Submittal Review Response

Project Name:	***Hilo WWTP Rehabilitation and Replacement Project Phase 1***
Submittal No.:	***03933-001.0***
Date:	***9/9/2025***

Client:	County of Hawai‘i	**Carollo Project No.:**	203975
Contractor:	Nan, Inc.		
Submittal Name:	Sika Polyurethane Resin		
Reviewed By:	Hipom Caleb Che		

SUBMITTAL REVIEW		
Review is for general compliance with contract documents. No responsibility is assumed by Carollo for correctness of quantities, dimensions, and details. No deviation or variation is approved unless specifically addressed in these review comments. Refer to Section 01330 for additional requirements. The Contractor shall assume full responsibility for coordination with all other trades and deviations from contract requirements.		
Approved	☒	No Exceptions
	☐	Make Corrections Noted - See Comments
	☐	Make Corrections Noted - Confirm
Not Approved	☐	Correct and Resubmit
	☐	Rejected - See Remarks
Receipt Acknowledged	☐	Filed for Record
	☐	With Comments - Resubmit

Review Comments:

1. Submitted product data is acceptable.

☐ High Priority

CONTRACTOR SUBMITTAL TRANSMITTAL FORM REV. A

Owner: County of Hawaii
Contractor: Nan, Inc.
Project Name: Hilo WWTP Phase 1
Submittal Title: Sika Plyurethane Resin
TO: County
From: Nan Inc.

Project No.: WW-4705R
Submittal Number: 03933 - 001.0
☐ For Information Only

Specification No. and Subject of Submittal / Equipment Supplier			
Spec: 03933	**Paragraph:** 1.03, 2.01		
Authored By: Sika		**Date Submitted:**	08/01/2025

Submittal Certification

Check Either (A) or (B):

☑ (A) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings with no exceptions.

☐ (B) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings except for the deviations listed.

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

General Contractor's Reviewer's Signature: Jyun-Cheng Jhuo

Printed Name and Title: Jyun-Cheng Jhuo, Project Engineer

In the event, Contractor believes the Submittal response does or will cause a change to the requirements of the Contract, Contractor shall immediately give written notice stating that Contractor considers the response to be a Change Order.

Firm: **Signature:** **Date Returned:**

PM/CM Office Use

Date Received GC to PM/CM:
Date Received PM/CM to Reviewer:
Date Received Reviewer to PM/CM:
Date Sent PM/CM to GC:

Nan, Inc

PROJECT: HILO WWTP REHABILITATION AND REPLACEMENT PROJECT - PHASE 1

JOB NO. WW-4705R

THIS SUBMITTAL HAS BEEN CHECKED BY THIS CONTRACTOR. IT IS CERTIFIED CORRECT, COMPLETE, AND IN COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. ALL AFFECTED CONTRACTORS AND SUPPLIERS ARE AWARE OF, AND WILL INTEGRATE THIS SUBMITTAL (UPON APPROVAL) INTO THEIR OWN WORK.

DATE RECEIVED 9/8/2025
SPECIFICATION SECTION # 03933
SPECIFICATION
PARAGRAPH 1.03, 2.01
DRAWING na
SUBCONTRACTOR na
SUPPLIER Sika
MANUFACTURER Sika

CERTIFIED BY CQCM or Designee :

SECTION 03933

HYDROPHILIC AND HYDROPHOBIC FOAM POLYURETHANE RESIN INJECTION SYSTEM

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Hydrophilic foam polyurethane resin injection system.

1.02 REFERENCES

A. ASTM International (ASTM):
   1. D3574 - Standard Test Methods for Flexible Cellular Materials-Slab, Bonded, and Molded Urethane Foams.

1.03 SUBMITTALS

A. General: Submit as specified in Section 01330 - Submittal Procedures.

B. Product data: Submit manufacturer's data completely describing polyurethane resin injection system materials.

C. Quality control submittals:
   1. Certificates of Compliance.
   2. Manufacturer's Instructions.
   3. Protection plan for surrounding areas and non-cementitious surfaces.

1.04 QUALITY ASSURANCE

A. Products:
   1. Provide materials that are new and use them within shelf life limitations set forth by the manufacturer.

B. Qualifications:
   1. Installer:
      a. Minimum 5 years' experience in concrete repair with focus on application of similar systems and products to projects of similar size and scope.

C. Pre-installation meeting:
   1. At least 1 week prior to commencing work of this Section, convene a meeting at the project site to review and discuss the following:
      a. Surface preparation.
      b. Substrate conditioning and pre-treatment.
      c. Installation procedures.
      d. Environmental conditions (including weather forecast) and curing requirements.
      e. Testing and inspection procedures.
      f. Protection of surrounding surfaces and equipment.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Labels shall indicate product identification, batch numbers, and shelf life.

