Submittal Review Response

Project Name:	***Hilo WWTP Rehabilitation and Replacement Project Phase 1***
Submittal No.:	***03111-001.1***
Date:	***9/22/2025***

Client:	County of Hawai‘i	**Carollo Project No.:**	203975
Contractor:	Nan, Inc.		
Submittal Name:	Geofoam		
Reviewed By:	Bruce DiFrancsico, 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. Original Engineer Comment: Confirm that Flame Spread is less than 25 per ASTM E84.
   Contractor Response – mfr. E-mail confirmation provided confirming that flame spread is less than 25.
   Engineer Response: Acknowledged; comment closed. Submitted product 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: GEOFOAM
TO: County of Hawaii, DEM
From: Nan Inc.

Project No.: WW-4705R
Submittal Number: 03111-001.1
☐ For Information Only

Specification No. and Subject of Submittal / Equipment Supplier			
Spec: 03111	**Paragraph:** 1.03A, 1.03B, 2.01A(1), 2.02A, 2.02B		
Authored By: Krishna Dubbudu		**Date Submitted:** 06/27/2025	

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: Krish

Printed Name and Title: Krishna Dubbudu, 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 9/16/2025
SPECIFICATION SECTION # 03111
SPECIFICATION CONCRETE VOID FILL (GE
PARAGRAPH 1.03A, 1.03B, 2.01A(1), 2.02A,
DRAWING N/a
SUBCONTRACTOR N/a
SUPPLIER N/a
MANUFACTURER Insulfoam

CERTIFIED BY CQCM or Designee :

Review Comments:

1. Confirm that flame spread is less than 25 per ASTM E84

Response - See Email Response/Confirmation Letter

SECTION 03111

CONCRETE VOID FILL (GEOFOAM)

PART 1 GENERAL

1.01 SUMMARY

A. This Specifications section includes expanded polystyrene rigid board (geofoam) for filling concrete voids where indicated on the Drawings.

1.02 REFERENCES

A. ASTM International (ASTM):
   1. D6817 - Standard Specification for Rigid Cellular Polystyrene Geofoam.
   2. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.03 SUBMITTALS

A. Product data:
   1. Technical data demonstrating compliance with ASTM D6817 for type specified.
   2. Adhesives.

B. Manufacturer's installation instructions for application type specified.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver geofoam labeled in accordance with ASTM D6817 material type.

B. Store protected from moisture and sunlight prior to installation.

C. Geofoam should be considered combustible and should not be exposed to open flame or other ignition sources.

D. Product should not be exposed to organic solvents, petroleum products, and their vapors. Examples include, but are not limited to, acetone, paint thinner, and gasoline.

E. Provide temporary ballast or other restraint prior to and during installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Concrete void filler system (geofoam): The following or equal:
   1. EPS Geofoam Fill, Insulfoam LLC.
   2. ACH Foam Technologies.

2.02 MATERIALS

✔A. Rigid cellular polystyrene geofoam in accordance with ASTM D6817.
1. Type: EPS46.
2. Density: Minimum 2.85 pounds per cubic foot.
3. Compressive resistance at 1 percent deformation: Minimum of 18.6 pounds per square inch.
4. Flexural strength: Minimum 75 pounds per square inch.
5. Size: As required to fill volume spaces that are indicated on the Drawings.
6. Flame spread: Less than 25 when tested in accordance with ASTM E84.

✔B. Adhesive: As recommended by the manufacturer for attachment of the void fillers against existing concrete.
1. Adhesive shall be sufficient to keep the void filler panels held securely in place during the casting of concrete.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean substrate of loose material, dust, and other debris that might inhibit the adhering of the void filler material against existing concrete surfaces.

3.02 INSTALLATION

A. Install geofoam in accordance with manufacturer's recommendations.

B. Cut and fit as necessary to accommodate dimensions.

C. Begin installation of geofoam at 1 corner. Tightly butt joints to form uninterrupted surface.

D. During placement of any concrete slabs over the top surface of the geofoam, it is permissible to use rebar supports to support the reinforcing steel during concrete placement, provided the rebar supports do not puncture the geofoam under any circumstances.

E. Where geofoam will be subjected to uplift and/or lateral pressures due to concrete pours, Contractor shall ensure:
1. Geofoam is adequately sealed with a sealant recommended by the manufacturer to prevent intrusion of water and concrete into areas filled with geofoam.
2. Geofoam is adequately secured to prevent uplift or movement of the geofoam during concrete pouring.

