engineering manual

STEEL DECK INSTITUTE

FLOOR DECK DESIGN

second edition



FLOOR DECK DESIGN MANUAL

SECOND EDITION

JUNE 2020

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Since hazards may be associated with the handling, installation, or use of steel and its accessories, prudent construction practices should always be followed. The Steel Deck Institute recommends that parties involved in the handling, installation or use of steel and its accessories review all applicable manufacturers' safety data sheets, applicable rules and regulations of the Occupational Safety and Health Administration and other government agencies having jurisdiction over such handling, installation or use, and other relevant construction practice publications.

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FOREWARD

This *SDI Floor Deck Design Manual, 2nd Edition* updates, expands upon, and replaces the First Edition of this Manual (2013) as the main steel deck industry manual on steel floor deck design. This Manual was developed to conform to the requirements of the ANSI/SDI NC-2017 "Standard for Non-Composite Steel Floor Deck" and the ANSI/SDI C-2017 "Standard for Composite Steel Floor Deck-Slabs" Standards. The SDI recommends that the user of this Manual obtain a copy of these Standards and refer to them when using this Manual. The ANSI/SDI NC-2017 and ANSI/SDI C-2017 Standards are available for download from the SDI website.

While conforming to the requirements of the Standards, this Manual also provides recommendations of good design practices that may either not be included in the Standards, or may exceed the minimum requirements of the Standards. When recommended practice is beyond the minimum requirements of the Standards, this will be noted. In all instances, the design of steel floor deck as a component of a building or other structure is within the scope of practice of a Licensed Professional Engineer or Architect, and all liability for compliance with building code requirements is the responsibility of that Designer. Professional judgment must be exercised when the user applies the data or recommendations contained in this Manual.

This Manual describes the use of steel floor deck in common applications. Floor deck can be used in applications that are not covered within the scope of this Manual. The use of deck in these alternate applications may be permitted under provisions included in the applicable building code.

Where this Handbook or other SDI publications refer to "Designer," this means "The licensed professional responsible for the content of the drawings and specifications from which the steel deck is to be constructed." This is usually the structural engineer of record, however it may be the architect or other licensed professional acting within the scope of their license.

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INTRODUCTION

SECTION 1

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Section 1.1 General Description of Floor Deck

Corrugated steel deck has been used for well over one hundred years. As early as 1903, corrugated steel deck appeared in the "*Pocket Companion containing Useful Information and Tables appertaining to the use of Steel as manufactured by Carnegie Steel Company For Engineers, Architects and Builders"* by Carnegie Steel Company. These products evolved into the steel form deck of today.

Composite steel deck has been used in the United States since the 1950's. Over the years it has established itself as a safe, dependable, and economical product. Today, almost all multi-story steel framed buildings use composite steel floor deck as a major component in the building.

Typically, steel form deck and composite steel deck have four main functions:

1. Serve as a working platform
2. Serve as a form for the concrete slab
3. Provide positive bending reinforcement for the composite steel deck-slab (composite deck only)
4. Provide resistance to horizontal loads resulting from wind or seismic forces

Non-composite steel form deck and composite steel floor deck, while serving two distinct purposes, have a number of similarities. These similarities include the material from which the deck is manufactured, manufacturing tolerances, and design methods used to determine the strength of the profile. In subsequent sections, the differences will be addressed.

Section 1.2 Floor Deck Production

Deck manufacturers purchase steel in coil form from steel producing companies. The steel is ordered to an ASTM specification or other acceptable criteria. As the steel is received at the deck plant it is logged into the inventory and each subsequent job produced from each coil is recorded.

The majority of the profiles that are available today are produced on roll forming equipment. A roll forming line consists of an uncoiler and a series of graduated tools that bend the flat steel into the required shape. The steel passes through the tooling in a continuous strip and at the correct instant the deck is cut to length (with a shear blade) making a square cut. The resulting profile is very consistent in cross section.

Some manufacturers have a coil coating line set up to paint the uncoiled steel immediately before the sheet is formed. But most manufacturers pre-paint coils or order pre-painted coils from coil coating companies for later forming into deck. In either case, the painting process is the same. As the steel unreels from the coil it is first cleaned and dried. It is sent through paint rollers and then baked, so that when it emerges it is coated with a provisional and flexible primer coat of paint. The steel can be recoiled or proceed directly into the roll former. The primer paint is designed to provide a surface that readily accepts a finish top coat. The primer paint can be applied over uncoated or galvanized steel. Primer paint is never applied to the topside of composite deck as it would adversely affect bonding with the concrete slab. If sprayed fireproofing materials are to be applied, only primer paints specifically approved for that purpose or a bare galvanized surface may be used.

Section 1.3 Non-Composite Floor Deck Profiles

Shallow Profiles for Short Spans

While manufacturers produce various profiles, the most common profiles for forming non-composite shallow slabs are nominally 9/16 inch, 7/8 (or 1) inch or 1-5/16 inch deep. These profiles are most frequently used on comparatively closely spaced open web steel joists or cold-formed trusses or joists. Thin slabs are typically used with these profiles.

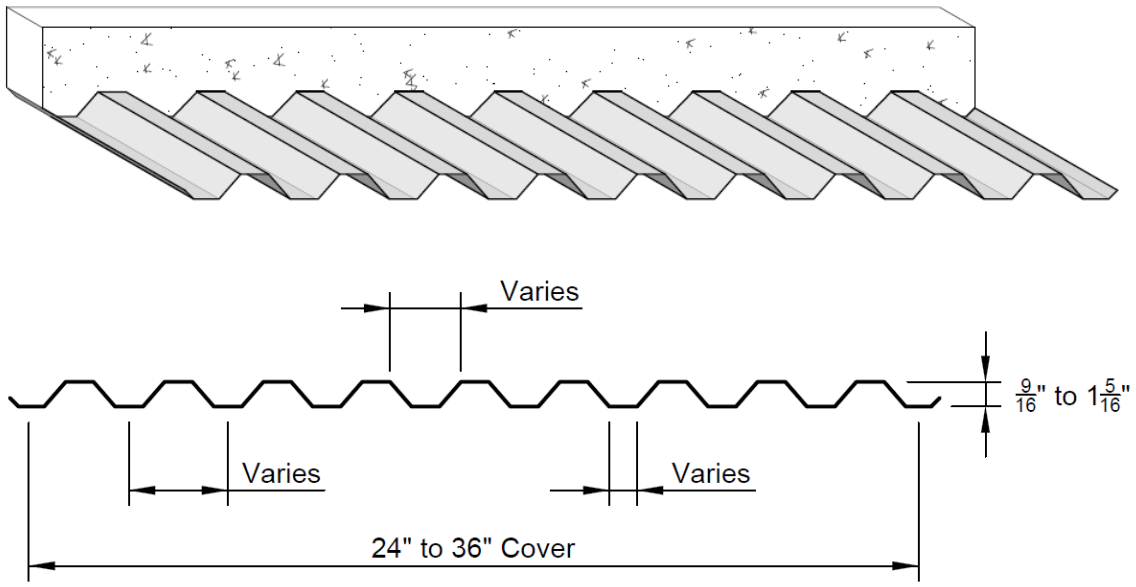


Figure 1.1 – Shallow Non-composite Deck

Standard Profiles for Medium Spans

Manufacturers produce trapezoidal shaped profiles of relatively standard dimensions in 1-1/2 inch, 2 inch, and 3 inch depths for use as non-composite or composite deck for forming concrete floor slabs spanning distances typically used in steel framed buildings. The dimensions of these profiles are intended to allow for the use of shear connectors on composite steel beams. They are most frequently used without temporary shoring, but shoring may be used and must be used in some instances.

The 1-1/2 inch deep deck typically shares a cross section profile with 1-1/2 inch Wide Rib roof deck and 1-1/2 inch composite deck (but without embossments). This deck is usually installed in an inverted position from Wide Rib roof deck, with the wide flange of the deck facing down, as shown in Figure 1.2, for additional effective concrete slab thickness. It is possible to install this deck in the same orientation as Wide Rib roof deck, with a resulting reduction in effective concrete slab thickness. Refer to individual manufacturer catalogs for what that manufacturer considers to be a normal or inverted orientation for this form deck profile.

The 2 inch and 3 inch decks typically share cross section profiles with 2 inch and 3 inch composite deck (but without embossments). Because of these commonalities, construction span tables for composite decks may be used for these profiles.

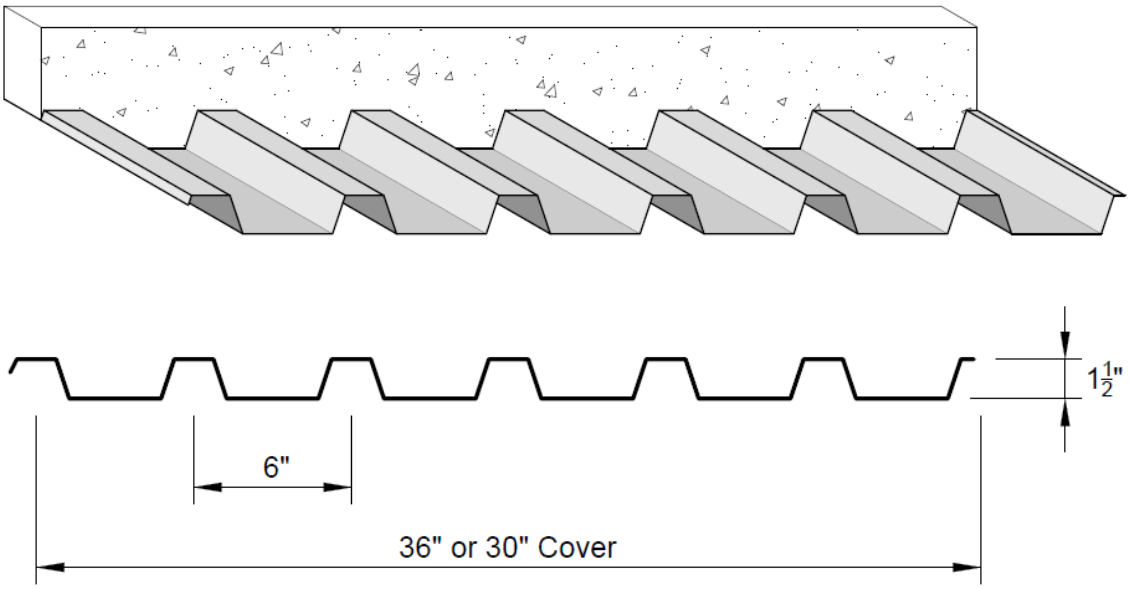


Figure 1.2 – 1-1/2 Inch Non-composite Deck (Typically Wide Flange Down *)

*** Note that used in this manner the deck is inverted from the normal position of 1-1/2 Inch Wide Rib Roof Deck. It may also be used Wide Flange Up, which changes the section properties and reduces the concrete fill factor.**

Other depths and profiles are available within medium span deck types from some manufacturers. Individual manufacturers should be consulted for availability of specific profiles.

Special Profiles for Long Spans

Long span non-composite floor decks (4-1/2 inch, 6 inch, 7-1/2 inch, and deeper) are produced by some manufacturers. However, there is less uniformity among these products than with shallow and standard depth deck profiles. Individual manufacturers offering these profiles must be contacted for technical information.

Section 1.4 Composite Floor Deck Profiles

Standard Profiles for Medium Spans

Manufacturers produce trapezoidal shaped profiles of relatively standard dimensions in 1-1/2 inch, 2 inch, and 3 inch depths for use as composite deck for forming concrete floor slabs spanning distances typically used in steel framed buildings. The dimensions of these profiles are intended to allow for the use of shear connectors on composite steel beams. They are most frequently used without temporary shoring, but shoring may be used and must be used in some instances.

The 1-1/2 inch deep deck typically shares a cross section profile with 1-1/2 inch Wide Rib roof deck and 1-1/2 inch non-composite deck. The ribs are typically spaced at 6 inches on center. This deck may be installed in an inverted position for additional effective concrete slab thickness with no change in the bond characteristics of the deck.

The 2 inch and 3 inch decks typically share cross section profiles with 2 inch and 3 inch non-composite deck. Because of these commonalities, construction span tables for these decks may be identical to those for the same non-composite deck profile. This should be verified with the specific manufacturer.

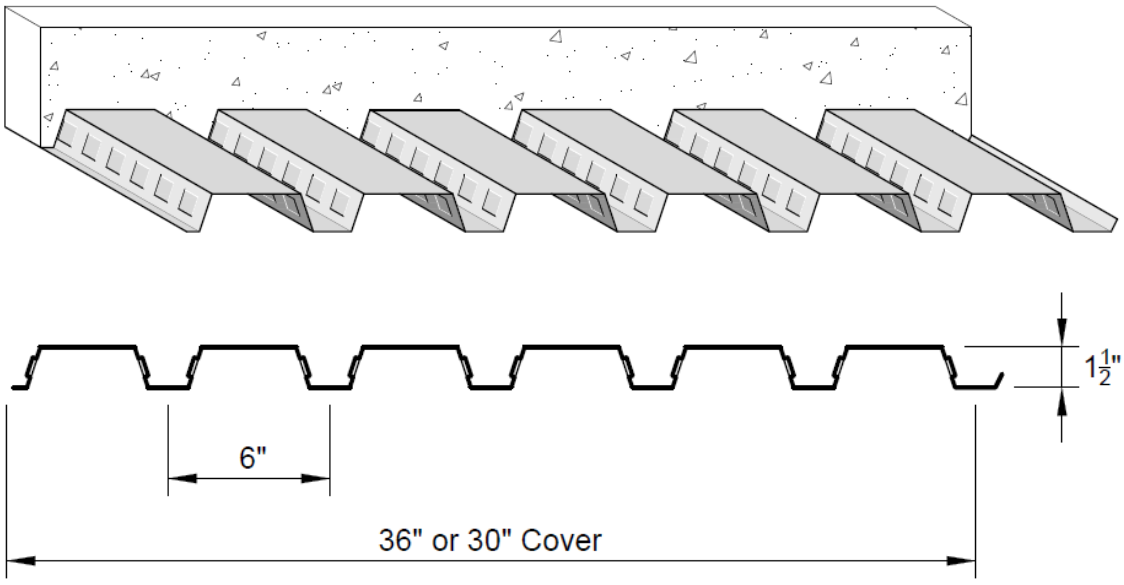


Figure 1.3 – 1-1/2 Inch Composite Deck (Typically Wide Flange Up)

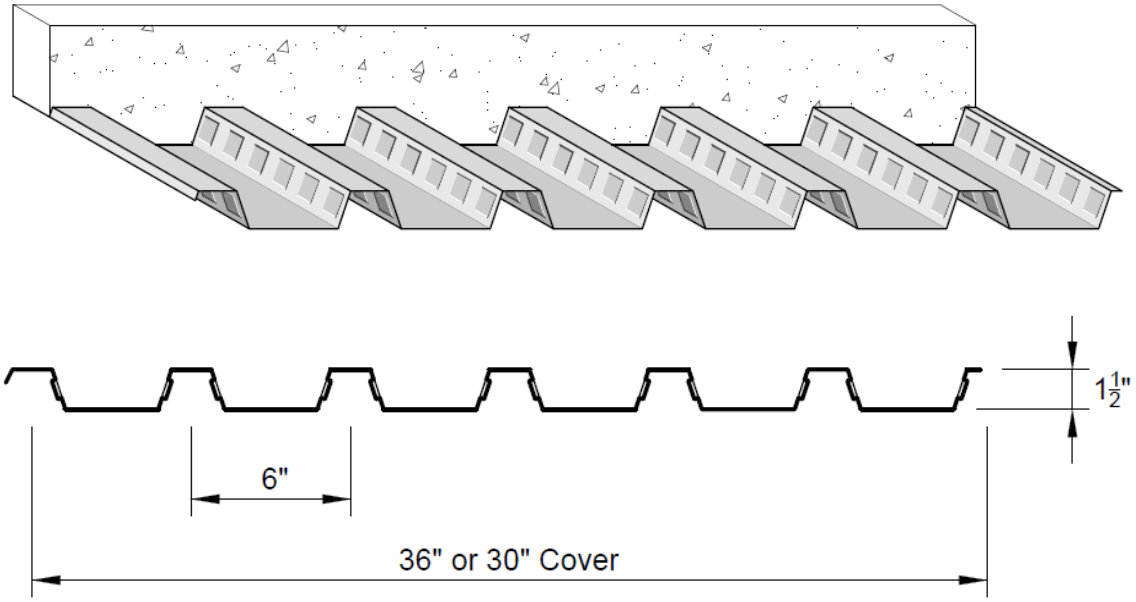


Figure 1.4 – 1-1/2 Inch Inverted Composite Deck (Typically Wide Flange Down)

