

GEORGIA INSTITUTE OF TECHNOLOGY  
Office of Contract Administration

SPONSORED PROJECT INITIATION

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Date: March 18, 1976

Project Title: Engineering Assistance - ASTM Patio, Carport, & Awning Standard

Project No: A-1817

Project Director: Mr. S. T. Alford + R. L. Sheppard

Sponsor: Chamberlain Manufacturing Corporation; Monroe, GA 30655

Agreement Period: From Feb. 12, 1976 Until Aug. 11, 1976

Type Agreement: Standard Industrial Agreement dated 2/12/76

Amount: \$12,635

Reports Required: Monthly Progress Letters; Preliminary Standard Sections

Sponsor Contact Person(s): Technical Matters Contractual Matters  
(thru OCA)

Mr. Gary Nelson  
Engineering Manager  
Chamberlain Manufacturing Corporation  
Monroe Division  
1118 West Spring Street  
Monroe, Georgia 30655

Assigned to: Systems & Techniques (~~School~~/Laboratory)

Copies to:

Project Director  
Division Chief (EES)  
School/Laboratory Director  
Dean/Director-EES  
Accounting Office  
Procurement Office  
Security Coordinator (OCA) ✓  
Reports Coordinator (OCA)

Library, Technical Reports Section  
Office of Computing Services  
Director, Physical Plant  
EES Information Office  
Project File (OCA)  
Project Code (GTRI)  
Other \_\_\_\_\_

GEORGIA INSTITUTE OF TECHNOLOGY  
OFFICE OF CONTRACT ADMINISTRATION  
SPONSORED PROJECT TERMINATION

Date: 2/18/77

*no action  
ack  
off*

*B/45-00*

Project Title: Engineering Assistance, ASTM Patio, Carport and Awning Standard.

Project No: A-1817

Project Director: Mr. <sup>John</sup>~~Jack~~ Kinney + R.R. Sheppard

Sponsor: Chamberlain Manufacturing Corporation

Effective Termination Date: 12/31/76

Clearance of Accounting Charges: 1/31/77

Grant/Contract Closeout Actions Remaining:

- Final Invoice and Closing Documents
- Final Fiscal Report
- Final Report of Inventions
- Govt. Property Inventory & Related Certificate
- Classified Material Certificate
- Other \_\_\_\_\_

Assigned to: Systems and Techniques (School/Laboratory)

COPIES TO:

- Project Director
- Division Chief (EES)
- School/Laboratory Director
- Dean/Director-EES
- Accounting Office
- Procurement Office
- Security Coordinator (OCA)
- Reports Coordinator (OCA)

- Library, Technical Reports Section
- Office of Computing Services
- Director, Physical Plant
- EES Information Office
- Project File (OCA)
- Project Code (GTRI)
- Other \_\_\_\_\_

ENGINEERING EXPERIMENT STATION  
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

13 April 1976

Chamberlain Manufacturing Corporation  
Monroe Division  
1118 W. Spring Street  
Monroe, Georgia 30655

Attention: Mr. Gary R. Nelson  
Engineering Manager

Reference: Engineering Assistance--ASTM Patio, Carport and Awning Standard  
(EES/GIT Project A-1817)

Subject: Monthly Progress Letter No. 1 for March 1976.

Gentlemen:

Due to the work load situation at the Engineering Experiment Station, responsibility for project A-1817 was transferred from Mr. O. D. Asbell to Mr. R. R. Sheppard.

On 5 March 1976 S. T. Alford, Chief, Systems Development Division, and R. R. Sheppard, Assistant Research Engineer of the Georgia Tech EES, visited the Chamberlain Manufacturing plant for a meeting with Mr. Nelson. Specific tasks required to fulfill the statement of work were discussed. Mr. Nelson conducted a tour of the Monroe facilities. Arrangements were made to attend the ASTM, E6.52 subcommittee structural task group meeting in Orlando, Florida on March 23 and 24, 1976. Mr. Nelson gave the EES group applicable standards, references, subcommittee minutes and a sample carport roof for study.

A literature search was undertaken to obtain applicable standards and specifications. ANSI, ASTM, ASCE, Metal Building Manufacturers Association and the Aluminum Association documents were reviewed.

On 16 March Mr. Nelson visited EES for a meeting with Mr. Sheppard. Plans were discussed for the Orlando ASTM meeting. The main points for EES consideration were analytical methodology and testing.

