

TECHNICAL MEMORANDUM



Village of Orland Park Evaluation of 3m Diving Platform at Centennial Park

April 29, 2016

Village of Orland Park
14700 Ravinia Avenue
Orland Park, IL 60462

Attention: Mr. Gary W. Couch Jr., CPRP
Parks Operations Manager
Village of Orland Park

Subject: Technical Memorandum
Evaluation of 3m Diving Platform at Centennial Park

Dear Mr. Couch:

The Village of Orland Park requested that Christopher B. Burke Engineering, Ltd. (CBBEL) perform an engineering assessment of the 3m diving platform at Centennial Park. CBBEL performed a visual inspection of the platform on April 14, 2016. CBBEL reviewed drawing number 5.21, prepared by WhiteWater West Industries Ltd. (dated 04/04/99) of the reinforcement layout in the platform. This memo summarizes the findings of our inspection and our recommendations.

Existing Structure:

The existing 3m diving platform is a reinforced concrete structure supported on 4 reinforced concrete columns. Reinforced concrete stairs lead up to the 10'-0" x 22'-10" main platform area. A 9'-0" x 5'-0" diving platform is cantilevered off of the main platform. A water slide is also attached to the main platform and reinforced concrete column. The design drawings are dated April 1999, which is when CBBEL assumes the platform was constructed. CBBEL was only provided drawing 5.21 of the design plans, and therefore had to make assumptions regarding the strength of the concrete used during construction and the design loading when analyzing this structure.

Field Observations:

There are several cracks that have developed on the top and bottom of the structure. See Appendix A for a location diagram of the cracking and crack width measurements (note that crack widths were only measured on the top of the structure). See Appendix B for photos from the inspection. It is CBBEL's understanding that some of these cracks developed a few years ago; however, more recently their condition has worsened, and additional cracks have developed.



CHRISTOPHER B. BURKE ENGINEERING, LTD.

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On the top side of the structure, several structural cracks (flexural) were observed. Four structural cracks were observed at the interface between the main platform and the diving platform. These cracks were between 2'-6" long and 3'-6" long and measured between 0.01" wide to 0.03" wide. Cracks were also observed over 3 of the columns (note that the slide covers the concrete over the northwest column. These are also likely flexural cracks. These cracks were between 2'-6" long to 4'-0" long and measured between 0.005" wide to 0.035" wide.

On the bottom of the structure, three transverse hairline cracks were observed in the main adjacent to the diving platform. One of the cracks was the full width of the main platform (approximately 10'-0"), and the other cracks were 3'-0" long and 3'-6" long. Five cracks were observed along the perimeter of the structure and had lengths between 1'-6" and 4'-0". Minor rust and efflorescence is present at one of these cracks. A full width transverse crack was also observed on the bottom of the stairs. This crack is likely a structural crack; however, it was too narrow to be measured (less than 0.005" wide).

Analysis of Existing Structure:

CBBEL reviewed the existing design drawing prepared by WhiteWater West Industries of the reinforcement layout of the platform. CBBEL performed an approximate analysis of the structure to evaluate the reinforcement layout shown in drawing 5.21. For this analysis, CBBEL assumed a concrete strength of 3,500 psi and a rebar strength of 60,000 psi. The design loading was not provided on this drawing. Based on our analysis of the structure, CBBEL believes that the structure was designed for a minimum of 50 psf live load.

Recommendations:

It appears that this structure has performed well over the course of its life, and CBBEL believes that repairing the structure is an appropriate course of action at this time. CBBEL recommends epoxy injecting the cracks before allowing use of the platform. CBBEL measured a total crack length of 59 ft. At a minimum, CBBEL would recommend sealing all of the cracks on the top of the platform, and also the cracks on the bottom of the platform that measure 0.007" or wider. Section 590 of IDOT Standard Specifications for Road and Bridge Construction only recommends injecting cracks that are 0.007" or wider; however, there are products that are available that can seal narrower cracks if the Village wants to seal all cracks. Sikadur 35 Hi-Mod LV (high-modulus, low-viscosity, high strength epoxy grouting/sealing/binder adhesive), Sikadur 52 (advanced, very-low viscosity, moisture-tolerant epoxy injection adhesive) and Sikadur 55 SLV (super low-viscosity, moisture-tolerant epoxy resin, crack healer/penetrating sealer) are some potential products for these repairs. Product data for these materials are attached in Appendix C.

There are several local restoration contractors that are capable and familiar with crack injection products and installation. Below is a short list of contractors that are capable of performing this work:

- National Restoration Systems
1500 Hicks Road, Suite 200
Rolling Meadows, IL 6008
Ralph Brown
(847) 483-7700



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- J Gill and Company
236 E. 161st Place (Suite A)
South Holland, IL 60473
Jim Bax
(708) 596-4455
- Sitar Construction
199 Poplar Place, Suite 1
North Aurora, IL 60542
Mark Sitar
(630) 649-0264

If requested by the Village, CBBEL could set up an on-site meeting with these contractors to discuss the work and request a proposal. CBBEL could also review any product data submittals submitted by the contractor.

CBBEL estimates that the crack injection work could cost approximately \$6,000.

After the cracks have been repairs, CBBEL recommend that an annual inspection of the structure be performed to monitor the condition of the structure.

