

J. A. JONES CONSTRUCTION COMPANY

SPECIAL PROCESS PROCEDURE

FOR

REPAIR AND CURING OF CONCRETE
REPAIR FOR PLACEMENT 499S02-10B

WATERFORD SES UNIT NO.3
CONTRACT NO. W3-NY-4

REV.	DATE	ENGINEERING APPROVED BY	DATE	QUALITY ASSURANCE APPROVED BY	DATE	CONSTRUCTION APPROVED BY	DATE
0	5/12/76	al Prince	5/12/76	W.E. II	5/12/76	Les Terry	5/12/76
1	5/31/76	al Prince	6/1/76	W.E. II	6/1/76	Les Terry	6/2/76
2	7/28/76	al Prince	7/28/76	W.E. II	7/28/76	Les Terry	7/28/76
3	8/9/76	al Prince	8/9/76	J.C. Henderson	8/9/76	Les Terry	8/9/76
4	8/16/76	al Prince	8/16/76	J.C. Henderson	8/16/76	Les Terry	8/16/76
5	8/26/76	al Prince	8/26/76	J.C. Henderson	8/26/76	Les Terry	8/26/76

REVIEWED

W/ COMMENTS

W/O COMMENTS

REJECTED

BRASCO QUALITY ASSURANCE

BY:

DATE:

X

8-28-76

FREEDOM OF INFORMATION
ACT REQUEST

84-855

C/617

SPECIAL PROCESS PROCEDURE		PROCEDURE NO. W-SP-7
TITLE: REPAIR AND CURING OF CONCRETE REPAIR FOR PLACEMENT 499S02-10B		REV. NO. 5 & DATE 8/26/76
PROJECT TITLE: WATERFORD SES UNIT NO. 3 CONTRACT NO. W3-NY-4		
<p>1.0 <u>PURPOSE</u></p> <p>To outline methods used by J. A. Jones Construction Company and Subcontractors for repair and curing of concrete repair for Placement 499S02-10B.</p>		
<p>2.0 <u>SCOPE</u></p> <p>This procedure includes the requirements to be used by J. A. Jones Construction Company and their Subcontractors in the concrete repair of Placement 499S02-10B.</p>		
R-2	<p>3.0 <u>REPAIR SEQUENCE</u></p>	
R-4	<p>3.1 The repair work shall be as follows and performed in the sequence as directed by the Engineer.</p>	
R-1	<p>3.1.1 Epoxy Pressure Grouting Cored Holes with Cracks.</p>	
	<p>3.1.2 Filling of holes not in crack area.</p>	
R-1	<p>3.1.3 Pressure grouting voids and horizontal cored hole #25 in West face.</p>	
R-2	<p>3.1.4 Repair of top surface shall be performed during recharging of backfill as directed by the Engineer.</p>	
	<p>Waterstop embedment may be performed at any time.</p>	
R-2	<p>4.0 <u>REFERENCES</u></p>	
	<p>4.1 Ebasco Services, Inc. Specification LOU-1564.472, Section II, latest revision, "Concrete Placement, Curing and Finishing".</p>	
	<p>4.2 ACI-503, Guide for use of epoxy compounds with concrete.</p>	
	<p>4.3 Sika Chemical Company brochure for "Sikadur Epoxy Adhesives". Appropriate sheets attached.</p>	
	<p>4.4 J. A. Jones Construction Company Work Procedure, W-WP-5, "Concrete Placing, Curing, Finishing and Repair."</p>	
	<p>4.5 J. A. Jones Construction Company Work Procedure, W-WP-11, "Waterproofing".</p>	
	<p>5.0 <u>RESPONSIBILITIES</u></p>	
	<p>5.1 Ebasco Services, Inc. is responsible for supplying all materials, receiving inspection, testing and documentation of such tests as required by Reference 4.1 to support J. A. Jones Construction Company and their Subcontractors in performing their work.</p>	

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<p>5.2 J. A. Jones Construction Company and their Subcontractors are responsible for forming, placing aggregate, grouting and curing of cement pressure grouted area, the epoxy pressuring grouting for sealing cracks and the surface preparation and topping and finishing of top surface as required by this procedure.</p>		
<p style="text-align: center;"><u>TOP SURFACE PREPARATION</u></p>		
<p>6.0 <u>PROCEDURE</u></p>		
	6.1 J. A. Jones Construction Company Engineering shall map the surface of the entire pour delineating the areas that can be made to meet the required elevation and finish by grinding and the areas that must be chipped out to sound concrete and topped.	
	6.2 The areas requiring chipping and topping shall be chipped down to a minimum of one and one-half inch ($1\frac{1}{2}$ ") below required elevation.	
-1	6.3 After chipping to sound concrete and prior to any topping or grinding of other area, J. A. Jones Construction Company Engineering shall notify Ebasco Engineering that the area is ready for inspection. Any area containing unsound concrete shall be inspected by the Windsor Probe method. In verifying the concrete soundness, the equivalent average 28 day compressive strength shall not be less than 5000 PSI and none of the equivalent compressive strengths shall be less than 4600 PSI.	
-2	6.4 Areas requiring grinding only to produce an acceptable surface shall be ground with suitable grinding machines until acceptable by the Engineer.	
-1	6.5 The surface of the chipped out area shall be cleaned and free from standing water, then coated with a neat coat of Sika Hi-Mod Epoxy mixed and applied per manufacturer's requirements. J. A. Jones' Quality Verification to verify and document the acceptance of epoxy material as to shelf life, mixing and application.	
3-1	6.6 After neat coat of epoxy, place 4000 PSI Class AA Concrete using pea gravel as coarse aggregate to required elevation and finish as required by approved construction drawings.	
	6.7 After the required finish has been obtained, cure per requirements of Reference 4.1 and 4.4.	

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<p style="text-align: center;"><u>WATERSTOP EMBEDMENT</u></p>		
7.0 <u>PROCEDURE</u>		
7.1 PREPARATION		
7.1.1 Determine area to be repaired. Area shall be determined by estimating workable area that can be worked, based on "pot life" and required cooling time if repair requires more than one inch (1") thickness, Reference 7.3.2.		
7.1.2 Clean area to be worked as follows:		
7.1.2.1 Chip to sound concrete.		
7.1.2.2 Surface must be dry.		
7.1.2.3 Remove all dust, laitance, grease, and other foreign particles.		
7.1.3 Straighten and support waterstop as required.		
7.2 MIXING		
7.2.1 Mix Sikadur-Hi-Mod Gel two (2) parts epoxy per manufacturer's recommendations. Amount to be determined by area to be worked.		
7.2.2 Measure Colma Quartzite Aggregate and mix one (1) part Sika-Hi-Mod Gel epoxy to one (1) part Quartzite Aggregate. Add aggregate slowly to binder while mixing.		
7.2.3 Do not attempt to use after "pot life" has expired. By adding aggregate, it will add approximately five (5) minutes to "pot life".		
7.3 APPLICATION		
7.3.1 Apply prepared epoxy mortar to embed waterstop as required per attached sketch, Appendix A.		
7.3.2 Apply mortar not to exceed one inch (1") thickness. If required mortar thickness exceeds one inch (1"), allow preceding layer to cool before applying second layer. Coolness can be determined when the mortar becomes hard. It should be cool, approximately one (1) hour after mixing.		