On 23 and 24 March, Mr. Nelson and Mr. Sheppard attended the ASTM meeting at the Dutch Inn in Orlando, Florida. At the structural task group meeting the first draft of the standard was discussed. The following changes were made to the draft. The sections are listed with a description of the change. Those sections listed without comments were accepted as previously written in the original draft.

## 1.0 General

- 1.1 Title -
- 1.2 Purpose - The term "pre-engineered" was deleted.
- 1.3 Scope - The words "non-habitable" and "installation" were added. The scope of the standard now reads:

"The provisions of this Specification are standard for the evaluation of awnings, carports, patio covers, canopies and similar non-habitable structures including elements, connections, installations and assemblies under actual or simulated conditions."

## 2.0 Applicable Documents

The statement was added:

"Whenever the requirements of this standard differ from the referenced standards, this Specification shall apply."

It was felt that the full names of the applicable documents should be included in addition to the number.

## 3.0 Materials

The term "pre-engineered" was deleted.

## 4.0 Construction

This entire section was deleted.

## 5.0 Design

- 5.1 Loads - "Uniform Building Code" was changed to read "Uniform standard Building Code." A map is to be included which defines specific minimum design loads as a function of geographic location. Also the National Building Code is to be included as a design load guide in addition to those already mentioned.
- 5.2 Stresses - The national design specifications to be used for determining allowable stresses are to be listed directly in this section instead of referencing Section 2.
- 5.3 Special Considerations - The item identification method for items (a) through (i) was changed to 5.3.1 through 5.3.9.

## 6.0 Tests

- 6.1 Procedure - There was considerable discussion and dispute over tests versus analysis. Some members believe testing is the best method but it was pointed out that such codes as ICBO and BOCA do not accept testing when analysis is possible.
- 6.2 The title of this section, "Test Evaluation" was changed to "Evaluation."
- 6.3 Special Considerations - The subsection designation (a) through (e) was changed to use the ASTM numbering system 6.3.1 through 6.3.4. Subsection (a) was deleted so section (b) is now 6.3.1, (c) is 6.3.2 etc.
- 7.0 Installation
  - 7.1 Storage at the Site
  - 7.2 Dissimilar Materials
    - 7.2.1 Dissimilar Metals (Isolation) - A sentence is to be inserted to indicate that care should be taken to protect exposed metal resulting from punching or drilling holes.
    - 7.2.2 Dissimilar Metals (Drainage Exposure)
    - 7.2.3 Masonry or Plaster
    - 7.2.4 Wood or Other Absorptive Materials - "...two coats of aluminum metal and masonry paint..." was changed to read "...two coats of aluminum metal or masonry paint...." Also "...two coats of aluminum house paint and seal..." was changed to read "...two coats of aluminum house paint or equivalent and seal...."
    - 7.2.5 Special Considerations - This section is to be added to address the problems associated with coastal areas.
  - 7.3 Fastening
    - 7.3.1 Anchorage Requirements General
    - 7.3.2 Roof to Supporting Wall
    - 7.3.3 Within the Structure - Beginning at "Plated or coated parts..." a portion of the section is to be deleted and rewritten to include plated and coated fasteners.
    - 7.3.4 To Foundation
      - 7.3.4.1 Slab, Pier and Other Anchors -
  - 7.4 Caulking and Sealing

## 7.5 Workmanship

## 7.6 Finish/Appearance

7.6.1 Cleaning and Inspection - "Pre-Painted" was deleted from the title of this section.

7.6.2 Paint Finish - The word "awning" was changed to "installation."

7.6.3 Paint Application - This section was deleted.

## 8.0 Instruction Guides

8.1 Outside of Carton (Consumer Use) - Section 8.1.4 is to be added to state that the unit is to meet ASTM product standards. Section 8.1.5 is to be added for standards.

8.2 Inside of Carton - "(Consumer Use)" was added to the title.

8.2.2.3 This section was reworded to read "Each Component shall be identified, illustrated and quantities of each given. Parts identification should be consistent with that on the certification sheet."

8.2.2.8 This section is to be added to give examples of sharp edges and the consequences not following the guide.

8.3 Inside of Carton (Installer) - This section is to be added for installer use.

## 9.0 Certification

### 9.1 Requirements

9.2 Plans - The sentence "Where alternate parts, projections... for the proposed structure." was deleted.

9.3 Calculations - "...to enable the review engineer to..." was changed to "...to enable the reviewer to...."

9.4 Test Results - A reference is to be included here to ASTM standard recording methods and test forms.

### 9.5 Quality Control

9.6 Plan distribution - "After obtaining approval of the reviewing agency..." was changed to read "After obtaining approval by the reviewing agency...."