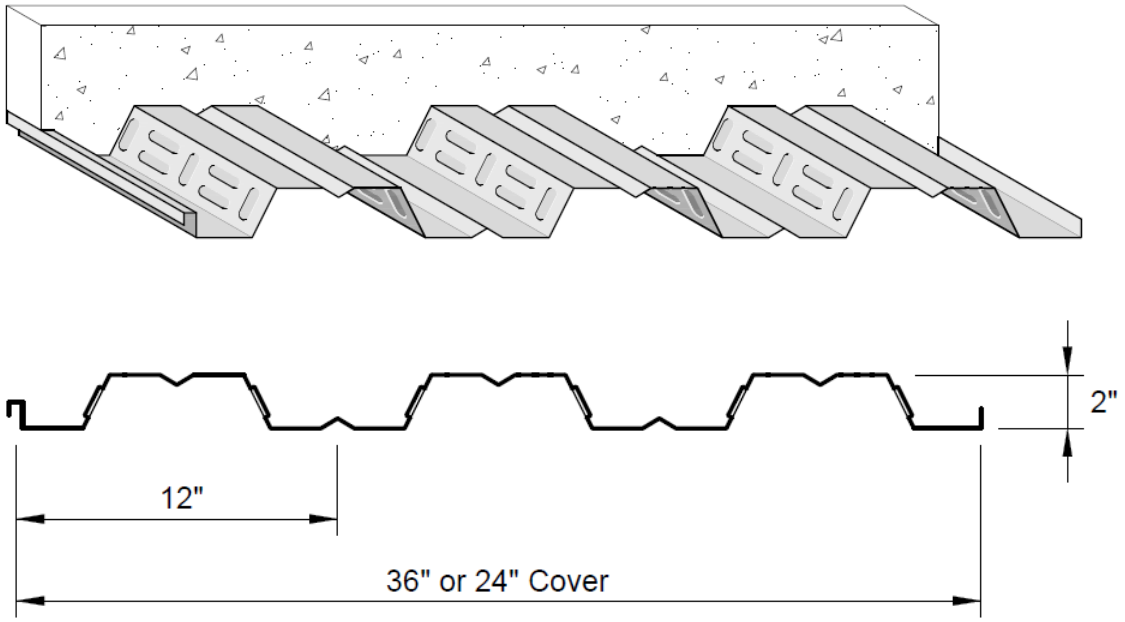


Figure 1.5 – 2 Inch Composite Deck

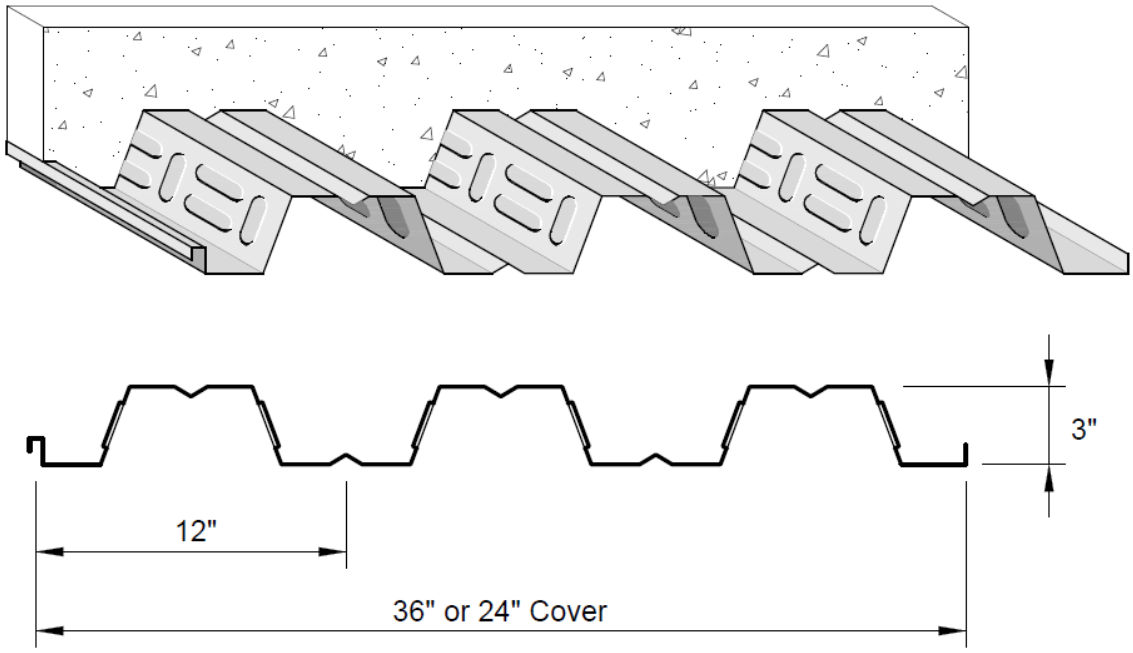


Figure 1.6 – 3 Inch Composite Deck

Other Composite Deck Profiles

Over the years, various profiles and systems were used for composite steel deck, including sections with welded transverse wires. Many of these are no longer produced, but still function as intended in existing construction.

Other composite deck depths and profiles are available from some manufacturers. Individual manufacturers should be consulted for availability of specific profiles.

Currently, some manufacturers produce a dovetail shaped profile, as shown in Figure 1.7. The load tables contained in this Manual are not applicable to these sections, and technical information must be obtained from the specific manufacturer.

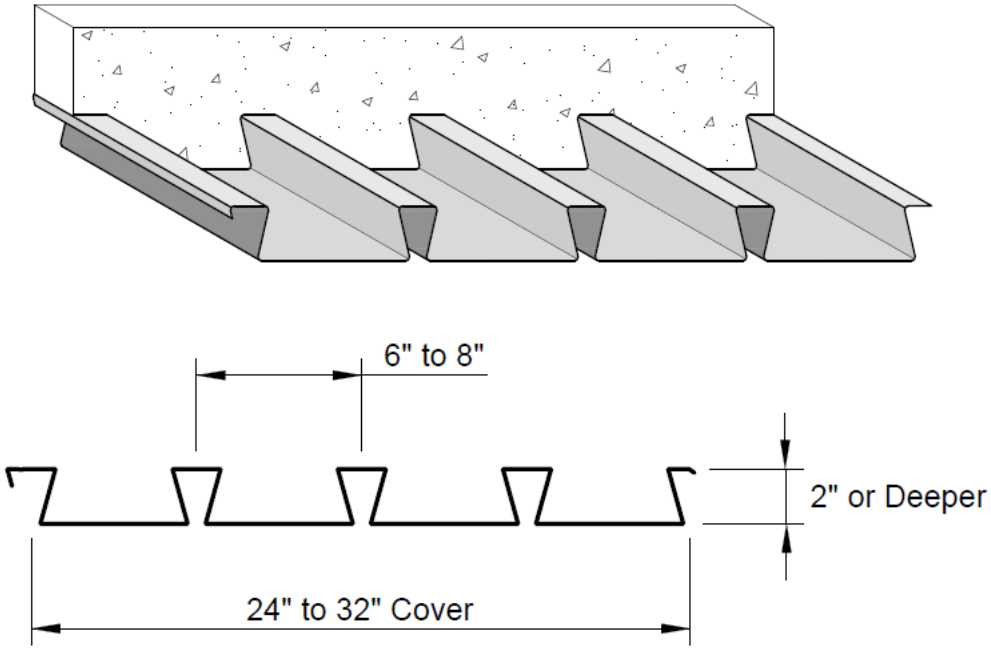


Figure 1.7 – Typical Dovetail Composite Deck Profile

Also currently produced by some manufacturers are composite versions of the 4-1/2 inch, 6 inch, and 7-1/2 inch long span profiles. Individual manufacturers offering these profiles must be contacted for technical information.

Section 1.5 Cellular Floor Deck Profiles

Some manufacturers produce cellular deck profiles for use in both composite and non-composite applications. Cellular profiles are made by attaching a flat sheet or another deck section to the bottom of many of the standard composite and non-composite deck profiles by either resistance welding or mechanical fastening. Due to the increased structural properties of the resulting cross section, these profiles can span longer distances and support larger live load capacities than non-cellular profiles. The bottom sheet may be used to create an exposed finished ceiling.

If the appearance is of concern, options are available from some manufacturers to enhance the appearance and function of the exposed surface. These include factory application of special paints, embossment of the exposed steel to mask the weld marks, and perforation to allow for improved sound absorption. Individual manufacturers offering these profiles and options must be contacted for technical information.

Cellular floor deck profiles have been used as raceways for in-floor electrical distribution in the past and are currently still available from some manufacturers. Technical information regarding these systems must be obtained from those manufacturers.

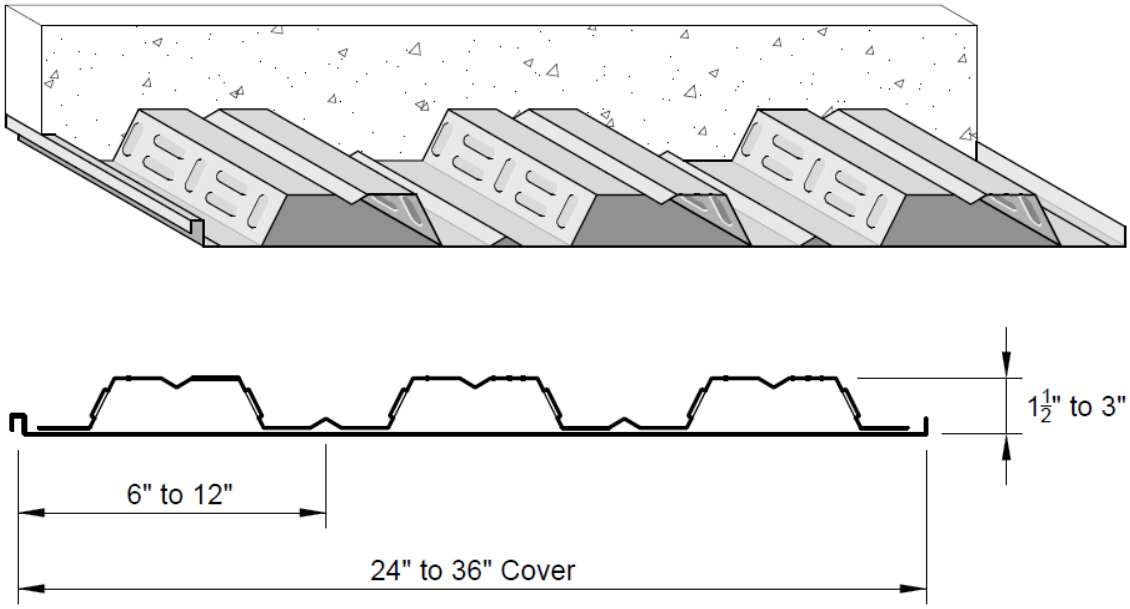


Figure 1.8 – Typical Cellular Deck Profile

Section 1.6 Side-lap Configurations

Deck can be manufactured with either a nested or interlocking side lap, depending upon the manufacturer. Generally however, profiles that are 1-1/2 inches and shallower are provided with nested side-laps, and deeper profiles have interlocking side-laps. However there are exceptions. Some manufacturers can provide either side-lap profile. A nested side lap can be connected by screws or arc fillet or arc spot welds. An interlocking side lap can be connected using screws, top arc seam welds, button punches, or proprietary clenching systems, depending upon the exact interlocking side-lap configuration. Some interlocking side-laps cannot accept screws and the manufacturer's details should be consulted.

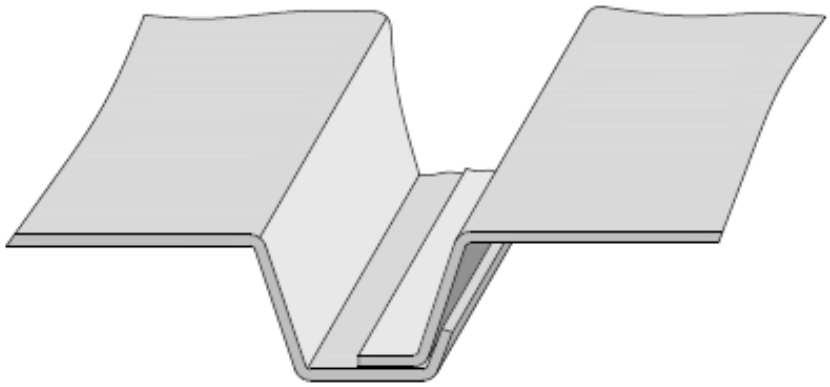


Figure 1.9 – Nested Side-lap

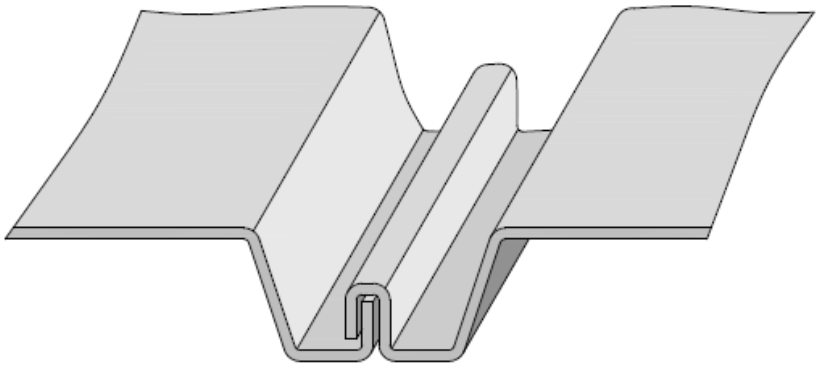


Figure 1.10 – Interlocking Side-lap

Section 1.7 Materials

Any steel that is listed in Section A of the AISI S100-16 Standard is permitted to be used for steel floor deck. Steel floor deck is most commonly produced from carbon steel meeting ASTM A1008 or galvanized or galvanealled steel meeting ASTM A653. Some manufacturers may have the ability to produce steel deck from other materials, such as stainless steel; however, deck produced from materials other than carbon or alloy steel is outside the scope of the ANSI/SDI NC-2017 and ANSI/SDI C-2017 Standards and this Manual. The availability of alternate materials must be confirmed with the individual manufacturer.

The load tables in this Manual are based on steel with a yield strength of 40 ksi for composite deck, and either 40 or 60 ksi for non-composite deck. Many manufacturers' product specific load tables are also based on the same assumption, but most manufacturers have the ability to use steels with other yield strengths. The literature of an individual manufacturer should be consulted to determine the specific steel grades used for their products.

Section 1.8 Deck Finishes

Floor deck is available in several finishes. The availability of any specific finish should be verified with the specific deck manufacturer. No deck finish is completely resistant to severe environmental conditions and the Designer must consider the exposure of the deck when selecting a deck finish and in determining what, if any, additional field coatings must be applied to the deck.

Galvanized Finish

A galvanized finish consists of a layer of zinc on top of a thin layer of zinc iron alloy. A zinc coating offers corrosion resistance (relative to the base steel) due to its self-sacrificial characteristics. Zinc is anodic to steel, which causes moisture, chlorides, and sulfides to attack and oxidize the zinc before the steel. Secondarily, the zinc coating provides a barrier between the steel substrate and the environment.

Galvanized deck with zinc coating complying with ASTM A924 is available in several coating thicknesses, the most common being G-30 (0.30 oz. per sq. ft. total over both sides of the sheet), G-60 (0.60 oz. per sq. ft. total over both sides of the sheet) and G-90 (0.90 oz. per sq. ft. total over both sides of the sheet.) Other thicknesses may be available; the specific manufacturers should be consulted as to availability.

A galvannealed finish complying with ASTM A924 has about 10% iron in the zinc coating due to the post-dip heating process, and may develop a reddish color when left exposed. Because this coloration can be confused with rust, this finish is best used when painted.

Zinc-Aluminum coating finishes complying with ASTM A924 are not recommended due to the aluminum content of the coating. Aluminum reacts with concrete, and in the presence of chloride ions, may also react electrolytically with steel, causing cracking and spalling of the concrete.

Bare (Uncoated) Finish

Steel floor deck may be provided without a protective finish. This deck, sometimes referred to as “black”, is provided without paint or galvanizing. Designers should be aware of the limited resistance to corrosion provided by bare deck. Because of this limited corrosion resistance, the use of bare steel is not recommended for composite deck because the deck provides permanent reinforcement for the deck-slab.

Primer Painted Finish

Primer paint may be either applied in the deck plant, or prepainted steel coils may be utilized in the deck forming process. Either method is acceptable, and should be left to the option of the deck supplier.

Approximate paint dry film thickness averages 0.3 mil for a single coat and 0.6 mil for a double coat. Manufacturers have standard colors, typically white or grey that may be varied if required for a specific project. The availability, minimum quantities and cost of special primer colors should be verified with the specific deck manufacturer.

Primer paints by nature are impermanent and provisional and should be protected as recommended in the SDI MOC. Primer paint alone is intended only to protect the steel floor deck for a short period of time under ordinary exterior atmospheric conditions. If appearance of the finished deck is important, the Designer should consider a field applied finish paint. Finish painting and its compatibility with the deck primer paint is not the responsibility of the deck supplier.

If field painting is intended, it is recommended that the steel surface, whether galvanized or pre-painted, be checked for compatibility by the painting contractor who should follow the recommendations of the field coating manufacturer, particularly with regard to ambient application temperatures and humidity, cleanliness, surface moisture and surface preparation. A typical procedure for field painting should include that the surfaces must be clean, dry, and free of oil, grease and dirt, to test-patch an area to assure compatibility, and to apply paint following the paint manufacturer's recommendations.

If paint is applied, either a primer or a finish paint coat, it must not be applied to the top surface of composite steel deck which is in contact with the concrete, unless the concrete-to-steel bond shear has been determined experimentally, and incorporated into the composite steel deck-slab design. This is an extremely rare situation which does not increase the corrosion resistance of the steel deck, and should be avoided.

Galvanized / Primer Painted

Galvanized floor deck is available with factory primer paint applied to one or both sides of the deck. Galvanizers refer to this as a "duplex system." Primer painted galvanized deck provides somewhat more corrosion resistance and may be suitable for applications where the deck will be field painted (and eliminates the need for field primer painting). Composite steel deck should only be painted on the bottom side.

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FLOOR DECK DESIGN CONSIDERATIONS

SECTION 2

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Section 2.1 Design of Steel Floor Deck as a Form

Both non-composite and composite steel floor deck must initially support the weight of the fresh concrete and construction loads of workers and equipment. The ANSI/SDI NC-2017 and ANSI/SDI C-2017 Standards contain design requirements for this condition in Section 2.4.A.

The Standards require designing for the worst case effects of the following minimum construction loads:

1. 20 psf uniform construction live load combined with the weight of the fresh concrete, or
2. 150 pound concentrated load that simulates the weight of a worker combined with the weight of the fresh concrete, or
3. 50 psf uniform construction load prior to placement of the concrete.

The uniform construction live load of 20 psf is considered adequate for typical construction applications that consist of concrete transport and placement by hose and concrete finishing using hand tools. The Designer typically has little control over means-and-methods of construction, and should bring to the attention of the constructor that bulk dumping of concrete using buckets, chutes, or handcarts, or the use of heavier motorized finishing equipment such as power screeds, may require design of the deck as a form using uniform construction live loads of 50 psf or greater. It is suggested that the construction documents require verification of adequacy by the constructor. This Manual contains construction span tables based on 20 psf, 50 psf and 75 psf uniform construction live loads.

When using floor deck on single spans, consideration must be given to the shorter allowable construction spans, as compared to continuous spans, and the consequences of underestimating the construction loads on these non-redundant spans. The deck installer must also be aware of the increased fall risk presented by unattached single span sheets that are not immediately attached to the supporting structure upon placement.

Deflection of the deck as a form under the weight of the fresh concrete shall not exceed the lesser of 1/180 of the span or ¾ inches for 3” deep and shallower deck profiles. However, for deep deck profiles greater than 3” in depth, the ¾ inch maximum deflection criteria may be impractical. The Designer may choose to utilize other deflection criteria more or less restrictive

for deep decks depending on serviceability requirements of the project design. Consult individual manufacturers for more information.