B. Store materials off the ground, away from moisture and direct sunlight, and at temperatures within manufacturer's recommended range.

C. Pre-condition materials to manufacturer's recommended temperatures before using.

1.06 PROJECT CONDITIONS

A. Take precautions to protect surfaces and equipment in the work area from damage and staining.

PART 2 PRODUCTS

2.01 MATERIALS

A. General:
   1. Polyurethane resin injection systems that will be in direct contact with water after the Work is completed shall comply with applicable federal, state, or local regulations.
      a. Confirm compliance by submitting documentation that products have been tested and listed in accordance with NSF-61 requirements. Provide testing by a nationally-recognized agency acceptable to Engineer.
   2. Repair materials shall be free of chlorides or alkalis (except for those attributed to water).
   3. To ensure that compatibility of materials and methods, a single manufacturer shall produce and provide all products used together in a single area of concrete repair.

B. Manufacturers: One of the following or equal:
   1. Master Builders Solutions, MasterInject 1210 IUG (Formerly Concresive 1210IUG).
   2. Sika Corp., SikaFix HH LV.
   3. Master Builders Solutions, MasterInject 1230 IUG.
   4. SealBoss Corp., 1510 Water Stop Foam.

C. Resin:
1. Water-insensitive 1-part low-viscosity polyurethane resin adhesive material containing 100-percent solids and meeting or exceeding following characteristics when tested in accordance with standards specified:
a. Uncured:

Physical Characteristic	Required Results
Viscosity	400-600 CPS at 70 degrees Fahrenheit
Flash Point	Greater than 200 degrees Fahrenheit
Corrosiveness	Non-corrosive
Reaction Time	75 - 90 seconds at 80 degrees Fahrenheit
Toxicity	Non-Toxic

b. Cured foam (1:1):

Physical Characteristic	Test Method	Required Results
Tensile Strength	ASTM D3574	150 - 400 pounds per square inch
Elongation	ASTM D3574	400 - 1200 percent

2.02 EQUIPMENT

A. Pump unit:
1. Furnish unit to be used for injection that is positive displacement type with interlock to provide in-line mixing and metering system for 1 component polyurethane resin.
2. Furnish pressure hoses and injection nozzle of such design as to allow proper mixing of polyurethane resin.
3. Standby injection unit may be required.

B. Resin pump: Operating pressure in excess of 2,000 pounds per square inch with a variable pressure control trigger mechanism with attached pressure gauge, on the downstream end of the material supply hose.

C. Water pump: High-pressure water blaster capable of 1,000 pounds per square inch or higher pressure.

D. Incidentals: To be determined by site conditions and Contractor. See Installation Bulletin 6I12 - Urethane Injection, from Master Builders Solutions Construction Chemicals, LLC.

PART 3 EXECUTION

3.01 PREPARATION

A. Surface preparation:
   1. Confirm that surface temperatures and moisture conditions are within manufacturer's recommended limits. Condition surfaces to within those limits before commencing urethane injection.
   2. Sweep or clean area in vicinity of cracks and joints that will be injected with polyurethane resin.
   3. Clean cracks and joints so they are free from dirt, laitance, and other loose matter.

3.02 INSTALLATION

A. Install and cure polyurethane resin materials in accordance with manufacturer's installation instructions.

B. Mixing:
   1. Mix urethane in accordance with manufacturer's installation instructions.

C. Injection:
   1. Apply adequate surface seal to crack or joint to prevent escape of polyurethane resin.
   2. Establish injection ports along seal at a spacing not greater than the thickness of cracked member.
   3. Injection:
      a. Inject polyurethane resin into crack or joint at first port with sufficient pressure to advance polyurethane resin to adjacent port. Start at lowest port along the injection line and work upwards.
      b. Seal original port and shift injection to next adjacent port at which polyurethane resin appears.
      c. Continue port-to-port injection until each crack or joint has been injected for its entire length.
   4. For small amounts of polyurethane, or where excessive pressures developed by injection pump unit might further damage the structure, material mixed and installed with a hand caulking gun may be used if acceptable to the Engineer.
   5. Seal ports, including adjacent locations where polyurethane resin seepage occurs, as necessary to prevent drips or run out.
   6. After injection is complete, remove surface seal material and re-finish concrete in the area where the polyurethane was injected to match surrounding concrete. Leave finished work and work area in a neat and clean condition.