Summary:

As requested, CBBEL performed an engineering assessment of the 3m diving in Centennial Park. CBBEL noted several structural cracks in the platform, and recommends that the cracks be repaired at this time. CBBEL also recommends annual inspections of the structure in the future. Qualified contractors and sample product data have been included in this memo. As mentioned, CBBEL would be pleased to assist the Village further with this matter.

Please contact us if you have any questions/comments regarding this memo.

Attachments:

- Appendix A – Crack Location Exhibits
- Appendix B – Photos
- Appendix C – Sample Product Data

Sincerely,



Majid Mobasserri, SE, PE
Head, Structural Engineering Department



Jeff Barnett, PE
Project Engineer



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APPENDIX A
CRACK LOCATION EXHIBITS



CHRISTOPHER B. BURKE
ENGINEERING, LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500 Fax (847) 823-0520

JOB OP - 3m Diving Platform

SHEET NO. _____

OF _____

CALCULATED BY JMB

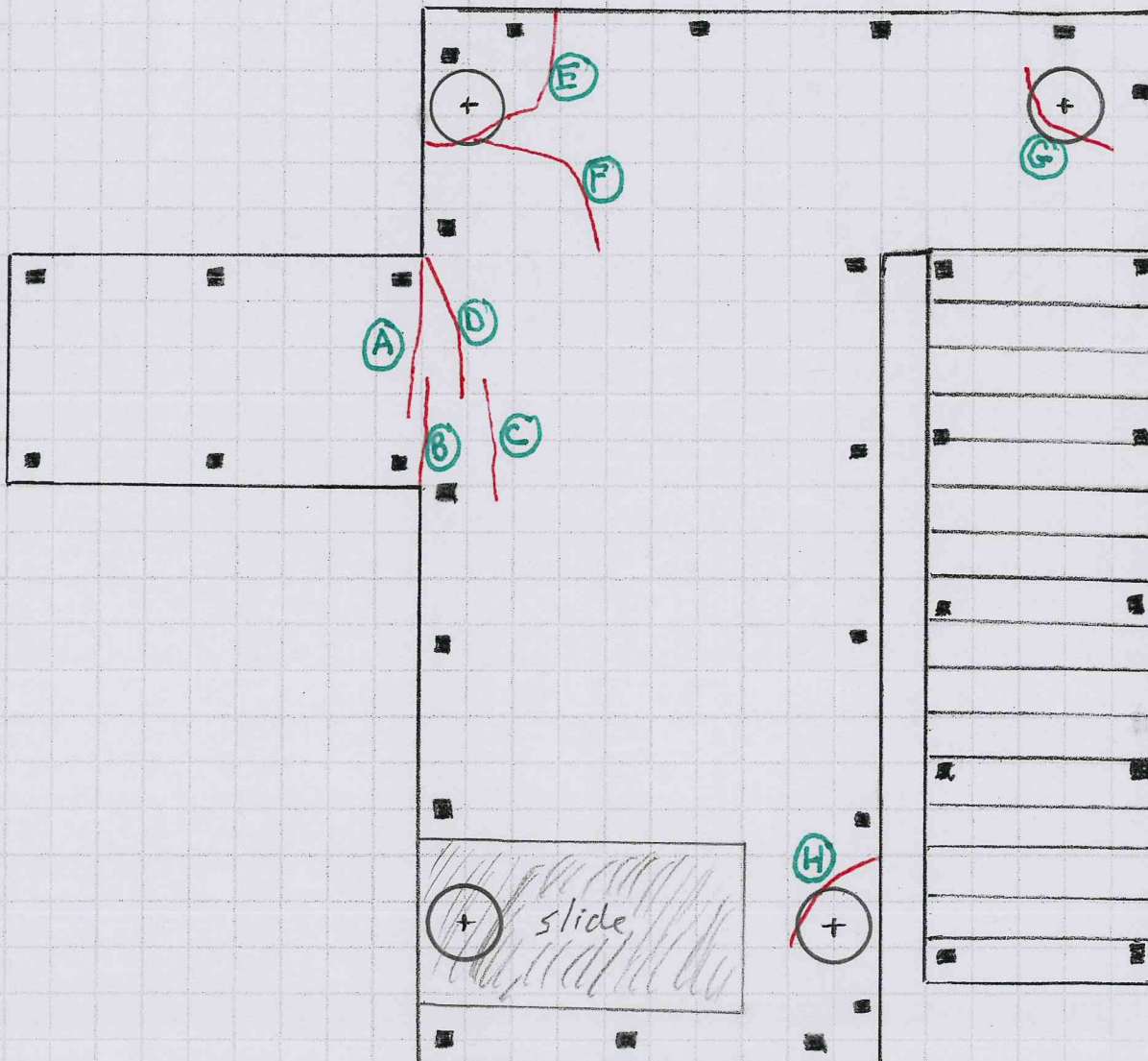
DATE 4/14/16

CHECKED BY _____

DATE _____

SCALE 1" = 1'

Top of Platform



- A** 3'-6" long, 0.015" to 0.025" thick
- B** 2'-6" long, 0.015" typ, 0.03" at end
- C** 2'-6" long, 0.01" to 0.015" thick
- D** 2'-6" long, 0.01" max.
- E** 4'-0" long, 0.015" typ, 0.035" max

