0001
Slip 4	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 10 – Recast Slab 2
Transverse Line Load at Midspan
Cast Date: 6/16/2006
Test Date: 7/20/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	15010 lb
Midspan Deflection at Maximum Load:	0.064 in
Quarter A Deflection at Maximum Load:	0.042 in
Quarter B Deflection at Maximum Load:	0.048 in
End Slip at Maximum Load:	0.0000 in

Table E-10: Experimental results of concentrated load Test 10 on recast STRUX-reinforced slab 2

Load	0	1016	2005	3010	4021	5010	6068	7026	8042	9010	10026
Wire Pot A1	0	0.0007	0.0007	0.0007	0.0078	0.0085	0.0078	0.0136	0.0149	0.0149	0.0208
Wire Pot A2	0	-0.0006	-0.0006	0	0.0072	0.0072	0.0065	0.0111	0.0143	0.0143	0.0195
Wire Pot A3	0	-0.0013	0	-0.0007	0.006	0.006	0.0134	0.012	0.0207	0.02	0.0207
Wire Pot A4	0	0.0004	0.0017	0.0054	0.0074	0.0094	0.0131	0.0164	0.0198	0.0224	0.0251
Wire Pot A5	0	-0.0012	0	0.0025	0.0061	0.0098	0.0135	0.0184	0.0184	0.0221	0.027
Wire Pot A6	0	0	0	0.0006	0	0.0006	0	0.0032	0.0071	0.0065	0.0137
Wire Pot B1	0	-0.0007	-0.0032	0.0045	0.0039	0.0077	0.011	0.0116	0.0168	0.0174	0.0245
Wire Pot B2	0	0.0032	0.0013	0.0084	0.0077	0.0155	0.0148	0.0226	0.0213	0.0284	0.0264
Wire Pot B3	0	0.0039	0.0143	0.0156	0.0156	0.0286	0.0273	0.0286	0.0415	0.0415	0.0415
Wire Pot B4	0	0	0.0065	0.0065	0.0137	0.0202	0.0196	0.0281	0.0346	0.0352	0.0405
Wire Pot B5	0	0.0098	0.0171	0.0183	0.0232	0.0293	0.033	0.0379	0.0513	0.0501	0.0513
Wire Pot B6	0	0	0.0074	0.0074	0.0134	0.02	0.0234	0.028	0.0347	0.034	0.0414
Wire Pot C1	0	0.0006	0.0006	0.0064	0.0064	0.0071	0.0064	0.0129	0.0142	0.0136	0.02
Wire Pot C2	0	0	0	0	0	0.0046	0.0093	0.0093	0.0093	0.0185	0.0209
Wire Pot C3	0	0.0012	0.0046	0.0069	0.0126	0.0149	0.0195	0.0195	0.0252	0.0287	0.031
Wire Pot C4	0	-0.0024	0.0012	0.0049	0.0085	0.0146	0.0146	0.017	0.0207	0.0243	0.034
Wire Pot C5	0	0.0023	0.007	0.007	0.0116	0.0139	0.0232	0.0209	0.0279	0.0348	0.0372
Wire Pot C6	0	-0.0024	0.0071	0.0167	0.0131	0.0179	0.0191	0.0215	0.0262	0.0298	0.0346
Strain Gage A1	0	5	9	14	19	22	29	34	39	44	50
Strain Gage A2	0	6	12	19	26	33	40	46	54	61	68
Strain Gage A3	0	8	16	25	35	45	56	67	78	88	99
Strain Gage A4	0	7	15	24	36	47	60	71	84	95	108
Strain Gage A5	0	6	13	19	24	31	38	44	50	56	63
Strain Gage A6	0	5	10	15	19	23	28	33	37	42	46
Strain Gage B1	0	8	15	22	30	38	47	55	63	72	80
Strain Gage B2	0	11	21	32	42	54	67	77	90	101	114
Strain Gage B3	0	15	27	40	53	66	79	91	104	117	130
Strain Gage B4	0	14	26	38	52	64	77	90	102	116	129
Strain Gage B5	0	19	38	60	85	108	134	158	183	205	231
Strain Gage B6	0	10	19	30	45	58	74	90	106	121	136
Strain Gage C1	0	5	9	14	19	24	29	34	40	45	51
Strain Gage C2	0	5	9	14	19	24	29	34	40	45	50
Strain Gage C3	0	6	13	20	29	39	50	58	69	78	90
Strain Gage C4	0	6	13	21	28	37	48	56	66	75	85
Strain Gage C5	0	4	9	16	21	27	34	39	46	52	59
Strain Gage C6	0	5	10	14	20	24	28	33	38	43	48
Slip 1	0	0	0	0	0	0	0.0001	0	0	0	0
Slip 2	0	0	0	0	0.0001	0	0.0001	0	0	0.0001	0
Slip 3	0	-0.0001	0	-0.0001	-0.0001	0	-0.0001	-0.0001	0	-0.0001	-0.0001
Slip 4	0	-0.0001	0	0	-0.0001	0	0	0	-0.0001	0	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-10: Test 10 (continued)