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<p>7.3.3 When more than one (1) layer is required, a neat coat of Sikadur-Hi-Mod epoxy to preceeding layer before applying additional layers of mortar is not required.</p> <p>7.4 CURING</p> <p>7.4.1 None required.</p> <p style="text-align: center;"><u>NOTE</u></p> <p style="text-align: center;"><u>DO NOT EXCEED ONE INCH (1") LAYER AS NOTED IN 7.3.2 ABOVE.</u></p> <p style="text-align: center;"><u>REPAIR OF VERTICAL CORED HOLES WITHOUT CRACKS</u></p> <p>8.0 <u>PROCEDURE</u></p> <p>8.1 Thoroughly clean and dewater all holes remaining after epoxy pressure grouting cored holes with cracks has been completed.</p> <p>8.2 Coat inside surface of hole and surface of area chipped out to expose reinforcing steel with Sikadur-Hi-Mod epoxy. The epoxy to be mixed and applied per manufacturer's recommendations. J. A. Jones' Quality Verification personnel is to verify and document epoxy acceptance as pertains to shelf life, mixing and application.</p> <p>8.3 In accordance with Reference 4.1 and 4.4, fill holes with 4000 PSI Class AA concrete in layers and vibrate as required to consolidate and finish to match required surface texture.</p> <p>8.4 Cure as required per Reference 4.1 and 4.4.</p> <p><u>PRESSURE GROUTING VOIDS AND HORIZONTAL CORED HOLES NO. 25 IN WEST FACE</u></p> <p>9.0 <u>PROCEDURE</u></p> <p>9.1 J. A. Jones to inspect and document both North and South large void has been chipped to sound concrete. All surfaces of existing concrete in both North and South large void shall be coated with a neat coat of Sika-Dur Hi Mod epoxy, mixed and applied in accordance with manufacturer's recommendations prior to the placement of fresh concrete.</p>		

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1-5	<p>9.2 Form North large void from the bottom toward the top covering approximately three fourths (3/4) of the large void. Prepare upper one fourth (1/4) of form to be installed after the concrete for the bottom three fourths (3/4) has been placed. The top of the form must have a "birds mouth" of sufficient size and height to assure complete filling of the void with concrete and provide access for vibrators and openings for venting all air. Place the concrete using "birds mouth" and chute or by placing pump hose to the rear of the void. As the concrete is placed and consolidated by vibration, continue toward the front of the void. Place concrete at a low rate of placement to allow sufficient time for consolidation and removal of air. By starting the placing at the rear, the air will be forced out the front. After the large opening of the void has been filled and consolidated, add forms as required until concrete cannot be placed and vibrated into the large opening of the void. Then add required forms and "birds mouth" and place concrete through the top of the void at the surface of the slab. Only place at a rate that can be consolidated. Fill the entire void including the void on the surface and the drilled hole from the surface into the void. Add chamfer strip and finish exposed surface as required by approved drawings and specifications per Reference 4.1.</p>	
1-5	<p>9.3 Form only the large portion South void approximately half way up. Form the top half in a manner that will allow adding forming as the placing continues toward the top of the void. Place concrete using "birds mouth" and chute or pump hose. Start placing and consolidating by vibrating at the rear of the void and continue toward the front. Starting at the rear will force air out the front of the void. Continue placing, adding forms with "birds mouth" until the entire void is full and consolidated. Place concrete at a rate that can be consolidated. Stop this placing operation at the top of the large void. The shallow portion of this void shall be repaired per Paragraph 9.4. Fill the drilled hole from the surface into the void, consolidate and finish surface as required by approved drawing and specifications per Reference 4.1. Place form over the large deep portion of the void only.</p>	
1-5	<p>9.4 All other voids on the West face shall be repaired by coating surface with Sika-Dur Hi-Mod epoxy, mixed and applied per manufacturer's recommendations, then dry packed per Reference 4.1.</p>	
1-5	<p>9.5 Cure by leaving forms in place to keep in moist condition. Areas not formed and the top surface shall be cured with burlap and water per Reference 4.1 and 4.4.</p>	

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3-5	<p>9.6 Pack hole number 25 as located on sketch, Appendix B, with bagged, oven dried pea gravel. Install steel plate plug in front of opening which contains two (2) one forth inch (1/4") NPT pipe nipple, one for fill and one for vent. The fill nipple shall have a one forth inch (1/4") NPT pipe attached long enough to reach the far back of the hole. The plug shall be installed with the vent at the top. Install the plug using Sika Set Plug. Epoxy grout the hole using Sika-Lo Mod LV applied with a pressure gun. Apply epoxy with vent open until all air has been removed. When air is removed, close vent and hold 20PSI pressure until refusal of material or .15 minutes. After epoxy has cured for a minimum of 24 hours, chip out plate plug and repair surface per Paragraph 9.4.</p>	
1-5	<p>9.7 After curing has been completed on West face, remove forms and apply waterproofing over entire West face of placement 10B per J. A. Jones' Work Procedure, W-WP-11, "Waterproofing". An additional twelve inch (12") wide layer shall be installed over the exposed edges of the first layer. All exposed edges shall have a trowelled bead of mastic applied after the membrane installation is complete. Terminate bottom and top of waterproofing in reglets as detailed in attached memo dated July 28, 1976, from E: J. Gallagher to J. O. Booth and sketch.</p>	
<u>EPOXY PRESSURE GROUTING CORED HOLES WITH CRACKS</u>		
-2	<p>10.0 <u>PROCEDURE</u></p> <p>10.1 All equipment required for this procedure shall be collected and checked out. A dry run shall be performed using water for the grout, pumping against a closed valve to assure the equipment is in good working order. Special note shall be made of the pressure gauge and relief valve to assure correct operability. Calibration of pressure gauge is to be verified and documented.</p>	

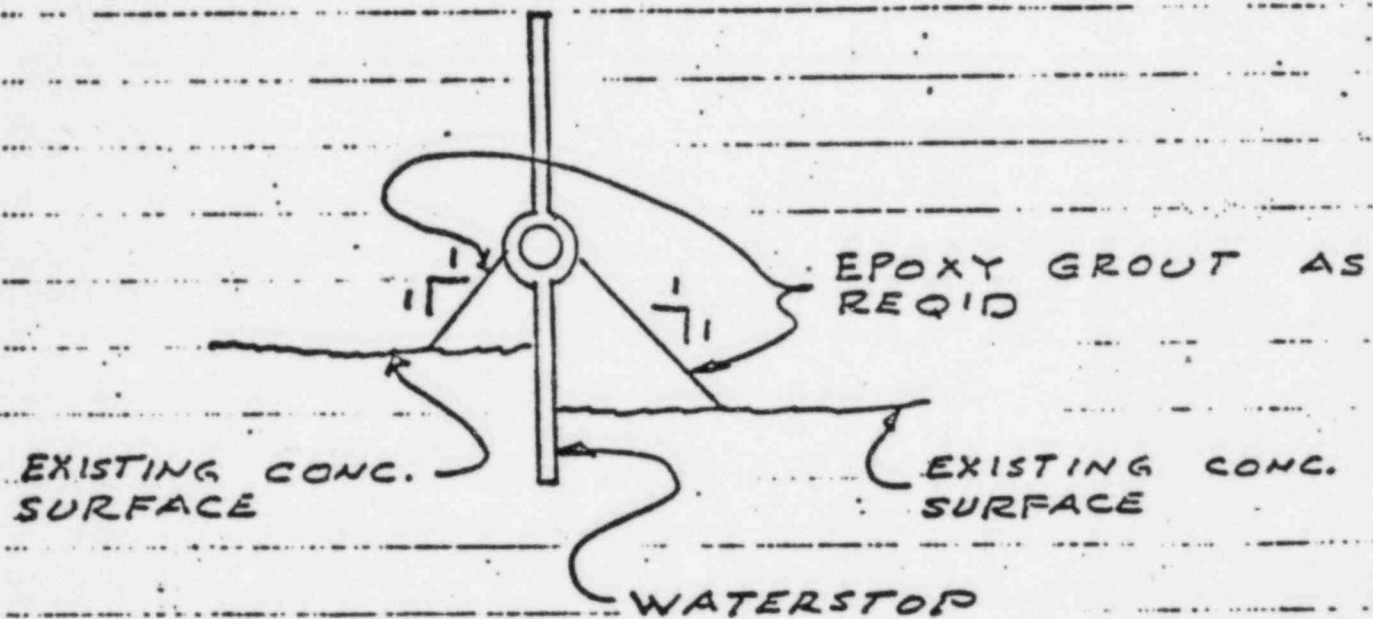
CONSTRUCTION WORK PROCEDURE	PROCEDURE NO. W-SP-7
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4 10.2	The Sikadur-Lo-Mod LV epoxy and bagged pea gravel shall be ordered, received and approved for use.
4 10.3	Cored holes Numbers 7, 9, 14, 15, 18, 19, 21, 22, 23 and 24 which have been determined to contain cracks by visual examination of cores and are located on Appendix "B" shall be cleaned of all foreign material and free of all standing water, before any other grouting operation is started.
10.4	An expanding plug as detailed on attached sketch, Appendix "D", shall be fabricated for each hole to be pressure grouted, and coated with wax to prevent adherence of the epoxy. Each plug shall provide a fill port and a vent. The fill port shall be provided with a quick coupling and the vent with a cap or valve for venting. The supply line between the pressure pot and quick coupling shall be provided with a sight glass for observing flow of epoxy.
10.5	The grouting operation shall begin with hole number 24. Assure that all holes are clean and dry, then pack hole number 24 with pea gravel from one of the sealed bags. When the hole has been packed with the pea gravel, install the plug, as provided in 10.4 above.
4 10.6	Mix the Sikadur-Lo-Mod LV epoxy per manufacturer's recommendations. Mix only the amount that can be used in approximately 15 minutes or as directed by the Sika representative. Place the container of epoxy into one of the paint pressure pots which has been connected to the quick coupling in the plug in hole 24. Apply air pressure as directed by Sika representative (approximately 10 PSI) to pressure pot and observe flow of epoxy in sight glass. When the epoxy runs out, switch grout supply line to other pressure pot and continue grouting operation. Clean first pressure pot grout supply line with Sika Equipment Cleaner 650 while additional epoxy is being mixed. Continue this switching and mixing operation until epoxy is observed passing into one of the adjacent cored holes or ability to move epoxy has ceased. If epoxy cannot be moved by the 10 PSI pressure, increase the pressure by 5 PSI increments until the epoxy begins to move or until 25 PSI has been obtained. If the epoxy cannot be moved at 25 PSI hold this pressure for 15 minutes.
4 10.7	If epoxy is observed passing into one of the adjacent cored holes, continue to hold pressure on the first hole, mix additional epoxy and fill hole which epoxy was observed flowing in to, approximately half full with neat epoxy, pour small amounts of pea gravel into the hole and "rod" into the neat epoxy, continue adding neat epoxy and pea gravel until hole is full. When hole is full, install plug as provided in 10.4. Open vent in plug and continue

