



STATE OF NEW JERSEY
DEPARTMENT OF LABOR & INDUSTRY
PERCY A. MILLER, JR., *Commissioner*

RULES AND REGULATIONS

governing the

DESIGN AND CONSTRUCTION REQUIREMENTS

for approval of

LOW-CARBON, HIGH TENSILE STRENGTH STEEL CIRCULAR ARCH BUILDINGS
OF THE QUONSET TYPE

BUREAU OF ENGINEERING AND SAFETY
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Trenton, New Jersey

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SECTION 1 - SCOPE AND PURPOSE

These rules and regulations embrace minimum requirements for design and construction standards of the Quonset type of building construction for use as storage buildings, manufacturing buildings and places of public assembly. Conformance to these rules and regulations shall be required for the approval of filed plans and the acceptance of construction.

SECTION 2 - DEFINITIONS

- 2.1 Approved: *shall mean approved by the Commissioner of Labor and Industry or his authorized representative.*
- 2.2 Commissioner: *shall mean the Commissioner of Labor and Industry of the New Jersey Department of Labor and Industry.*
- 2.3 Department: *shall mean the New Jersey Department of Labor and Industry.*
- 2.4 Division: *shall mean the Division of Labor of the Department.*
- 2.5 Effective date: *shall mean the date on which these rules and regulations become effective.*
- 2.6 Shall: *shall mean a mandatory requirement.*
- 2.7 Should: *shall mean an advisory recommendation.*
- Adequately, Effective or Securely: *shall mean conditions subject to determination by the Commissioner.*
- 2.8 Words in the singular and plural shall have the same meaning in the plural and singular respectively.
- 2.9 Substantial: *shall mean construction of such strength and workmanship that the assembly shall under normal or reasonably foreseen conditions or circumstances resist usage, wear, shock and deterioration.*
- 2.10 Place of public assembly: *any structure or building that is used for the purpose of public entertainment at any time and located in a municipality that has no local building supervision.*

SECTION 3 - FILING OF PLANS

- 3.1 Excepting as provided hereinafter there shall be compliance with the requirements as specified in general rules and regulations for examination and approval of plans.
- 3.2 Minimum information -
- Inasmuch as standard drawings have been approved and are on file, requirements regarding details of design as ordinarily required will be waived. The following minimum information shall be provided on all drawings:
- Plot plan to a scale of 1 inch equals 50 feet or larger.*
 - Foundation plan to a scale of 1/8 inch or larger to also include egress locations. Foundation plan shall show a section of the foundation, minimum depth 3 feet 6 inches. (See Section 5.)*
 - Elevation - side and end, to a scale of 1/16 inch equal 1 foot or larger.*
 - Typical cross section, to the same scale as elevation.*
 - Reference shall be made to applying standard drawings.*
- 3.3 Where there are deviations from approved standards, complete plans and details of design of such modifications must be submitted for approval in addition to the minimum information set forth above.
- 3.4 Plans for sanitation facilities and provisions for heating the building as required in the 'Rules and Regulations Governing Sanitation in Places of Employment' are to be made a part of the filing.

SECTION 4 - APPROVED DRAWINGS AND OCCUPANCIES

- 4.1 The following types of structures are approved for the indicated occupancies. Information and details shown on approved standard drawings of the approved designs may be referred to by a suitable notation on plans that are submitted for approval. The redrawing of such information and details may be omitted,

Approved types of structures -

4.1.1 *Single Circular arch:*

- 40-B-A; 40-B-B; 40-B-C;*
- 36-A; 36-B; 36-C;*
- 32-A; 32-B; 32-C;*
- 24-A with vertical side walls;*
- 20-A; 20-B; 20-C;*

4.1.2 *Multiple circular arch:*

60-A; 60-B; 60-C;
80-A; 80-B; 80-C;
100-A; 100-B; 100-C; and up in multiples of 20;

4.1.3 *Multiple circular arch with one straight side wall:*

30-A; 30-B; 30-C;
50-A; 50-B; 50-C;
70-A; 70-B; 70-C;
90-A; 90-B; 90-C;
110-A; 110 -B; 110 -C; and up in multiples of 20;

4.1.4 *Multiple circular arch with two straight side walls:*

40-A; 40-B; 40-C;
60-A; 60-B; 60-C;
80-A; 80-B; 80-C; and up in multiples of 20.

4.2 Approved occupancy for each approved type of structure is indicated by final letter sub-script as follows:

A - Storage

B - Manufacturing

C - Public Assembly

4.3 Where the fire load exceeds ten (10) pounds per square foot or the collateral loading exceeds four (4) pounds per square foot, or both, special designs shall be submitted for approval for all occupancies.

