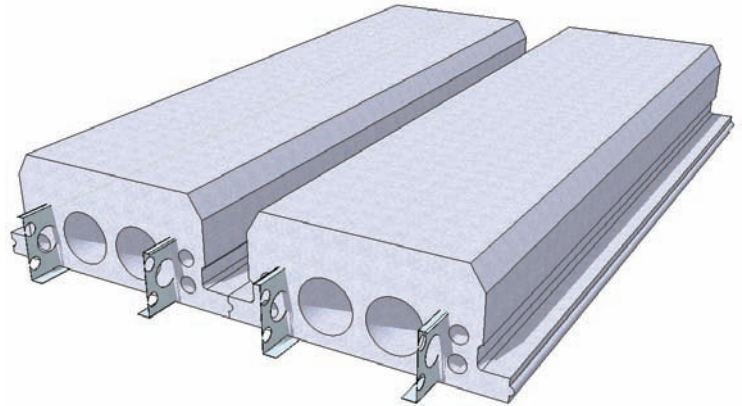


Building Concrete Floors & Roofs With Quad-Deck

What is Quad-Deck?

Quad-Deck is what is called a “pan-form” for the construction of a monolithic structure combining concrete joists, spaced at 24” centers (610mm), with a thin slab, usually between 2 and 5 inches (51 and 127mm), which acts as a shear panel. Like other ICFs, Quad-Deck is meant to stay in place and act as both insulation and a substrate for finishes after the concrete is placed into service. Another term for this type of structure is a “T-beam panel”, which is commonly seen in parking garage designs. The concrete joists and slab combine to provide a “one-way” slab, supporting loads between two supporting structures.



Span and Floor Loads for Quad-Deck

Spans of up to 32 feet (9.75m), measured from the center of the supporting elements, can be accomplished (using L/360 deflection criteria) without modification to standard Quad-Deck profiles. Spans will of course, depend on live loads assumed in the design of the structure. Depending on the span, live loads exceeding 100 lbs/sqft (488kg/m²) can be supported. Longer spans may be achieved by increasing the T-beam height profile with sheet foam added to the Quad-Deck. Other design features, like additional reinforcing steel, post tensioning, or camber can also increase spans or loading. It is recommended that a licensed engineer provides specifications for each structure.

Shoring During Pour

Each Quad-Deck panel contains two steel “Z-bars” that act as secondary form support. You need to provide primary shoring to support the panels and maintain elevation of the structure. This means that typically, less shoring is needed with Quad-Deck than conventional systems, generally every 6 to 8 feet, depending on the design of the floor/roof. It is recommended that an analysis of the shoring needs for each job be carried out by a licensed engineer. Other guidelines on shoring and re-shoring are available from the American Concrete Institute (ACI). See standards list at the end of this bulletin.

Shoring Removal

The concrete structure must be able to support its own weight (dead load) and the loads imposed during construction (construction load) without deflection that will harm the structure.

Preferred Method: Determination of the length of time required before removal of shoring (or re-shoring) should be made by the engineer/architect of record, based on the compressive strength of the concrete. Compressive strength can be determined by cylinder tests on field cured test specimens taken during the pour. Your ready-mixed

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concrete supplier can supply high-early-strength concrete for early removal of shoring. Depending on temperature and curing conditions, the desired strengths of field cured cylinders can be reached in 1 - 7 days.

Alternate Method: If plans and contract documents contain no specification for minimum compressive strength of concrete at the time of formwork and shoring removal, ACI 347, Section 3.7 provides guidelines pertaining to one-way floor slabs and the removal of shoring. See standards list at the end of this bulletin.

Slab Thickness

Because of the support provided by the reinforced concrete joists every 24 inches (610mm), a much thinner slab section is required, usually between 2 and 5 inches (51 and 127mm), depending on live loads and other forces applied to the slab. This design results in 30 to 40% concrete savings in most jobs, and therefore eliminates 30 to 40% of the weight of the floor/roof.

Rebar Requirements

Reinforcing requirements are mostly a function of the desired span between supporting points, and the live loads imposed on the structure. The size, grade and frequency of reinforcing bar should be determined by a licensed engineer for each project. For estimating purposes, Quad-Lock can provide span tables showing suggested reinforcement.

These are general conditions around design and construction with Quad-Deck. The Quad-Lock Training and Technical Services Department can answer more specific question regarding your project.