Deflection calculations should not take into account construction loads because these are considered to be temporary loads. The deck is designed to always be in the elastic range, so removal of temporary loads will allow the deck to recover.

The supporting structural steel also deflects under the loading of the fresh concrete. Therefore, the Designer is urged to check the deflection of the total system, especially if composite beams and girders are being used. The basic load tables are based on uniform slab thickness. If the Designer wants to include additional concrete loading on the deck because of frame deflection, the additional load should be shown on the design drawings or stated in the deck section of the project specifications, and the Designer must specify the deck having taken into account the weight of the additional concrete.

Section 2.2 Design of Non-Composite Steel Floor Deck Floors

The ANSI/SDI NC-2017 Standard contains design requirements for the design of the concrete slab in Section 2.4.B.

The concrete slab is designed by the Designer as a reinforced concrete slab in accordance with ACI 318. The design of the slab is not the responsibility of the deck manufacturer or deck supplier. Tables and a design example are included in this Manual as an aid to Designers.

The minimum concrete thickness above the top of the deck must not be less than 1-1/2 inches. In addition to strength considerations, the thickness of the slab and the concrete strength and reinforcing must meet any applicable fire resistance requirements. Additionally, thicker slabs may be less prone to negative moment flexural cracking over supports. Slab design for temperature and shrinkage effects in the concrete shall be performed using methods permitted by ACI 318. Currently, ACI 318 does not permit the use of steel or synthetic fibers for this application.

The coating condition of the steel deck must be considered when determining the dead loads used for design of the slab. When the steel deck is not galvanized, it is considered to be an impermanent component and the concrete must be designed to carry the complete load,

including the weight of the slab. When galvanized deck is used, it is considered to be a permanent component, and the dead weight of the concrete may be considered to be carried by the deck. If temporary shoring is used to support the deck during concrete placement, the weight of the concrete slab must be deducted from the calculated capacity of the reinforced concrete slab, regardless of the deck finish.

Except for some tested diaphragm values, the non-composite deck should not be assumed to act compositely with the concrete even though strong chemical bonds can, and do, develop.

Section 2.3 Strength Design of Composite Steel Floor Deck-Slabs

The ANSI/SDI C-2017 Standard contains design requirements for the strength design of the concrete slab in Section 2.4.B. The supposition central to composite deck-slab design is that the concrete bonds to the steel deck by a combination of friction, bearing, and chemical bond, and thereby functions as tensile reinforcement for the concrete slab, similar to a reinforced concrete slab with reinforcing steel bars. Because the deck is only on the bottom face, the deck only functions as reinforcement for positive bending. Therefore, the deck-slab will function and be designed as a series of simple spans, unless additional reinforcing steel is added to the slab to resist negative moments.

The flexural strength of the composite deck-slab can be determined in accordance with one of the following methods:

1. “Prequalified Section Method” as per ANSI/SDI C-2017 Appendix 2.
2. “Shear Bond Method” as per ANSI/SDI C-2011 Appendix 3.
3. “Ultimate Strength Method” as per ANSI/SDI C-2017, Appendix 4.
4. Full scale performance testing as per ANSI/SDI-T-CD-2017.
5. Other methods approved by the building official.

The “Prequalified Section Method” and the “Shear Bond Method” both rely upon the concrete forming a reliable bond with the steel deck. This bond is reported as a bond stress. The “Shear Bond Method” requires that this bond stress be determined using testing in accordance with the ANSI/SDI T-CD-2017 Test Standard, while the “Prequalified Section Method” allows for determination of the allowable bond stress through empirical calculations based on an existing database of testing. Both methods are equally valid.

Alternately, performance testing in accordance with ANSI/SDI T-CD is permitted for both general and specific applications. Other methods that are acceptable to the building official under Alternate Methods provisions of the applicable building code can also be used.

Under the “Prequalified Section Method” and the “Shear Bond Method”, the maximum nominal moment capacity of the composite deck-slab is limited to the moment that will cause the initial yielding of the steel deck, M_y. Many current composite steel deck profiles under 3 inches in depth are capable of developing this initial yield moment. The composite deck-slab tables and examples contained within this Manual use flexural strength based on this initial yield moment, considering simple spans. The superimposed load capacity is determined by deducting the weight of the slab and the deck from the total load capacity. Most design tables, including those in this manual, have had these loads deducted and report the superimposed load capacity considering all superimposed loads as live loads.

For manufacturers utilizing the "Prequalified Section Method" for determination of the deck-slab flexural strength, ANSI/SDI C-2017 Appendix 2 specifies a K factor, dependent upon the deck profile and embossment shape and pattern, that must be applied to the yield moment to account for any ineffectiveness in achieving the yield moment. For those manufacturers, M_{no} calculated per C-2017 Section A2.2 will replace M_y for flexural resistance where shown in the examples in this manual. Manufacturers utilizing the "Shear Bond Method" limit the flexural resistance of the composite deck-slab based on the tested shear bond resistance as specified in ANSI/SDI C-2017 Section A3.3.

Simple span design is the normal condition and this is acceptable for most applications. Unless composite deck-slabs are specifically designed for continuity, slabs should be assumed to act as simple spans. An example for designing continuous span composite deck-slabs is included in this Manual.

For most applications, the deck thickness and profile is selected so that shoring is not required; the live load capacity of the composite system is usually more than adequate for the superimposed loads. The reported superimposed load capacity in this Manual is limited to 400 psf (ASD) and 640 psf (LRFD) for practical purposes. It is extremely rare that a capacity higher than this would be required. If higher capacities are needed, a manufacturer should be contacted for design assistance.

Criteria for one-way and punching shear are contained in ANSI/SDI C-2017, Sections 2.4.B.9 and 2.4.B.10 respectively. These are seldom the controlling limit state for composite deck-slab design.

Load tables are generally calculated by using a concrete strength of 3000 psi. Composite slab capacities are not greatly affected by variations in concrete compressive strength and higher strength concrete provides little additional flexural capacity; but if the strength falls below 3000 psi, it would be advisable to check shear anchor design for composite beam action as necessary.

Deflections are calculated using the moment of inertia of the composite section and are limited in magnitude by the applicable building code. Deflections seldom control the design, but must be considered in accordance with ANSI/SDI C-2017, Section 2.4.B.7.

Section 2.4 Ultimate Strength Design of Composite Steel Floor Deck-Slabs Utilizing Shear Anchors

Appendix 4 of ANSI/SDI C-2017 presents a method for the design of composite steel deck-slabs considering the beneficial effects of shear anchors (shear studs) that may be present for composite beam action. The restraint provided by these anchors may permit the deck-slab to develop moments up to the ultimate (full yield) moment, M_u, similar to ultimate strength design of reinforced concrete beams. This method was the basis of the SDI Composite Deck Design Handbook (1997). Additional specific guidance regarding specific application of this method should be obtained from individual manufacturers.

Section 2.5 Concentrated Loads

Concentrated loads may be accommodated on composite deck-slabs by designing the concrete to adequately distribute the concentrated load transversely across the deck. A procedure for distributing the load and calculating the concrete slab design moment is found in ANSI/SDI C-2017, Section 2.4.B.11.

Concentrated loads on concrete slabs cast on non-composite deck should be designed using methods found in ACI 318 for reinforced slab design.

Section 2.6 Forklift Loading

Composite floor deck is not recommended as the only concrete reinforcement for use in applications where the floor is loaded with repeated lift truck (forklift) or similar heavy wheeled traffic. (Lift trucks are defined as small power operated vehicles that have devices for lifting and moving product. The definition of lift trucks does not include manually operated “pallet jacks.”) Loading from lift trucks includes not only moving gravity loads, but also includes vertical impact loading and in-plane loading effects from starting, stopping, and turning. The repetitive nature of this loading, including impact, fatigue, and in-plane effects can be more detrimental to the deck-slab performance than the gravity loads. Suspended floor slabs subjected to lift truck traffic have special design requirements to ensure the fatigue stress in the reinforcement is low to keep the cracks sufficiently tight and serviceable to minimize crack spalling due to the hard wheel traffic. The design should only use the steel deck as a stay-in-place form. Structural concrete design recommendations contained in ACI 215R and AASHTO-LRFD are suggested for guidance in the design of these slabs. Due consideration for the stiffness of the supporting framing should be given by the Designer. Flexible support framing can exacerbate the effects of repetitive and dynamic loads.

Composite floor deck has successfully been used in applications that are loaded by occasional “scissor lift” use, and in warehouses with industrial racks without lift truck traffic and in areas serviced by “pallet jacks.” Proper analysis and design for moving and point loads must be performed.

Section 2.7 Parking Structures

Composite floor deck has been used successfully in many parking structures around the country; however, the following precautions should be observed:

1. Slabs should be designed as continuous spans with negative bending reinforcing over the supports.
2. Additional reinforcing should be included to deter cracking caused by large temperature differences and to provide load distribution.

3. In areas where salt water; either brought into the structure by cars in winter or carried by the wind in coastal areas, may deteriorate the deck, protective measures must be taken. The top surface of the slab must be effectively sealed so that the salt water cannot migrate through the slab to the steel deck. A minimum G90 (Z275) galvanizing is recommended, and the exposed bottom surface of the deck should be protected with a durable paint. The protective measures must be maintained for the life of the structure.
4. Consideration should be given to using the steel deck as a stay in place form only, with the concrete slab then being designed to carry all loads as a reinforced concrete slab using reinforcing bars. Structural concrete design recommendations contained in ACI 215R and AASHTO-LRFD are suggested for guidance in the design of these slabs.

Additional information regarding steel floor deck in parking structures, including recommendations for concrete mix design and protection, may be found in AISC Design Guide Number 18 (2003) and Flynn and Astaneh-Asl (2001).

Section 2.8 Pour Stops

Pour stops at the edge of floor slabs may be rationally designed to resist the load of the fluid concrete and construction loads. The design method shown in this Manual was experimentally verified through testing at the Missouri University of Science and Technology in 1983. The tests verified that the theory worked and it was found that if the theoretical deflection was increased by 20% it would account for the scatter in the tests. The SDI adopted a 1/4” deflection limit and increased the calculated (theoretical) deflection by 20%. The return lip on the pour stop is a desirable feature because it reduces slab edge waviness.

The following theory was used in developing the SDI Pour Stop Table shown in Table 11 of Section 5. Other rational analytical methods may be used.

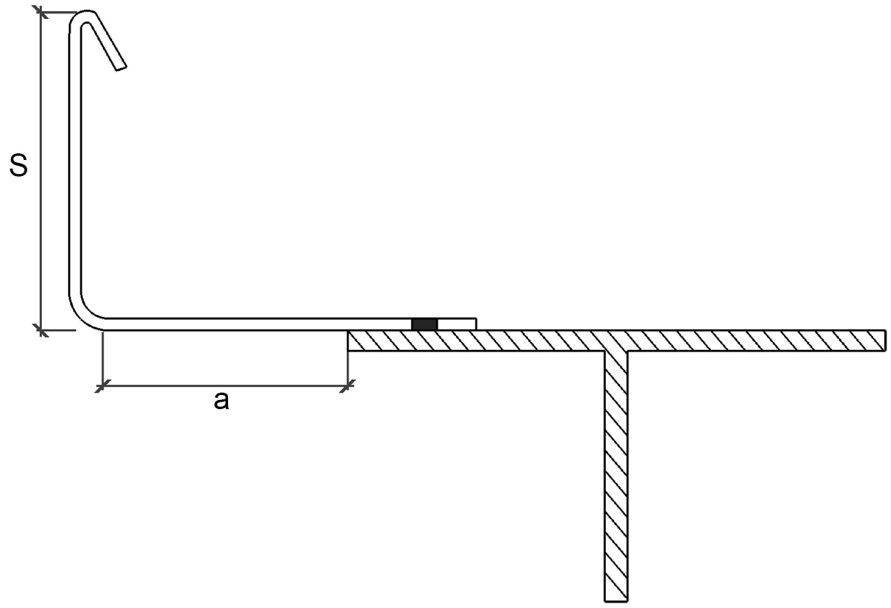


Figure 2.4 – Pour Stop Section

Figure 2.4 shows the pour stop and supporting beam or joist in section, where:

S = Concrete Depth (in.)

a = Pour Stop Overhang

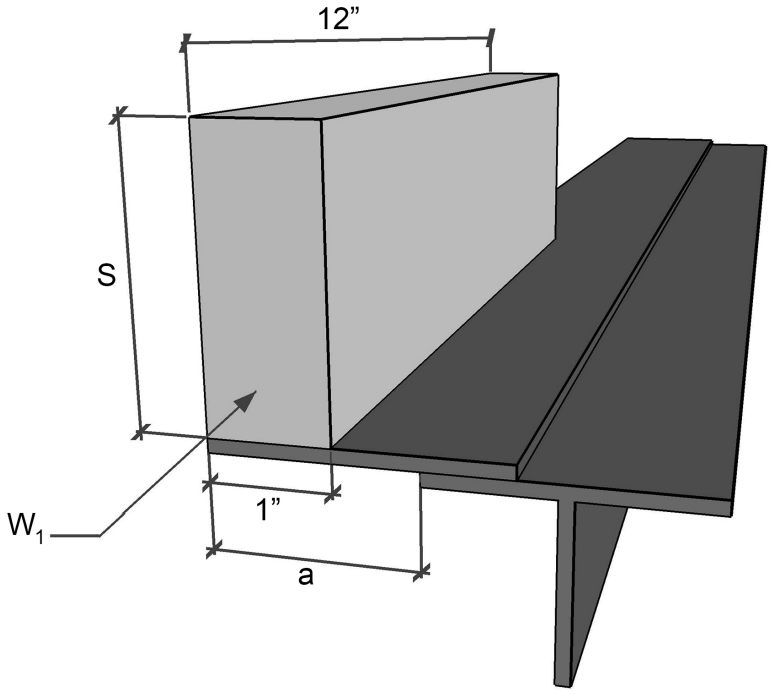


Figure 2.5– Isometric View

Figure 2.5 shows the load from the fresh concrete in an isometric view. If W is equal to the concrete weight in pounds per cubic foot (pcf), then:

$$W_1 = \left(\frac{S}{12}\right)\left(\frac{W}{12}\right) = \frac{SW}{144}$$

W_1 is the vertical load from the fresh concrete in units of pounds per linear inch along the cantilever.

Analysis of Vertical Leg

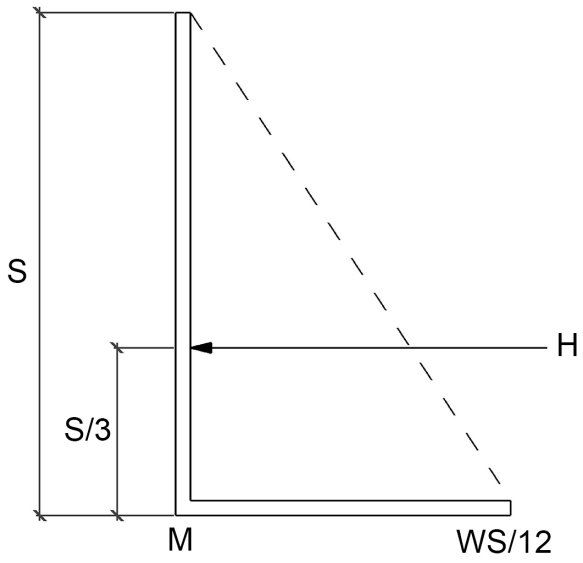


Figure 2.6 – Lateral Load Applied to Vertical Leg

Figure 2.6 shows the lateral load due to the hydrostatic pressure of the fresh concrete applied to the vertical leg of the pour stop. The horizontal load, H, is calculated in units of pounds per linear foot (plf) as:

$$H = \left(\frac{1}{2}\right)\left(\frac{S}{12}\right)\left(\frac{WS}{12}\right) = \frac{WS^2}{288}$$

Using statics, the bending moment at the base of the vertical leg, M, is calculated in units of in-lbs per foot of length as:

$$M = \frac{HS}{3} = \frac{WS^3}{864}$$

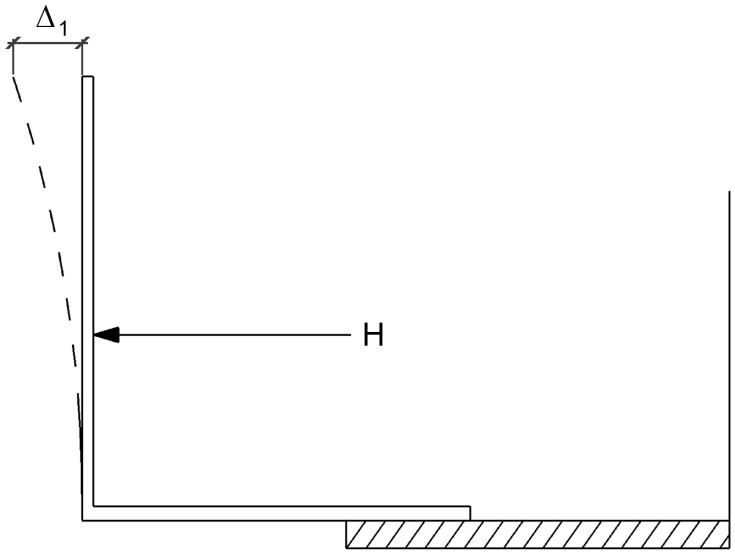


Figure 2.7 – Horizontal Deflection of Vertical Leg Due to Cantilever Bending

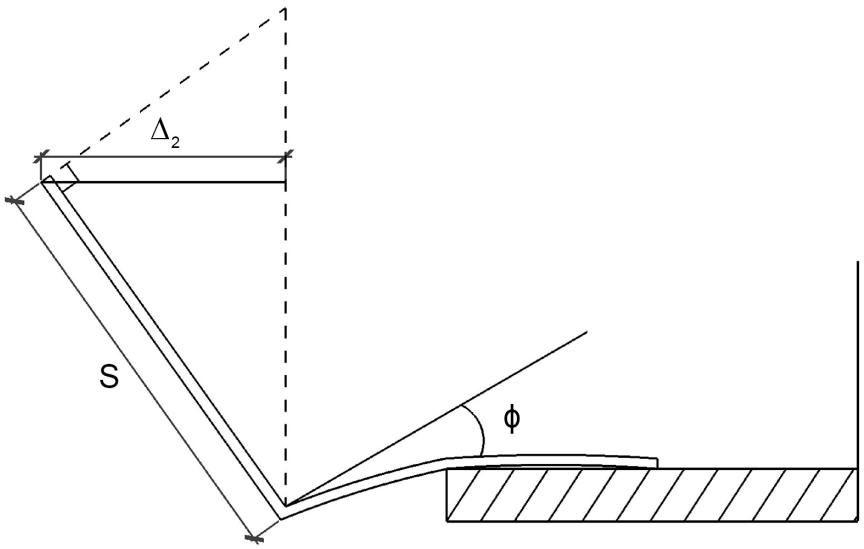


Figure 2.8 – Horizontal Deflection of Vertical Leg Due to Horizontal Leg Bending

Figures 2.7 and 2.8 show the two components of the horizontal deflection of the top edge of the pour stop. Through statics, these deflections, in units of inches, are respectively:

$$\Delta_1 = \frac{HS^3}{15EI} = \frac{WS^5}{4320EI}$$

$$\Delta_2 = (S)(\sin\Phi)$$

Where Φ is the Slope (Radians) at end of horizontal leg due to vertical loading.