F. Geofoam shall not be used as a substitute for formwork when placing concrete walls.

G. As applicable, Contractor shall follow manufacturer's recommended guidelines, which may include additional requirements for formwork bracing, form ties, reinforcing steel bar supports, reinforcing steel bar spacers, and concrete pour sequencing.

END OF SECTION

PRODUCT DATA

INSULFOAM® GF GEOFOAM EPS46

Description

InsulFoam® GF (Geofoam) EPS46 is a high-performance, lightweight, geosynthetic fill material consisting of clised cell expanded polystyrene (EPS). Geofoam is the common industry term for InsulFoam GF and similar produts. InsulFoam GF is manufactured from the same high-quality blocks as our InsulFoam brand insulations and meets or exceeds the requirements of ASTM D6817, Standard Specification for Rigid Cellular Polystyrene Geofoam. InsulFoam GF is manufactured in a common density range between .70 to 2.85 lb/ft³ (11.2-45.7 kg/m³) and is an ideal, lightweight fill alternative for many construction applications.

Uses

InsulFoam GF EPS46 is commonly used in areas where unstable soil conditions exist and as an alternative to various fill materials. The unique load disbursement and lightweight characteristics of InsulFoam GF help to minimize any post-construction settling. InsulFoam GF is also used as backfill to reduce lateral earth pressure behind adjacent structures such as retaining walls. InsulFoam GF is successfully used in the following engineered applications:

- Roads & Highways
- Bridge Approaches
- Retaining Walls
- Berms & Embankments
- Loading Docks & Ramps
- Landscaping
- Dikes & Levees
- Foundations
- Parking Structures
- Buried Utilities Protection
- Compressible Inclusions

Advantages

- Lightweight. With a density of 2.85 lb/ft³ (45.7 kg/m³), InsulFoam GF EPS46 is significantly lighter than soil (approximately 120 lb/ft³).
- Cost Effective. The lightweight nature of InsulFoam GF can reduce or eliminate the need for heavy earth moving and compaction equipment. The InsulFoam GF blocks can be easily picked up and placed manually. At sites with rough terrains or poor access, InsulFoam GF blocks can be transported, handled and placed faster than soil and other fills.
- Environmentally Safe. InsulFoam GF contains no ozone depleting CFCs, HCFCs, or formaldehyde. It is an inert and highly stable product that will not decompose, decay or produce undesireable gasses or leachates. InsulFoam GF is recycleable and save for waste-to-energy (WTE) systems and landfills.
- Insect and Mold Resistant. InsulFoam GF can be manufactured with an inert addititve that repels termites and carpenter ants. InsulFoam GF does not sustain mold and mildew growth.

LIGHTWEIGHT STABILITY SIMPLIFIED.

- Proven Performer. For over 40 years engineers have been successfully using Geofoam worldwide. It's currently approved for use by the Federal Highway Administration (FHWA), many state Departments of Transportation (DOT) and other government and private entities.
- Weather Resistant. InsulFoam GF can be transported, handled and installed in most weather conditions and is unaffected by freeze-thaw cycling, moisture and road salts. Other fill materials such as wood chips, saw dust, lightweight concrete and soil can be weather sensitive during installation.
- Maintenance Free. Under normal conditions, InsulFoam GF requires no maintenance for the life of the fill system.
- Homogenous Make-up. InsulFoam GF is manufactured with consistent properties throughout individual blocks. Other lightweight fill materials (such as used tires, wood chips and fibers) can be varied and inconsistent in their make-up. Such inconsistencies can result in non-uniform load transfer and differential settlement.
- No Preloading. Unlike other fill materials, InsulFoam GF does not require surcharging, preloading or staged construction.

Product Features

- Job Specific Sizes. InsulFoam GF is manufactured to meet job specific requirements. With varying maximum block-sizes available from the Insulfoam facilities, it is important the designer contact the local Insulfoam Representative to determin maximum block sizes for each project.
- Adaptable. If jobsite block size adjustments are needed, InsulFoam GF can easily be cut on-site with hot wire tooling or saws.
- Clear Product Marketings. Each InsulFoam GF block is marked with the manufacture date, location, ASTM designation and density.