- F** 3'-6" long, 0.01" to 0.015" thick
- G** 2'-6" long, 0.005" to 0.01" thick
- H** 2'-6" long, 0.005" to 0.01" thick



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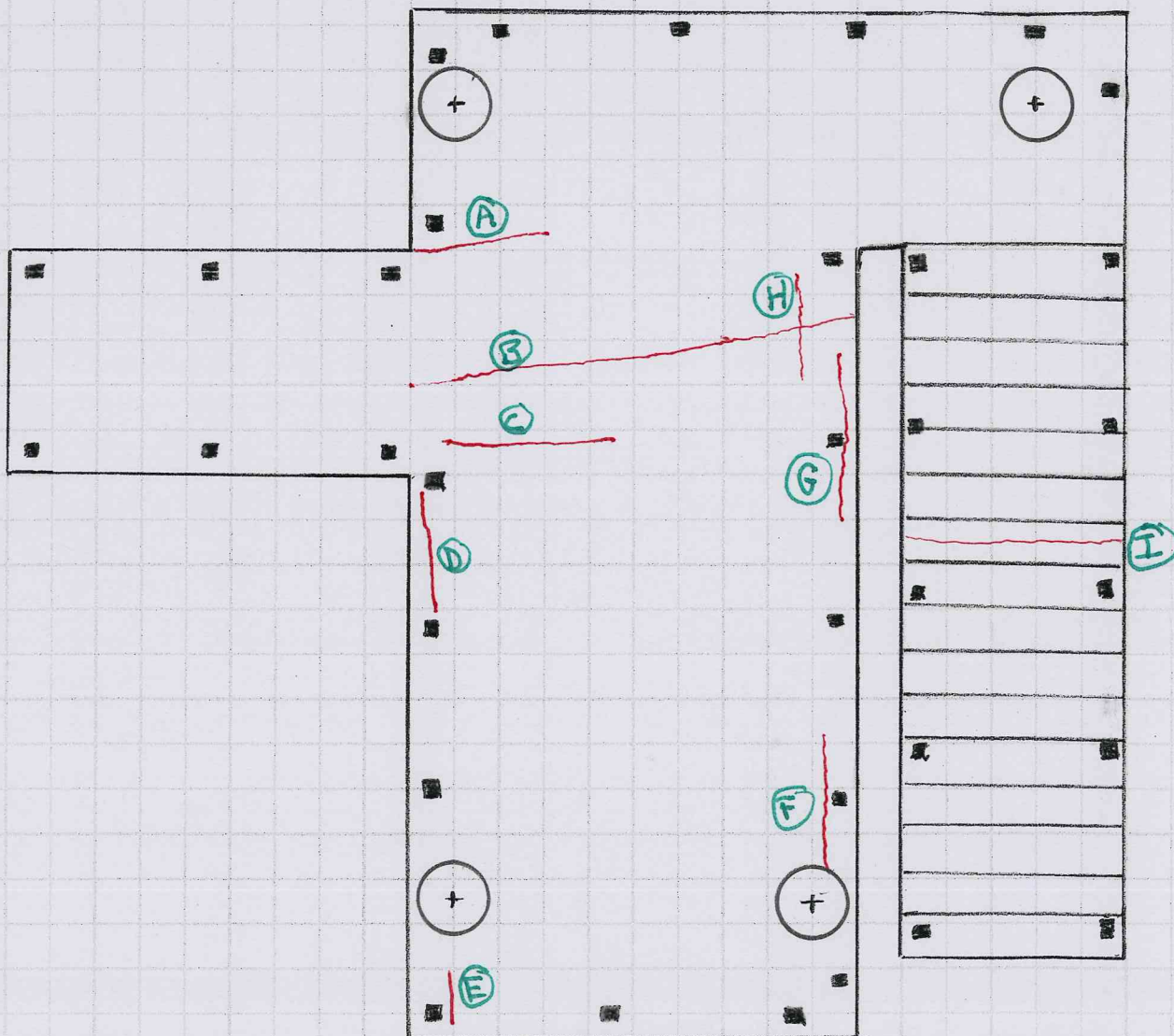
DATE

SCALE

1" = 1'

Bottom of Platform

(crack widths not measured on underside of platform)



A $\approx 3'-0"$ long, hair line crack

B $\approx 10'-0"$ long, hair line crack

C $\approx 3'-6"$ long, hair line crack

D $\approx 3'-0"$ long

E $\approx 1'-6"$ long

F $\approx 3'-0"$ long

G $\approx 4'-0"$ long, rust + minor efflorescence

H $\approx 2'-6"$ long, hair line crack

I $5'-0"$ long, hair line crack - hard to see.