The total horizontal deflection is the sum of the components.

$$\Delta T = \Delta_1 + \Delta_2 = \text{Total Deflection}$$

$$\Delta T = \frac{WS^5}{4320EI} + (S)(\sin\Phi)$$

Analysis of Horizontal Leg

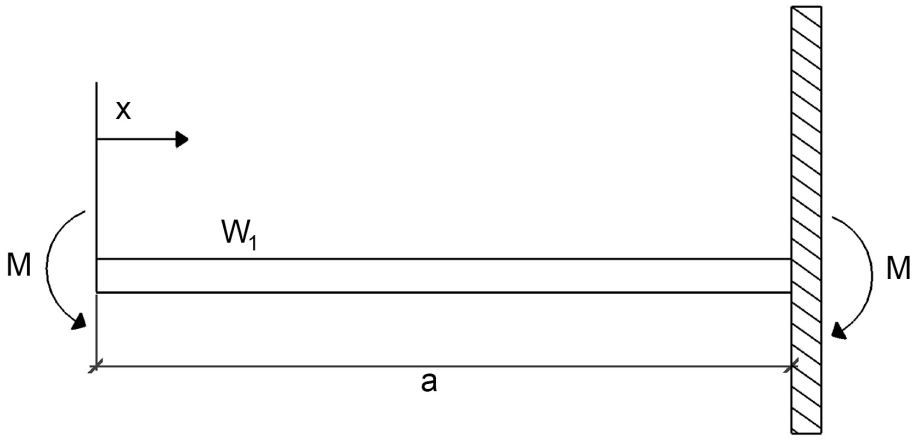


Figure 2.9 – Loading of Horizontal Leg

Using Figure 2.9, the bending moment, M_x, at any location in the horizontal leg can be calculated as:

$$M_x = M + \frac{W_1 x^2}{2}$$

Where M_x is the moment at a point x, measured relative to the left edge.

The slope of the horizontal leg can be calculated as:

$$EI\frac{dy}{dx} = \int_0^x M_x dx = \int_0^x M + \frac{W_1 x^2}{2} = Mx + \frac{W_1 x^3}{6} + C_1$$

At x = a, the slope is equal to zero, therefore $\frac{dy}{dx} = 0$ at x=a.

Therefore, solving the slope equation at x=a,

$$0 = Ma + \frac{W_1 a^3}{6} + C_1$$

Solving for C_1:

$$C_1 = -Ma - \frac{W_1 a^3}{6}$$

Therefore,

$$EI\frac{dy}{dx} = Mx + \frac{W_1 x^3}{6} - Ma - \frac{W_1 a^3}{6}$$

Calculating the slope at the left end at x = 0,

$$EI\frac{dy}{dx} = -Ma - \frac{W_1 a^3}{6} = \Phi EI$$

The vertical deflection at any location along the leg can be calculated as follows:

$$EIy = \frac{Mx^2}{2} + \frac{W_1 x^4}{24} - Max - \frac{W_1 a^3 x}{6} + C_2$$

At x = a, the vertical deflection is equal to zero, therefore:

$$0 = \frac{Ma^2}{2} + \frac{W_1 a^4}{24} - Ma^2 - \frac{W_1 a^4}{6} + C_2$$

Where:

$$C_2 = \frac{Ma^2}{2} + \frac{W_1 a^4}{8}$$

Therefore:

$$EIy = \frac{Mx^2}{2} + \frac{W_1 x^4}{24} - Max - \frac{W_1 a^3 x}{6} + \frac{Ma^2}{2} + \frac{W_1 a^4}{8}$$

Calculating the deflection at the left end at x = 0:

$$EIy = \frac{Ma^2}{2} + \frac{W_1 a^4}{8}$$

Summary

Vertical Legs:

$$M_{max} = \frac{WS^3}{864}$$

$$\Delta T_v = \frac{WS^5}{4320EI} + S \cdot \sin\Phi$$

This does not include the theoretical deflection increased by 20% (multiplied by 1.2) to cover test scatter.

$$\text{Where } \Phi = \frac{Ma}{EI} + \frac{W_1 a^3}{6EI}$$

Horizontal Legs:

$$M_{max} = \frac{WS^3}{864} + \frac{W_1 a^2}{2}$$

$$\Delta T_h = \frac{Ma^2}{2EI} + \frac{W_1 a^4}{8EI}$$

This does not include the theoretical deflection increased by 20% (multiplied by 1.2) to cover test scatter.

Section 2.9 Girder Fillers

Girder fillers are used to fill the gap between the longitudinal edge of the deck and a girder when the deck must be split over a girder to allow for shear stud attachment.

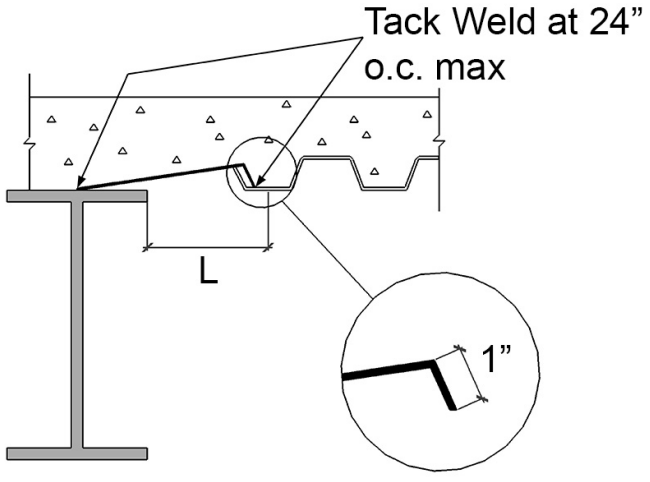


Figure 2.9 – Girder Filler

The girder filler table (Table 12) is based on the following design assumptions:

1. The girder filler is analyzed as a simply supported beam.
2. The fillers are designed using an ASD allowable bending strength of 20,000 psi for F_y = 33 ksi steel. No additional strength increase is permitted.
3. When the girder filler span is 5 inches or less, the girder filler must carry the fluid concrete weight (150 pcf) plus a construction live load of 20 psf.
4. When the girder filler span is greater than 5 inches, but does not exceed 9 inches, an additional load case which considers a concentrated load of 200 pounds per foot of girder filler width which simulates an erector standing on the filler must also be considered.
5. Deflection of the girder filler is limited to ¼ inches under the weight of the concrete.
6. This procedure shall not be used for girder filler spans exceeding 9 inches.

Based on these criteria, the following rational design equations are presented.

Strength – Concrete weight plus 20 psf live load

$$M_r \le M_a$$

$$M_r = \frac{(w_1 + w_2)L^2}{8}$$

$$M_a = F_b S = F_b\left(\frac{bt^2}{6}\right) = F_b\left(\frac{12t^2}{6}\right)$$

$$t = \sqrt{\frac{6}{12F_b}\frac{(w_1 + w_2)L^2}{8}}$$

Where:

w_1 = concrete weight = $\frac{\gamma_c t_c}{144}$ lbs/inch/ftw

w_2 = construction load = 20 psf = $\frac{20}{12}$ lbs/inch/ftw

L = girder filler span, inches; $L \le 9$ inches

F_b = 20,000 psi

t = thickness of girder filler, inches

γ_c = concrete density, lbs/ft^3

t_c = thickness of concrete over girder filler, inches

Strength – 200 pound concentrated load

$$M_r \le M_a$$

$$M_r = \frac{\left(\frac{P}{L}\right)(L)^2}{8}$$

$$M_a = F_b S = F_b\left(\frac{12t^2}{6}\right)$$

$$t = \sqrt{\frac{6}{12F_b}\frac{\left(\frac{P}{L}\right)(L)^2}{8}}$$

Where:

P	=	erector weight
	=	200 lbs/ftw
L	=	girder filler span, inches; 5 inches ≤ L ≤ 9 inches
F_b	=	20,000 psi
t	=	required minimum design thickness of girder filler, inches

Deflection – Limited to 0.25 inches

$$\Delta = \frac{5w_1L^4}{384EI} \le 0.25 \text{ inches}$$

$$I = \frac{bt^3}{12} = \frac{12t^3}{12} = t^3$$

$$t = \sqrt[3]{\frac{5w_1L^4}{384E\Delta}} = \sqrt[3]{\frac{5w_1L^4}{384E(0.25)}}$$

Where:

w_1	=	concrete weight = $\frac{y_c t_c}{144}$ lbs/inch/ftw
L	=	girder filler span, inches; L ≤ 9 inches
E	=	29,500,000 psi
t	=	required minimum design thickness of girder filler, inches
γ_c	=	concrete density, lbs/ft^3
t_c	=	thickness of concrete over girder filler, inches

Section 2.10 Penetrations Through Floor Slabs

Penetrations through floor slabs are commonly needed for passage of plumbing or ductwork through floors. Economy requires proper planning for penetrations and safety requires engineered designs for penetrations.

It is the responsibility of the Designer to designate holes and openings to be decked over in compliance with OSHA Regulation 29 CFR Section 1926.754(e)(2)(2003). To comply with this regulation, it is recommended that the steel floor deck not be cut out until immediately prior to the hole or opening being used. Figure 2.10 illustrates this requirement.

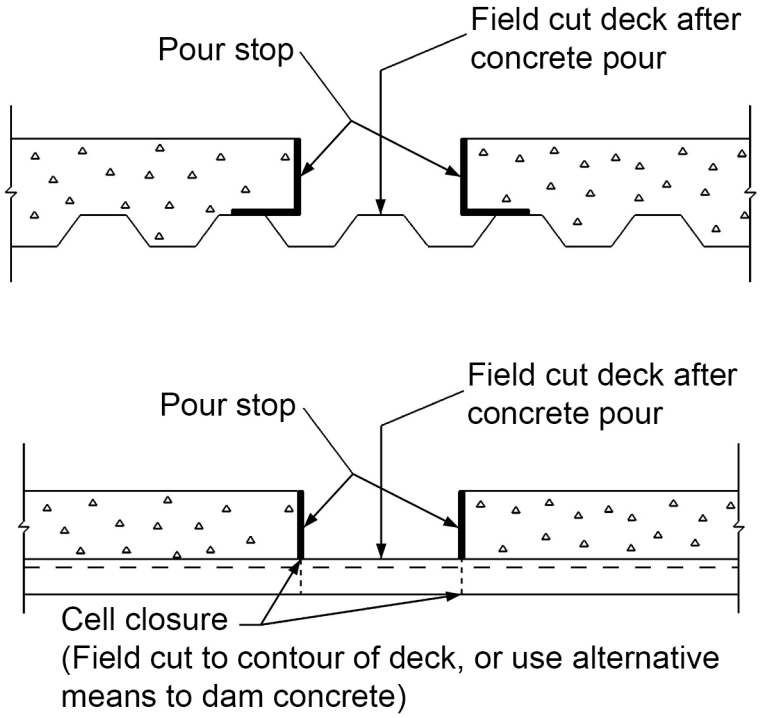


Figure 2.10 Decked Over Opening

Holes or other openings can be designed using several different methods.

Section 2.10.1 Openings Supported by Structural Frames

Openings, particularly larger ones, should be designed to have all deck bearing edges supported by structural framing which is designed by the Designer. The deck supplier will not design or provide this framing. This method has the advantage of simplicity in design. The structurally reinforced concrete slab (with non-composite deck) or composite deck-slab, is then designed as being supported by this framing.

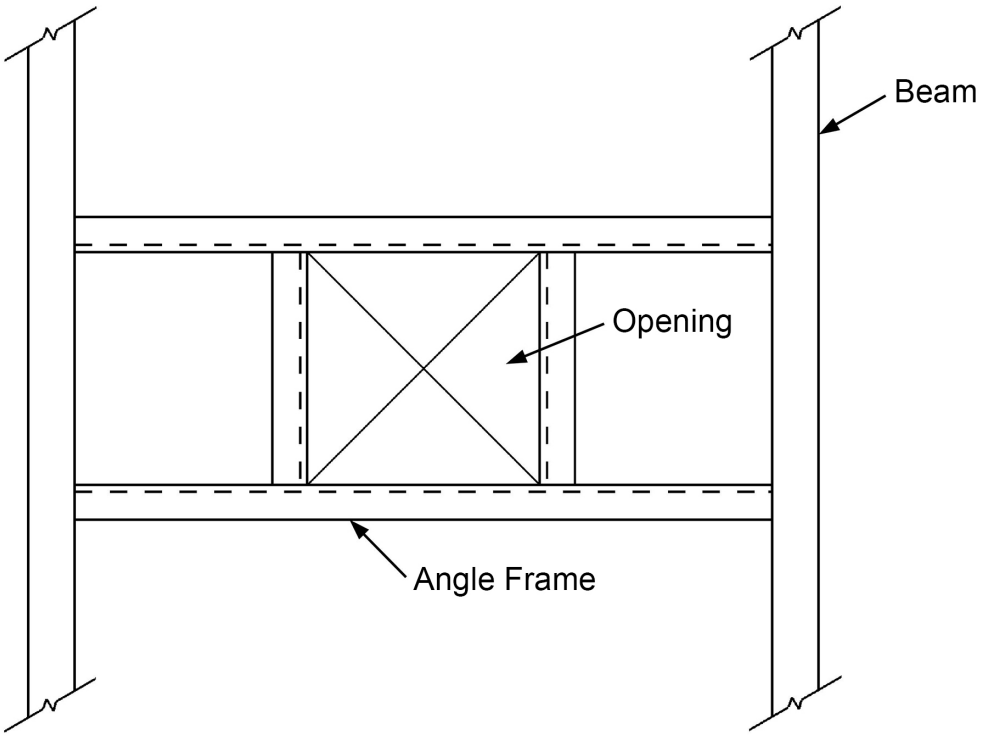


Figure 2.11 Typical Structural Frame

Section 2.10.2 Openings Not Supported by Structural Frames

Openings that are of moderate or small size may be accommodated without structural frames. When using this method, it is highly recommended that the deck not be removed from the opening until after the concrete has cured, to comply with the OSHA safety regulation, and to allow the deck to properly act as a structural form for the fluid concrete and construction loads. If for some reason the deck must be cut prior to concrete placement, adequate shoring must be provided, or a structural frame must be installed.

Section 2.10.2.1 Reinforced Concrete Slabs on Non-Composite Deck

Structurally reinforced concrete slabs on non-composite deck are designed using reinforced concrete design methods in compliance with ACI 318. Design for openings in concrete slabs are covered in ACI 318 and other concrete references. Designers are referred to these resources.

Section 2.10.2.2 Composite Steel Deck-Slabs

The responsibility for the design of openings in composite steel deck slabs is the responsibility of the Designer, and not the deck supplier. One possible method of designing for these openings makes the standard composite deck-slab assumption that the deck-slab behaves as a simply supported one-way slab, spanning in the direction of the deck ribs.

The concrete above the top of the deck along the cut edges of the opening that are perpendicular to the ribs is assumed to act as a shallow beam that supports this edge. The assumed width of this shallow beam should be conservatively no greater than 2 times the thickness of the concrete above the top of the deck, nor greater than 25% of the span of this shallow beam. This beam can be designed as a reinforced beam, or as a structural plain concrete beam (using ACI 318, Chapter 22). Both flexure and shear need to be checked. The ends of this shallow beam can be considered to be fixed for the purpose of this analysis.
The load on this shallow beam should be the sum of the dead weight of the deck-slab plus the superimposed design loads.

The end reaction from this shallow beam must be supported as a point load on the composite deck-slab adjacent to the opening. A suggested width of deck-slab to consider effective to resist these point loads would be 2 times the overall deck-slab thickness. The loads applied to this width of composite deck-slab should be the concentrated point loads (superimposed loads plus dead load) and the dead and superimposed uniform loads on this width of deck-slab. An illustration of this model is shown in Figure 2.12

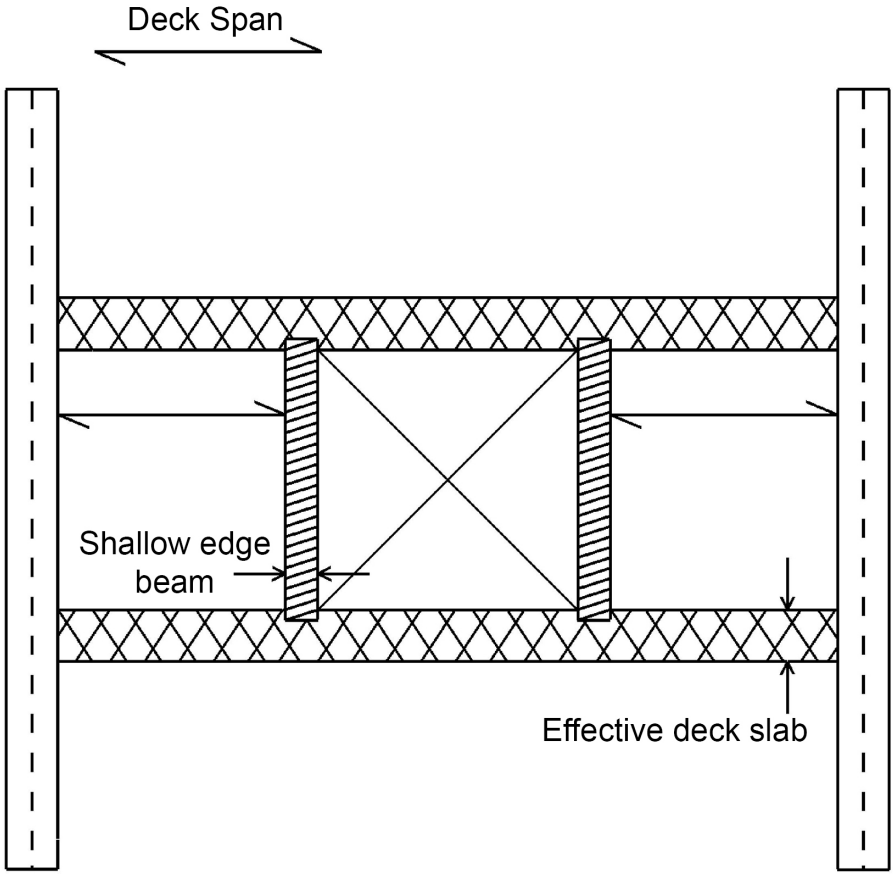


Figure 2.12 Unsupported Opening Model

The resulting moment from this analysis can be converted to an equivalent uniform load, and compared to the permitted uniform load.

