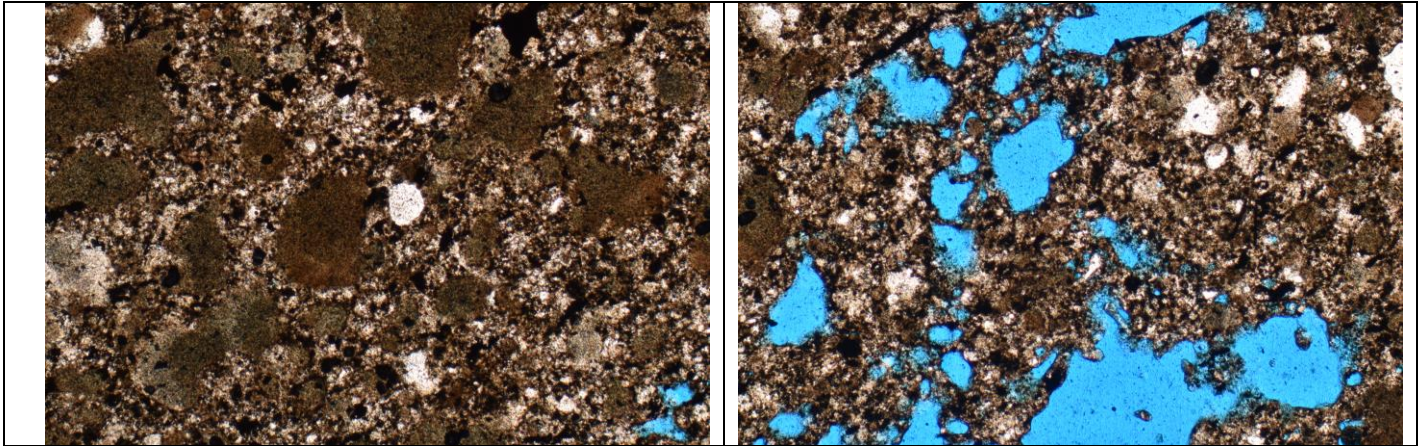


**PETROGRAPHIC EVALUATION OF LIGHTWEIGHT AGGREGATES**  
*CAROLINA STALITE COMPANY*



**Prepared for:**

Carolina Stalite Company  
Gold Hill, North Carolina

**Prepared by:**

**C3S, Inc.**  
**Houston, Texas**



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**April 18, 2025  
C3S Project No.: 25-5132**

**Michael Hammill  
Carolina Stalite Company**  
16815 Old Beatty Ford Road  
Gold Hill, NC 28071

**Re: Petrographic Evaluation of Lightweight Aggregate**  
Carolina Staline Company

Dear Mr. Hammill:

C3S, Inc. has completed an evaluation of the referenced lightweight aggregate sample as per ASTM C 295 "Petrographic Analysis of Aggregates for Concrete"

Please find attached the results of our findings and do appreciate the continued use of our services.

Sincerely,  
C3S, Inc.

A handwritten signature in blue ink that reads "S. Ebow Coleman".

**S. Ebow Coleman, Ph.D., P.E.  
Principal Consultant**

## I. PROJECT INFORMATION

A plastic bag of lightweight aggregates, weighing about 3 lbs., was submitted for petrographic examination as per ASTM C295. "Petrographic Examination of Aggregates for Concrete" The sample was received, on April 9, 2025, from Gold Hill, North Carolina.

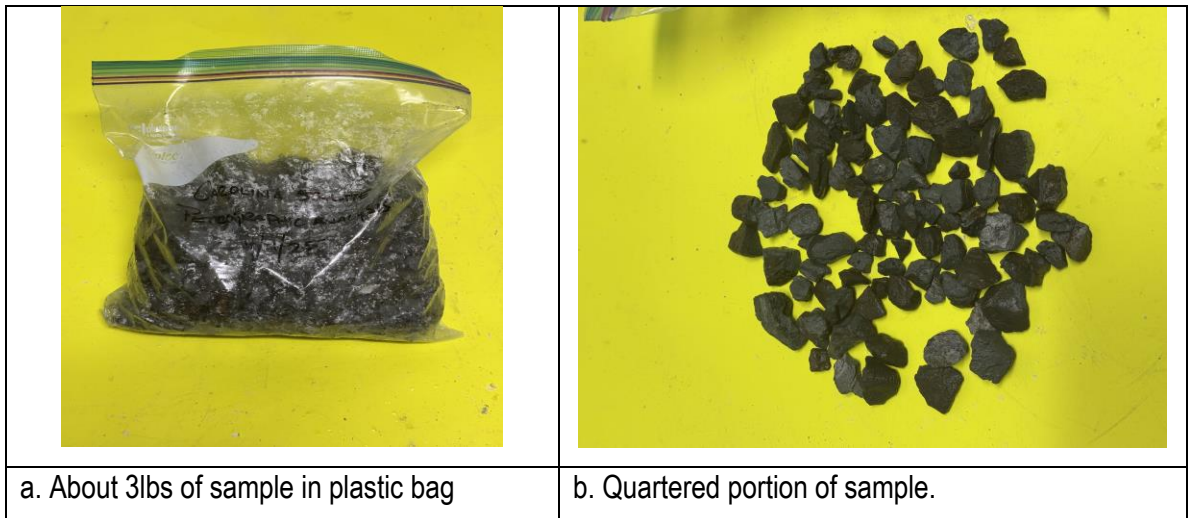


Figure 1 (a) shows sample as received; (b) a quartered portion of sample.

## II. OBJECTIVE

To determine whether aggregate will not have any adverse effect when used as an ingredient in concrete.