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pressurizing first hole until second hole is full and air is vented out vent hole. If connection between the holes is not of sufficient size to pressure the second hole in approximately 15 minutes, after pressure has been increased as outlined above, then apply epoxy to second hole using second pot. If epoxy is observed entering a third hole, fill it with neat epoxy and pea gravel as above. Continue to pressure second hole if pot had to be connected to pressurize it, if not, then connect pot to second hole and apply pressure in 5-PSI increments as outlined above. Disconnect pot from first hole. Continue this filling and pressurizing operation until all connecting holes are grouted and pressure maintained for 15 minutes. Should epoxy be observed reaching any surface outside cored holes, release pressure and seal opening with Sika set plug then resume pressure.

- 4 10.8 Holes without connecting cracks shall be grouted by cleaning and filling with neat epoxy and pea gravel and pressurized as outlined in Paragraph 10.6 above.
- 4 10.9 Remove all plugs and clean plugs and equipment with Sika Equipment Cleaner 650.
- 4 10.10 After epoxy has set and at time of filling of holes which did not contain cracks, fill the remainder of the holes using the procedure for filling cored holes without cracks, Paragraph 8.0 above.
- 5 11.0 ATTACHMENTS
 - 11.1 Appendix A (Diagram of application of epoxy mortar to embed waterstop.)
 - 11.2 Appendix B (Core Locations - Concrete Placement 499-10B).
 - 5 11.3 Appendix C (Forming for West voids) DELETED.
 - 11.4 Appendix D (Detailed sketch of expanding plug).
 - 11.5 Sika Chemical Data Sheets
 - 11.6 Memorandum (To J. O. Booth from E. J. Gallagher dated July 28, 1976).



CORE LOCATION
POUR NO. 499-10B

N4213.50

N4213.50



#25

#24

#20

#23

#19

#15

#16

#7

#17

#8

#13

#18

#21

#11

#4

#22

#12

#14

#6

#5

#1

#2

#3

W3962.50

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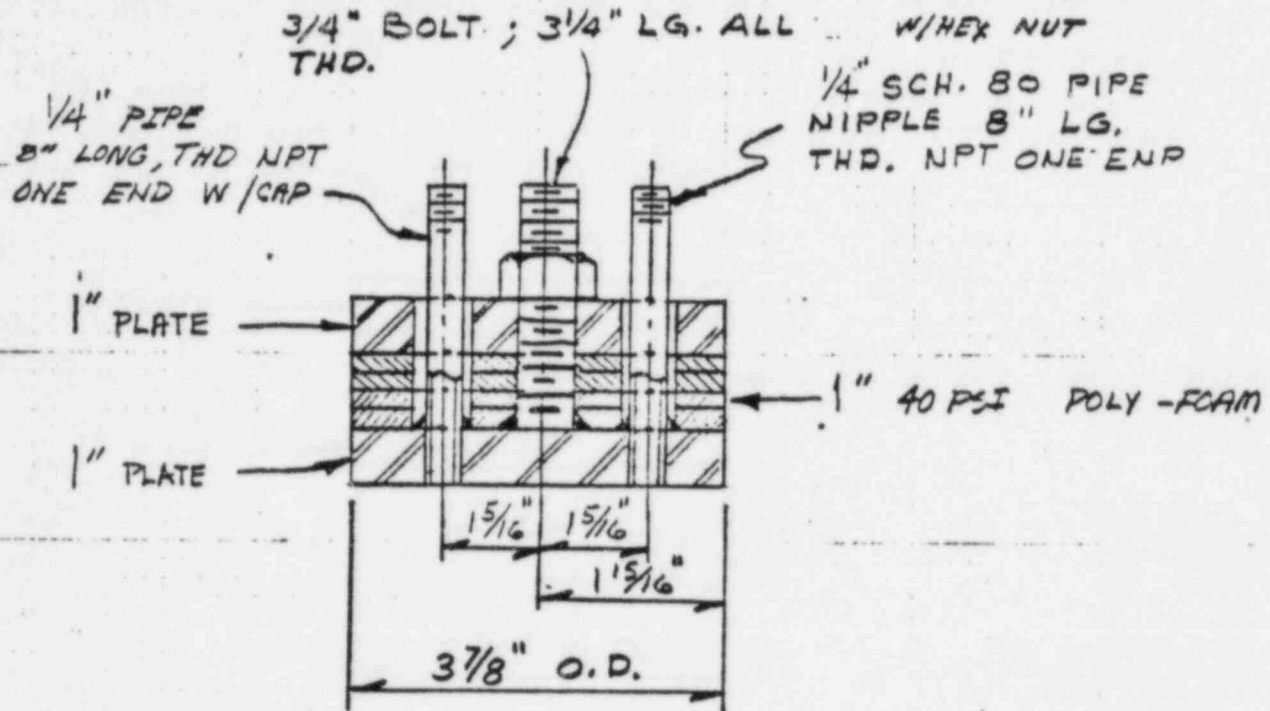
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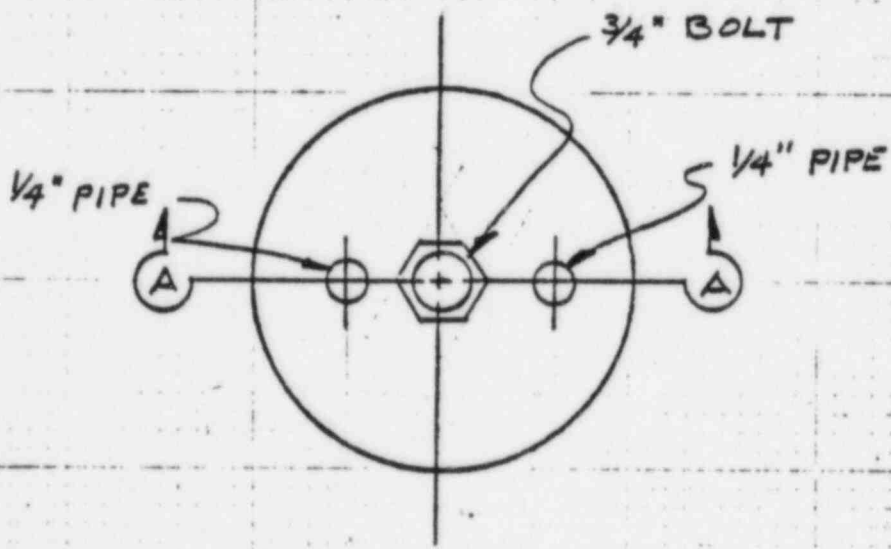
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CONCRETE PLACEMENT
For POUR 10B
PLACEMENT DATE FEBRUARY 5, 1976

W-SP-7
APPENDIX B



SECTION A-A



PLAN



- ▲ ADMIXTURES
- ▲ ADHESIVES
- ▲ QUICKSETS
- ▲ SEALANTS
- ▲ SURFACING AGENTS

GROUP: SIKASTIA
Code: 370

Data Sheet HT-0070
Supersedes TB: 75/12

SIKADUR HI-MOD[†]

High-modulus, high-strength,
moisture-insensitive epoxy adhesive



SIKA CHEMICAL / LYNDHURST, N. J. 07071

DESCRIPTION

Sikadur Hi-Mod is a 100%-solids, 2-component, moisture-insensitive, epoxy-resin system. It is an all-purpose, high-strength, rigid adhesive designed for structural bonding of dry, can't-dry, damp, or wet structural materials free of standing water. Especially suitable for bonding fresh plastic-portland cement to sound hardened concrete, or, when mixed with granules, to prepare a high-strength grout to level base plates and to anchor bolts.