Load	11016	12016	13016	14010	15010
Wire Pot A1	0.0208	0.0214	0.0292	0.0272	0.0285
Wire Pot A2	0.0188	0.0201	0.0279	0.0273	0.0338
Wire Pot A3	0.0281	0.0267	0.0347	0.0347	0.0421
Wire Pot A4	0.0278	0.0301	0.0335	0.0372	0.0412
Wire Pot A5	0.0319	0.0331	0.0368	0.0392	0.0392
Wire Pot A6	0.0137	0.0209	0.0209	0.0254	0.028
Wire Pot B1	0.0245	0.031	0.0304	0.0388	0.0413
Wire Pot B2	0.0348	0.0355	0.0406	0.0471	0.0496
Wire Pot B3	0.0571	0.0558	0.0545	0.0688	0.0675
Wire Pot B4	0.0489	0.0483	0.0541	0.0548	0.0613
Wire Pot B5	0.0538	0.0575	0.0587	0.0648	0.0721
Wire Pot B6	0.048	0.048	0.0553	0.0553	0.0613
Wire Pot C1	0.0207	0.02	0.0272	0.0272	0.0278
Wire Pot C2	0.0232	0.0255	0.0255	0.0371	0.0325
Wire Pot C3	0.0367	0.039	0.0401	0.0447	0.0481
Wire Pot C4	0.0364	0.0389	0.0401	0.0413	0.0474
Wire Pot C5	0.0395	0.0395	0.0465	0.0511	0.0511
Wire Pot C6	0.0382	0.043	0.0454	0.0466	0.0513
Strain Gage A1	55	61	67	72	79
Strain Gage A2	76	82	90	96	103
Strain Gage A3	110	122	131	141	150
Strain Gage A4	120	131	142	152	161
Strain Gage A5	69	76	84	89	95
Strain Gage A6	53	57	62	67	72
Strain Gage B1	88	98	107	118	129
Strain Gage B2	126	143	187	256	303
Strain Gage B3	143	158	173	198	380
Strain Gage B4	140	147	154	171	292
Strain Gage B5	256	284	312	345	387
Strain Gage B6	153	168	185	203	223
Strain Gage C1	56	62	67	73	79
Strain Gage C2	56	61	67	73	77
Strain Gage C3	99	110	120	130	139
Strain Gage C4	95	106	114	124	132
Strain Gage C5	66	72	79	86	92
Strain Gage C6	53	58	62	68	74
Slip 1	0	0	0.0001	0.0001	0
Slip 2	0	0	0	0.0001	0
Slip 3	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 4	0	0	0	0	-0.0001

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Test Designation: STRUX Concentrated Load Test 11 – Recast Slab 2
Concentrated Point Load at Midspan
Cast Date: 6/16/2006
Test Date: 7/20/2006

Materials and Dimensions

Composite Slab:

Width:	9 ft (3 panels)
Span Length:	8 ft
Type of Reinforcement:	STRUX 90/40

Steel Deck:

Deck Type:	2VLI-20
Design Thickness:	0.0358 in
Height:	2 in
Area:	0.519 in^2/ft

Concrete:

Compressive Strength:	4700 psi
Total Depth:	5.5 in

Results

Maximum Applied Load:	20435 lb
Midspan Deflection at Maximum Load:	0.131 in
Quarter A Deflection at Maximum Load:	0.080 in
Quarter B Deflection at Maximum Load:	0.087 in
End Slip at Maximum Load:	0.0000 in

Table E-11: Experimental results of concentrated load Test 11 on recast STRUX-reinforced slab 2

Load	0	508	1026	1524	2005	2518	3016	3503	4000	4503	5000
Wire Pot A1	0	0	-0.0007	0.0006	0.0006	0	0.0006	0	0.0058	0.0078	0.0078
Wire Pot A2	0	-0.0006	0	0.0007	0	0.002	0.0007	0.0007	0.0072	0.0072	0.0078
Wire Pot A3	0	0	0.002	0.0033	0.0033	0.0033	0.0067	0.01	0.0107	0.01	0.01
Wire Pot A4	0	0	0	0.001	0.0027	0.0041	0.0054	0.0071	0.0081	0.0097	0.0104
Wire Pot A5	0	0	-0.0012	0	0.0012	0.0012	0.0024	0.0024	0.0049	0.0086	0.0086
Wire Pot A6	0	-0.0007	0	0	0	0.0006	0	-0.0007	-0.0007	-0.0013	-0.002
Wire Pot B1	0	0.0007	0	0	0.002	0	0.0065	0.0084	0.0065	0.0078	0.0123
Wire Pot B2	0	-0.0006	0	-0.0006	0	0.0058	0.0046	0.0058	0.0065	0.0129	0.0129
Wire Pot B3	0	-0.0013	0.0078	0.0065	0.0091	0.0104	0.0091	0.0104	0.0143	0.0208	0.0208
Wire Pot B4	0	0.0006	0	0.0013	0.0072	0.0072	0.0072	0.015	0.0143	0.013	0.0208
Wire Pot B5	0	-0.0013	0.0012	0.0012	0.0049	0.0085	0.0073	0.011	0.011	0.0146	0.0171
Wire Pot B6	0	0	0	-0.0007	0.0073	0.0073	0.008	0.0107	0.014	0.014	0.014
Wire Pot C1	0	0.0013	0.0019	0.0013	0.0013	0.0007	0.0052	0.0058	0.0078	0.0097	0.0078
Wire Pot C2	0	-0.0023	0.0023	0.0023	0	0.0023	0	0	0.0023	0.0046	0.0046
Wire Pot C3	0	-0.0022	0.0012	0.0035	0.0046	0.0069	0.0092	0.0115	0.0126	0.0126	0.0161
Wire Pot C4	0	0	-0.0012	-0.0012	0	0.0012	0.0049	0.0061	0.0073	0.0097	0.0121
Wire Pot C5	0	0.0023	0.0023	0.0023	0.0047	0.007	0.0093	0.0093	0.0093	0.0186	0.014
Wire Pot C6	0	0	0	-0.0012	0	0.0036	0.0047	0.0131	0.0095	0.0095	0.0107
Strain Gage A1	0	3	5	8	10	12	15	17	20	22	24
Strain Gage A2	0	4	6	10	13	16	21	24	27	31	34
Strain Gage A3	0	4	8	12	16	20	25	28	33	37	43
Strain Gage A4	0	3	6	10	15	19	24	29	34	40	45
Strain Gage A5	0	3	6	10	13	16	19	23	26	30	32
Strain Gage A6	0	2	4	6	9	10	13	16	17	19	21
Strain Gage B1	0	4	8	11	15	19	22	26	31	34	38
Strain Gage B2	0	7	12	18	24	31	39	46	55	63	71
Strain Gage B3	0	9	18	28	37	51	63	75	89	102	116
Strain Gage B4	0	8	15	23	29	39	48	57	67	78	89
Strain Gage B5	0	7	16	24	34	43	54	64	75	88	99
Strain Gage B6	0	5	9	13	18	23	29	36	43	49	57
Strain Gage C1	0	3	5	8	10	12	14	17	19	22	24
Strain Gage C2	0	2	5	7	10	11	15	17	19	21	24
Strain Gage C3	0	3	7	9	13	17	20	24	28	33	38
Strain Gage C4	0	2	5	8	12	15	20	23	27	32	37
Strain Gage C5	0	2	5	8	10	13	15	19	21	25	28
Strain Gage C6	0	1	4	6	8	10	13	15	16	19	21
Slip 1	0	0	0	0	0	0	0	0.0001	0	0	0
Slip 2	0	0	0	0	0	0	0	0	0	0	0
Slip 3	0	0.0001	0	0.0001	0	0.0001	0	0	0.0001	0	0.0001
Slip 4	0	0	0.0001	0.0001	0	0	0	0	0	0.0001	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-11: Test 11 (continued)