APPENDIX B

PHOTOS



East Elevation of 3m Diving Platform



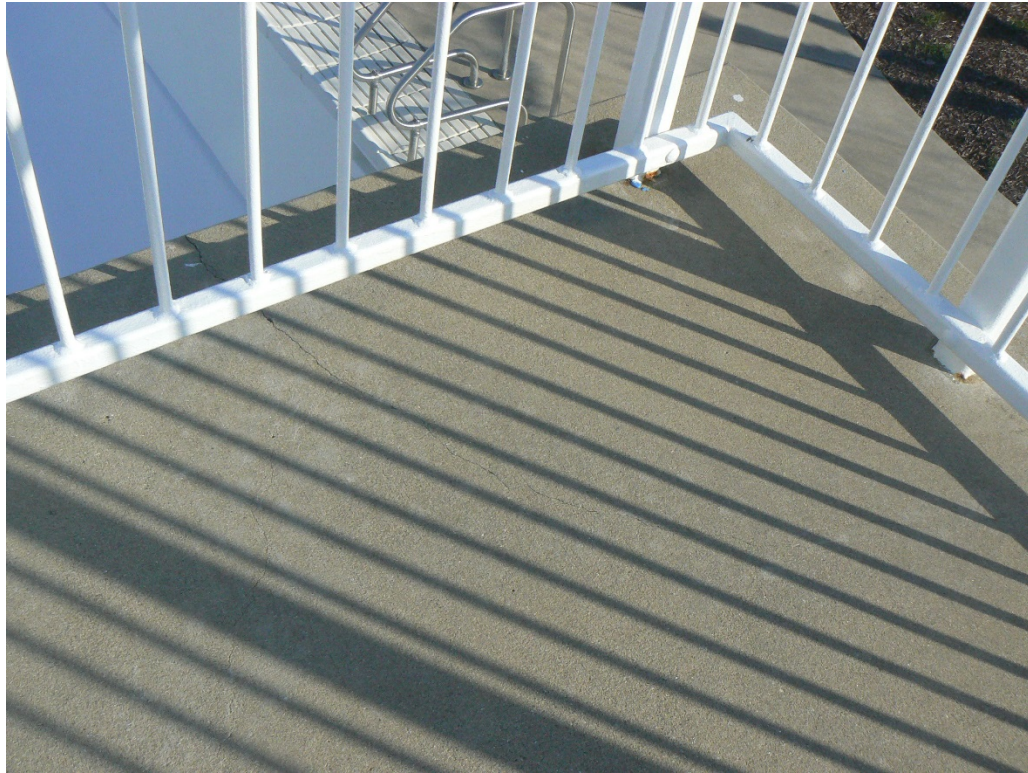
North Elevation of 3m Diving Platform



Cracks A-D on top slab – located at edge of diving platform



Close-up of crack A on top slab – measured 0.020"



Crack E over top of northeast column



Close-up of crack E on top slab – measured 0.035"



Crack G on top slab over southeast corner



Underside of main platform



Underside of diving platform



Slide attachment to northwest column



Underside of stairs



Crack I - underside of stairs – hairline crack, probably too small to inject at this time



Crack F – Underside of main platform



Crack D – Underside of main platform



Crack B - Underside of main platform



Crack G – Underside of main platform – with minor rust and efflorescence



Crack E - Underside of main platform – northwest corner



Crack B/H – Underside of main platform



Side of main platform near southwest column

APPENDIX C

SAMPLE PRODUCT DATA

Sikadur® 35, Hi-Mod LV

High-modulus, low-viscosity, high-strength epoxy grouting/sealing/binder adhesive

Description	Sikadur® 35, Hi-Mod LV is a 2-component, 100% solids, moisture-tolerant, low-viscosity, high-strength, multi-purpose, epoxy resin adhesive. It conforms to the current ASTM C-881, Types I, II, and IV, Grade-1, Class C* and AASHTO M-235 specifications. * Except for gel time
Where to Use	■ Pressure-injection of cracks in structural concrete, masonry, wood, etc. ■ Gravity-feed of cracks in horizontal concrete and masonry. ■ Epoxy resin binder for epoxy mortar patching and overlay of interior, horizontal surfaces. ■ Seal interior slabs and exterior above-grade slabs from water, chlorides, and mild chemical attack; also improves wearability.
Advantages	■ Super low viscosity. ■ Convenient easy mix ratio A:B = 2:1 by volume. ■ Unique, high-strength, structural adhesive for "can't dry" surfaces. ■ Deep penetrating and tenacious bonding of cracks in structural concrete. ■ High-early-strength developing adhesive. ■ Excellent chemical resistance for flooring systems.
Coverage	1 gal. yields 231 cu. in. of adhesive and grout. 1 gal. of adhesive, when mixed with 5 gal. by loose volume of oven-dried aggregate, yields approximately 808.5 cu. in. of epoxy mortar.
Packaging	3 gal. units; 1 gal. units; 12 fl.-oz. units, 12/case.

Typical Data (Material and curing conditions @ 73°F (23°C) and 50% R.H.)

RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIX DESIGNS, MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATIONS METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS

Shelf Life	2 years in original, unopened containers.					
Product Storage	Store dry at 40°-95°F (4°-35°C).					
Product Conditioning	Condition material to 65°-75°F (18°-24°C) before using.					
Color	Clear, amber.					
Mixing Ratio	Component A : Component B=2:1 by volume.					
Viscosity (Mixed)	Approximately 375 cps.					
Pot Life	Approximately 25 minutes. (60 gram mass)					
Tack Free Time	40°F (4°C)	73°F (23°C)			90°F (32°C)	
(3-5 mils) Neat	14-16 hrs.	3-3.5 hrs.			1.5-2 hrs.	
Tensile Properties (ASTM D-638)		Neat		Mortar		
7 day	Tensile Strength	8,900 psi (61.4 MPa)		14 day	840 psi (5.8 MPa)	
	Elongation at Break	5.4%			0.3%	
14 day	Modulus of Elasticity	4.1 X 10 ⁵ psi (2,800 MPa)			7.6 X 10 ⁵ psi (5,200 MPa)	
Flexural Properties (ASTM D-790)						
14 day	Flexural Strength (Modulus of Rupture)	14,000 psi (96.6 MPa)			2,200 psi (15.2 MPa)	
	Tangent Modulus of Elasticity in Bending	3.7 x 10 ⁵ psi (2,600 MPa)			9.5 X 10 ⁵ psi (6,500 MPa)	
Shear Strength (ASTM D-732)						
14 day	Shear Strength	5,100 psi (35.2 MPa)			2,300 psi (15.9 MPa)	
Heat Deflection Temperature (ASTM D-648)						
7 day	[fiber stress loading = 264 psi (1.8 MPa)]			124°F (51°C)	129°F (54°C)	
Bond Strength (ASTM C-882): Hardened concrete to hardened concrete						
2 day	(moist cure)	Bond Strength	4,000 psi (27.6 MPa)			
14 day	(moist cure)	Bond Strength	2,900 psi (20.0 MPa)			
2 day	(dry cure)	Bond Strength	2,800 psi (19.3 MPa)			
Water Absorption (ASTM D-570)		7 day	(24 hour immersion)0.27 %			
Compressive Properties (ASTM D-695)						
Compressive Strength, psi (MPa)		Neat		Mortar (1:5)		
	40°F (4°C)	73°F (23°C)	90°F (32°C)	40°F(4°C)	73°F (23°C)	90°F (32°C)
4 hour	-	-	-	-	-	800 (5.5)
8 hour	-	180 (1.2)	3,200 (22.1)	-	-	4,100 (28.3)



PRIOR TO EACH USE OF ANY SIKA PRODUCT, THE USER MUST ALWAYS READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS ON THE PRODUCT'S MOST CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET WHICH ARE AVAILABLE ONLINE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING SIKA'S TECHNICAL SERVICE DEPARTMENT AT 800.933.7452 NOTHING CONTAINED IN ANY SIKA MATERIALS RELIEVES THE USER OF THE OBLIGATION TO READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS FOR EACH SIKA PRODUCT AS SET FORTH IN THE CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET PRIOR TO PRODUCT USE.

16 hour	-	4,500 (31.1)	6,300 (43.5)	-	400 (2.8)	5,700 (39.3)
1 day	-	6,000 (41.4)	9,100 (62.8)	120 (0.8)	5,000 (34.5)	6,900 (47.6)
3 day	4,000 (27.6)	10,700 (73.8)	10,500 (72.5)	6,200 (42.8)	6,800 (46.9)	7,000 (48.3)
7 day	6,800 (46.9)	11,000 (75.9)	10,500 (72.5)	6,300 (43.5)	7,900 (54.5)	8,800 (60.7)
14 day	10,300 (71.1)	12,000 (82.8)	10,500 (72.5)	6,800 (46.9)	8,500 (58.7)	8,800 (60.7)
28 day	12,400 (85.6)	13,000 (89.7)	10,500 (72.5)	7,000 (48.3)	8,600 (59.3)	8,800 (60.7)
Compressive Modulus		Neat		Mortar		
7 day		3.2 X 10⁵ psi (2,200 MPa)		28 day		
				8.1 X 10⁵ psi (5,600 MPa)		

How to Use

Surface Preparation

Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles and disintegrated materials.

Concrete - Blast clean, shot blast or use other approved mechanical means to provide an open roughened texture.

Steel - Should be cleaned and prepared thoroughly by blast cleaning.

Mixing

Proportion 1 part Component 'B' to 2 parts Component 'A' by volume into a clean pail. Mix thoroughly for 3 minutes with Sika Paddle on low-speed (400- 600 rpm) drill until uniformly blended. Mix only that quantity that can be used within its pot life.

To prepare an epoxy mortar, slowly add 4-5 parts by loose volume of an oven-dried aggregate to 1 part of the mixed Sikadur® 35, Hi-Mod LV and mix until uniform in consistency.

Application

To gravity feed cracks - Blow vee-notched crack clean with oil-free compressed air. Pour neat Sikadur® 35, Hi-Mod LV into vee-notched crack. Continue placement until completely filled. Seal underside of slab prior to filling if cracks reflect through.

To pressure-inject cracks - Use automated injection equipment or manual method. Set appropriate injection ports based on system used. Seal ports and crack with Sikadur® 31, Hi-Mod Gel or Sikadur® 33. When the epoxy adhesive seal has cured, inject Sikadur® 35, Hi-Mod LV with steady pressure. Consult Technical Service for additional information.

To seal slabs - Spread neat Sikadur® 35, Hi-Mod LV over slab. Allow penetration. Remove excess to prevent surface film. Seal interior slabs and above-grade exterior slabs only.