Section 2.10.3 Unplanned Openings

An unfortunate reality is that unplanned holes and openings are occasionally necessary. When evaluating unplanned openings that are cut through the slab, the following guidance should be followed.

For reinforced concrete slabs on non-composite deck, the hole should be evaluated using reinforced concrete design criteria and ACI 318 requirements. If the slab does not have adequate capacity, the use of a post-installed structural frame below the deck is suggested.

For composite deck-slabs, the proposed hole should be evaluated using the criteria for an unsupported opening. Unless the presence and location of reinforcing steel can be verified, the supporting shallow concrete beam at the cut edge should be considered as unreinforced concrete. When checked, if there is not sufficient capacity in either the shallow beam or the supporting edges of the composite deck-slab, the use of a post-installed structural frame below the deck is suggested.

Section 2.10.4 Considerations for Locations of Openings and Holes

Proper consideration must be given to the location and spacing of openings or holes.

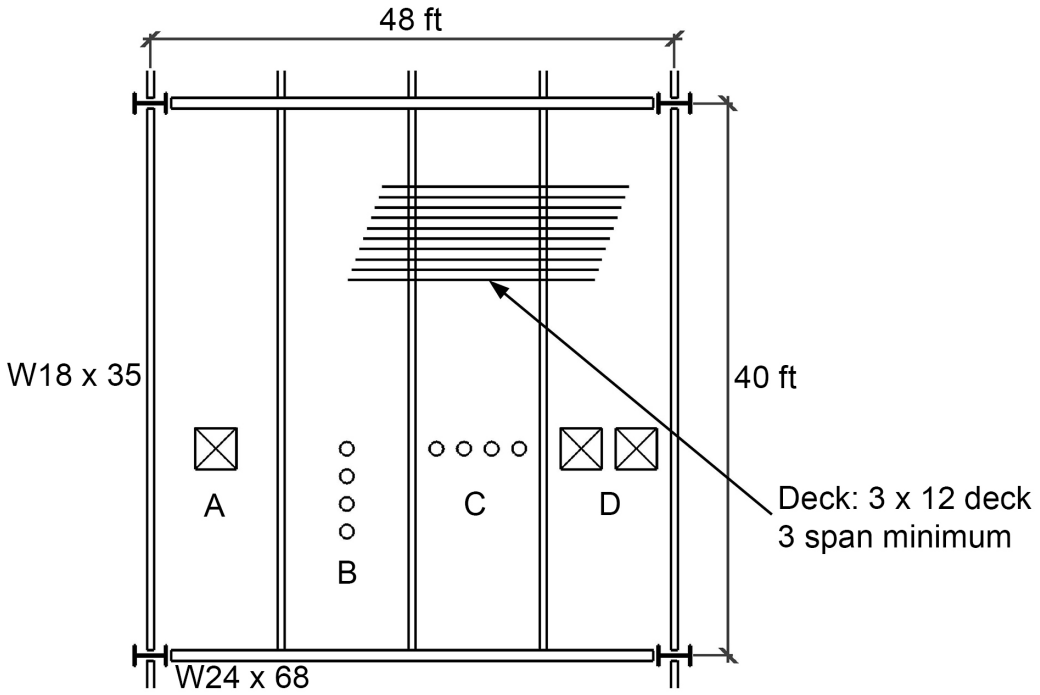


Figure 2.13 Opening Locations

Hole A in Figure 2.13 is the typical basic condition and needs no further elaboration.

The holes shown as B in Figure 2.13 are small in diameter, but run perpendicular to the span of the deck-slab. When in this configuration, unless there is adequate deck remaining between the holes, the width of the hole should be considered to be the overall length along the string of holes. The determination as to if the hole spacing is adequate to consider each hole as separate can only be determined through an analysis of the deck-slab.

The holes shown as C in Figure 2.13 are lined up parallel to the bearing direction of the deck. These holes can be considered as the width of a single hole.

The openings shown as D in Figure 2.13 can be considered as 2 separate holes, or as a single hole.

Section 2.11 Fire Resistance in Design

Oftentimes the fire resistance of the floor deck or the floor assembly is a critical design parameter. Requirements for fire resistance are found in the applicable building code, and are usually stated in units of time.

A common source of confusion is the difference between building code requirements for a “Fire Separation” versus a “Fire Resistance Rating”. A Fire Separation means an element or construction assembly that acts as a barrier against the spread of fire. A fire separation may or may not have a fire-resistance rating. A Fire Resistance Rating means the time in hours or fraction thereof that a material or assembly of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria, or as determined by extension of interpretation derived therefrom.

Fire separations for floor slabs can often be determined by calculation using the thickness of the concrete slab. Table 13 in Section 5 provides equivalent slab thicknesses for slabs cast on 1-1/2” deck. This equivalent slab thickness can be compared to required slab thicknesses from the building codes for various separation times.

Fire resistance testing is usually performed to requirements contained in ASTM E119, using a defined time versus temperature curve. For the duration of the fire test, the tested floor assembly must carry the design load, not allow a 250 degree F temperature rise through the assembly, and not permit flames or hot gases to penetrate the assembly. Some rated assemblies include fireproofing materials applied to the deck or beams or ceiling assembly elements. The specific requirements for concrete compression strength, concrete unit weight, reinforcing, and maximum permitted load capacity must be adhered to for any specific assembly.

Most rated assemblies that are published in the UL Certifications Directory are specific to one or more deck manufacturers, and specific details of those assemblies must be followed. Most assemblies for composite deck are found in the D-series, and for non-composite deck, the G-series. For preliminary design purposes, Figure 2-14 can be used to estimate the required concrete cover over the top of the steel deck for various ratings. This information was extracted from the UL Certifications Directory.

Rating (hours)	Lightweight Concrete Cover (inches)	Normalweight Concrete Cover (inches)	Fireproofing Required on Deck?
1	2.5	3.5	No
1.5	3	4	No
2	3.25	4.5	No
3	4.25	5.25	No
1	-	2.5	Yes
1.5	2.5	2.5	Yes
2	2.5	2.5	Yes
3	2.5	2.5	Yes
4	2.5	2.5	Yes
4	3.25	-	Yes

Figure 2-14 Concrete Cover Thicknesses for Preliminary Design

One assembly that includes generic deck is UL Design No. D982. This assembly has an Unrestrained Assembly Rating of 2 hours and an Unrestrained Beam Rating of 1 hour. This is based on full-scale fire tests conducted by the American Iron and Steel Institute (AISI) and the American Institute of Steel Construction (AISC) in 2013. This testing showed that there is no difference in required fire protection for either restrained or unrestrained construction, and that restrained ratings should be applicable to the majority of steel building construction.

Section 2.12 Sound (Noise) Considerations for Composite Steel Deck-Slabs

Sound Transmission Class (STC) is a number rating to measure the effectiveness of materials in reducing sound transmission between rooms. The STC single number rating is measured as decibels (dB) reduction in airborne sound passing through a particular built-up assembly. As it relates to a composite steel deck-slab, it is a measure of the reduction of airborne sound when passing through a floor assembly (room-to-room).

Impact isolation class (IIC) is a number rating to measure the effectiveness of materials in reducing sound impacts, such as footsteps (heel drops) between rooms. IIC is effectively the floor assembly's ability to absorb sound caused by any impact and the resultant single number rating is measured in decibels.

The Steel Deck Institute (SDI) conducted several Sound Transmission and Impact Isolation tests to provide baseline data points for designers. Testing was performed using a 2" deep, 20 gage composite floor deck with a 2-1/2" lightweight concrete topping (112 pcf concrete density). The total slab thickness was 4-1/2 inches. This particular composite slab configuration was utilized for the baseline testing because it achieves a one-hour unprotected UL fire rating.

The test results are summarized in Figure 2-15.

The sound tests were performed in accordance with:

- ASTM E90 "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements".
- ASTM E492 is the "Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine".

According to the International Building Code: Walls, partitions and floor/ceiling assemblies separating dwelling units and sleeping units from each other or from public or service areas shall have a sound transmission class of not less than 50. In addition, floor/ceiling assemblies between dwelling units and sleeping units or between a dwelling unit or sleeping unit and a public or service area within the structure shall have an impact isolation class rating of not less than 50.

Test	Flooring	Underlayment	Ceiling	STC	IIC
1	None	None	None	49	21
2	None	None	1-1/2 inch deep, 25 gage furring channel + 5/8 inch thick gypsum board	49	26
3	1/2 inch thick carpet	7/16 inch thick carpet pad	1-1/2 inch deep, 25 gage furring channel + 5/8 inch thick gypsum board	49	73
4	3/8 inch thick engineered wood	None	1-1/2 inch deep, 25 gage furring channel + 5/8 inch thick gypsum board	48	45
5	1/8 inch thick VCT	None	1-1/2 inch deep, 25 gage furring channel + 5/8 inch thick gypsum board	49	30
6	5/16 inch thick ceramic tile	None	1-1/2 inch deep, 25 gage furring channel + 5/8 inch thick gypsum board	50	36
All Tests: 2” deep, 20 gage composite steel floor deck 2-1/2” lightweight concrete topping (112 pcf concrete density) Total slab thickness is 4-1/2 inches.					

Figure 2-15 Sound Transmission and Impact Isolation Tests

Generally speaking, the above referenced baseline testing resulted in some values at or above 50 and some that are below 50. The test assembly make-up with values below 50 can be slightly modified to increase both transmission loss and impact isolation by incorporating one or more of the following items to the floor/ceiling assembly:

- Increasing the slab thickness
- Increasing the concrete density
- Adding an isolation material between the top of concrete slab and the floor covering
- Adding an isolation device between the bottom of concrete slab and the ceiling material
- Adding fiberglass batting between the bottom of concrete slab and the ceiling
- Increasing the airspace between the bottom of concrete slab and the ceiling

Note that manufacturers and suppliers of sound control devices such as flooring underlayment materials, ceiling isolation devices, ceiling systems and floor systems are good sources for additional STC and IIC test results utilizing composite steel deck floor slabs.

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STEEL DECK INSTITUTE sdi®

FASTENERS

SECTION 3

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Section 3.1 Fasteners

The importance of quality fastening cannot be overstated. The type and number of fasteners primarily depends on horizontal (diaphragm) shear loads and (or) uplift tension loads. Horizontal loads result from wind or earthquakes, uplift loads from wind suction. The magnitude of these loads must be determined by the Designer as part of the overall building design process, and are not known by the deck supplier or detailer. Fastening is therefore a design function and the type and number of fasteners cannot be selected by the deck supplier or by the deck detailer, but should clearly be shown on the drawings by the Designer. The information in this Manual is presented to aid the Designer in the choice of fasteners. In no case should the deck installer be allowed to substitute fasteners for those shown on the plans without first consulting the Designer.

Deck fasteners can be mechanical fasteners (screws, power-actuated fasteners, or mechanically formed connections) or welds.

Fasteners are described by function as follows:

Support Fastener: A fastener connecting one or more sheets to the support framing. Also referred to as a structural fastener.

Side-Lap Fastener: A fastener connecting adjacent panels to each other, but not connecting to the support framing. Also referred to as a stitch fastener.

Section 3.2 Welding

Sheet steel welding methods and operator qualifications are described in the American Welding Society Structural Welding Code - Sheet Steel, AWS D1.3. Arc welding can be used for both support and side-lap connections. The essential issues in forming a good weld rest in bringing the surfaces to be welded to fusion temperature at the same time, avoiding “burn-out” in the sheet, achieving adequate penetration into the beam or joist, and obtaining proper weld engagement on the weld perimeter.

The most common filler metal used for welding steel deck is an E6022 electrode, due to the ability of that electrode to produce welds with good penetration. AWS D1.3 does permit the use of "undermatched" electrodes, provided that the strength of the welded connection is calculated. Therefore, an E60xx electrode can be used with any strength of sheet steel. Strength of welds can be calculated using the provisions of AISI S100.

Additionally, the use of low-hydrogen electrodes is seldom necessary and may actually reduce the weld quality due to the higher amperages usually required for these electrodes.

Refer to SDI Technical Note No. 2 "SDI Commentary on Application of AWS D1.3-2018 to Welding of Steel Deck" for further discussion on electrode selection.

Section 3.2.1 Arc Spot Welds

Arc spot welds may be used for support fasteners, however, they can also be used for side-lap fasteners for deck that is 20 gage or thicker. The arc spot or “puddle” weld is started by striking an arc on the deck surface causing a hole to form in the deck. The weld operation then continues by depositing electrode material on the beam or joist and allowing the molten “puddle” to engage the penetrated deck. It is essential that the finished weld penetrates into the supporting beam or joist and that the puddle engages the deck on the weld perimeter. The complete welding process usually requires an average arc time in excess of 8 seconds for a 5/8" diameter weld, and an average in excess of 13 seconds for a 3/4" diameter weld. Additional time may be required to weld multiple deck thicknesses. Weld quality also depends heavily on the properties of the parts being connected, welding machine settings and experience / technique of the welder. This process requires a welder who is AWS qualified to make these specific welds on the floor deck project. Arc spot welds can be made through multiple thicknesses of steel deck, as long as the total base metal (bare steel) thickness of the deck does not exceed 0.15 in.



Figure 3.1 – Arc Spot Weld

Weld washers are small elements of sheet steel with a punched hole at their center and may be curved to fit into the valleys of deck panels. Washers may be of differing thickness and have different hole diameters or hole shapes. The most common type is approximately 0.06” thick with holes of 3/8” in diameter and a minimum ultimate strength of 45 ksi, and may be designated as 3/8” x 16 gage washers. Weld washers are laid in position on the deck units, an arc is struck on the sheet inside the hole, and the operation continues usually until the hole is filled. The weld washer acts as a heat sink and retards burn-away of the sheet. The washer permits welds in thin deck that might otherwise burn away from the welding operation faster than weld material can be deposited.

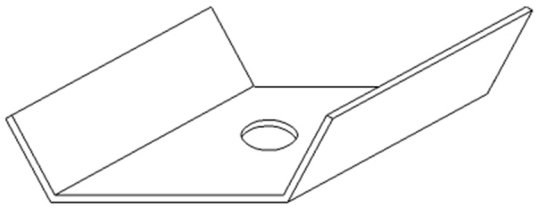


Figure 3.2 – Weld Washer

Weld washers are not recommended with deck design thicknesses equal to or greater than 0.028 inches because their use may actually reduce the weld penetration. Weld washers are required for welding in deck panels thinner than 0.028 inches. 22 gage deck is 0.0295 inches thick and does not require weld washers.

Diaphragm tables using arc spot welds may be based on "visible" or "effective" diameters; therefore, Designers should clarify weld diameters when referencing these tables.

Welding machine power settings required usually are well below those needed for welding in hot-rolled steels. The settings should be such that electrode burn-off rates are between 0.15 inches and 0.25 inches of rod per second in typical E6022 or E7014, 5/32 inch diameter rods. Heavier support steel requires more welding time, but increased power settings may burn out the deck faster than electrode material can be deposited.

A preliminary field quality check can be made by placing a pair of welds in adjacent valleys at one end of a panel. An inspection should show the weld material in fused contact over most of the weld perimeter. Spotty contact may indicate power settings that are excessive. The opposite end of the panel can be rotated, within the panel plane, placing the welds in shear, and continued rotation can lead to separation. Separation, leaving no apparent external perimeter distress, but occurring at the sheet-to-structure plane, may indicate insufficient welding time and poor fusion with the support steel. Failure around the external weld perimeter, showing distress within the panel, but the weld still attached to the support steel, indicates a higher quality weld. The ending of the welding operation may not permit complete fusion on the whole perimeter. Good fusion should be visible over no less than 90 percent of the weld perimeter (Clause 6.1.1.4 of AWS D1.3 permits undercut on 12% of the weld perimeter).