ADVANTAGES

- Unique, non-polysulfide bonding adhesive - - Sikadur Hi-Mod is a polysulfide-free adhesive for 'gluing' plastic concrete to hardened concrete.
- High-strength adhesive for 'can't-dry' surfaces - - Exclusive formulation. Patented curing agent makes Hi-Mod insensitive to moisture before, during, and after cure. Reduces need for job shut-down due to wet conditions.
- Excellent adhesive for grouting base plates and anchoring bolts - - When mixed with granules, Sikadur Hi-Mod produces a high-strength grout for base plates and to anchor bolts.

TYPICAL PROPERTIES

Ratio : 1 part by volume Component B to 1½ parts Component A
Color : Component A is hazy-straw; B is amber: Mixed color: Hazy-straw.
Viscosity : Similar to heavy oil
Shelf life: 2 years

Pot life of neat Sikadur Hi-Mod	25 min at 73F
Tack-free (thin film)	3 hours at 73F
Final cure (75% ultimate strength) ASTM D-695	3 days at 73F

Ultimate physical characteristics after cure at 73F and 50% relative humidity

Tensile strength	ASTM D-638	3,000 psi min
Tensile elongation	ASTM D-638, modified	5% max
Compressive strength	ASTM D-695	10,000 psi min
Compressive modulus	ASTM D-695	475,000 psi min

All values approximate. Will vary with temperature and humidity.

PACKAGING

Sikadur Hi-Mod is available in 10-gallon and 3-gallon units.

COVERAGE

Neat - One gallon of Sikadur Hi-Mod covers approximately 80 sq ft on a smooth surface.

† Patented

SIKA PRODUCTS ARE INTENDED FOR INDUSTRIAL USE ONLY • KEEP AWAY FROM CHILDREN • OBSERVE PRODUCT CAUTION

Every reasonable precaution is taken in the manufacture of our products and compliance of data is assured that these data comply with the existing standards. Information given is correct to the best of our knowledge and the products are sold as satisfactory for the purposes proposed. However, the

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accuracy of the results, using these products and data is given without any warranty or liability on the part of Sika Chemicals. Users are cautioned against the use of these products in any application where the manufacturer's instructions are not followed. The user assumes all liability for the use of these products in any application where the manufacturer's instructions are not followed.

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HOW TO USE

Surface Preparation - - Concrete: Surface must be clean and sound. It may be dry, damp, or wet, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles, and disintegrated materials by mechanical abrasion methods such as sandblasting. Steel: Sandblast to appropriate finish.

Proportioning/Mixing - - Volumetric ratio of Sikadur Hi-Mod is 1:1½ (B:A). To mix, proportion 1 part B and 1½ parts A into clean pail. Mix thoroughly for 3 minutes with Sika paddle on low-speed (400- to 600-rpm) drill until blend is a uniform straw color. Mix only that amount of Hi-Mod that you can use in 25 minutes at 73F.

Application - - To prepare a grout to anchor bolts or level base plates, mix Hi-Mod with Sikadur Granules. The amount of granules used should be the maximum amount possible while still maintaining a pourable consistency. The ratio should be approximately 1:1½ by loose volume (Hi-Mod:Granules). See technical bulletin on anchor bolt grouting and grouting base plates.

LIMITATIONS

Do not thin Sikadur Hi-Mod! Solvents will prevent proper cure.

Use only oven-dry granules to avoid encapsulation of moisture. Exposure to temperatures (after cure) above 180F (dry) and 120F (wet) not recommended. Substrate temperature must not be below 40F.

CAUTION

A COMPONENT - For Industrial Use Only! Warning! May cause skin sensitization or other allergic responses. Avoid inhalation of vapor. Use good ventilation particularly if material is heated or sprayed. Prevent all contact with skin or eyes. If contact with skin occurs, wash immediately with soap and water. In case of contact with eyes, flush immediately with water and contact a physician. SPI Class 4.

B COMPONENT - DANGER! CAUSES (SEVERE) BURNS. Contains alkaline amines: strong sensitizer. Do not get in eyes, on skin, on clothing. Avoid breathing vapor. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

FIRST AID: IN CASE OF CONTACT, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes. MCA

WEAR PROTECTIVE CLOTHING, GOGGLES, GLOVES, AND/OR BARRIER CREAMS



LYNDHURST, NEW JERSEY 07071
201-933-8801 (NJ) - 212-695-2253 (NY)



A. ADHESIVES
A. ADHESIVES
A. QUICKSETS
A. SEALANTS
A. SURFACING
AGENTS

Group: SIKASTIX
Code: 320

Data Sheet LMLV-0875
Supersedes TB: 75/14

SIKADUR LO-MOD LV[†]

Low-modulus, low-viscosity,
moisture-insensitive epoxy adhesive



DESCRIPTION

SIKA CHEMICAL / LYNDHURST, N. J. 07071

Sikadur Lo-Mod LV is a 100%-solids, 100%-reactive, 2-component, moisture-insensitive, epoxy-resin system. Its low modulus of elasticity provides greater 'give' under stress due to impact and thermal change. Excellent for epoxy-mortar floor toppings and patching on dry, can't-dry, damp, or wet structural materials that are free of standing water. LV's also an efficient penetrating impregnation to seal dry porous substrates.

ADVANTAGES

- Unique, low-modulus adhesive for 'can't-dry' surfaces - - Patented, exclusive formulation of Lo-Mod LV makes it insensitive to moisture before, during, and after cure. Reduces need for job shut-down due to wet conditions.
- Impact-, thermal-resistant toppings, patches, overlays, grouts - - Lo-Mod LV has an approximate minimum tensile strength of 3,000 psi and a minimum tensile elongation of approximately 5% for greater 'give' under stresses of impact and thermal change.
- Effective sealer for dry, porous concrete - - Low viscosity (lightweight oil) enhances penetration of dry, porous concrete. Also seals LV-mortar toppings.

TYPICAL PROPERTIES

Ratio : 1 part by volume Component B to 2 parts by volume Component A
Color : Component A is clear straw; B is clear amber. Mixed: light straw.
Viscosity : Similar to lightweight oil
Shelf life: 2 years

Pot life of neat Sikadur Lo-Mod LV 25 min at 73F
Tack-free (thin film) 4 hours min at 73F
Final cure (75% ultimate strength) ASTM D-695 5 days at 73F

Ultimate physical characteristics after cure at 73F and 50% relative humidity

Tensile strength	ASTM D-638	3,000 psi min
Tensile elongation	ASTM D-638, modified	5% min
Compressive strength	ASTM D-695	7,000 psi min
Compressive modulus	ASTM D-695	250,000 max

All values approximate. Will vary with temperature and humidity.

PACKAGING

Sikadur Lo-Mod LV is available in 9-gallon and 3-gallon units.

COVERAGE

Impregnation - Approximately 125 sq ft/gal on smooth surfaces.
As a mortar - One gallon of Lo-Mod LV mixed with 3½ parts by loose volume of Colma Quartzite Aggregate yields approximately 679 cu in. of epoxy mortar.