Load	5545	6016	6524	7010	7513	8005	8503	8995	9508	10010	10503
Wire Pot A1	0.0071	0.0071	0.0071	0.0129	0.0136	0.0149	0.0136	0.0136	0.0136	0.0155	0.0201
Wire Pot A2	0.0091	0.0085	0.0078	0.0143	0.0136	0.0156	0.0149	0.0149	0.0175	0.0214	0.0208
Wire Pot A3	0.0167	0.016	0.0174	0.0174	0.0234	0.024	0.0234	0.0247	0.0294	0.0314	0.0321
Wire Pot A4	0.0131	0.0151	0.0161	0.0184	0.0204	0.0218	0.0234	0.0244	0.0258	0.0268	0.0285
Wire Pot A5	0.0122	0.0171	0.0147	0.0171	0.0171	0.0208	0.0208	0.0233	0.0245	0.0269	0.0294
Wire Pot A6	0	0.0006	0	0	0.0052	0.0065	0.0071	0.0065	0.0065	0.0071	0.0091
Wire Pot B1	0.0143	0.0143	0.0143	0.0143	0.0207	0.022	0.0239	0.0233	0.0285	0.0298	0.0298
Wire Pot B2	0.0117	0.0136	0.02	0.0194	0.02	0.0213	0.0265	0.0265	0.0265	0.0329	0.0323
Wire Pot B3	0.0221	0.0221	0.0208	0.0312	0.0338	0.0364	0.0351	0.0338	0.0377	0.0467	0.0493
Wire Pot B4	0.0208	0.0287	0.0267	0.028	0.0339	0.0358	0.0345	0.0417	0.0417	0.0417	0.0489
Wire Pot B5	0.0195	0.0208	0.022	0.0232	0.0281	0.0379	0.0379	0.0403	0.0415	0.0415	0.0415
Wire Pot B6	0.0213	0.022	0.022	0.0273	0.028	0.0287	0.036	0.0353	0.036	0.0347	0.042
Wire Pot C1	0.0078	0.0084	0.0078	0.0156	0.0162	0.0149	0.0156	0.0156	0.0143	0.022	0.0227
Wire Pot C2	0.0046	0.0069	0.0162	0.0139	0.0116	0.0139	0.0162	0.0209	0.0185	0.0185	0.0185
Wire Pot C3	0.0195	0.0195	0.0218	0.0241	0.0241	0.0264	0.031	0.0321	0.0344	0.0333	0.0367
Wire Pot C4	0.0134	0.0146	0.0146	0.0182	0.0219	0.0206	0.0243	0.0279	0.0316	0.0328	0.0352
Wire Pot C5	0.0209	0.0186	0.0233	0.0256	0.0256	0.0302	0.0279	0.0279	0.0302	0.0372	0.0372
Wire Pot C6	0.0131	0.0155	0.0167	0.0191	0.0203	0.0239	0.0239	0.0262	0.0274	0.031	0.0334
Strain Gage A1	27	30	32	34	38	41	42	45	48	50	54
Strain Gage A2	38	42	46	49	53	56	61	64	68	71	75
Strain Gage A3	48	52	57	62	67	72	77	82	87	93	96
Strain Gage A4	51	57	62	67	74	79	85	90	97	102	107
Strain Gage A5	36	39	43	47	50	53	57	60	64	67	71
Strain Gage A6	23	26	28	31	33	36	38	40	42	45	47
Strain Gage B1	42	47	51	54	59	64	67	72	76	81	85
Strain Gage B2	81	89	98	106	115	124	133	142	151	160	170
Strain Gage B3	132	145	158	172	187	202	215	230	245	260	276
Strain Gage B4	101	111	121	131	143	155	164	175	187	198	211
Strain Gage B5	113	123	135	148	160	172	184	196	208	221	234
Strain Gage B6	65	71	79	86	94	102	110	118	125	133	141
Strain Gage C1	27	30	33	35	38	41	44	46	50	51	54
Strain Gage C2	27	30	32	35	37	40	43	46	49	53	55
Strain Gage C3	43	47	52	57	62	66	72	77	83	89	94
Strain Gage C4	41	44	50	55	60	65	70	76	82	87	92
Strain Gage C5	31	36	39	42	45	48	53	55	60	63	66
Strain Gage C6	24	26	29	31	33	36	38	41	42	45	48
Slip 1	0	0	0	0	0	0	0	0	-0.0001	0	0
Slip 2	0	-0.0001	-0.0001	0	0	-0.0001	0	0	0	0	0
Slip 3	0.0001	0.0001	0.0001	0	0	0.0001	0	0	0	0	0
Slip 4	0.0001	0	0	0	0.0001	0	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-11: Test 11 (continued)