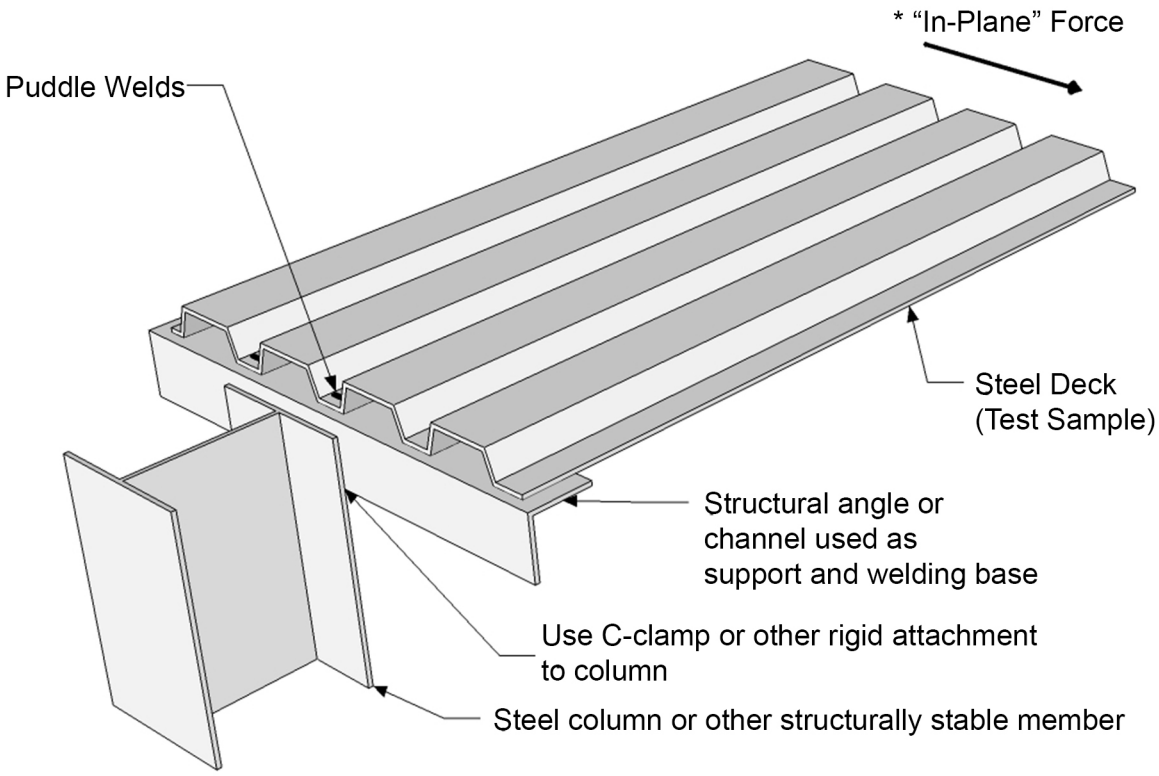


Figure 3.3 – Field Arc Spot Weld Quality Control Test Procedure

Section 3.2.2 Arc Top Seam and Arc Fillet Welds

The top arc seam side-lap weld has long tenure in roof deck diaphragm side-laps. This weld is less commonly specified for floor decks because higher diaphragm strengths in the deck alone are often unnecessary and the slab is relied upon for its superior diaphragm strength and stiffness. As with all deck welds, field quality control by the erector is required. Greater deck depth and narrow flute gaps increase the difficulty of making this connection. As shown in Figures 3.4 and 3.5, both vertical-to-vertical and hem-to-vertical connections are possible. In either case, firm contact is required for fusion and shear transfer. The hem lap is pinched or button punched to clamp the vertical leg and to establish contact between the three vertical legs. The hem lap must be burned through and fusion established at the top of at least the two adjacent vertical legs with one being in each of the respective panels. At a hem lap, that leg must be closest to the center of the panel. With proper clamping, fusion at all three legs is common and preferred. Fusion must exist at both vertical legs. Blowholes at top seam side-lap weld ends are to be expected and are not detrimental to the strength, which is based on the fused length.

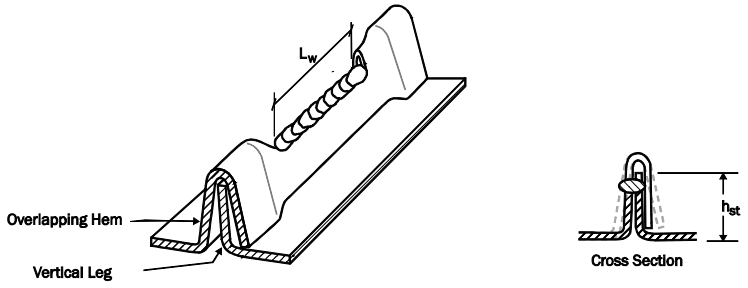


Figure 3.4 – Arc Top Seam Weld - Vertical Leg and Overlapping Hem Joint

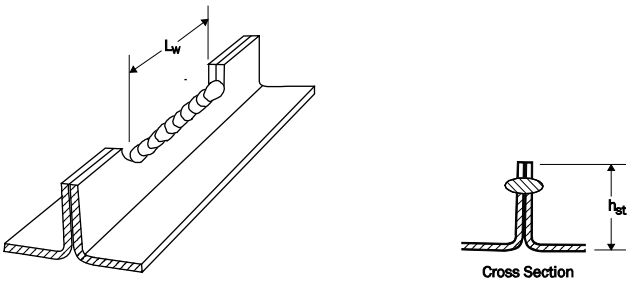


Figure 3.5 – Arc Top Seam Weld - Back-to-Back Vertical Leg Joint

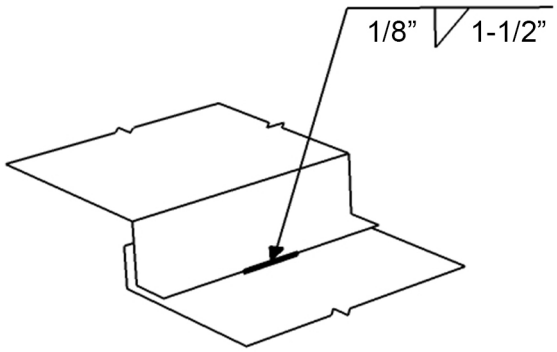


Figure 3.6 – Side-Lap Fillet Weld

Figure 3.6 shows a fillet weld at a nested side-lap. The design weld leg size does not exceed the thickness of the thinner sheet joined per AWS D1.3, Clause 2.3.3.2. However, it is common (but not required) to specify a minimum 1/8 inch weld to ensure that an adequate weld is made.

Section 3.3 Screw Fasteners

Screw fasteners are commonly used for structural and side-lap connections of steel decks and work well for attachment of most nestable profiles and types. These mechanical fastening systems are alternates to arc spot welding or power-actuated fasteners.

Common side-lap screw sizes include #10 and #12 self-drilling screws. #12, #14 or ¼” screws are generally used for steel deck floor attachment to structural supports. These structural screws resist both uplift and shear.

Self-drilling screw points drill through the steel deck panels and support steel prior to threads tapping. Typical screw drill points range from No. 3 – 5. See Figure 3.7 below for some typical self-drilling tapping screw profiles.



Figure 3.7 – Typical Screws

Standard screws generally have hex washer head configurations. Screws may also be configured with pre-mounted steel washers that help in resisting pullover due to wind uplift forces.

AISI S100 Section J4 provides design provisions for screw connections and performance in shear limited by tilting and bearing failures, tension pullout, tension pullover and combined shear and tension limit states. The values presented in this Manual are consistent with the AISI S100 design provisions for screws.

Proprietary screws are also available for structural and side-lap screw applications. The capacities of these screws are developed through testing in accordance with AISI S904 and S905 test methods. The SDI Diaphragm Design Manual, the AISI S100 Standard, and specific product evaluation reports provide design equations or capacities of these screw fasteners in shear and tension.

Ergonomic, stand-up screw fastening systems exist on the market today and offer high production rates for speedy installation. Additionally some manufacturers have collated screws available reducing the re-load time and increasing the deck installer productivity. Screw fastening tools can access standard and deep deck profiles and offer a reliable connection method for steel floor deck attachment. Electric or battery operated screw fastening tools with maximum 2500 rpm should be used to avoid burning up of the screw drill tip. Screw fastening tools should have torque clutches and/or depth gauges to avoid over-driving the screw and fracturing of screw heads. Screw fasteners should be installed with a minimum of three threads protruding through the base steel component.

Side-lap screw connections must positively engage both steel deck floor panel sheets. See Figure 3.9 for illustrations of screw side-lap connections.

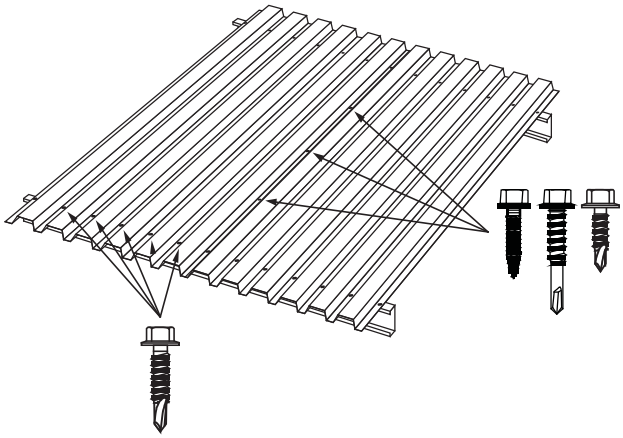


Figure 3.8 – Support and Side-Lap Screws

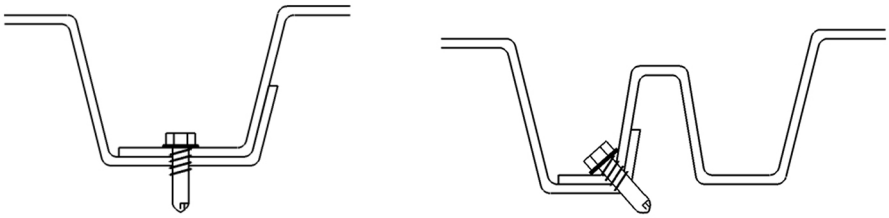


Figure 3.9 – Screw Side-lap Connections

Section 3.4 Power-Actuated Fasteners

Power-actuated fasteners are commonly used for steel floor deck attachment, resisting both uplift and diaphragm loading. These mechanical fastening systems are alternatives to arc spot welding or screw fastening of the steel floor panels to the supporting steel members (open web steel joists or steel beams). Power-actuated fasteners are not used for steel deck side-lap connections. Power-actuated fasteners are acceptable with all steel floor deck profiles and thicknesses for attachment to base steels of thickness 1/8 inch or greater. Attachment to support thicknesses less than 1/8" may be permitted for specific fasteners.

Each system is proprietary in nature, with different sources of driving energy, either powder-actuated cartridges or compressed air. Today's power-actuated fastening tool systems are advanced in design with ergonomic, stand-up systems available that can improve deck installer productivity. Together with large magazines for holding many fasteners, this is a very efficient and reliable method of installing floor deck.

Types of Power-Actuated Fasteners

Power-actuated fasteners are available with pre-mounted steel washers to assist in clamping the steel deck panels to the supporting steel members. Other fastener types have large heads without steel washers. The washers or large heads also serve to resist tension pull-over due to wind uplift forces. The SDI Diaphragm Design Manual provides more information on power-actuated fasteners used for steel deck attachment.

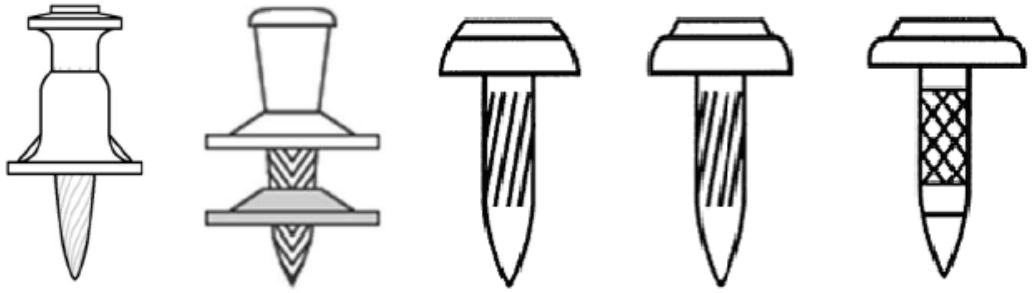


Figure 3.10 – Examples of Power-Actuated Fasteners

Technical Data

Design equations for tension, shear and combined loading of power-actuated fasteners are provided in the SDI Diaphragm Design Manual. These equations are based on extensive research done by manufacturers and supported by the SDI. Performance data are developed for power-actuated fasteners through testing programs conducted in accordance with the AISI S905, AISI S907 and ASTM E1190 test standards.

The SDI Diaphragm Design Manual provides information on power-actuated fasteners for resisting tension uplift and combined shear and tension forces due to combined horizontal diaphragm shear loads and wind uplift. These design equations can be used alternatively to the design equations provided in the FDDM for screw fasteners and welds.

Alternatively, AISI S310, Section B1.1, allows for nominal strength of the connection to be determined by testing and by calibration in accordance with Section E1 or E2 of AISI S310. These nominal strengths, along with calibrated safety factors, may be used in lieu of the equations provided in the DDM.

Other sources for technical data for International Building Code (IBC) compliance are ICC-ES Evaluation Reports based on AC43 Acceptance Criteria for Steel Deck Roof and Floor Systems or IAPMO-ES (International Association of Plumbing and Mechanical Officials) Evaluation Reports based upon AC43 or IAPMO EC 007 Acceptance Criteria.

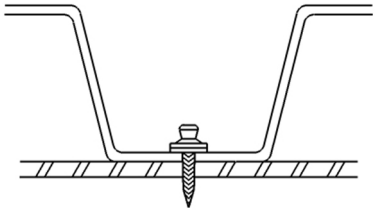


Figure 3.11 – Power-Actuated Fastener Attachment of Steel Deck to Framing

Section 3.5 Mechanically Formed Side-lap Connections

Side-lap connections can be formed by crimping the upstanding edge of interlocking side-lap deck. Crimps can only be made with deck that is designed with the upstanding edge to receive them and not all deck has upstanding edges that will accept crimps. Crimping can be categorized as either generic “button punching” or one of several proprietary mechanically formed connection systems.

Generic button punches serve only to align the deck side-laps and provide little resistance to shear at the panel edge. Proprietary mechanically formed connection systems are tested connections formed using specific tools for a specific deck. These proprietary systems have defined shear strength and stiffness values that are contained within research and evaluation reports. Information on these proprietary systems can be obtained from specific manufacturers.

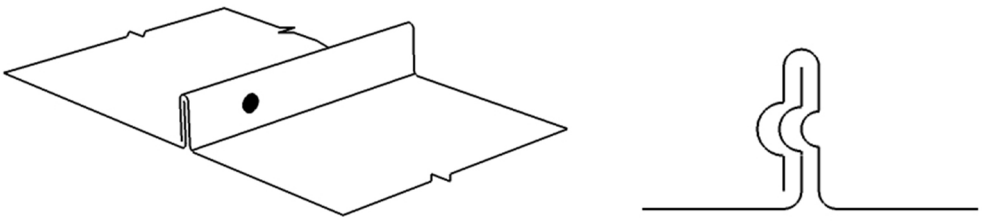


Figure 3.12 – Side-Lap Button Punch

Section 3.6 Suspended Loads

Loads may be suspended from the bottom of both composite deck and non-composite deck using various methods.

Hanger Tabs

Some manufacturers can provide deck that has integral hanger tabs rolled into the bottom flange of the deck for support of light loads. These tabs are intended for supporting lightweight ceilings or ductwork suspended by wires. Because these tabs do not engage the concrete, the permitted loads are generally low, and should be confirmed by the deck manufacturer.

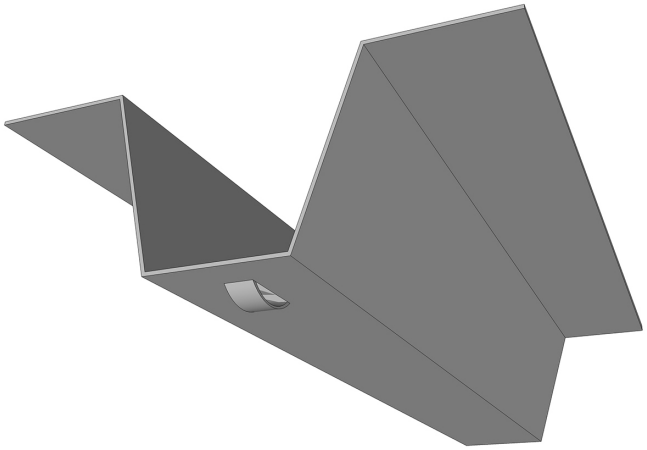


Figure 3.13 – Integral Hanger Tab

Much less common are piercing hanger tabs. These tabs are field inserted into the deck prior to concrete placement. While sometimes available, this technology is considered antiquated, and should not be specified.

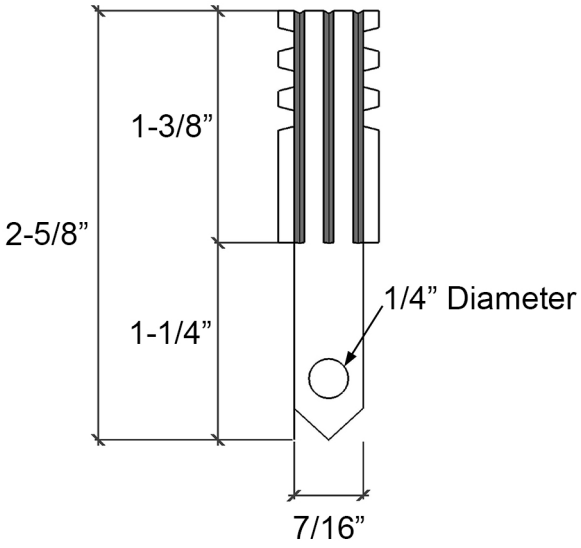


Figure 3.14 – Piercing Hanger Tab

Proprietary Fasteners

Various proprietary fasteners are available for suspending loads. The use of proprietary fasteners has largely replaced hanger tabs due to the greater flexibility and ease of use provided by these fasteners. Many of these fasteners can be installed after the concrete has been placed.

These fasteners include power-actuated fasteners, screws, adhesive and mechanical concrete anchors, interference body hangers, and pigtail anchors. The literature and reports of the fastener supplier should be consulted for permitted load values.

Proprietary fasteners may provide substantial permitted load values. When large loads are envisioned being suspended from the composite deck-slab or non-composite slab, the Designer must consider the effect of these concentrated loads, or limit the concentrated loads suspended from the slab.

CONSTRUCTION PRACTICES

SECTION 4

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Section 4.1 Common Industry Practices

The Designer should be aware of common industry practices related to deck design and installation. Excellent sources of this information include the SDI Code of Standard Practice, the SDI Manual of Construction with Steel Deck, and the SDI Standard Practice Details. Adherence to these industry practices result in the most efficient and economical floor deck construction.

Section 4.2 Welding Requirements

The deck installation contractor is responsible for following AWS D1.3 and Welding Procedure Specification (WPS) documents. A WPS is a detailed document providing required variables for a specific welding application to assure repeatability by properly trained welders and welding operators. WPS documents must be written for all welds permitted as prequalified and all welds qualified in conformance with Clause 6 of AWS D1.3.

Each deck installation contractor must be responsible for inspection and testing of WPS qualification tests and welder performance testing as described in AWS D1.3. Arc spot weld WPS's are not described in Clause 5 of AWS D1.3 and, therefore, must be qualified by testing and recorded on a Procedure Qualification Record (PQR.)

Visual inspection is required to determine if a weld meets the acceptance criteria of AWS D1.3. It is the deck installation contractor's responsibility to ensure that all WPSs and welders are qualified. The EOR may accept previously qualified or prequalified WPS. However, if the EOR does not accept such evidence, the deck installation contractor must successfully complete the required tests prior to welding.

Section 4.3 Mechanical Fastening Requirements

The deck installation contractor is responsible for complying with the installation instructions provided by the fastener supplier for the specific fastener. Training provided by the fastener supplier in the installation of the fasteners and operation of fastening equipment may be required.