SIKA PRODUCTS ARE INTENDED FOR INDUSTRIAL USE ONLY • KEEP AWAY FROM CHILDREN • OBSERVE PRODUCT CAUTION

Every reasonable precaution is taken in the manufacture of our products and complete data is given to assure that they conform with the applicable standards. Information given is correct to the best of our knowledge and the products are sold as satisfactory for the purposes described. However, no

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guarantee of the results. Using these products and data is given because every possible precaution is taken in the manufacture of them and all customers under which they are applied should be advised that the user is responsible for the results. The user should be advised to check for any patent held by others.

† Patented

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HOW TO USE

Surface Preparation - - Concrete: Surface must be clean and sound. It may be dry, damp, or wet, but free of standing water. For sealer application, substrate must be dry. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles, and disintegrated materials by mechanical abrasion methods. Steel: Sandblast to appropriate finish.

Proportioning/Mixing - - The volumetric ratio of Lo-Mod LV is 1:2 (B:A). To mix, proportion 1 part B and 2 parts A into clean pail. Mix thoroughly for 3 minutes with Sika paddle on low-speed (400- to 600-rpm) drill. Mix only that amount of Lo-Mod LV that you can use in 25 minutes at 73F.

Mortar - - To prepare Sikadur Lo-Mod LV epoxy mortar, slowly add approximately 3½ parts by loose volume of Colma Quartzite Aggregate to premixed Lo-Mod LV while continuing to mix to a uniform consistency.

Application - - Impregnation - Apply mixed Lo-Mod LV with rubber squeegee or roller to dry substrate. Allow time to penetrate. Squeegee off excess while it is still liquid. Spalled areas - Prime with Lo-Mod LV. Apply with broom, brush, or ¼-in.-nap rollers. Pour mixed Lo-Mod LV into large, clean pail. Add Colma Quartzite Aggregate (approximately 3½ parts by loose volume) while slowly continuing to mix to uniform consistency. Apply mortar while prime coat is still tacky. Use temporary or permanent screeds to strike off and level. Finish with steel trowel. Occasionally wipe trowel lightly with water-dampened rag for smooth finish. A sealer coat of Lo-Mod LV should be applied for optimum results.

LIMITATIONS

Do not thin Sikadur Lo-Mod LV. Solvents will prevent proper cure. Not designed for use as an adhesive for fresh plastic portland-cement mortar or concrete. Use Sikadur Hi-Mod.

Use only oven-dry aggregate to avoid encapsulation of moisture. Exposure to temperatures (after cure) above 180F (dry) and 120F (wet) not recommended. Substrate temperature must not be below 40F.

CAUTION

A COMPONENT - For Industrial Use Only! Warning! May cause skin sensitization or other allergic responses. Avoid inhalation of vapor. Use good ventilation particularly if material is heated or sprayed. Prevent all contact with skin or eyes. If contact with skin occurs, wash immediately with soap and water. In case of contact with eyes, flush immediately with water and contact a physician. SPI Class 2.

B COMPONENT - DANGER! CAUSES (SEVERE) BURNS. Contains alkaline amines: strong sensitizer. Do not get in eyes, on skin, on clothing. Avoid breathing vapor. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

FIRST AID: IN CASE OF CONTACT, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes. MCA

WEAR PROTECTIVE CLOTHING, GOGGLES, GLOVES, AND/OR BARRIER CREAMS



LYNDHURST, NEW JERSEY 07071
201-933-8801 (NJ) - 212-695-2253 (NY)



- ▲ ADMIXTURES
- ▲ ADHESIVES
- ▲ QUICKSETS
- ▲ SEALANTS
- ▲ SURFACING AGENTS

Group: SIKASTIX
Code: 390

Data Sheet HMG-0875
Supersedes TB: 75/13

SIKADUR HI-MOD GEL[†]

High-modulus, gap-filling,
moisture-insensitive epoxy adhesive



SIKA CHEMICAL / LYNDHURST, N. J. 07071

DESCRIPTION

Sikadur Hi-Mod Gel is a 100%-solids, 2-component, epoxy-resin system. A unique high-modulus, moisture-insensitive, structural adhesive for vertical and overhead bonding and embedment - - it cures under dry, can't-dry, and wet conditions.

ADVANTAGES

- Gelled adhesive for 'can't-dry' surfaces - - Thick consistency of patented Sikadur Hi-Mod Gel makes it an efficient gap-filler to bond irregular, non-mating, overhead, or vertical surfaces whether they are dry, damp, or wet - - concrete, steel, wood, stone, brick, and many other structural materials.
- Grouting mortar - - Mixed with oven-dry aggregate, Sikadur Hi-Mod Gel produces workable, sag-resistant mortar for overhead and vertical grouting.

TYPICAL PROPERTIES

Ratio : 1 part by volume Component B to 2 parts by volume Component A
Color : Component A is milky white; B is light brown.. Mixed: light straw.
Viscosity : non-sag ... similar to petroleum jelly
Shelf life: 2 years

Pot life of neat Sikadur Hi-Mod Gel 25 min at 73F
Tack-free (thin film) 3 hours at 73F
Final cure (75% ultimate strength) ASTM D-695 3 days at 73F

Ultimate physical characteristics after cure at 73F and 50% relative humidity

Tensile strength	ASTM D-638	2,000 psi min
Tensile elongation	ASTM D-638, modified	5% max
Compressive strength	ASTM D-695	9,000 psi min
Compressive modulus	ASTM D-695	350,000 psi min

All values approximate. Will vary with temperature and humidity.

PACKAGING

Sikadur Hi-Mod Gel is available in 9-gallon and 3-gallon units.

COVERAGE

Mortar - - One gallon of Sikadur Hi-Mod Gel, mixed with 1 part by loose volume of Colma Quartzite Aggregate, will yield 358 cu in. of epoxy mortar.

[†] Patented

SIKA PRODUCTS ARE INTENDED FOR INDUSTRIAL USE ONLY • KEEP AWAY FROM CHILDREN • OBSERVE PRODUCT CAUTION

SIKA CORPORATION
10000 W. 10th Avenue
Minneapolis, MN 55426
U.S.A.

SIKA LTD.
P.O. Box 10
Chesham, Bucks HP80 1JY
England

HOW TO USE

Surface Preparation - - Concrete: Surface must be clean and sound. It may be dry or damp. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles, and disintegrated materials by mechanical abrasion methods such as sandblasting. Steel: Sandblast to appropriate finish.

Proportioning/Mixing - - Volumetric ratio of Sikadur Hi-Mod Gel is 1:2 (B:A). To mix, proportion 1 part B and 2 parts A into clean pail. Mix thoroughly for 3 minutes with Sika paddle on low-speed (400- to 600-rpm) drill until blend is a uniform straw color. Mix only that amount of Hi-Mod Gel that you can use in 25 minutes at 73F.

Preparing mortar - - Slowly mix up to 1 part by loose volume of Colma Quartzite Aggregate into premixed Gel. Continue mixing until consistency is uniform.

Application - - Used neat or as a mortar, Sikadur Hi-Mod Gel may be applied with a spatula, trowel, or caulking gun. For information on bolt grouting, see technical bulletin on 'Bolt Grouting.'

LIMITATIONS

Do not thin Sikadur Hi-Mod Gel! Solvents will prevent proper cure. Not designed for use as an adhesive for fresh plastic portland-cement mortar or concrete. Use Sikadur Hi-Mod.

Use only oven-dry aggregate to avoid encapsulation of moisture. Exposure to temperatures (after cure) above 180F (dry) and 120F (wet) not recommended. Substrate temperature must not be below 40F.

CAUTION

A COMPONENT - For Industrial Use Only! Warning! May cause skin sensitization or other allergic responses. Avoid inhalation of vapor. Use good ventilation particularly if material is heated or sprayed. Prevent all contact with skin or eyes. If contact with skin occurs, wash immediately with soap and water. In case of contact with eyes, flush immediately with water and contact a physician. **SPI Class 4.**

B COMPONENT - DANGER! CAUSES (SEVERE) BURNS. Contains alkaline amines: strong sensitizer. Do not get in eyes, on skin, on clothing. Avoid breathing vapor. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

FIRST AID: IN CASE OF CONTACT, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes. MCA

WEAR PROTECTIVE CLOTHING, GOGGLES, GLOVES, AND/OR BARRIER CREAMS



LYNDHURST, NEW JERSEY 07071
201-933-8801 (NJ) - 212-695-2253 (NY)



The fastest quick sets in the world

...to stop
water dead

...to make
swift repairs

St. Louis

Sikaset QUICKSETS



New job-right swiftset
 New no-cal accelerator
 New workability
 New low shrink formulations
 New high strengths
 New durability
 New sulfate resistance
 New freeze/thaw resistance
 New Sikaset swiftsets

Your new breed of quicksets:
 trigger-quick Sikaset Plug seals
 trowel-paced Sikaset Mortar no

2 new Sika quicksets — unique, patented accelerator is the trigger

Sikaset Plug and Sikaset Mortar are your new breed of quicksets. Job-paced swiftsets, they're like no other on the market. Not just new, they're unique. Not just different, they're better than anything you've ever used to plug a pressure leak, or pretty-up a pipe for your inspector's 'ayes.'