SECTION 5 - GENERAL REQUIREMENTS

5.1 Plans for all buildings drawn in accordance with Section 3 above must be submitted in triplicate together with the necessary applications and fee. Plans and applications must be sealed by a New Jersey License Professional Engineer or Registered Architect for approval and be approved before commencement of construction.

5.2 The design must conform to the design standards that have been approved and which are on file at Bureau offices.

5.3 Foundations

5.3.1 *The bottom of footings shall rest on firm, undisturbed soil but in no case shall be less than 3 feet 6 inches below grade.*

5.3.2 *Foundation walls resisting earth pressure or horizontal thrusts shall be designed for such specific purpose and shall be of monolithic concrete.*

5.3.3 *Foundation walls not over 12 feet high supporting vertical loads only shall be constructed of masonry at least 8 inches thick. When blocks are used adequate bracing or reinforcing shall be provided, where necessary, by pilasters, reinforcing steel or spandrel beams.*

5.3.4 *Buildings of Type B and C shall be anchored to the foundation walls with bolts at least $\frac{3}{4}$ inch diameter with standard hook imbedded in the concrete for at least 12 inches and shall be spaced at least every 10 feet along the foundation walls*

5.4 Columns

5.4.1 *All free standing columns fabricated of light gage steel which are not a part of walls or partitions shall be encased in masonry for a height of 8 feet above the floor line. The masonry shall extend at least 3 inches from the steel in all directions.*

5.5 Fire Protection

5.5.1 *Reasonable consideration shall be given to fire protection and fire prevention, the requirements for which shall be governed by the estimate of the content, fire resistance which must be approved. If the fire load is estimated to exceed 10 pounds per square foot over any portion of the area, the percentage to be allowed before additional fire resistance shall be required shall be determined by the Commissioner.*

5.5.2 *Adequate fire protection shall be provided for the heating unit which is installed to heat the building.*

- 5.5.3 *Buildings shall not exceed 10,000 square feet in fire area. Buildings with a gross floor area of more than 10,000 square feet shall be divided into fire areas not exceeding 10,000 square feet by fire resistive walls of 2 hour fire rating extending 3 feet above the roof and 3 feet at each side at the exterior walls of the building. In lieu of wing walls "T" six feet wide walls or other arrangements providing effective fire cutoffs may be accepted.*
- 5.5.4 *Buildings that exceed 4,000 square feet in floor area shall comply with one of the following two requirements:*
- a. *Exterior wall construction shall have at least one hour fire resistive rating.*
 - b. *Distance from other buildings, property lines, or combustible storage shall be not less than 50 feet.*
- 5.6 *Where collateral load exceeds 4 pounds per square foot there shall be additional structural requirements to be determined by the Commissioner.*
- 5.7 *Immediately upon completion of construction, a field inspection shall be made by a Licensed Professional Engineer or Registered Architect and shall be certified in writing to the Division that the building conforms with the approved plans and design standards if such be the case. Such a certification shall be one of the minimum requirements for acceptance.*
- 5.8 *The structure shall be in a safe condition at all times and no other loads other than those indicated on approved drawings shall be super-imposed.*
- 5.9 *No building of any of the types specified herein shall be either erected, altered or used unless approval has been received from the Department.*
- 5.10 *There shall be compliance with the requirements for sanitation, ventilation and lighting as provided for in appropriate rules and regulations now in effect.*

SECTION 6 - SPECIAL REQUIREMENTS

6.1 Manufacturing

- 6.1.1 *All circular ribs are to be doubled every 20 feet.*
- 6.1.2 *Fire protection for the structural members is to be provided in such a manner and of such combustible material, as to be equal to or equivalent to, providing insulation of $\frac{1}{4}$ inch by asbestos flux board of the circular ribs.*
- 6.1.3 *Where collateral materials that are to be applied for fire protection or other purposes exceed 4 pounds per square foot, all circular arch ribs must be doubled.*
- 6.1.4 *The building shall be adequately sealed to provide an average temperature during the work hours of not less than 70°. Adequate temperature control shall be provided during periods of hot weather.*
- 6.1.5 *Where the fire load exceeds 10 pounds per square foot an altered design shall be submitted for approval.*

6.2 Places of Public Assembly

- 6.2.1 *For fire loads not in excess of 3 pounds per square foot and collateral load not in excess of 6 pounds per square foot, all arch ribs shall be doubled. For fire or collateral loadings in excess thereof, the design shall be altered in an approved manner.*
- 6.3 *Provision for expansion shall be made in all structures of the type herein mentioned for lengths exceeding 160 feet. In such cases, an additional rib shall be installed with purlins properly spaced and separated.*

These rules and regulations supersede those pertaining to storage building requirements for circular arch buildings and filed in the office of Secretary of State on December 27, 1948.