Some general criteria for proper fastener installation include:

- Proper fastener driving (not over- or under-driven)
- Proper fastener selection for the substrate and total fastened metal thickness
- Complying with minimum edge distance limits on both the deck and substrate

Generally, visual inspection of the installed fasteners is required. Some fastener suppliers may provide "feeler gages" to check for proper fastener driving.

Section 4.4 Adhesion of Spray Fireproofing and Field Paint

If spray fireproofing is to be applied to the deck, the Designer must verify that the prime paint being provided is compatible with the fireproofing that is specified. Galvanized and bare deck can also receive spray fireproofing. The adherence of fireproofing materials is dependent on many variables and neither the seller, the deck manufacturer, nor the deck installer can be responsible for the adhesion or adhesive ability of the fireproofing.

If field painting is intended, it is recommended that the steel surface, whether galvanized or prime painted, be checked for compatibility by the painting contractor, following the recommendations of the field coating manufacturer, particularly with regard to ambient application temperatures and humidity, cleanliness, surface moisture and surface preparation if required.

Section 4.5 Repair of Deck Finish at Welds

In most cases, deck welds are removed from a corrosive environment when the deck is installed and no weld touch up paint or cold galvanizing is necessary. In those instances where the welds are left exposed to a corrosive atmosphere, the weld should be wire brushed and coated with an approved substance specified by the Designer.

Section 4.6 Quality Control and Quality Assurance

The SDI has developed the ANSI/SDI QA/QC-2017 “Standard for Quality Control and Quality Assurance for Installation of Steel Deck” which provides requirements for steel deck installation quality in a mandatory format that can be used for inspection purposes. This Standard is available for download from the SDI website and it is recommended that Designers require compliance with the quality procedures in the Standard through incorporation of the standard in project specifications to promote quality in deck installation.

Section 4.7 Deck Used as a Working Platform

Steel form deck and composite steel deck shall be selected so that it provides at least fifty pounds per square foot as a working platform. Step loading or skip loading is required when designing the steel deck as a working platform. Refer to ANSI/SDI NC-2017, Appendix 1 and ANSI/SDI C-2017, Appendix 1 to assist in the design and analysis of the deck. If temporary shoring is required to attain fifty pounds per square foot, then the shoring must be securely in place before the floor deck erection begins. The fifty pounds per square foot loading does not consider concrete weight. Compliance with the allowable construction spans found in Table 2 of this Manual will meet these requirements.

ANSI/SDI NC-2017 and ANSI/SDI C-2017 design provisions for the deck as a working platform are as follows:

ASD: $w_{dl} + w_{cdl}$

LRFD: $1.2w_{dl} + 1.4w_{cdl}$

The load factor of 1.4 for the construction live load is calibrated to provide equivalent design results to those of ASD.

To make the working platform safe and to prevent damage, the deck sheets must be attached to the frame and the side-lap must be connected as soon as possible. If the deck sheets are temporarily used to access bundles, they must be end bearing – not cantilevered – and must be securely attached to the frame to prevent slip off. A working area should be at least twelve feet wide. It is recommended that a working area be established around or along each bundle so that the bundle can safely be accessed. The platform can then be extended in any convenient direction. Specific job requirements need to be considered to determine deck erection starting points and erection progression. As the platform is extended it will be necessary for at least one worker to work from the structural frame. OSHA standards require that employers provide fall protection during deck erection operations and all OSHA guidelines for safety while erecting deck must be followed. Refer to OSHA Regulation 29 CFR Section 1926.760c (2003) which states that under special circumstances a Controlled Decking Zone (CDZ) may be established which permits flexibility to the methods of personal fall protection.

As the deck sheets are placed, one edge of deck will always be “open” or leading. This leading edge should only be approached in order to place the next sheet. Workers should also maintain a safe distance (six feet if possible) from the end of the deck unit. When aligning the edge (side) lap, the worker should kneel. Kneeling lowers his center of gravity and decreases the chance of falling. Refer to OSHA Regulation 29 CFR Section 1926.760(a)(1) (2003) which states that under special circumstances a Controlled Decking Zone (CDZ) may be established which permits flexibility to the methods of deck installation.

Holes and openings shall be decked over, unless the sizes of the holes or special circumstances prevent it from being decked over. It is the responsibility of the design professional to determine whether a hole is required to be decked over. Where large size holes or other conditions do not allow an opening to be decked over, employees shall be protected in accordance with OSHA Regulation 29 CFR 1926.760(a)(1) (2003).

Additional requirements for deck installation are found in ANSI/SDI C-2017 Standard for Composite Steel Floor Deck-Slabs, ANSI/SDI NC-2017 Standard for Non-Composite Steel Floor Deck and SDI Manual of Construction with Steel Deck.

Section 4.8 Temporary Shoring

Temporary shoring, if required, should be installed before placing deck panels and should be designed to resist at a minimum the loading criteria indicated in ANSI/SDI C-2017 Section 2.4.A. and ANSI/SDI NC-2017, Section 2.4.A. Shoring shall be securely in place before floor deck erection begins. The shoring shall be designed and installed in accordance with standards applicable to the specific shoring system and shall be left in place until the concrete attains 75% of its specified design strength. Typical practice is to retain the shoring in place for not less than seven (7) days.

Design of shoring and supplying or installation of that shoring is not the responsibility of the deck manufacturer, seller, or installer. Responsibility for the design of the shoring resides with the Designer or the Designer’s designee. See the SDI Code of Standard Practice (SDI COSP-2017) for additional information on scope of responsibility.

Section 4.9 Loads During Concrete Placement and Finishing

The uniform construction live load of 20 psf is considered adequate for typical construction applications that consist of concrete transport and placement by hose and concrete finishing using hand tools. The Designer typically has little control over means-and-methods of construction, and should bring to the attention of the constructor that bulk dumping of concrete using buckets, chutes, or handcarts, or the use of heavier motorized finishing equipment such as power screeds, may require design of the deck as a form using uniform construction live loads, w_{lc} of 50 psf or greater. ANSI/SDI C-2017, Section A1.3.1 requires that the Designer include the assumed construction loads in the construction documents and it is suggested that the construction documents require verification of adequacy by the constructor.

Section 4.10 Conduit or Pipe Imbedded in Concrete Slabs

Conduit or pipe may be imbedded in concrete slabs, subject to the following limitations:

Section 4.10.1 Slabs on Non-Composite Deck

The design of concrete slabs on non-composite steel deck is governed by ACI 318. ACI 318 provides specific limitations for conduit and pipe in Section 20.7, which should be followed.

Section 4.10.2 Composite Steel Deck-Slabs

No research specific to conduit or pipe imbedded in composite steel deck-slabs is available, but the following guidelines have been shown to provide for adequate performance in practice:

1. Imbedded conduit or pipe must conform to local building code and fire rating requirements.
2. Conduit or pipe diameter must not exceed 1/3rd of the thickness of the concrete over the deck.
3. Conduit or pipe must have a minimum concrete cover of ¾ inch above and below the conduit.
4. Conduit or pipe should not be placed within the ribs of the composite deck.
5. Conduit or pipe must not be spaced any closer than 18 inches on center.
6. There must be no crossover of conduit or pipe.
7. Conduit or pipe must not be made of or coated with aluminum, unless the aluminum is acceptably coated to separate it from the concrete, reinforcing steel, and steel deck.

Section 4.10.3 Radiant Heating Piping in Concrete Slabs

The following restrictions should be followed for radiant heating piping when used with concrete on steel deck.

1. Slabs on Non-composite Deck: ACI 318 governs the design of concrete slabs on non-composite steel deck. ACI 318 provides specific limitations for radiant heating in Section 26.8, which should be followed.
2. Composite Steel Deck-Slabs: No research specific to radiant heating piping imbedded in composite steel deck-slabs is available. It is generally recommended that this piping be installed in a non-structural topping slab that is cast above the structural composite steel deck-slab.

Section 4.11 Two Stage Slab Placement

Sometimes there are situations where it is necessary to place a slab in two separate pours. This can be used for thicker slabs where the deck cannot support the weight of the fluid concrete when poured at one time. For this case the first stage pour must meet minimum concrete cover requirements for composite deck. The deck must be adequate to support the weight of the fresh concrete for the depth of the first pour and it acts compositely only with the first stage pour. The resulting slab from the first stage pour will serve as the form for the second stage pour, and, therefore, the second stage pour cannot occur until the first stage pour has adequately cured. The second stage pour must contain adequate temperature and shrinkage reinforcement in the form of fibers, welded wire reinforcement or rebar. Two stage placement is also used for cases where topping slabs are used as a means of helping to create a level surface, where mechanical or plumbing is to be installed in the topping slab, or where an elevated slab situation is desired in certain locations, perhaps even utilizing fiberglass insulation board between pours to build up the topping slab even higher, or when providing an insulated slab for freezers or coolers.

Under no circumstances should a two stage slab placement be changed to a single placement without review and consent by the Designer for the project after consideration of the ability of the steel deck to carry the weight of the full depth of the fluid concrete.

Section 4.12 Concrete Slab Moisture Control

Control of moisture content of concrete slabs is a concern when some types of flooring are applied to the slab. Due to fast-paced construction schedules, contractors may not allow adequate time to allow for the slabs to reach the required moisture content. If flooring is applied when the moisture is too high, the flooring may not properly adhere. Many of the problems appear to be related to current formulations of adhesives that are more affected by moisture levels in the concrete than previously available adhesives. Problems with the application of flooring on concrete slabs have been reported on concrete slabs cast on varied concrete substrates, including slab on grade, suspended slabs, and slabs cast on steel deck.

The desire to hasten the concrete drying time often leads to requests for vented composite steel deck. Steel form deck products have traditionally been made available with venting to allow for excess mix water to drain from the cementious slurry component of lightweight insulating concrete (LWIC) in roof systems. This slurry contains excess water to allow for pumping and placement of the mix. Additionally, this venting allows for reduction of vapor pressure that will develop in the LWIC when covered with an impermeable roofing membrane. Unrelieved vapor pressure, driven by heating caused by exposure to the sun, can cause blistering in roofing membranes unless venting is provided. LWIC, an insulating product, is not to be confused with structural lightweight concrete, which is a structural component of a composite floor system.

In reality, the steel deck acts as a vapor barrier, preventing diffusion of water vapor out from the bottom of the slab. Some publications (Lstiburek, 2008 and “Sealing”, 2005) note that the amount of diffusion is directly proportional to the open area in the vapor barrier (Ficks Law). For example, providing a hypothetical 1.5% open area will increase the diffusion of water vapor by 1.5%, an inconsequential amount. This has been experimentally verified through testing sponsored by the Expanded Shale Clay and Slate Institute (ESCSI, 2011), which has shown that the rate of concrete drying is not increased by venting the steel deck.

Specifiers who are concerned about moisture in concrete slabs cast on steel deck can consider a slab cast on steel deck to be similar to a concrete slab on grade cast on a vapor barrier, when considering drying performance. PCA (2008) and ACI 302.2R-06 contain guidelines for control of moisture in concrete slabs, including minimizing total water content (minimize cement content and use lowest reasonable water/cement (w/c) ratio) in the concrete mix, consider the use of water reducers (without chlorides) in the mixtures, provide protection from external moisture

sources (enclose the building envelope), control drying temperature and relative humidity, and increase air movement to reduce vapor pressure, all of which may be considered to be applicable for the particular application. These and other methods have the potential to increase the drying rate of the concrete beyond any effect of venting.

SDI Technical Note No. 4, Venting of Composite Steel Floor Deck is an additional source of information on this topic.

Section 4.13 Concrete Slab Crack Control

Cracking in concrete cast on steel deck is primarily the result of two causes:

1. temperature and shrinkage of the concrete, and
2. negative bending over supports resulting in flexural cracking.

Section 4.13.1 Temperature and Shrinkage Cracking: General Application

Concrete floor slabs employing Portland cement will start to experience a reduction in volume as soon as they are placed due to drying. Where shrinkage is restrained, cracking will occur in any concrete slab. The use of the appropriate types and amount of reinforcement for shrinkage and temperature movement control is intended to result in a larger number of small cracks in lieu of a fewer number of larger cracks. Even with the best floor design and proper construction, it is unrealistic to expect crack free floors. Every owner should be advised by both the Designer and contractor that it is normal to expect some amount of cracking and that such occurrence does not necessarily reflect adversely on either the adequacy of the floor's design or quality of the construction.

Cracking can be reduced when the causes are understood and preventative steps are taken in the design phase. The major factors that the Designer can control concerning shrinkage and cracking include cement type, aggregate type and gradation, water content, water/cement ratio, and reinforcement.

Most measures that can be taken to reduce concrete shrinkage will also reduce the cracking tendency. Using less water in the mixture and the largest practical maximum-size aggregate can reduce drying shrinkage. Lower water content can be achieved by using a well-graded

aggregate and lower initial temperature of the concrete. Designers are referred to ACI 302.1R and ACI 224.1 for additional information.

Although cracking is inevitable, properly placed reinforcement used in adequate amounts will reduce the width of individual cracks. By distributing the shrinkage strains, the cracks are distributed so that a larger number of narrow cracks occur instead of a few wide cracks. Additional consideration by the Designer may be required to further limit the size and frequency of cracks. Additional provisions for crack control are frequently required where concrete is intended to be exposed, floors that will be subjected to wheel traffic, and floors which will receive an inflexible floor covering material (such as tile).

Temperature and shrinkage cracks may form either parallel or perpendicular to the deck ribs. Cracks parallel to the ribs may be more prevalent due to the reduced effective slab thickness perpendicular to the ribs, and due to the additional restraint to the slab provided by the ribs.

The use of control joints, to provide weak planes in the slab that will hopefully cause cracks to form in the joints, should be considered. When using control joints, care must be exercised to not cause damage to the deck or any imbedded items during any slab cutting operations. Design of control joints is similar to those for slabs on grade and should be located in regions of negative bending over supports whenever possible.

Section 4.13.2 Reinforcement for Temperature and Shrinkage: Non-composite deck

Concrete placed on non-composite steel deck should be designed as a conventionally reinforced concrete slab using the criteria found in ACI 318-14. Section 24.4 of ACI 318 specifies minimum reinforcement for temperature and shrinkage reinforcement as 0.0018 times the gross concrete area for Grade 60 rebar and welded wire reinforcement.

It should be noted that this prescription has not been shown to completely eliminate temperature and shrinkage cracking in slabs, nor does it guarantee that visually objectionable crack widths will not form. This is due to the wide variation in concrete mix shrinkage rates, and variation in concrete curing conditions.

For the purposes of temperature and shrinkage reinforcement, the Designer may consider the area of the steel deck to contribute to the required reinforcement area. However, this is not explicitly permitted by either ACI 318 or ANSI/SDI NC-2017. Engineering judgment is required in this instance. Under no circumstances should the non-composite steel deck be relied upon for flexural resistance to loading.

Section 4.13.3 Reinforcement for Temperature and Shrinkage: Composite Deck-Slabs

The ANSI/SDI C-2017 Standard permits three options for temperature and shrinkage reinforcement in composite steel deck-slabs.

1. Welded wire reinforcement or reinforcing bars with a minimum area of 0.00075 times the area of the concrete above the deck, but not be less than the area provided by 6 x 6 – W1.4 x W1.4 welded wire reinforcement.
2. Concrete specified in accordance with ASTM C1116, Type I, containing steel fibers meeting the criteria of ASTM A820, Type I , Type II, or Type V, at a dosage rate determined by the fiber manufacturer for the application, but not less than 25 lb/cu yd.
3. Concrete specified in accordance with ASTM C1116, Type III, containing macrosynthetic fibers meeting the criteria of ASTM D7508 at a dosage rate determined by the fiber manufacturer for the application, but not less than 4 lb/cu yd.

The prescription for welded wire reinforcement or reinforcing bars comes from the earlier ASCE 3-84 Standard. This prescription is approximately 50% of what ACI 318 requires for reinforced concrete slabs, with the assumption that the composite steel deck would account for the difference. This prescription, while shown to be acceptable for covered, general use floors, may not prove to be adequate for exposed or special use floors.

Through use, steel or macrosynthetic fibers have proven to be appropriate for shrinkage and temperature reinforcement usage in concrete slabs. Several manufacturers supply fibers for these purposes.

Modifications to fiber dosages will vary depending upon the specific fiber manufacturers' recommendations. As a general rule, increasing the fiber dosage and minimizing the shrinkage potential of the concrete can achieve reduced crack widths.

It is suggested that if fibers are used for this purpose, the Designer include quality control provisions in accordance with ACI 544.3R in the project specifications.

Section 4.13.4 Flexural Cracking: General Application

While strong in compression, concrete is relatively weak in tension, with a tension cracking strain of approximately 10% of the compression crushing strain. Therefore, concrete slabs will crack on the tension face at relatively low loads. Once the concrete cracks in tension, the tension force that was carried by the concrete is transferred to the steel reinforcing. This basic theory of the reinforced concrete is well established and can be found in any concrete design textbook.

Through basic engineering mechanics, if the tension cracking stress of concrete is known, the moment that causes the slab to crack can be calculated. It needs to be understood that the amount of, and even the presence of, steel reinforcing has little effect on the cracking moment of the concrete slab. Therefore, adding additional reinforcing steel will not prevent flexural cracks, however, additional reinforcing may reduce flexural crack widths.

Visible flexural cracks are most likely to form over supports where negative bending occurs. Negative bending creates tensile stresses in the top of the slab. Visible flexural cracks can form over beams or over girders.

Flexural cracking of the concrete in negative moment regions of the slab (over beams and girders) is not typically objectionable unless the floor is to be left exposed or covered with inflexible floor coverings. Flexural cracking and crack widths can be minimized by paying strict attention to preventing overloads at deck midspan during construction, utilizing a stiffer steel deck or reducing the slab span.

Section 4.13.5 Flexural Cracking: Composite Deck-Slabs

Because composite deck-slabs are typically designed as a series of simple spans, flexural cracks may form over supports. If flexural cracks must be strictly controlled, consideration should be given to designing the composite deck-slab for negative moments over supports (both beams and girders) and providing appropriate reinforcing steel at these supports. This negative moment reinforcing may reduce crack width, but will not completely eliminate cracks.

Example 9 demonstrates in an order-of-magnitude way the flexural strains that may develop in composite deck-slabs. This example is not intended to be an exact calculation of the strains in the concrete, but does indicate the difficulty in completely eliminating flexural cracking, especially over girders.