INSULATION ENGINEERED TO MAKE A DIFFERENCE.

LIGHTWEIGHT STABILITY SIMPLIFIED.

INSULFOAM GF

Design Considerations

- For InsulFoam GF applications, design load stresses should not exceed 1% straing for combined live and dead loads.
- In conditions where InsulFoam GF is periodically subjected to submergence from fluctuating ground water, add 1.87 lb/ft³ (30 kg/m³) to the InsulFoam GF design density.
- In conditions where InsulFoam GF is continually below ground water, add 5.00 lb/ft³ (80kg/m³) to the InsulFoam GF design density.
- In earth work applications (such as levees, dikes and berms) uplift buoyancy forces must be considered. The buoyancy force must be counteracted with overburden or restraint devices with geogrids or geomembranes.

Installation Recommendations

- InsulFoam GF contains a flame retardant additive; however, it shall be considered combustible and should not be exposed to open flame or any source of ignition.
- Protect InsulFoam GF from exposure to hydrocarbons, highly solvent extended mastics and coal tar.
- If long-term (6 months or greater) outside storage is necessary, InsulFoam GF should be covered with an opaque material. Exposure to UV may cause surface discoloration but does not effect physical properties.
- Blocks of InsulFoam GF should be placed tightly on a prepared leveling course.
- If multiple layers of InsulFoam GF are required, orient the successive layers wiht the long axis at 90° to the previous layer.
- Use InsulGrip plates during inclement weather to provide horizontal restraint between layers of InsulFoam GF and to help keep the product from shifting.
- In windy conditions, InsulFoam GF should be ballasted during storage and upon installation.
- Heavy equipment should not operate directly on the surface of the InsulFoam GF.

Typical Tested Physical Properties of InsulFoam Geofoam EPS46*

Type - ASTM D6817	Units	EPS46
Density (nomical pcf)	lb/ft³ (kg/m³)	2.85 (45.7)
Compressive Resistance ** min. @ 1% deformation	psi (kPa)	18.6 (128)
Compressive Resistance ** min. @ 5% deformation	psi (kPa)	43.5 (300)
Compressive Strength (psi, 10% deformation)	psi (kPa)	50.0 (345)
Flexural Strength (min. psi)	psi (kPa)	75.0 (517)
Oxygen Index, min.	Volume %	24.0
Dimensional Stability	max. %	< 2%
Buoyancy Force	lb/ft³ (kg/m³)	59.5 (950)
Poisson's Ratio	--	.05
Coefficient of Friction	--	.6
Absorption	Volume %	< 4.0
Elastic Modulus, min.	psi (kPa)	1860 (12800)

*Properties are based on data provided by resin manufacturers, independent test agencies and Insulfoam.
** For InsulFoam GF applications the design load stresses should not exceed 1% strain for combined live and dead loads.

INSULATION ENGINEERED TO MAKE A DIFFERENCE.

Krishna Dubbudu

From: Sam de Almeida <sam@harperwinn.com>
Sent: Thursday, September 11, 2025 10:19 AM
To: Krishna Dubbudu
Cc: Joey Ing
Subject: Re: Product information

Yes, The flame spread is less than 25 per ASTM E84

Hi Krishna,

Per manufacturer:

- ***Flexible Fast. Safe for use with EPS:*** *Geofoam is a lightweight, expanded polystyrene (EPS) fill material used in construction. Many standard adhesives and chemicals contain solvents that will degrade or melt EPS foam. Flexible FAST is formulated to be compatible with EPS and will not cause damage.*

- *https://www.carlislesyntec.com/en/Document-Viewer/flexible-fast-adhesive-product-data-sheet-pds/rw1957auuUyaOyb-gEUuiA*

- *Insulfoam Geofoam has a flame spread index (FSI) not exceeding 25 and a smoke developed index (SDI) not exceeding 450, for a Class A fire rating when tested in thicknesses up to 5 inches according to UL 723 (ASTM E84).* *https://www.insulfoam.com/wp-content/uploads/2016/08/Insulfoam-Geofoam-Safety-Data-Sheet.pdf*
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- *https://insulfoam.com/wp-content/uploads/2014/04/Geofoam-TDS.pdf*

https://www.insulfoam.com/wp-content/uploads/2014/05/ULEX.R14313.-Final-Web-Site-3-2015.pdf

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Regards

Sam de Almeida

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