Load	11000	11503	12000	12503	13000	13497	14005	14497	15010	15508	16005
Wire Pot A1	0.0207	0.022	0.0207	0.0214	0.0207	0.0278	0.0278	0.0285	0.0272	0.0272	0.0311
Wire Pot A2	0.0221	0.0221	0.0221	0.0273	0.0286	0.0292	0.0292	0.0292	0.0351	0.0364	0.0357
Wire Pot A3	0.0314	0.0321	0.0387	0.0381	0.0387	0.0387	0.0461	0.0461	0.0461	0.0468	0.0541
Wire Pot A4	0.0295	0.0311	0.0321	0.0351	0.0371	0.0385	0.0405	0.0422	0.0438	0.0458	0.0475
Wire Pot A5	0.0306	0.0306	0.0318	0.0355	0.0355	0.0367	0.0404	0.038	0.0416	0.0416	0.0416
Wire Pot A6	0.0137	0.0137	0.013	0.0176	0.0195	0.0195	0.0209	0.0195	0.0235	0.0274	0.0267
Wire Pot B1	0.0291	0.033	0.0349	0.0343	0.0336	0.0356	0.0414	0.042	0.0407	0.0414	0.0472
Wire Pot B2	0.0323	0.031	0.04	0.0413	0.0407	0.0407	0.0458	0.0458	0.0465	0.0523	0.0529
Wire Pot B3	0.0493	0.0493	0.0519	0.048	0.0636	0.0623	0.0649	0.0636	0.0636	0.0766	0.0779
Wire Pot B4	0.0482	0.0548	0.0561	0.0548	0.0613	0.0619	0.0639	0.0678	0.0678	0.0756	0.0756
Wire Pot B5	0.0428	0.0452	0.0452	0.0464	0.0476	0.0501	0.0525	0.0562	0.0574	0.0623	0.0635
Wire Pot B6	0.0427	0.0433	0.0487	0.0493	0.0493	0.05	0.0566	0.056	0.0566	0.0626	0.062
Wire Pot C1	0.022	0.0207	0.022	0.0227	0.0292	0.0285	0.0279	0.0292	0.0292	0.0298	0.0363
Wire Pot C2	0.0255	0.0278	0.0278	0.0255	0.0278	0.0348	0.0325	0.0348	0.0325	0.0394	0.0417
Wire Pot C3	0.0378	0.039	0.0413	0.0424	0.0413	0.0459	0.047	0.0527	0.0527	0.0527	0.0562
Wire Pot C4	0.0364	0.0364	0.0376	0.0389	0.0401	0.0425	0.0486	0.0461	0.051	0.0522	0.0522
Wire Pot C5	0.0372	0.0372	0.0418	0.0418	0.0418	0.0465	0.0465	0.0488	0.0511	0.0535	0.0535
Wire Pot C6	0.0322	0.0358	0.0358	0.0394	0.0394	0.0394	0.0418	0.0442	0.0442	0.0466	0.0466
Strain Gage A1	57	59	62	64	67	71	74	78	81	84	88
Strain Gage A2	79	82	86	91	95	98	102	105	108	112	115
Strain Gage A3	102	107	112	116	120	121	124	126	127	129	129
Strain Gage A4	113	118	124	130	134	138	141	145	148	151	153
Strain Gage A5	74	77	80	83	88	91	95	98	101	105	107
Strain Gage A6	50	52	54	58	59	62	65	67	71	74	77
Strain Gage B1	90	94	98	103	109	113	119	124	132	138	145
Strain Gage B2	179	189	199	210	223	241	251	258	277	288	303
Strain Gage B3	293	313	335	362	380	385	388	395	378	382	389
Strain Gage B4	223	238	256	279	329	368	399	425	459	485	503
Strain Gage B5	246	258	270	284	299	316	333	348	369	386	405
Strain Gage B6	149	157	165	173	181	190	198	208	218	228	239
Strain Gage C1	57	60	64	66	69	72	76	78	83	86	90
Strain Gage C2	58	61	65	68	70	73	77	80	82	85	87
Strain Gage C3	99	104	109	115	119	123	128	133	136	140	143
Strain Gage C4	98	102	108	113	117	123	126	132	136	140	144
Strain Gage C5	70	74	78	81	85	88	93	96	100	105	107
Strain Gage C6	50	54	55	58	60	63	66	68	73	74	78
Slip 1	0	0	0	0	0	0	0	0	0	0	0
Slip 2	-0.0001	0	0	0	0	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
Slip 3	0	0	0	0	0	0	0	-0.0001	0	0	0
Slip 4	0	0.0001	0.0001	0	0	0	0	0	0	0	0

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

Table E-11: Test 11 (continued)

Load	16492	17005	17497	17990	18492	18995	19482	19984	20435	13110
Wire Pot A1	0.035	0.035	0.035	0.0356	0.0408	0.0427	0.0414	0.0479	0.0544	0.0751
Wire Pot A2	0.0364	0.0422	0.0422	0.0422	0.0428	0.0487	0.0487	0.0571	0.0623	0.1051
Wire Pot A3	0.0534	0.0534	0.0554	0.0594	0.0608	0.0655	0.0668	0.0748	0.0808	0.1383
Wire Pot A4	0.0499	0.0529	0.0545	0.0582	0.0602	0.0629	0.0659	0.0722	0.0803	0.1465
Wire Pot A5	0.0429	0.0465	0.0514	0.0527	0.0551	0.0563	0.06	0.0649	0.0723	0.1164
Wire Pot A6	0.0274	0.0261	0.0293	0.0339	0.0339	0.0346	0.0404	0.0404	0.0463	0.0731
Wire Pot B1	0.0504	0.0485	0.055	0.0543	0.0543	0.0621	0.064	0.0685	0.0802	0.1629
Wire Pot B2	0.0523	0.0594	0.0607	0.06	0.0665	0.0671	0.0729	0.0807	0.0936	0.2129
Wire Pot B3	0.0779	0.0779	0.0896	0.0896	0.0909	0.1013	0.1039	0.1169	0.1312	0.2676
Wire Pot B4	0.0828	0.0815	0.0887	0.0887	0.0952	0.1004	0.1082	0.116	0.131	0.2765
Wire Pot B5	0.066	0.0672	0.0709	0.077	0.0843	0.0868	0.0904	0.099	0.1137	0.2286
Wire Pot B6	0.0626	0.07	0.07	0.07	0.0766	0.0773	0.084	0.0833	0.0986	0.196
Wire Pot C1	0.0356	0.0363	0.0356	0.0356	0.0428	0.0428	0.0421	0.0493	0.0564	0.1581
Wire Pot C2	0.044	0.0394	0.0464	0.0487	0.0464	0.051	0.051	0.0649	0.0672	0.1484
Wire Pot C3	0.0585	0.0642	0.063	0.0642	0.0699	0.071	0.0779	0.0802	0.0882	0.1524
Wire Pot C4	0.0559	0.0559	0.0595	0.0631	0.0631	0.068	0.0704	0.0765	0.0862	0.1579
Wire Pot C5	0.0558	0.0604	0.0627	0.0604	0.0674	0.0674	0.0697	0.0744	0.0813	0.158
Wire Pot C6	0.0501	0.0489	0.0537	0.0549	0.0573	0.0573	0.0621	0.0657	0.0716	0.1696
Strain Gage A1	93	97	102	106	110	117	125	132	137	124
Strain Gage A2	118	121	124	125	126	124	119	117	114	116
Strain Gage A3	131	132	136	150	173	209	286	310	338	256
Strain Gage A4	155	157	160	161	161	173	225	266	295	236
Strain Gage A5	111	113	117	120	120	123	124	127	127	61
Strain Gage A6	80	85	88	92	96	101	111	120	131	95
Strain Gage B1	153	162	170	172	180	190	230	366	515	468
Strain Gage B2	278	301	325	343	371	388	415	464	518	603
Strain Gage B3	408	456	468	492	502	517	522	506	539	714
Strain Gage B4	503	527	531	523	531	529	547	519	578	746
Strain Gage B5	427	446	467	487	495	525	553	622	638	647
Strain Gage B6	250	265	278	292	310	330	357	388	412	291
Strain Gage C1	93	98	101	105	110	112	117	122	125	317
Strain Gage C2	90	93	96	98	100	102	104	103	97	306
Strain Gage C3	148	151	155	157	160	162	164	197	281	211
Strain Gage C4	148	152	154	158	161	164	167	191	257	171
Strain Gage C5	112	116	120	123	127	130	135	135	134	120
Strain Gage C6	82	86	89	92	97	101	106	111	115	299
Slip 1	0	0	0	0	0	0.0001	0	0	0	0
Slip 2	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001
Slip 3	-0.0001	0	0	0	0	0	0	0	0	0.0361
Slip 4	0	0	-1E-04	0	0	-1E-04	0	0	0	0.0314