Sikaset Plug is a new, instant-setting, portland-cement seal that stops water dead! It's a ready-to-plug powder... you bring the water.

Sikaset Mortar is a new, rapid-setting, portland-cement patching compound. Add water, mix, go.

New 'trigger' is key

The accelerator for your new swiftsets is a new kind of 'trigger.' One of a kind. Unique. Patented. Another Sika first! Our organic accelerator eliminates chloride, sulfate, aluminate, the common accelerators that gave you fast set... at the expense of durability.

With your new Sikaset quicksets you get great improvement. But what you *don't* get is also important... no chloride, no sulfate, no aluminate!

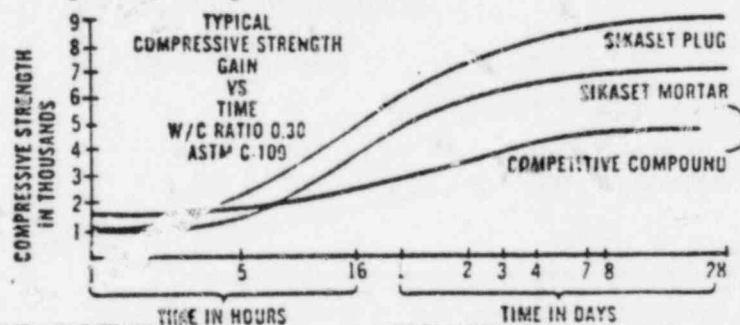
Sikaset Plug and Sikaset Mortar give you the best 1-2 combo in the swiftset business. You get full-strength portland cement — with all its advantages — plus new long-term benefits.

5 great advantages for the applicator

1. The fastest-setting plug in the waterstop business... stops water dead on contact.
2. 28-day strengths in 72 hours. Rapid, predictable set — similar to concrete — without flash set.
3. Extended workability for tooling... more time between initial set-up and final 'grab.'
4. Cold-water, cold-weather cure — uniform setting time over wide temperature ranges.
5. Non-toxic, non-corrosive, non-rusting.

And 6 more for owner and engineer

1. Greater durability for longer service life.
2. Excellent resistance to freeze/thaw attack.
3. Superior sulfate resistance — you can specify for sulfate-saturated soils, water-treatment/sewage plants.
4. Rapid gain of tensile strength to resist cracking.
5. 'No-cal' compounds give you the benefits designed and paid for.
6. Meets specs... already in use in concrete-pipe plants, utility installations.



ater out.
ens-up concrete.

SIKASET PLUG

All new... not another 'me-too'. A great leak-stopper. No 'flash set'. No high heat build up. Your plugs are cohesive enough to dam the leak, stay pliable for nice workability. You can get as fast as a 90-second set. And you get more than instant pressure-leak stoppage—great ultimate strengths; better freeze/thaw resistance; superior sulfate resistance.

WHERE TO USE

Use Sikaset Plug to stop pressure leakage and seepage through concrete, brick, stucco. Great for sewers, utility manholes, plant basements, sumps, elevator pits, pools, tunnels. Vertical or horizontal. Indoors or out.

SPEC/USE SIKASET PLUG

Fast... without flash—sets at twice the speed of conventional quicksets. Stops leakage and seepage. Pronto. Unlike competitive compounds that crumble with handling, Sikaset Plug does not flash set... plugs may be tooled and struck off without reducing tenacious adhesion.

Easy, effective—plugs are cohesive... stop leaks while still soft and workable.

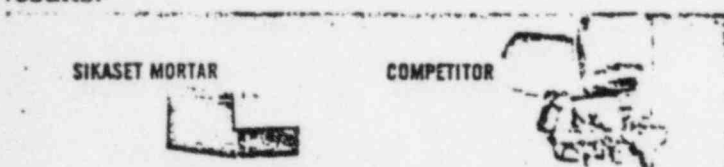
Cold-weather use—if your mix water drops to a cool F, you still get swift set... even at ambient temperatures as low as 35F.

Reduces water—Sikaset Plug features an outstanding water reducer... you get improved long-term characteristics.

Versatile—Plug with Sikaset Plug... you know your leak-stopper will not deteriorate on exposure even to high-sulfate soils and water.

Sulfate-resistance test

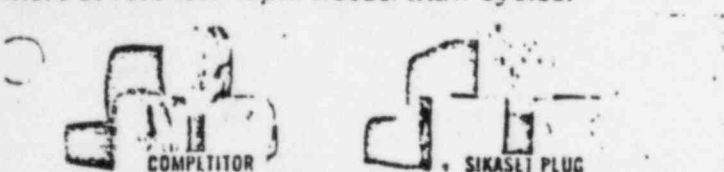
ASTM test, applied equally to new Sikaset Plug and a commercially available material, produced these results:



Tested in accordance with ASTM-C-88-71A (qualitative examination), a 2-in. cube of commercially available quicksetting plug completely disintegrated. Sikaset Plug showed excellent resistance to sulfate attack; exhibited no signs of deterioration.

Freeze/thaw-resistance test

One of the most damaging attacks on concrete and masonry is repeated freeze/thaw. Here's how Sikaset Plug and a competitive product stood up to an even more severe test: rapid freeze/thaw cycles:



Excellent rapid freeze thaw resistance—tested in 4% sodium chloride solution—Sikaset Plug withstood 270 cycles with zero weight loss. Commercially available quickset lost 28% of its weight.

SIKASET MORTAR

DESCRIPTION

To give you greater quickset capability, versatility. Sika offers you its all-new Sikaset Mortar. A ready-to-use powder. Add water... get high-strength mortar that sets within 10 minutes. Enough time to work into coves, patch spalls, and touch-up your precast pieces.

Sikaset Mortar, of course, contains no chloride, no sulfate, no aluminate... its rapid set is due to Sika's new, exclusive organic accelerator. It cures with minimum volume change.

WHERE TO USE

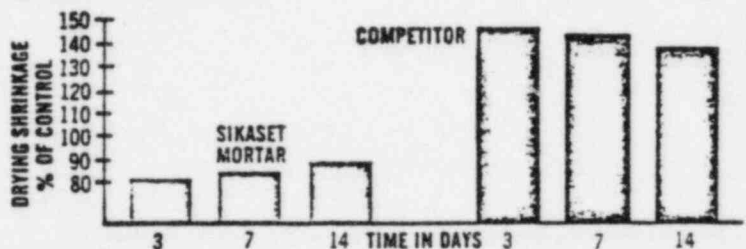
Use Sikaset Mortar to get low-shrink masonry repairs and to patch concrete, brick, and stucco in industrial plants, utilities, precast pipe plants. Fine for basements, sumps, elevator pits, pools, tunnels, sewers. Surfaces may be vertical or horizontal. Dry, damp, wet. Indoors or out.

SPEC/USE SIKASET MORTAR

Trowel-paced set—slower than Sikaset Plug—plus all the advantages of workability, high strength, durability, with early holding power. Reduced shrinkage, too.

Shrinkage

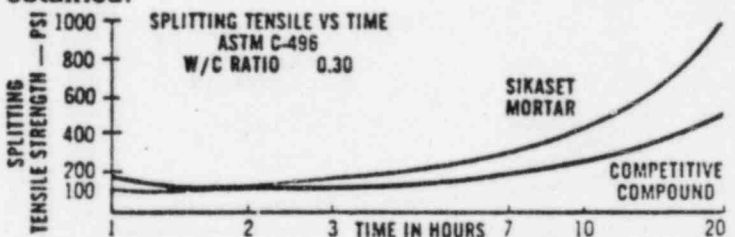
The graph below illustrates drying shrinkage as a percent of control. Test was based on ASTM qualitative norms:



Sikaset Mortar has low shrinkage on drying... actually 10% less than plain cement mortar... and 50% less than competitive material.