10.0 Packaging - This section, as yet unwritten, is to make extensive use of existing ASTM standards.

11.0 Definitions

11.1 Awning - "Rooflike" was changed to "lightweight."

11.2 Carport - The term "free-standing" was deleted from this definition.

11.3 Patio Cover

Also to be included are the definitions of installer and consumer.

Additional changes and refinements are to be made during the ASTM meeting interim via written correspondence between the subcommittee members.

If additional information is required, please contact me at (404) 894-3576.

Very truly yours,

Richard Sheppard  
Assistant Research Engineer

RRS:sl



A-1817

**ENGINEERING EXPERIMENT STATION**  
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

28 June 1976

Chamberlain Manufacturing Corporation  
Monroe Division  
1118 West Spring Street  
Monroe, Georgia 30655

Attention: Mr. Gary R. Nelson  
Engineering Manager

Reference: Engineering Assistance -  
ASTM Patio, Carport and  
Awning Standard (EES/GIT  
Project A-1817)

Subject: Monthly Progress Letter - #2  
April, May 1976

Gentlemen:

In April Mr. Nelson indicated that the changes discussed at the ASTM E6.52.2 sub-committee meeting be documented and comments made on each section for improvements to the standard. The documentation is reported in EES/GIT Project A1817 progress letter for the month of March.

Enclosed is a revised copy of sections 1, 2 and 3 as they stand at the present time. Please note the rewording of sections 1.2 and 1.3.

The addresses of the various societies have been included to aid the standard user in obtaining the applicable documents. The Architectural Aluminum Manufacturers Association standards which appear in the first draft of the standard (and are not referenced in the text) appear to be useful, however, I could not locate copies of these specifications in the Georgia Tech library. The AAMA has been contacted to obtain copies of these papers. The following societies have also been contacted for the publications indicated:

- American Institute of Steel Construction - "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings"
- American Iron and Steel Institute - "Light Gage Cold-Formed Steel Design Manual" ; "Specifications for the Design, Fabrication and Erection of Cold-Formed Steel Structural Members" ; "Specifications for the Design of Light Gage Cold-Formed Stainless Steel Structural Members"




- U. S. Superintendent of Documents - CS-214 CS138-55 CS248-64

These standards may be of use as the "national design specification" referred to in section 5.2.

The ANSI standards A135.1 and A135.3 are approved ASTM standards E72-68 and E196-64 respectively. They are included in the ASTM reference section with a note indicating the ANSI number.

Many standards included in section 2 of the standard are not specifically referenced in draft #1. I have included them as suggested reference standards. I will indicate their proper location in the standard text at our next meeting.

Sincerely,

  
Richard Sheppard

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ASTM E6.52.1

1.0 General

1.1 Title

This standard shall be known as "Specifications for Design, Test, and Quality Control of Awnings, Patio Covers, and Carports," may be cited as such, and will be referred to herein as "this Specification."

1.2 Purpose

The purpose of this Specification is to provide minimum standards to evaluate performance and assure quality by the standardization and regulation of the design, construction and quality of materials used in carports, awnings, and patio covers.

1.3 Scope

The provisions of this Specification are standard for the evaluation of awnings, carports, patio covers, canopies and similar non-habitable structures including elements, connections, installations and assemblies under actual or simulated service conditions.

2.0 Applicable Documents

The following standards and specifications are a part of this Specification where referenced. Where requirements of this specification differ from those listed here, this Specification shall apply.

2.1 The Aluminum Association, 750 Third Avenue, New York City 10017

2.1.1 "Aluminum Standards of Data"

2.1.2 "Aluminum Construction Manual"

2.2 American National Standards Institute, 1430 Broadway, New York,  
N.Y. 10018

2.2.1 A58.1-72 "Building Code Requirements for Minimum Design Loads  
in Buildings and other Structures"

2.2.2 Z34.1 "Certification Procedures"

2.3 American Society for Testing and Material, 1916 Race Street, Philadel-  
phia 3, Pennsylvania.

2.3.1 E72-68 "Conducting Strength Tests of Panels for Building  
Construction" (ANSI A135.1-75)

2.3.2 E196-66 "Load Tests of Floors and Flat Roofs" (ANSI A135.3-75)

2.3.3 B117-73 "Salt Spray Testing" (ANSI Z118.1-74)

2.3.4 A165-71 "Electrodeposited Coatings of Cadmium on Steel"  
(ANSI G53.2-73)

2.3.5 A164-71 "Electrodeposited Coatings of Zinc on Steel" (ANSI  
G53.1-73)

2.3.6 D635-74 "Method of Test for Flammability of Self-supporting  
Plastics"

2.3.7 D568-74 "Method of Test for Flammability of Flexible Plastics."

2.3.8 A446-73 "Physical (Structural) Quality Specifications for Steel  
Sheet, Zinc coated (Galvanized) by the Hot-Dip Process"