Publications:

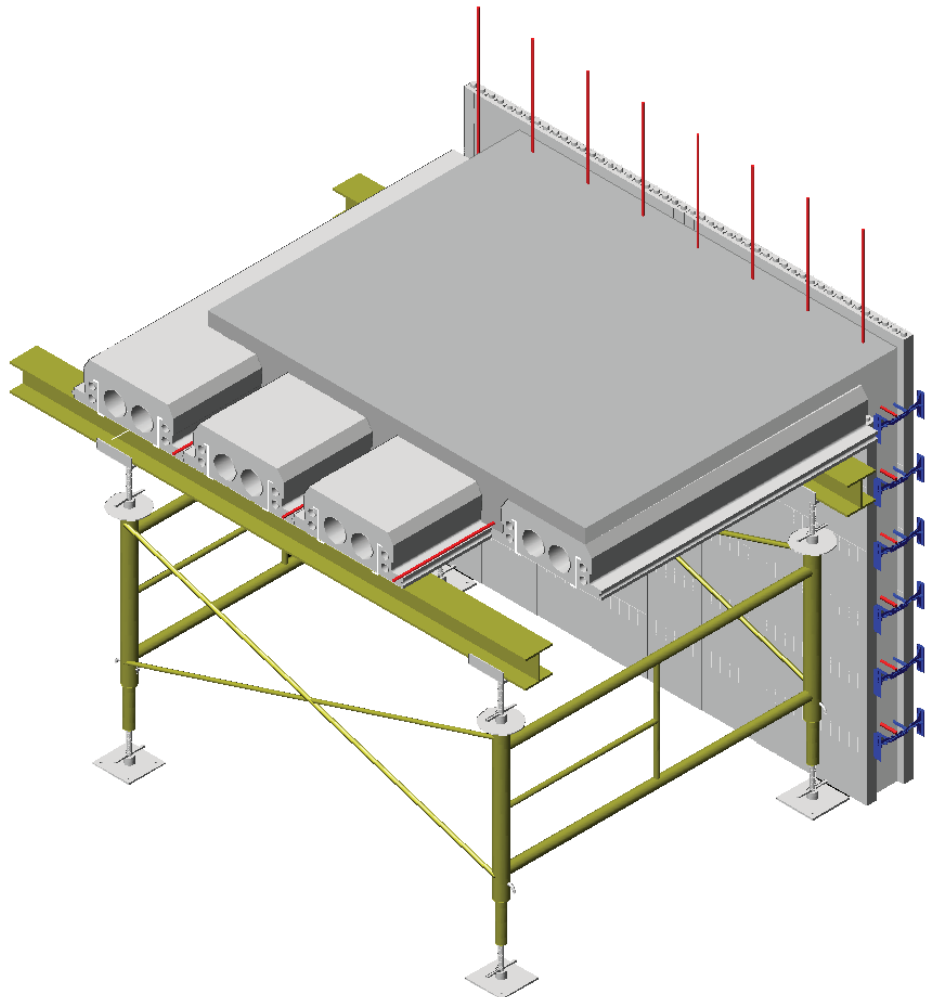
More information, code requirements, and guidelines can be found in these publications.

Document	Title
ACI 347	Guide to Formwork of Concrete
ACI 347.2R-05	Guide for Shoring/Reshoring of Concrete Multistory Buildings
ACI 318	Building Code Requirements for Structural Concrete
ACI 301	Specifications for Structural Concrete
ANSI A10.9	American National Standard for Construction and Demolition Operations – Concrete and Masonry Work – Safety Requirements
OSHA 29 CFR	Construction Safety and Health Regulations for Construction
SEI/ASCE 37	Design Loads on Structures During Construction
CSA S269.1-1975	Falsework for Construction (Reaffirmed 1998)
CSA S269.3-M92	Concrete Formwork
CSA A23.1	Concrete Materials & Methods of Construction
CSA A23.2	Methods of Test and Standard Practices for Concrete
CSA A23.3	Designing Concrete Structures

Building Concrete Floors & Roofs With Quad-Deck - *cont'd...*

Shoring & Bracing: Installer is responsible for the design and correct installation of shoring of Quad-Deck forms in accordance with ACI (American Concrete Institute) 347.2R-05 "Guide to Framework for Concrete", Chapter 2, Design. Any variance from these standards must be provided and certified in advance, by a Structural Engineer, licensed for the jobsite location and specifications.

Reinforced Concrete: Installer is responsible for placement of all reinforcing steel in accordance with ACI 318-05 "Building Code Requirements for Reinforced Concrete". Any variance from these standards must be provided and certified in advance by a Structural Engineer, licensed for the jobsite location and specifications.



For more information, contact Quad-Lock's Training and Technical Services Department at 888-711-5625 or 604-590-3111.