Note: Load is in units of lb. Strain gage measurements are in units of microstrain (ue). All displacements are measured in inches. Data represents test results from the re-cast composite slab shown in the test designation.

*****Reached 20435 lb and then failed. After cracking, more load was applied but would not go above 13500 lb.

APPENDIX F
RESULTS OF COUPON TESTING

The following section presents test results for the ASTM E8 Standard Test Method for Tension Testing of Metallic Materials. Four tensile coupons were machined from untested steel deck and tested for the actual yield strength of the steel. The average of the four yield strengths was used for all calculations.

Prior to testing, a 2 in. gage length was marked on all specimens and the necessary dimensions were measured. The coupons were tested in a computer-controlled mechanical testing machine. For each specimen, a summary of test parameters, measured dimensions, and the measured stress and strain at yield and ultimate are given. The values of strain shown are based off the extensometer displacement measured during testing. The actual stress versus strain plot is also shown.

Test Designation: Tensile Coupon 1
Test Date: 5/16/2006

Materials and Dimensions

Steel Source:	2VLI-20 Deck
Design Thickness:	0.0358 in
Measured Thickness:	0.036 in
Measured Width:	0.506 in
Gage Length:	2.00 in
Design Yield Strength:	50 ksi

Testing Results:

Yield Stress:	53.91 ksi
Yield Strain:	0.002416 in/in
Ultimate Stress:	61.65 ksi
Ultimate Strain:	0.1972 in/in
Post-Yield Gage Length:	2.649 in
% Elongation:	32.5 %

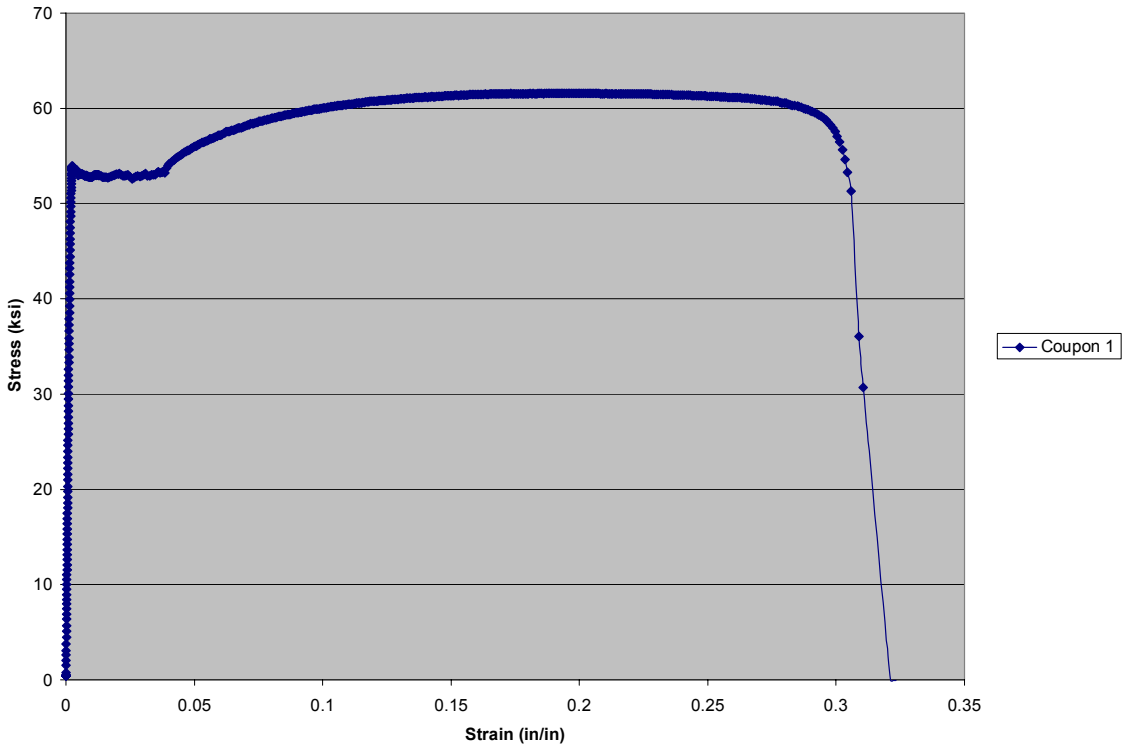

Figure F-1: Stress versus strain diagram for Tensile Coupon 1

Test Designation: Tensile Coupon 2
Test Date: 5/16/2006

Materials and Dimensions

Steel Source:	2VLI-20 Deck
Design Thickness:	0.0358 in
Measured Thickness:	0.0363 in
Measured Width:	0.5085 in
Gage Length:	2.00 in
Design Yield Strength:	50 ksi