For an epoxy mortar - Prime prepared surface with neat Sikadur® 35, Hi-Mod LV. Place prepared epoxy mortar before primer becomes tack-free. Place the epoxy mortar using trowels. Compact and level with vibrating screed or trowels. Finish with finishing trowel. Sikadur® 35, Hi-Mod LV mortar is for interior use only.

Limitations

- Minimum substrate and ambient temperature 40°F (4°C).
- Do not thin with solvents. Consult Technical Service at 800-933-7452.
- Use oven-dried aggregate only.
- Maximum epoxy mortar thickness is 1.5 in. (38 mm) per lift.
- Epoxy mortar is for interior use only.
- Do not seal exterior slabs on grade.
- Minimum age of concrete must be 21-28 days, depending on curing and drying conditions, for mortar and to seal slabs.
- Porous substrates must be tested for moisture-vapor transmission prior to application.
- Not for injection of cracks under hydrostatic pressure at the time of application.
- Do not inject cracks greater than 1/4 in. (6 mm) Consult Technical Service.
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.

PRIOR TO EACH USE OF ANY SIKA PRODUCT, THE USER MUST ALWAYS READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS ON THE PRODUCT'S MOST CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET WHICH ARE AVAILABLE ONLINE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING SIKA'S TECHNICAL SERVICE DEPARTMENT AT 800.933.7452 NOTHING CONTAINED IN ANY SIKA MATERIALS RELIEVES THE USER OF THE OBLIGATION TO READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS FOR EACH SIKA PRODUCT AS SET FORTH IN THE CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET PRIOR TO PRODUCT USE.

KEEP CONTAINER TIGHTLY CLOSED. KEEP OUT OF REACH OF CHILDREN. NOT FOR INTERNAL CONSUMPTION. FOR INDUSTRIAL USE ONLY. FOR PROFESSIONAL USE ONLY.

For further information and advice regarding transportation, handling, storage and disposal of chemical products, users should refer to the actual Safety Data Sheets containing physical, ecological, toxicological and other safety related data. Read the current actual Safety Data Sheet before using the product. In case of emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Product Data Sheet, product label and Safety Data Sheet which are available online at <http://usa.sika.com/> or by calling Sika's Technical Service Department at 800-933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instruction for each Sika product as set forth in the current Product Data Sheet, product label and Safety Data Sheet prior to product use.

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor. NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS. SALE OF SIKA PRODUCTS ARE SUBJECT SIKA'S TERMS AND CONDITIONS OF SALE AVAILABLE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING 201-933-8800.

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Fax: 514-694-2792

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Fracc. Industrial Balvanera
Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2250537



Sika®

Sikadur® 52

Advanced, very-low-viscosity,
moisture-tolerant epoxy injection adhesive

Description	Sikadur® 52 is a 2-component, 100% solids, moisture-tolerant, epoxy adhesive. It is a low-viscosity, high-strength adhesive formulated specifically for grouting both dry and damp cracks. It conforms to the current ASTM C-881, Types I and II, Grade-1, Class C and AASHTO M-235 specifications.
Where To Use	■ Use neat for gravity feed or pressure injection of cracks in structural concrete, masonry, wood, etc. ■ Seal interior slabs and exterior above grade slabs from water, chlorides and mild chemical attack and to improve wearability.
Advantages	■ Tenacious crack-sealing grout. ■ Convenient easy mix ratio A:B = 2:1 by volume. ■ Advanced low-viscosity structural resin. ■ Unique, high-strength adhesive for 'can't dry' cracks.
Coverage	1 gal. yields 231 cu. in.
Packaging	3 gallons units.

Typical Data (Material and curing conditions @ 73°F (23°C) and 50% R.H.)

RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS.

Shelf Life	2 years in original, unopened containers		
Storage Conditions	Store dry at 40°-95°F (4°-35°C). Condition to 65°-75°F (18°-24°C) before using.		
Color	Clear, pale yellow.		
Mixing Ratio	Component 'A': Component 'B' = 2:1 by volume.		
Viscosity (Mixed)	Approximately 200 cps.		
Pot Life	Approximately 30 minutes. (60 gram mass)		
Tensile Properties (ASTM D-638)			
14 day	Tensile Strength	7,900 psi (54 MPa)	
	Elongation at Break	3.1%	
	Modulus of Elasticity	2.0 X 10 ⁵ psi (1,400 MPa)	
Flexural Properties (ASTM D-790)			
14 day	Flexural Strength (Modulus of Rupture)	5,400 psi (37.2 MPa)	
	Tangent Modulus of Elasticity in Bending	3.8 X 10 ⁵ psi (2,620 MPa)	
Shear Strength (ASTM D-732)	14 day	Shear Strength	4,300 psi (29.6 MPa)
Bond Strength (ASTM C-882): Hardened Concrete to Hardened Concrete			
2 day (dry cure)	Bond Strength	3,000 psi (20.6 MPa)	
14 day (moist cure)	Bond Strength	2,200 psi (15.1 MPa)	
Heat Deflection Temperature (ASTM D-648)			
14 day	122°F (50°C)		
	[fiber stress loading = 264 psi (1.8 MPa)]		
Water Absorption (ASTM D-570)	7 day	(2 hour boil)	1.5%
Compressive Properties (ASTM D-695)			
Compressive Strength, psi (MPa)			
	40°F* (4°C)*	73°F* (23°C)*	90°F* (32°C)*
8 hour	-	-	90 (0.62)
16 hour	-	3,000 (20.6)	7,300 (50.3)
1 day	-	4,500 (31.0)	8,400 (57.9)
3 day	1,800 (12.4)	10,000 (68.9)	8,700 (60.0)
7 day	6,100 (42.0)	11,300 (77.9)	10,400 (71.7)
14 day	6,800 (46.8)	11,700 (80.6)	10,400 (71.7)
28 day	8,400 (57.9)	12,000 (82.7)	10,400 (71.7)