## III. PETROGRAPHIC ANALYSIS

Petrographic analysis involves the optical examination of concrete specimens under low and high power magnification. Detailed instructions on conducting a petrographic examination of hardened concrete can be found in ASTM C295 For our examination, a sample of the aggregate was impregnated with blue dye under vacuum. The impregnation under vacuum causes the dye to permeate every crack, microcrack and all pores,

# **Petrographic Evaluation of Lightweight Aggregate**

**Carolina Stalite Company**

including micro pores in the total sample. The impregnated aggregate is cut and placed on a glass plate, ground and polished to a thickness of about 30 microns.

The thin section of aggregate was examined for the following features:

- Forms of silica in aggregate
- The void system in aggregate
- Presence of cracks and micro cracks

The sample was examined using a magnification of 400X.

## **I. Findings from Petrographic Analysis**

Three predominant aggregates of different coloration were randomly picked and evaluated. The blue areas in the photomicrographs represent voids in the aggregates.

*The form of silica in the aggregates does not appear to be that which will pose a danger for its use in concrete; namely, be susceptible to alkali-silica reaction when used with high alkali cement.*

The void system in the aggregates is random as expected for lightweight aggregates.

No cracks or micro-cracks were found in any of the randomly picked sample that was examined.

## **LIMITATION**

Reasonable variations from kiln batches of lightweight aggregates are assumed. If the source of raw materials change and/or notable changes occurs in firing conditions, observations made, and conclusions reached in this report may not reflect the change. C3S, Inc. should be notified if conditions different from those in the preparation of this lightweight aggregate are encountered.

### **NOTE:**

*Unless other disposition arrangements are made, samples will be discarded after one (1) month upon presentation of this final report.*

**Petrographic Evaluation of Lightweight Aggregate**

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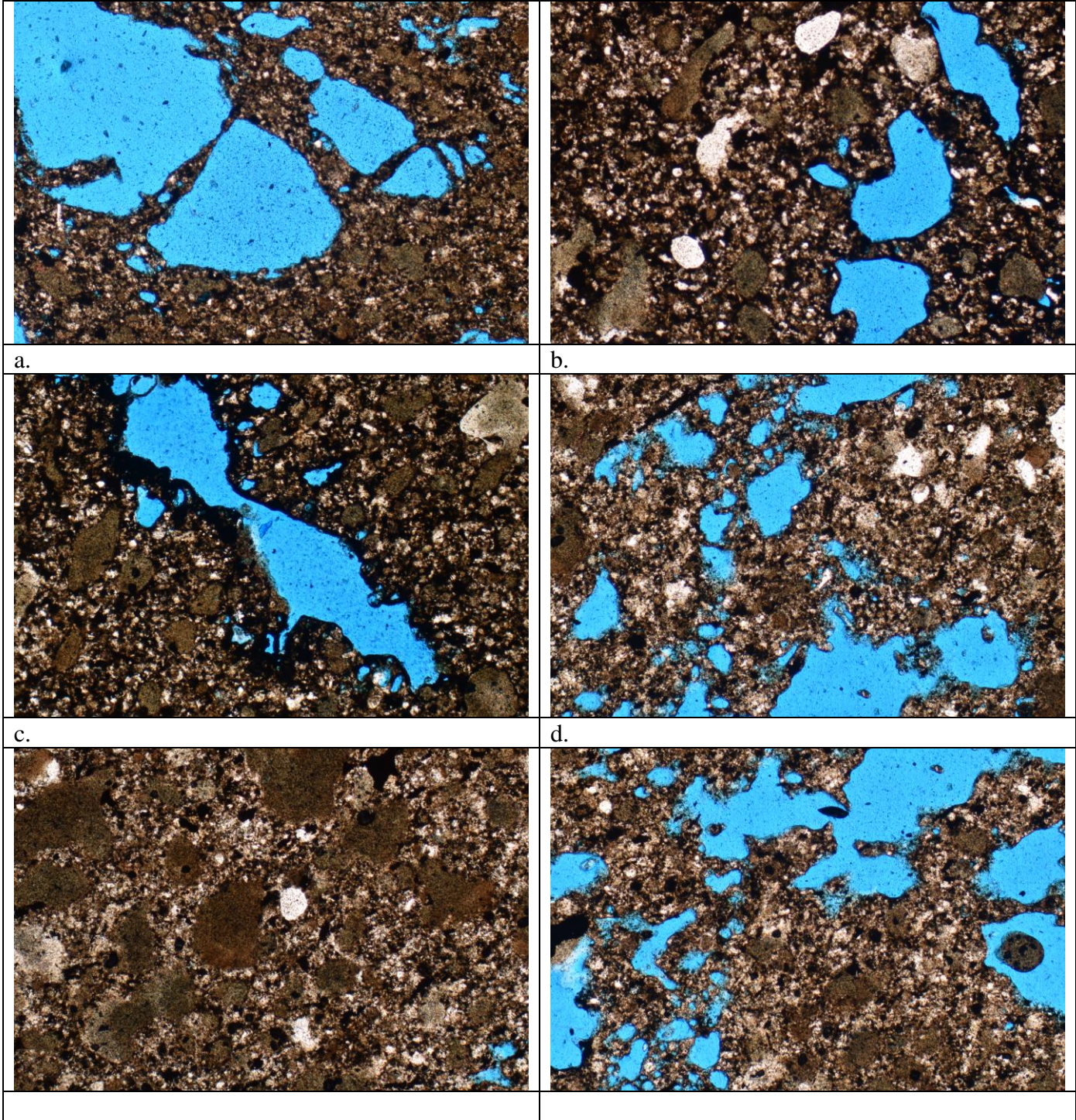


Figure 2 shows representative sections of predominant aggregate particles in the Sample.