Testing Results:

Yield Stress:	54.18 ksi
Yield Strain:	0.002851 in/in
Ultimate Stress:	61.33 ksi
Ultimate Strain:	0.1911 in/in
Post-Yield Gage Length:	2.580 in
% Elongation:	29.0 %

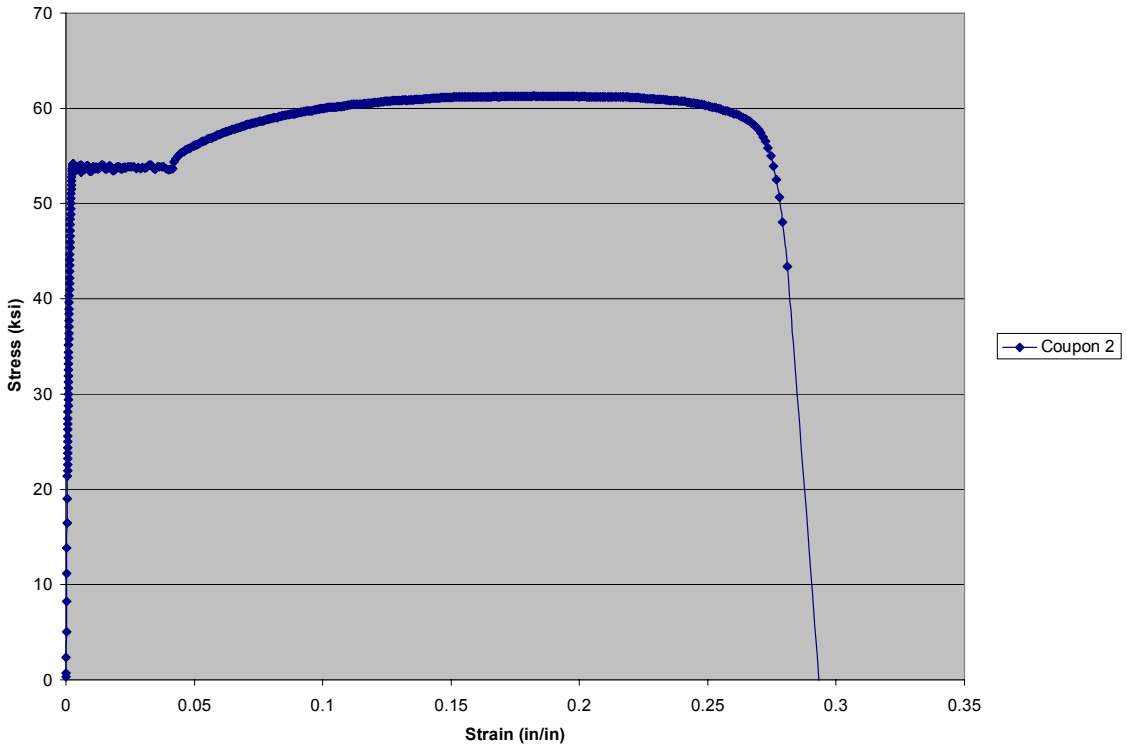

Figure F-2: Stress versus strain diagram for Tensile Coupon 2

Test Designation: Tensile Coupon 3
Test Date: 5/16/2006

Materials and Dimensions

Steel Source:	2VLI-20 Deck
Design Thickness:	0.0358 in
Measured Thickness:	0.036 in
Measured Width:	0.506 in
Gage Length:	2.00 in
Design Yield Strength:	50 ksi

Testing Results:

Yield Stress:	53.76 ksi
Yield Strain:	0.003274 in/in
Ultimate Stress:	61.76 ksi
Ultimate Strain:	0.2007 in/in
Post-Yield Gage Length:	2.626 in
% Elongation:	31.3 %