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Compressive Modulus**28 days**3.5 x 10⁵ psi (2,400 MPa)

* Material cured and tested at the temperatures indicated.

How to Use**Surface Preparation**

Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes and any other contaminants.

Preparation Work: Concrete - Should be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blast cleaning or equivalent mechanical means.

Steel - Should be cleaned and prepared thoroughly by blast cleaning or other equivalent mechanical means.

Mixing

Proportion 1 part Component 'B' to 2 parts Component 'A' by volume into a clean pail. Mix thoroughly for 3 minutes with Sika Paddle on low-speed (400-600 rpm) drill until uniformly blended. Mix only that quantity that can be used within its pot life.

Application

To gravity feed cracks - Blow vee-notched crack clean with oil-free compressed air. Pour neat Sikadur® 52 into vee-notched crack. Continue placement until cracks are completely filled. Prior to filling, seal underside of slab if cracks reflect through.

To pressure inject cracks - Use automated injection equipment or manual method. Set appropriate injection ports based on system used. Seal ports and cracks with Sikadur 31, Hi-Mod Gel, or Sikadur® 33.

When the epoxy adhesive seal has cured, inject Sikadur® 52 with steady pressure. Consult Technical Service for additional information.

To seal slabs - Spread neat mixture of Sikadur® 52 over slab using a roller or squeegee, working material thoroughly into the substrate to ensure penetration. Coverage should be uniform. Coat interior slabs and above-grade exterior slabs only.

Limitations

- Minimum substrate and ambient temperature 40°F (4°C).
- Do not thin. Addition of solvents will prevent proper cure.
- Material is a vapor barrier after cure.
- Not for injection of cracks under hydrostatic pressure at the time of application.
- Do not inject cracks greater than 1/4 in. (6 mm) without consulting Technical Service.
- Do not seal exterior slabs on grade.
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.

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Product Data Sheet

Edition 9.23.2014

Sikadur® 55 SLV

Sikadur® 55 SLV

Super low-viscosity, moisture-tolerant epoxy resin,
crack healer/penetrating sealer

Description	Sikadur® 55 SLV is a 2-component, 100% solids, moisture-tolerant, epoxy crack healer / penetrating sealer, having a fast tack-free time to minimize downtime. It is a super low-viscosity, high-strength adhesive formulated specifically for sealing both dry and damp, existing, non-dynamic cracks. It conforms to the current ASTM C-881, Types I and II, Grade-1, Class-C* and AASHTO M-235 specifications. * except for gel time
Where to Use	■ Sikadur® 55 SLV seals cracked concrete. ■ For interior slabs and exterior above-grade slabs. ■ For elevated horizontal decks, parking garages and other structures exposed to foot and pneumatic tire traffic.
Advantages	■ Super low viscosity/low surface tension for excellent penetration into existing cracks. ■ Seals existing cracks by gravity down to 2 mils (0.002" / 0.05 mm) in width. ■ Prolongs life of cracked concrete. ■ Penetrates and seals surface from water absorption, chloride-ion intrusion, and chemical attack (patent pending technology). ■ Improves concrete surface by reducing water and chloride intrusion. ■ Can be open to traffic in 6 hours at 73°F (23°C). ■ High bond strength, even in damp cracks. ■ U.S. Patent No. (pending) for ultra low viscosity healer/sealer to strengthen cracked concrete.
Coverage	1 gal. (3.8 liters) yields 231 cu. in. (3,785 cm³) Typical coverage is 150-175 ft²/gal. (3.7-4.3 m²/L) for surface sealing. Coverage varies with porosity and surface profile of substrate. Higher porosity concrete will reduce coverage. For crack healing, follow Application instructions and allow to pond over cracks.
Packaging	3 gal. (11.35 l) unit = 'A' = 2 gal. (7.6 l) + 'B' = 1 gal. (3.8 l)

Typical Data [Material and curing conditions @ 73°F (23°C) and 50% R.H.]

RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS.