Tensile strength

Following ASTM C-496 procedure, tensile splitting tests were conducted and the following results were obtained:



Sikaset Mortar exhibits twice the tensile strength of a competitive quickset. This early development of high tensile strength gives you a stronger patch with better early 'grabbing' power and reduced cracking.

For your convenience when ordering—

Sikaset is our family name for the quicksetting compounds. These are products manufactured, warehoused, and shipped via computer codes. When ordering, please use the code numbers:

Sikaset 543, Plug

Sikaset 544, Mortar

Sikaset Swiftsets

	Sikaset Plug	Sikaset Mortar
Yield (per 20 lb)	360 cu in. of hardened compound	
Packaging	20-lb, 50-lb pails; 550-lb drums	
Shelf life	1 year... but you must keep material dry	
Job-paced set	1 to 3 minutes*	5 to 10 minutes*
Mixing	Mix quickset with sufficient clean water to obtain consistency desired. Do not over-mix. Do not over-wet. Do not retemper.	
Surface Preparation	Nothing complicated... just chip away soft, deteriorated, unsound substrate. Clean cavity completely. Lightly dampen substrate just prior to application.	
Application	Plug minor leaks first. Wedge plug firmly into crack or hole. For large openings, form compound into a carrot shape, and when plug is firm, ram it into cavity. Hold in place with heel of hand. Let go, strike off flush with surface.**	Mix with water to workable consistency. Trowel into place. Knead into honeycombs with rubber-gloved hand.**
	Reseal container. Unused material will deteriorate rapidly if left unsealed.	
Caution	Sikaset quicksets contain portland cement which is alkaline. Prolonged contact may irritate skin. Avoid direct contact where possible and wash exposed skin areas promptly with water. If any of the cementitious material gets into your eyes, rinse immediately and repeatedly with water.	

*All times approximate. Times will vary depending on ambient and material temperatures. Do not mix more material than you can use within described setting times.

**NOTE: Unlike materials containing gypsum (where you are warned to place plug with minimum working), Sikaset Plug gives you more leeway to tool.

Sika. First in 1910. First today.

Sika was the first to develop quicksetting compounds. Back in 1910. Sika's leak-stopping products 'made it'... they solved problems... like waterproofing Switzerland's electrified-railroad tunnels.

But our original compounds—and the many materials that copied them—often sacrificed long-term durability to develop fast set, a set kicked off by chloride-, sulfate-, aluminate-based accelerators. Consequently, the average quickset was often inadequate for demanding applications. It could fail after a few freeze/thaw cycles; exposure to sulfate caused early disintegration.

Even today, many popular quicksets on the market still are high in aluminates... a chemical, incidentally, that must be removed to produce sulfate-resistant, Type V cement. Quicksets containing this chemical, therefore, are obviously not your best choice for such projects as water-control facilities, sewage treatment plants, and marine construction where incidence of sulfate is high. For the same reason, why patch 6,000-psi concrete pipe with a material that will disintegrate on 3 exposures to sewage water!

Only with Sika, with its new organic accelerator, can you get 'quick-ability' combined with workability and durability.

Your best bet is a Sikaset. Our salesmen, our dealers know their way around quickset jobs. Ask one... or contact Sika's Technical Service people at 201-933-8800.

Sika Chemical Corporation

Box 297, Lyndhurst, N.J. 07071
Phone 201-933-8801 / TWX: 710-989-0288

California:	
Los Angeles	213-222-0000
San Diego	619-444-0000
San Francisco	415-398-0000
Colorado:	
Denver	303-733-0000
Connecticut:	
Meriden	203-236-0000
Dayton:	
Dayton, OH	513-233-0000
Florida:	
Miami	305-375-0000
Orlando	305-847-0000
Georgia:	
Atlanta	404-361-0000
Illinois:	
Chicago	312-222-0000
Indiana:	
Chicago, Ill	312-222-0000
Iowa:	
Des Moines	515-261-0000
Kentucky:	
Cincinnati	513-261-0000
Louisiana:	
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Michigan:	
Dearborn	313-261-0000
Minnesota:	
Minneapolis	612-222-0000
Missouri:	
Kansas City	816-222-0000
St. Louis	314-222-0000
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Elizabeth	201-326-0000
New York:	
New York	212-222-0000
Ohio:	
Columbus	614-222-0000
Pennsylvania:	
Philadelphia	215-222-0000
Pittsburgh	412-222-0000
Texas:	
Dallas	214-222-0000
Houston	713-222-0000
Wisconsin:	
Milwaukee	414-222-0000

Dealers to protect your Sika



MEMORANDUM

July 28, 1976

TO: J. O. Booth ✓
FROM: *EJ Gallagher*
E. J. Gallagher

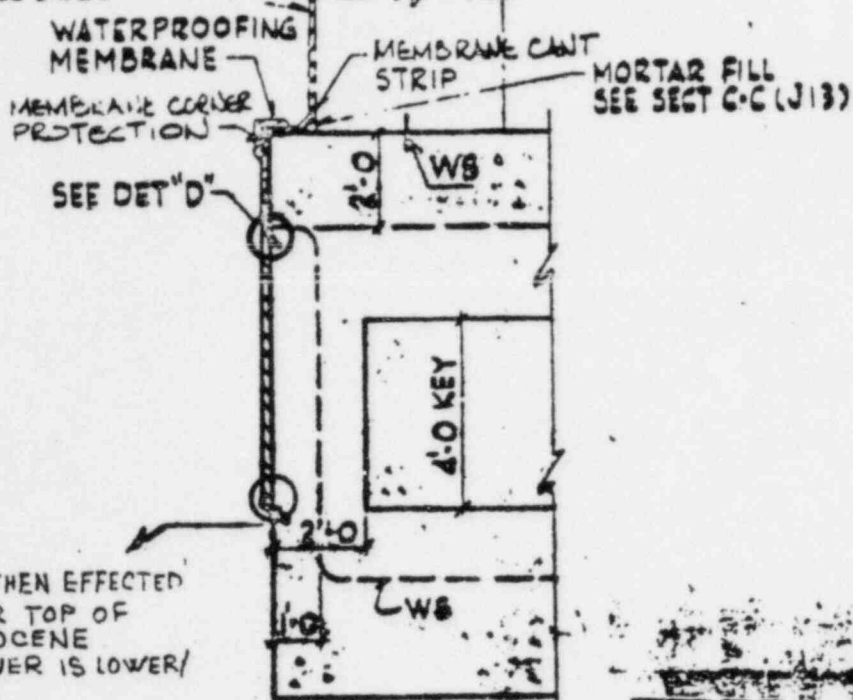
SUBJECT: LOUISIANA POWER AND LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION - UNIT NO. 3
CONCRETE REPAIRS FOR PLACEMENT 499S02 - 10B

Attached is a revised sketch (SK CH-153, Rev. 1) detailing the extent of waterproofing required on the west face of foundation block 10B. Note that the waterproofing should extend below the effected area or to the top of the pleistocene whichever is lower. For ease of construction the reglet is to be cut horizontally into the concrete.