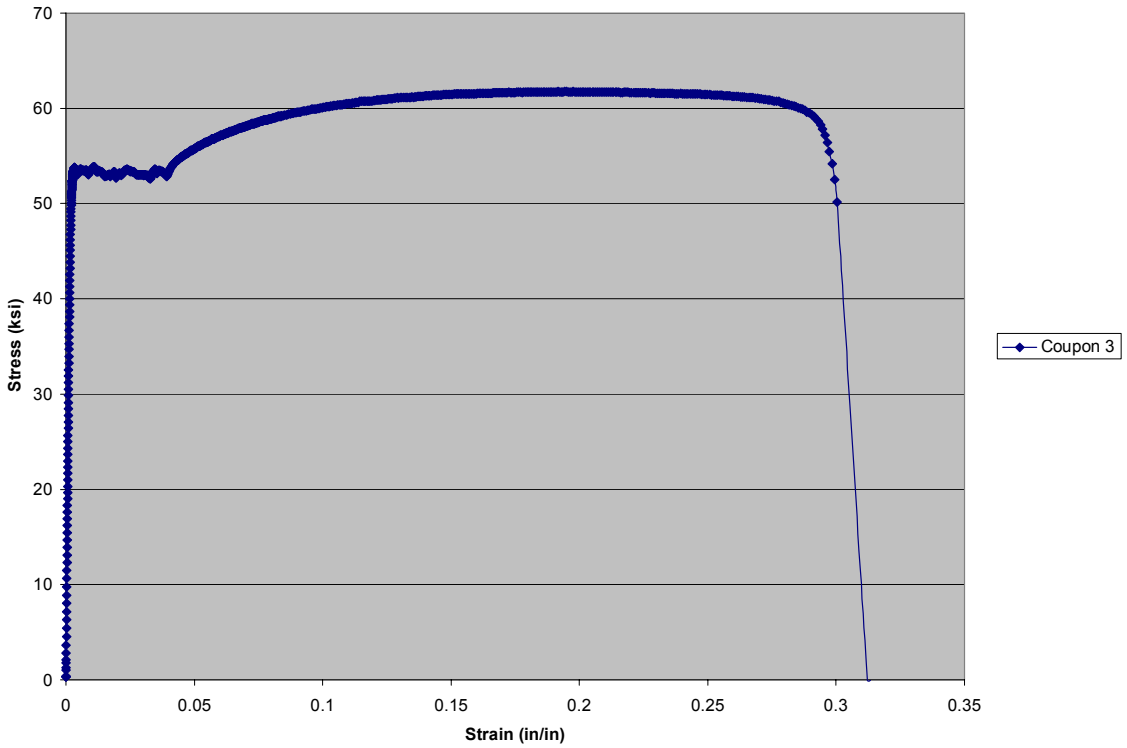

Figure F-3: Stress versus strain diagram for Tensile Coupon 3

Test Designation: Tensile Coupon 4
Test Date: 5/16/2006

Materials and Dimensions

Steel Source:	2VLI-20 Deck
Design Thickness:	0.0358 in
Measured Thickness:	0.0362 in
Measured Width:	0.506 in
Gage Length:	1.971 in
Design Yield Strength:	50 ksi

Testing Results:

Yield Stress:	54.70 ksi
Yield Strain:	0.002911 in/in
Ultimate Stress:	61.31 ksi
Ultimate Strain:	0.1955 in/in
Post-Yield Gage Length:	2.650 in
% Elongation:	34.4 %

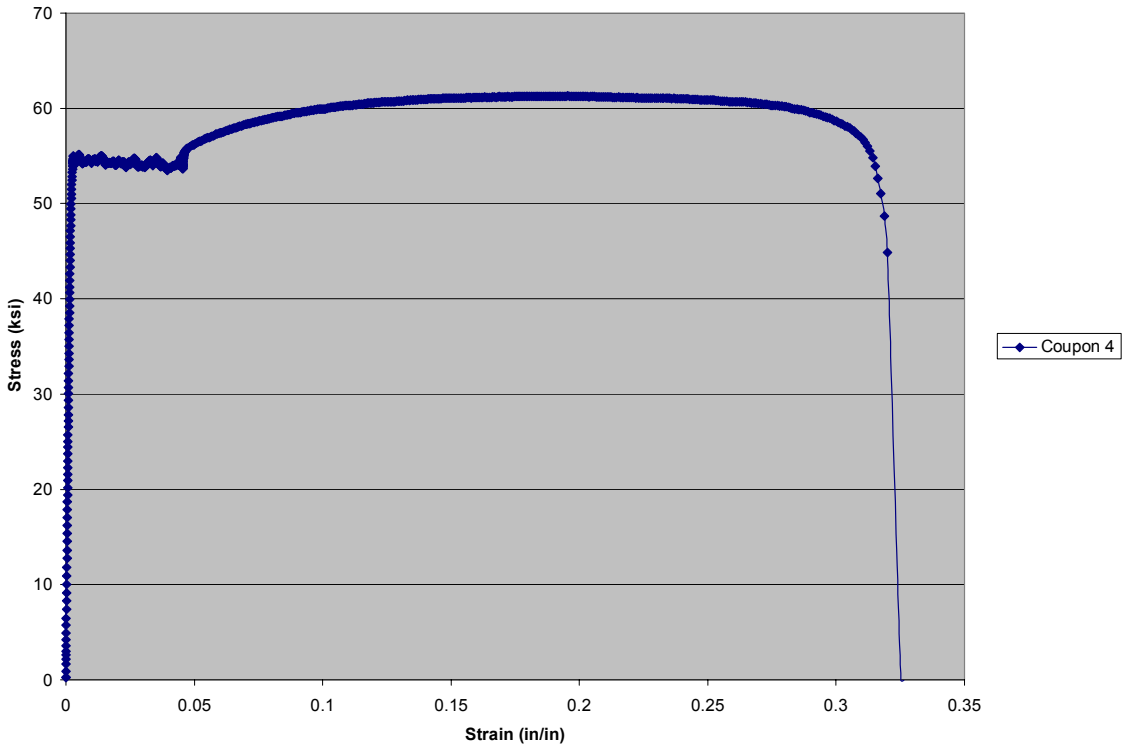

Figure F-4: Stress versus strain diagram for Tensile Coupon 4

APPENDIX G
EXAMPLE CALCULATIONS

Example 1: First Yield Method (Example for WWF Slab 1)

A_s = Cross-sectional area of the steel deck = 0.519 in^2/ft

b = Unit width of slab = 12 in.

b_d = Total width of composite test slab = 6 ft

B_b = Width of the bottom flange of the steel deck = 5 in.

B_t = Width of the top flange of the steel deck = 5 in.

C_s = Cell spacing = 12 in.

d = Distance from the top of the slab to the centroidal axis of the steel deck = 3.5 in.

d_d = Overall depth of the steel deck profile = 2 in.

D_w = Width of the web of the steel deck = 2.24 in.

t = Uncoated thickness of the steel deck = 0.0358 in.

h = Depth of the total composite deck profile = 4.5 in.

h_c = Depth of concrete above top corrugation of steel deck = 2.5 in.

$f`_c$ = Measured compressive strength of concrete = 4300 psi

S_p = Positive deck section modulus = 0.355 in^4/ft

F_y = Measured yield strength of the steel deck = 54.14 ksi

f_c = Casting stress = $M/S_p = w_d L^2/8S_p = (0.045/12)(120^2)/8(0.355)$ = 19.01 ksi

f_{yc} = Corrected yield strength of the steel deck = $F_y - f_c$ = 54.14 – 19.01 = 35.13 ksi

E_c = Concrete modulus of elasticity = $57000\sqrt{f`_c} = 57000\sqrt{4300}$ = 3738 ksi

E_s = Steel modulus of elasticity = 29500 ksi

n = Modular ratio = $E_s/E_c = 29500/3372$ = 7.892

ρ = Ratio of tension reinforcement = $A_s/bd = 0.519/(12)(3.5)$ = 0.01236/ft

$\rho n = (0.01236)(7.892) = 0.098$/ft

$y_{cc} = d\{[2\rho n + (\rho n)^2]^{1/2} - \rho n\}$ = 3.5{[2(0.098) + 0.098^2]$^{1/2}$ – 0.098} = 1.244 in. < h_c = 2.5 in.