Shelf Life	2 years in original, unopened containers			
Storage Conditions	Store dry at 40°-95°F (4°-35°C). Condition material to 65°-75°F (18°-24°C) before using.			
Color	Clear, amber			
Mixing Ratio	Component 'A' : Component 'B' = 2:1 by volume			
Viscosity (Mixed)	Approximately 105 cps			
Pot Life	Approximately 20 minutes			
Tack-Free Time	40°F (4°C)* > 11 hrs.	60°F (15°C)* 11 hrs.	73°F (23°C)* 6 hrs.	90°F (32°C)* 2.5 hrs.
Tensile Properties (ASTM D-638)	73°F (23°C)			
7 day	Tensile Strength	7,100 psi (48.9 MPa)		
	Elongation at break	10%		
Bond Strength (ASTM C-882)				
Hardened Concrete to Hardened Concrete	2 day (moist cure)	2,500 psi (17.2 MPa)		
	14 day (moist cure)	2,500 psi (17.2 MPa)		
Hardened Concrete to Steel	2 day (moist cure)	1,500 psi (10.3 MPa)		
	14 day (moist cure)	1,600 psi (11.0 MPa)		
Flexural Properties (ASTM D-790)				
7 day	Flexural Strength	8,500 psi (58.6 MPa)		
	Tangent Modulus of Elasticity	3.2 x 10 ⁵ psi (2,206 MPa)		
Shear Strength (ASTM D-732)	7 day	5,800 psi (40.0 MPa)		
Heat Deflection Temperature (ASTM D-648)	7 day			
[fiber stress loading = 264 psi (1.8 MPa)]		110°F (43°C)		
Water Absorption (ASTM D-570)	7 day	(24 hour immersion)	0.60%	



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Compressive Properties (ASTM D-695)**Compressive Strength, psi (MPa)**

	40°F (4°C)*	60°F (15°C)*	73°F (23°C)*	90°F (32°C)*
1 day	-	320 (2.2)	1,100 (7.6)	4,800 (33.1)
3 day	2,000 (13.8)	6,500 (44.8)	8,300 (57.2)	8,000 (55.2)
7 day	7,800 (53.8)	10,400 (71.7)	10,900 (75.1)	8,300 (57.2)
14 day	9,600 (66.2)	11,000 (75.8)	11,800 (81.4)	10,000 (68.9)
28 day	11,700 (80.7)	12,000 (82.7)	12,000 (82.7)	10,000 (68.9)

Compressive Modulus **7 day** 3.0 x 10⁵ psi (2,068 MPa)

How to Use**Surface Preparation**

Substrate must be clean, sound and free of surface moisture. Remove dust, laitance, grease, oils, curing compounds, waxes, impregnations, foreign particles, coatings and disintegrated materials by mechanical means (i.e. shot blasting, sandblasting, etc.). For best results, substrate should be dry. Surfaces prepared by Low Pressure Water Cleaning or High Pressure Water Jetting methods should be allowed to dry for 24 hrs. minimum [at 73°F (23°C)].

Mixing

Mix 1 part Component 'B' to 2 parts Component 'A' by volume into a clean pail. Mix thoroughly for 3 minutes with Sika paddle or jiffy mixer on a low-speed (400-600 rpm) drill until uniformly blended. Mix only that quantity which can be used within its pot life.

Application

To gravity feed cracks: Sikadur® 55 SLV is applied to horizontal surfaces by flat squeegee or broom. Spread material over area and allow to pond over cracks. Let material penetrate into cracks and substrate. Remove excess epoxy with roller leaving no visible surface film. For cracks greater than 1/8 in. (3 mm) wide, fill crack with oven-dried sand before applying Sikadur® 55 SLV. Seal cracks from underside, when accessible, to prevent leakage.

A second treatment may be required on very porous substrates. Apply second treatment before broadcasting. After treatment, wait a minimum of 20-30 minutes at 73°F (23°C) before broadcasting sand. Cover with broadcast of an oven-dried 20/40 silica sand or similar sand. Distribute evenly over the surface to excess at a rate of 30-40 lbs./100 sq. ft.. Allow to cure 6 hours minimum at 73°F (23°C). Remove any loose sand and open to traffic once epoxy has cured. Consult Sika Technical Service at 1-800-933-SIKA for additional information.

To pressure inject cracks: Use automated injection equipment. Set appropriate injection ports. Seal ports and cracks with Sikadur® 31, Hi-Mod Gel, Sikadur® Injection Gel or Sikadur® AnchorFix 2/Sikadur® AnchorFix 500. When the epoxy adhesive has cured, inject Sikadur® 55 SLV with steady pressure. Consult Technical Service at 1-800-933-SIKA for additional information. Mock ups to ascertain penetration on job site conditions is strongly recommended. Actual penetration should be verified by core testing.

Limitations

- Do not thin. Addition of solvents will prevent proper cure.
- Material is a vapor barrier after cure.
- Do not apply if rain is imminent. Water exposure or humidity will affect surface appearance and may cause surface whitening.
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.
- Sealed concrete surface may appear blotchy due to differential absorption.
- Allow sufficient time for the substrate to dry after rain or other inclement conditions.
- Application temperature of substrate must be minimum 5°F (3°C) above the dew point.
- Minimum ambient and substrate temperature 40°F (4°C). Maximum application temperature 95°F (35°C).
- Do not inject cracks greater than 1/4 in. (6 mm) Consult Technical Service at 1-800-933-SIKA.
- Minimum age of concrete is 21-28 days, depending on curing and drying conditions.
- Not designed to seal or inject cracks under hydrostatic pressure during application.
- Penetration results will vary. Factors that may impede penetration include, but are not limited to, temperature (ambient and material), geometry of crack, concrete porosity, and dirt inside cracks.
- Product is not appropriate for use in dynamic cracks.

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