3.03 FIELD QUALITY CONTROL BY CONTRACTOR

A. Provide Contractor quality control as specified in Section 01450 - Quality Control.

B. Field inspections and tests:
   1. Submit records of inspections and test to Engineer within 24 hours after completion.

C. Manufacturer's services.
   1. Pre-installation meeting. Provide manufacturer's technical representative to attend pre-installation meeting specified in Section 01450 - Quality Control.

3.04 FIELD QUALITY CONTROL BY OWNER

A. Provide Owner quality control as specified in Section 01450 - Quality Control.

B. Special inspections, special tests, and structural observation:
   1. Not required.

C. Field inspections:
   1. Preparation.
      a. Review manufacturer's product data and installation instructions.
   2. Required inspections:
      a. Observe surfaces to be injected for temperature and moisture conditions.
      b. Observe conditioning and preparation of urethane resin.
      c. Observe injection procedures for filling cracks.
   3. Records of inspections:
      a. Provide record of each inspection.
      b. Submit to Engineer upon request.

3.05 NON-CONFORMING WORK

A. Cracks, after injection, shall show no evidence of running or seeping water. Re-inject as necessary to provide watertight seal at no additional cost to Owner.

B. Rework surface finishes that do not match surrounding concrete to the satisfaction of the Engineer at no additional cost to Owner.

END OF SECTION

BUILDING TRUST

PRODUCT DATA SHEET

SikaFix® HH LV

Low viscosity, expanding, polyurethane chemical grout

PRODUCT DESCRIPTION

SikaFix® HH LV is a hydrophobic polyurethane that, when used alone or with SikaFix® Accelerator, is designed to form flexible gaskets or plug joints and cracks in concrete from water infiltration.

USES

- Sealing leaks through concrete cracks and joints.
- Defective concrete (cracked and honeycombed).
- Limestone (tunnels, dams).
- Pipe intrusions.
- Wastewater tanks.
- Sewers, manholes, utility boxes, etc.

CHARACTERISTICS / ADVANTAGES

- Easy to apply, one component with accelerator.
- Hydrophobic, only a small amount of water is needed for reaction.
- Expands up to 30 times in volume depending upon the amount of SikaFix® Accelerator used.
- Low viscosity permits injection into narrow hair line cracks.
- Excellent elongation creates tight seal in moving cracks.
- Tenacious adhesion to wet and dry surfaces.
- Contains no volatile solvents.
- ANSI Standard 61 potable water compliant
- Non-corrosive

PRODUCT INFORMATION

Packaging	5 gal plastic pail; 1 pint plastic container.	
Color	**SikaFix® HH LV (uncured)**	**SikaFix HH LV Accelerator**
	Amber	Transparent liquid
Shelf Life	1 year in original, unopened container.	
Storage Conditions	Store in a dry area between 40–90 °F (4–32 °C) using original re-sealable containers. Low temperatures will affect viscosity. To minimize this effect, store the product at room temperature for a minimum period of 24 hours prior to use. Material must be preconditioned to between 60–90 °F (16–32 °C) before use. If site temperatures are extremely low, heat bands or heated water baths may be used on the pails, before and during use to maintain the products temperature. Immerse only the lower 2/3 of the pails. Avoid splashing water into open containers. Do not use if ambient temperature is below 40 °F (4 °C).	

Density	**Uncured**	**Cured**	**SikaFix HH LV Accelerator**	(ASTM D-1622)
	1.15 @ 74 °F (23 °C)	4 lbs/ft³	.95 @ 74 °F (23 °C)	

Flash Point	**Uncured**	**SikaFix HH LV Accelerator**	(ASTM D-93) (ASTM D-3278-96)
	>200 °F	216 °F	

Viscosity	**Uncured**	**SikaFix HH LV Accelerator**	(ASTM D-1638)
	500 cps @ 74 °F	25 cps @ 74 °F (23 °C)	

TECHNICAL INFORMATION

Tensile Strength	29 psi	(ASTM D-638)
Elongation at Break	44 %	(ASTM D-638)
Lap Shear Strength	17 psi	(ASTM C-273)
Expansion	Shrinkage: <1 % Absorption: <1%	

APPLICATION INFORMATION

Ambient Air Temperature	180 °F (82 °C) maximum
Substrate Temperature	180 °F (82 °C) maximum

Cure Time

Temperature	Gel Time (Accelerator dosage %)
50 °F (10 °C)	3m 10s (2.5 %) 12m 0s (0 %)
68 °F (20 °C)	1m 50s (2.5 %) 6m 15s (0 %)
77 °F (25 °C)	1m 15s (2.5 %) 5m 10s (0 %)
86 °F (30 °C)	1m 05s (2.5 %) 4m 0s (0 %)

Based on a 2.5 % SikaFix® Accelerator dosage, corresponding with the recommended 5 gallon: 1 pint ratio of SikaFix® HH LV to SikaFix® Accelerator, and a 0 % dosage, corresponding with no SikaFix® Accelerator added. SikaFix® Accelerator must be agitated by shaking the container prior to use.