$e_3 = h - y_{cc}/3$ = 4.5 – 1.244/3 = 4.085 in.

$e_2 = e_3 - d_d/2$ = 4.085 – 2/2 = 3.085 in.

$e_1 = e_3 - d_d$ = 4.085 – 2 = 2.085 in.

$T_1 = f_{yc}(B_t t)[(h - y_{cc} - d_d)/(h - y_{cc})]$ = 35.13(5)(0.0358)[(4.5 – 1.244 – 2)/(4.5 – 1.244)] = 2.426 kips/ft

$T_2 = f_{yc}(2D_w t)[(h - y_{cc} - d_d/2)/(h - y_{cc})]$ = 35.13(2)(2.24)(0.0358)[(4.5 – 1.244 – 2/2)/(4.5 – 1.244)] = 3.904 kips/ft

$T_3 = f_{yc}(B_b t)$ = 35.13(5)(0.0358) = 6.288 kips/ft

$M_{et} = (T_1 e_1 + T_2 e_2 + T_3 e_3)/12$ = [2.426(2.085) + 3.904(3.085) + 6.288(4.085)]/12 = 3.566 k-ft/ft = 21.394 k-ft (for the entire width)

$w_{et} = 8M_{et}/L^2$ = 8(3566)/(10^2) = 285 psf

Example 2: ASCE Appendix D Alternate Method (Example for WWF Slab 1)

M_{et} = 3566 ft-lbs/ft

$N = 12b_d/C_s$ = 12(6)/12 = 6

$K_3 = 0.87 + 0.0688N - 0.00222N^2$ = 0.87 + 0.0688(6) – 0.00222(6^2) = 1.203 < 1.4

$K_1 = [d_d/7.8]^{0.5}$ = $(2/7.8)^{0.5}$ = 0.506

ℓ_{nf} = Length of clear span = 10 ft

ℓ_e = Length of embossment = 1.225 in.

N_v = Number of vertical elements in embossment pattern lengths = 1

N_h = Number of horizontal elements in embossment pattern lengths = 2

p_h = Height of embossment = 0.105 in.

s = Length of repeating embossment pattern = 3.32 in.

w = Average width of embossment = 0.43 in.

$p_s = 12(N_v \ell_e + N_h w)/s = 12(1(1.225) + 2(0.43))/3.32 = 7.536$

$SS1 = (3\ell_{nf}/70)(\ell_{nf} - 14) + 3.6 = (3(10)/70)(10-14) + 3.6 = 1.886$

$$K_2 = \frac{D_w^{0.8} K_3 / SS1}{1.0 + 60(p_h^2 p_s^{1/3})} = \frac{2.24^{0.8} 1.203/1.886}{1 + 60(0.105^2 7.536^{1/3})} = 0.529$$

$K = K_3/(K_1 + K_2) = 1.203/(0.506 + 0.529) = 1.162$

$M_t = KM_{et}(12/C_s) = 1.162(3566)(12/12) = 4143.69$ ft-lbs/ft

$w_{et} = 8M_{et}/L^2 = 8(4143.69)/(10^2) = 331$ psf

Example 3: ASCE Method for a Concentrated Load (Example for WWF Slab 1)

$f`_c = 5200$ psi

b_2 = width of the load area in the transverse direction = 9 in.

t_c = cover depth of concrete = 3.5 in.

$M_t = 5060.5$ ft-lbs/ft (using the procedure as in Example 2)

$B_e = b_2 + t_c = 9 + 3.5 = 12.5$ in.

$M_{th} = B_e M_t = (12.5/12)5060.5 = 5271$ ft-lbs

Example 4: SDI Handbook Method for a Concentrated Load (Example for WWF Slab 1)

$n = E_s/E_c = (29500/4110) = 7.177$

$$\sum_{N.A.} = \frac{12}{n}\frac{a}{2}a - A_s(h - \frac{d_d}{2} - a) = 0 \text{ (solve for } a)$$

$a = 1.39$ in.

$Z = h - d_d/2 - a = 5.5 - 1 - 1.39 = 3.11$ in.

$I_c = \frac{12}{n}\frac{a^3}{3} + A_s Z^2 + I_{sf} = (12/7.177)(1.39^3/3) + 0.519(3.11^2) + 0.418 = 6.935$ in^4

$S_c = I_c / (h - a)$ = 6.935/(5.5-1.39) = 1.687 in^3

$M_o = f_{yc} S_c$ = 30.055(1.687) = 50.70 in-k

$b_m = b_2 + 2t_c + 2t_t$ = 9 + 2(3.5) + 2(0) = 16 in.

$x = L/2$ = 120/2 = 60 in.

$b_e = b_m + 2(1 - \frac{x}{L})x$ = 16 + 2(1 – 60/120)(60) = 76 in.

$b_e > 8.9(t_c / h)$ = 8.9(3.5/5.5)(12) = 68 in. therefore b_e = 68 in.

$M_n = M_o b_e$ = 50.70(1000/12)(68/12) = 23932 ft-lbs

Vita

James Louis Ordija was born in Carbondale, Illinois on February 4, 1982 to Victor and Roberta Ordija. He then lived in St. Louis, Missouri until the age of seven, and moved to Shelton, Connecticut where he grew up. Following his high school graduation from Shelton High School in 2000, James attended Rutgers, the State University of New Jersey. He graduated summa cum laude from Rutgers in 2004 with a Bachelors of Science degree in Civil Engineering. James then pursued a Masters of Science degree in Structural Engineering at Virginia Tech. Upon completion of his graduate degree, James will begin a career in structural design.