EJG/lls

cc: A. A. Ferlito
A. H. Wern
P. C. Liu
R. K. Stampley
W. L. Sheehan
D. N. Galligan
J. W. Seaver
J. C. Saldarini
J. M. Brooks
G. J. Lambrakos
H. W. Nelson
C. White
E. J. Gallagher ✓

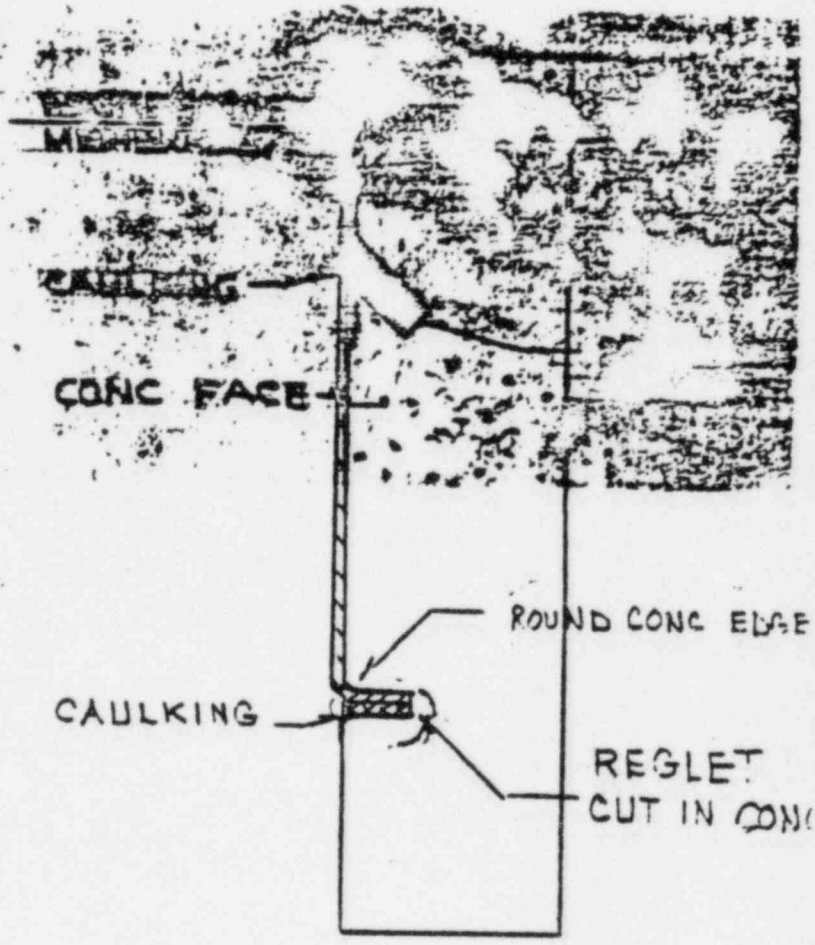
FOR CONT SEE
WALL DWG'S



SECT B-B
WATERPROOFING DET FOR
WEST FACE OF BLOCK 108
1/4" = 1'-0"

NOTE: ADD AN ADDITIONAL 12" OF BITUTHENE WITH A BEAD AROUND ALL EDGES AND PIPES.

SK CH-163 REV. 1



DET "D"
NTS

M E M O R A N D U M

July 26, 1976

To: J. O. Booth/B. D. Fowler

From: *E. J. Gallagher*
E. J. Gallagher

Subject: WATERFORD SES UNIT NO. 3
CONCRETE REPAIRS FOR PLACEMENT 499S02-10B

The repair procedure for mat placement 10B, section 9.6, deals with waterproofing the repaired area. The extent of the waterproofing should be such that the entire length of the west face of placement 10B be waterproofed using W. R. Grace's bituthene to a depth as shown on the attached sketch. This will require excavating a trench along the side of the foundation mat, preparing the surface and applying the waterproofing membrane according to Ebasco specification LOU-1564.475. An additional 12 inches of the waterproofing membrane with a bead of bituthene mastic should be installed around all edges.

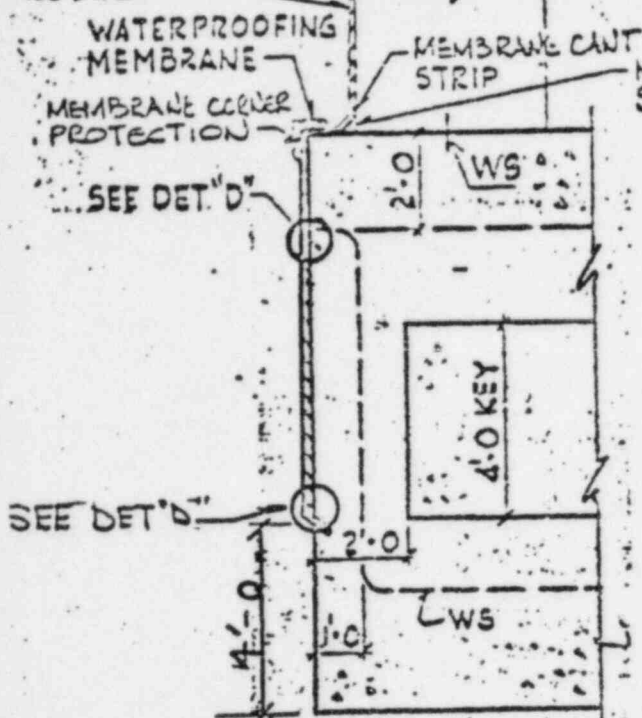
It should be also made clear that the repair of the voids on the west face of placement 10B be made prior to concreting wall placements 565-1A, 499S04-4A-1 and 499S04-8A-1. These walls are exterior walls located above the voids. The concrete being used to repair these voids should also be allowed to reach design strength before these walls are placed.

EJG/11

Enclosure

cc: A. A. Ferlito (w/encl)
A. H. Wern (w/encl)
P. C. Liu (w/encl)
N. Hasan (w/encl)
R. K. Stampley (w/encl)
W. L. Sheehan (w/encl)
D. Galligan (w/encl)
J. W. Seaver (w/encl)
J. C. Salarini (w/encl)
J. M. Brooks (w/encl)
G. J. Lambrakos (w/encl)
H. W. Nelson (w/encl)
C. White (w/encl) ✓
E. J. Gallagher (w/encl)

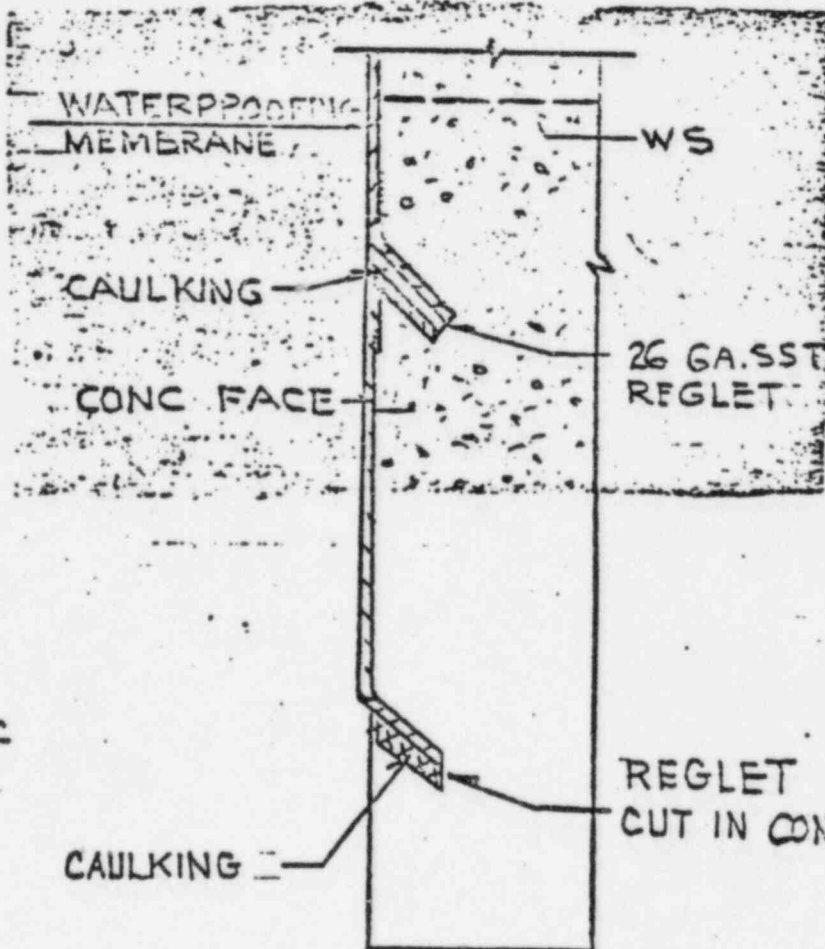
OR CONT. SEE
ALL DWG'S



MORTAR FILL
SEE SECT C-C (J13)

SECT B-B
WATERPROOFING DET FOR
WEST FACE OF BLOCK 10B

1'4" = 1'-0"



NOTE: ADD AN ADDITIONAL 12" OF
BITUTHENE WITH A BEAD OF MASTIC
AROUND ALL EDGES AND PIPES.

DET "D"
NTS