APPLICATION INSTRUCTIONS

SUBSTRATE PREPARATION

When the crack is contaminated at the outside, it will be necessary to clean the crack surface so that the crack can be exactly located. If the crack is wide or high water flows are encountered, it will be necessary to seal the surface of the crack with a surface sealing material (SikaSet® Plug, Sikadur® 31 Hi Mod Gel, or open cell polyurethane foam saturated with SikaFix® HH LV). The surface sealing can be done before or after drilling the injection holes, depending on the particular situation.

MIXING

Prior to installation, the material should be agitated by vigorously shaking the 5-gallon pail or by mixing with a jiffy mixer, bung mixer or by hand. Prior to using SikaFix® Accelerator, the container should be shaken vigorously as the contents may settle during storage. For normal use, each 5 gallon unit of SikaFix® HH LV should be used with one pint container of SikaFix® Accelerator, a dosage of 2.5 %. The grout should never be used with more than 5 % SikaFix® Accelerator. Excess acceleration will cause vigorous expansion that is prone to shrinkage. Pour the desired amount of SikaFix® HH LV into a clean pail. Measure the appropriate amount of SikaFix® Accelerator and pour it into the SikaFix® HH LV and mix adequately.

APPLICATION METHOD / TOOLS

Begin by drilling 5/8” diameter holes along the side of the crack at a 45 degree angle. Drill the hole to intersect

the crack midway through the substrate. Install injection packers in the holes and tighten. Spacing of the injection ports depends on crack width, but normal varies from 6” to 36”. It is always necessary to flush the drilled holes with water to remove debris and drill dust from the holes and crack. This will also ensure that the crack is wet enough to react with the grout when it is introduced to the crack. Begin the injection of the grout as the lowest packer installed on a vertical crack, or at the first packer flushed for a horizontal crack. During the injection, you will notice that the SikaFix® HH LV displaces water from the crack. Continue injecting until the grout appears at the adjacent packer hole. Stop pumping and reinstall the packer in the adjacent hole. Tighten the packer and move the pump hose to the second packer and begin injection. Continue the process until 3–4 packers have been grouted. Disconnect and go hack to the first packer and inject all the ports for the second time if necessary. Some ports may take additional grout, which will fill up and further densify the material in the crack. Continue process until the length of the prepared crack is injected.

Note: Injection pressure will vary from 200 psi to 2500 psi depending on the width of the crack, thickness of concrete and condition of concrete.

Tooling & Finishing

When finished with the injection process, re-inject each installed packer with a small amount of water. This will react with the resin left behind in the drill hole. After the injection, the packers or injection ports can be cut flush with the concrete surface or can be removed from the injection holes. Let SikaFix® HH LV completely cure before removing the packers. Packer holes can be filled with Sikadur® 31 or SikaSet® Plug and troweled smooth.

Removal

Residual resin that has foamed from the crack can be removed with a scraper as long as it is not cured to a solid on the surface. If the material has cured, remove with a wire brush or hand held grinders. SikaFix® HH LV will aggressively bond to concrete surfaces.

LIMITATIONS

- Low temperatures will significantly affect viscosity and reaction time. If SikaFix® Accelerator is allowed to freeze, it will lower performance of the product.
- Avoid splashing water into open containers, as material is water activated.
- Water used to activate SikaFix® HH LV must be in a range of pH 3-10 for optimum foam quality.
- Material must be stored between 40–90 °F (4–32 °C).
- Material must be preconditioned to between 60–90 °F (16–32 °C) before use.
- Ambient temperature must be between 40–90 °F (4–32 °C) for use.
- Must be used in confined spaces.
- The reaction may be affected by the presence of hydrocarbons. Pretesting is recommended.

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

OTHER RESTRICTIONS

See Legal Disclaimer.

ENVIRONMENTAL, HEALTH AND SAFETY

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

LEGAL DISCLAIMER

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

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or 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 label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

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 the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs. **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 to the Terms and Conditions of Sale which are available at https://usa.sika.com/en/group/SikaCorp/termsandconditions.html or by calling 1-800-933-7452.

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