2.4 Building Codes

2.4.1 Uniform Building Code

2.4.2 BOCA Basic Building Code

2.4.3 Southern Standard Building Code

2.4.4 National Building Code

2.4.5 South Florida Building Code

### 3.0 Material

This Specification applies to all materials, metal, plastic, cloth etc., used in the manufacture of pre-engineered awnings, patio covers and carports. The provisions of this Specification are not intended to prevent the use of any material not specifically prescribed by this Specification, provided any such alternate meets the minimum specifications set forth herein. The reviewing official may approve any such alternate provided he finds that the material is satisfactory and for the purpose intended at least the equivalent of that prescribed in this Specification in quality, strength, effectiveness, fire resistance, durability and safety.



ENGINEERING EXPERIMENT STATION  
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

28 January 1977

Chamberlain Manufacturing Corporation  
Monroe Division  
1118 W. Spring Street  
Monroe, Georgia 30655

Attention: Mr. Chester Lockhart

Subject: Letter Report covering the period August 16, 1976 to December 31, 1976, Project A-1817 (Contract for Engineering Assistance ASTM Patio Cover, Carport and Awning Standard)

Reference: Chamberlain Manufacturing Corporation - Georgia Tech Industrial Agreement, EES Project A-1817

Dear Sir:

During the report period, the ASTM standards and specifications were examined for areas of interest to the Carport/Patio Cover/Canopy Preliminary Standard. This review indicated a number of areas where additional testing standards/specifications are needed to supplement and support the planned Carport/Patio Cover/Canopy Standard. Some of these are:

- Tests for Complete Structures
- Tests for Standing Seam Panels
- Tests for Other Panels
- Tests for Panel Connections
- Tests for Beam Connections
- Tests for Sheet Metal Screw Withdrawal
- Tests for Anchor Bolt Shear and Withdrawal

Note: Robert W. Hausler is undertaking getting at least some of the above topics initiated in other sub-committees of ASTM E 06, Performance of Building Material.

Copies of six model building codes were obtained and studied relative to the Preliminary Standard. This information revealed that at least some modification of existing codes will be required. Of course the committee hopes that the code writing bodies will accept an ASTM Standard and write it into the code eventually.

Other pertinent material has been studied relative to the Preliminary Standard from sources such as:

The Aluminum Association  
American Iron and Steel Institute  
Architectural Aluminum Manufacturers Association  
American National Standards Institute  
U. S. Navy Facilities Manual DM-2  
Mobile Homes Manufacturers Association  
Metal Building Manufacturers Association

Two conferences were held with the sponsor at Monroe on September 7, 1976 and October 27, 1976 to review the status of the work and to plan additional effort under this engineering assistance effort.

At the request of the sponsor, Georgia Tech had a representative at the Denver meetings of the committee working on the Preliminary Standard and has updated the copy to reflect the work at the Denver meeting.

Finally, at the Denver meeting, the sponsor requested Georgia Tech to perform calculations on wind-loading of the model structures described by Harold Stillman, Chairman, Sub-Committee E06.52, in his letter of April 20, 1976. These calculations have been completed.

The work has been completed with an approximately \$500 overrun of the budget caused by the unbudgeted trip to the Denver ASTM meeting November 14-16, 1976.

The present contract extension expired December 31, 1976. Copies of the updated Preliminary Standard, wind load calculations and a few comments relative to the undersigned's thoughts on the present draft since Denver are being forwarded under separate cover.

This letter report and the reports submitted under separate cover complete all requirements under the present contract. Georgia Tech sincerely hopes that our efforts have significantly assisted Chamberlain and the ASTM in the preparation of the draft of the Preliminary Standard and we would certainly appreciate the opportunity of providing continuing assistance in this or any other area of mutual interest.

Yours very truly,

John F. Kinney /  
Project Director

JFK:sab