Section 4.14 Concrete Slab Finishing

ACI 302.1R-04 contains guidelines for placement and finishing of concrete slabs. The use of these guidelines is recommended.

Section 3.3.5 of ACI 302.1R-04 suggests placing slabs to a uniform thickness rather than seeking to create level slabs. The SDI endorses this recommendation.

Section 4.15 Damaged Floor Deck

Composite steel deck that has been damaged by denting is usually capable of resisting the design load once the concrete has cured. An explanation of why this is so, along with the results of testing, is contained in the SDI White Paper, Damaged Composite Steel Deck (2008).

Section 4.16 Deck Deflection and Concrete Quantities

Similar in concept to ponding of roof framing under rain, concrete slabs cast on steel framing will deflect. The total deflection of a floor bay is the sum of the deflections of the girders, beams, and deck. When field measuring the deflection of the deck, the deck deflection must be measured relative to the position of the deflected framing; that is the framing deflection must be subtracted from the total deflection to determine the deck deflection.

Deflection calculations are simple to perform so it would seem an easy task to arrive at an accurate prediction of the volume required to produce a reasonably level slab. While it is true the calculations are both simple and individually accurate, placing methods and tolerances of the system eliminate precision in the answer. (Ruddy, 1986) In the worst condition, a flexible frame could cause ponding, that is, as wet concrete is loaded onto the frame the deflection of the frame requires more concrete to be added in order to produce a level surface. Additional concrete means additional deflection so the process continues until some equilibrium is reached. At the other extreme one could imagine the beams and girders to be perfectly

cambered, and as the concrete is gently snowed into place the system settles into a uniformly thick and level slab. (Ricker, 1989) Both situations are unrealistic.

It is possible to determine the additional concrete required as a result of deck deflection. To do this the deck is assumed to be supported by non yielding supports; although the assumption would not be valid for most conditions, it is necessary because:

1. The flexibility of the supporting framing;
2. The beams and girders may be cambered in order to take their own deflection into account; and
3. The beams may be shored.

The results are shown on two nomographs (Figures 4.2 and 4.3); the difference between them being the concrete unit weight. To find the increased volume for a deck application, read the intersection of the span and the deck moment of inertia. (The deck spans are in feet and the moment of inertia values for the deck are in^4 per foot of width.)

Although the graphs are designed to cover the deck profiles shown in this Manual, they also apply to other (proprietary) deck sections – one simply must know the concrete volume required to fill the ribs of the deck so undeflected concrete volumes can be calculated.

It is apparent from the graphs that deck deflection will seldom cause as much as 5% increase in concrete. The Designer is urged to check the frame deflection under the concrete weight, and to hold the frame deflection to a reasonable limit. If frame deflections are deemed significant, additional concrete resulting from frame deflections can be added to the additional concrete resulting from deck deflection.

Derivation of the Charts

"Exact" solutions were found by integrating under the deflection curves of both two and three span beams. Equal spans and constant I values were used.

The area bounded by the level (undeflected) beam and the deflection curve for a two span, uniformly loaded, beam (deck) is:

$$A = \frac{3.125x10^{-3}wL(20736)}{EI}$$

where:

w	=	load (plf)
L	=	deck span (ft)
E	=	29,500 ksi
A	=	area under the deflection curve (in^2)

The area, A, under the deflection curve of the outside span of a three-span beam is:

$$A = \frac{4.166x10^{-3}wL(20736)}{EI}$$

The theoretical area under the middle span of a three-span beam is zero so the average for all three spans is then:

$$A = \left[\frac{4.166x10^{-3}wL(20736)}{EI}\right]2/3$$

The difference between three span and two span areas are obviously small so the average of the two is used and is taken as:

$$A = \frac{3x10^{-3}wL(20736)}{EI}$$

The total weight increase W, is given by:

$$W = \frac{12Aw_c}{1728}$$

where:

w_c = Unit weight of concrete (pcf)

$$W = \frac{0.432wL^5w_c}{EI}$$

where:

$$w = Vw_c = \left(\frac{t}{12} + C_V\right)w_c$$

$V = \frac{t}{12} + C_V$ = Unit concrete volume needed to produce a specific slab thickness on a given deck profile (ft^3 / ft^2)

t = Slab thickness above top of deck (inches)

C_v = Deck profile concrete volume constant (ft^2 / ftw)

V is a factor (cubic feet per square foot) that represents the volume needed to produce a specific slab thickness on a given deck profile, and t is the slab thickness above the top of the deck.

Volume constants, C_v, are shown in Figure 4.1 for generic composite deck profiles. For proprietary sections the deck manufacturer can provide the number.

Profile	C_v
3 x 12	0.125
2 x 12	0.0833
1.5 x 6	0.0469
1.5 x 6 Inverted Composite or 1.5 x 6 Form	0.0781

Figure 4.1 – Deck Volume Constants

The total volume increase is:

$$\Delta V = \frac{W}{w_c} = \frac{0.432 w_c L^5 V}{EI}$$

The percent increase in volume (compared to an undeflected deck) is:

$$P = 100\left[\frac{0.432 w_c L^5 V}{EILV}\right] = \frac{43.2 w_c L^4}{EI}$$

Since the volume increases (and the dead load increases) caused by deck deflection are observed to be generally small, it is not necessary to make iterations. The deck need not be considered to be in a ponding situation. If the frame is to be analyzed from a level starting position, iterations may be required for the frame but not the deck. The slab weight obtained from these calculations is suggested as the starting dead load for the frame calculations.

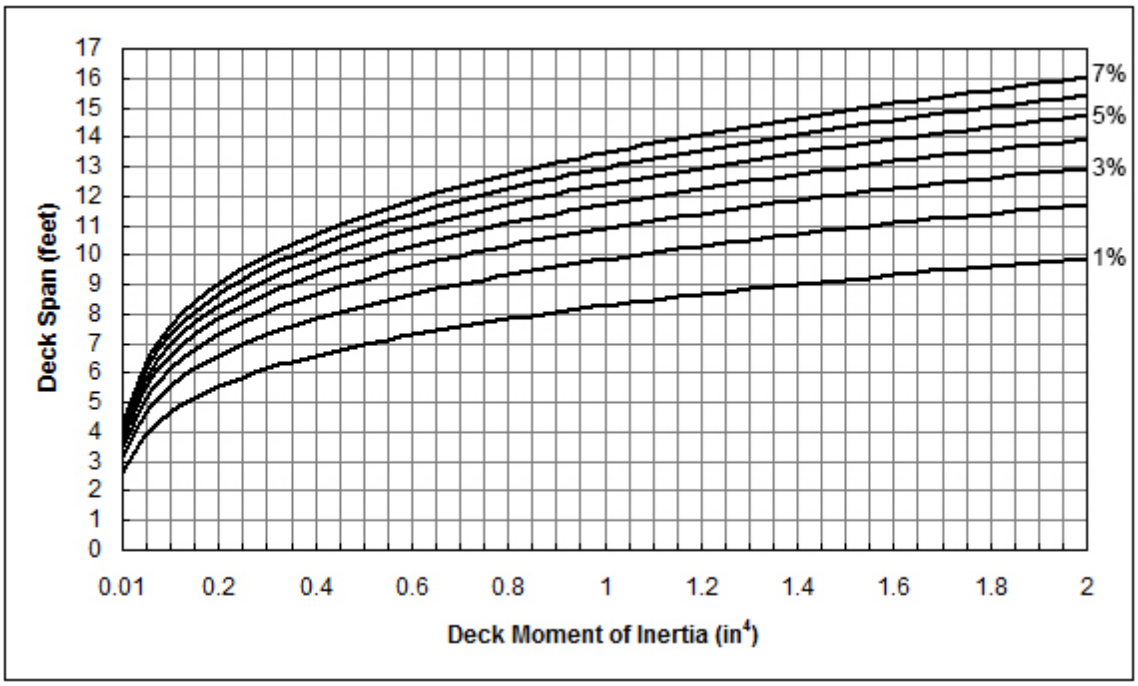


Figure 4.2 – Concrete Volume Increase (Normal Weight Concrete)

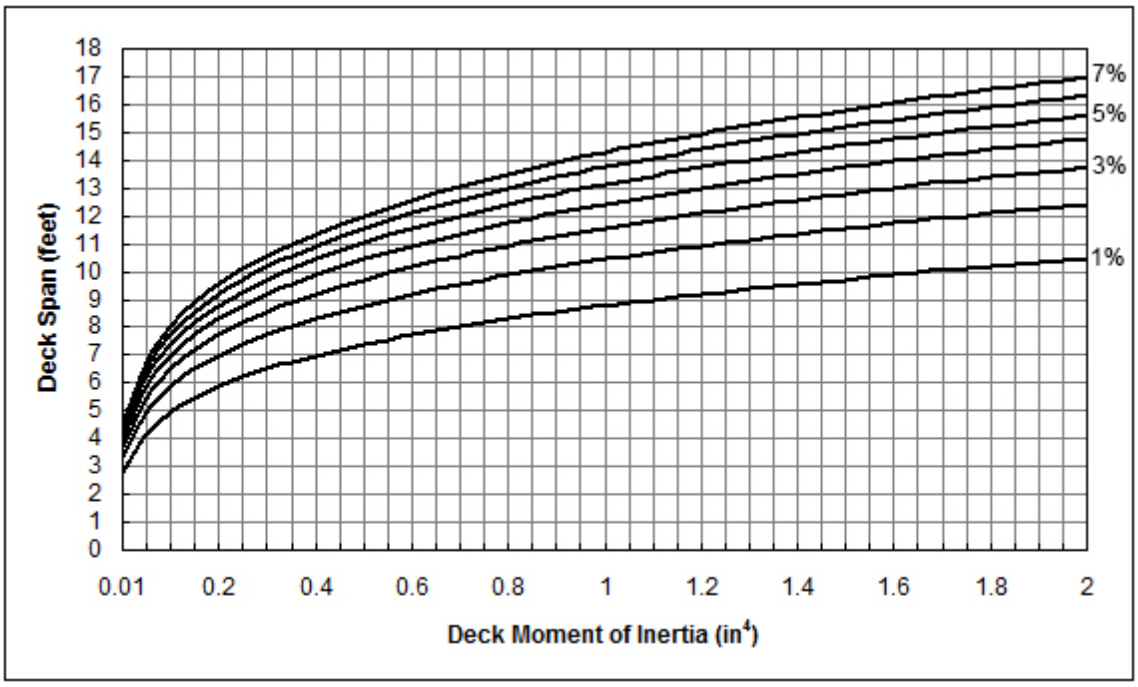


Figure 4.3 – Concrete Volume Increase (Lightweight Concrete)

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TABLES

SECTION 5

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Table 1 – Bare Deck Section Properties and Flexural Resistance

TABLE 1A
Composite Bare Deck Section Properties and Flexural Resistance (F_y = 40 ksi)

Profile	Gage Number	Design Thickness (inches)	I_p (inch^4)	I_n (inch^4)	S_p (inch^3)	S_n (inch^3)	A_s (inch^2)
1.5x6	22	0.0295	0.1424	0.1732	0.1693	0.1753	0.4720
1.5x6	20	0.0358	0.1850	0.2104	0.2098	0.2244	0.5728
1.5x6	18	0.0474	0.2675	0.2791	0.2855	0.2963	0.7584
1.5x6	16	0.0598	0.3528	0.3528	0.3666	0.3722	0.9568
1.5x6 INV	22	0.0295	0.1732	0.1424	0.1753	0.1693	0.4720
1.5x6 INV	20	0.0358	0.2104	0.1850	0.2244	0.2098	0.5728
1.5x6 INV	18	0.0474	0.2791	0.2675	0.2963	0.2855	0.7584
1.5x6 INV	16	0.0598	0.3528	0.3528	0.3722	0.3666	0.9568
2x12	22	0.0295	0.2960	0.2878	0.2453	0.2497	0.4425
2x12	20	0.0358	0.3765	0.3671	0.3246	0.3295	0.5370
2x12	18	0.0474	0.5000	0.4949	0.4736	0.4664	0.7110
2x12	16	0.0598	0.6315	0.6248	0.5982	0.5872	0.8970
3x12	22	0.0295	0.7283	0.7351	0.3994	0.4363	0.5015
3x12	20	0.0358	0.9214	0.9318	0.5246	0.5734	0.6086
3x12	18	0.0474	1.2213	1.2673	0.7534	0.7845	0.8058
3x12	16	0.0598	1.5426	1.5995	0.9536	0.9904	1.0166

		ASD (Ω = 1.67)		LRFD (Φ = 0.90)	
Profile	Gage Number	M_p/Ω inch-lbs	M_n/Ω inch-lbs	ΦM_p inch-lbs	ΦM_n inch-lbs
1.5x6	22	4055	4199	6095	6311
1.5x6	20	5025	5375	7553	8078
1.5x6	18	6838	7097	10278	10667
1.5x6	16	8781	8915	13198	13399
1.5x6 INV	22	4199	4055	6311	6095
1.5x6 INV	20	5375	5025	8078	7553
1.5x6 INV	18	7097	6838	10667	10278
1.5x6 INV	16	8915	8781	13399	13198
2x12	22	5875	5981	8831	8989
2x12	20	7775	7892	11686	11862
2x12	18	11344	11171	17050	16790
2x12	16	14328	14065	21535	21139
3x12	22	9566	10450	14378	15707
3x12	20	12565	13734	18886	20642
3x12	18	18046	18790	27122	28242
3x12	16	22841	23722	34330	35654

Table 1A Notes:

1. Strength and section properties are calculated assuming F_y = 40 ksi. Individual deck manufacturers may supply deck using other steel yield strengths.
2. All section properties and ASD and LRFD flexural strengths are calculated in accordance with ANSI/SDI C-2017, Section 2.4.A.1, and are per foot of width.
3. p = Property in positive bending; n = Property in negative bending.

TABLE 1B
Non-Composite Bare Deck Section Properties and Flexural Resistance

Profile	Gage Number – Steel Yield	Design Thickness (inches)	I_p (inch^4)	I_n (inch^4)	S_p (inch^3)	S_n (inch^3)
9/16x2.5 Form	26 ga F_y = 60 ksi	0.0179	0.013	0.013	0.043	0.043
9/16x2.5 Form	24 ga F_y = 60 ksi	0.0238	0.017	0.017	0.057	0.057
9/16x2.5 Form	22 ga F_y = 60 ksi	0.0295	0.021	0.021	0.070	0.070
1x4 Form	26 ga F_y = 60 ksi	0.0179	0.040	0.042	0.067	0.071
1x4 Form	24 ga F_y = 60 ksi	0.0238	0.049	0.049	0.098	0.099
1x4 Form	22 ga F_y = 60 ksi	0.0295	0.073	0.073	0.125	0.126
1x4 Form	20 ga F_y = 60 ksi	0.0358	0.080	0.080	0.152	0.153
1.5x6 Form	22 ga F_y = 40 ksi	0.0295	0.1732	0.1424	0.1753	0.1693
1.5x6 Form	20 ga F_y = 40 ksi	0.0358	0.2104	0.1850	0.2244	0.2098
1.5x6 Form	18 ga F_y = 40 ksi	0.0474	0.2791	0.2675	0.2963	0.2855
1.5x6 Form	16 ga F_y = 40 ksi	0.0598	0.3528	0.3528	0.3722	0.3666

		ASD (Ω = 1.67)		LRFD (Φ = 0.90)	
Profile	Gage Number – Steel Yield	M_p/Ω inch-lbs	M_n/Ω inch-lbs	ΦM_p inch-lbs	ΦM_n inch-lbs
9/16x2.5 Form	26 ga - F_y = 60 ksi	1545	1545	2322	2322
9/16x2.5 Form	24 ga - F_y = 60 ksi	2048	2048	3078	3078
9/16x2.5 Form	22 ga - F_y = 60 ksi	2515	2515	3780	3780
1x4 Form	26 ga - F_y = 60 ksi	2407	2551	3618	3834
1x4 Form	24 ga - F_y = 60 ksi	3521	3557	5292	5346
1x4 Form	22 ga - F_y = 60 ksi	4491	4527	6750	6804
1x4 Form	20 ga - F_y = 60 ksi	5461	5497	8208	8262
1.5x6 Form	22 ga - F_y = 40 ksi	4199	4055	6311	6095
1.5x6 Form	20 ga- F_y = 40 ksi	5375	5025	8078	7553
1.5x6 Form	18 ga - F_y = 40 ksi	7097	6838	10667	10278
1.5x6 Form	16 ga - F_y = 40 ksi	8915	8781	13399	13198

Table 1B Notes:

1. Strength and section properties are calculated assuming indicated yield stress. Individual deck manufacturers may supply deck using other steel yield strengths.
2. All section properties and ASD and LRFD flexural strengths are calculated in accordance with ANSI/SDI NC-2017, Section 2.4.A.1, and are per foot of width.
3. p = Property in positive bending; n = Property in negative bending.

Table 2 – Construction Span Tables

TABLE 2A-N
Construction Span Table
1.5x6 Composite Deck (F_y = 40 ksi) - 20 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 34 PSF	1.5x6x22 ga	5'-7	6'-7	6'-8
	1.5x6x20 ga	6'-6	7'-8	7'-9
	1.5x6x18 ga	8'-0	9'-4	9'-6
	1.5x6x16 ga	9'-4	10'-5	10'-9
4.00 (t=2.50) 40 PSF	1.5x6x22 ga	5'-4	6'-3	6'-4
	1.5x6x20 ga	6'-2	7'-3	7'-4
	1.5x6x18 ga	7'-7	8'-10	8'-11
	1.5x6x16 ga	8'-10	9'-10	10'-2
4.50 (t=3.00) 46 PSF	1.5x6x22 ga	5'-1	6'-0	6'-1
	1.5x6x20 ga	5'-11	6'-11	7'-0
	1.5x6x18 ga	7'-2	8'-5	8'-6
	1.5x6x16 ga	8'-5	9'-5	9'-9
5.00 (t=3.50) 52 PSF	1.5x6x22 ga	4'-11	5'-9	5'-10
	1.5x6x20 ga	5'-8	6'-7	6'-8
	1.5x6x18 ga	6'-11	8'-1	8'-2
	1.5x6x16 ga	8'-1	9'-0	9'-3
5.50 (t=4.00) 58 PSF	1.5x6x22 ga	4'-8	5'-6	5'-7
	1.5x6x20 ga	5'-5	6'-4	6'-5
	1.5x6x18 ga	6'-7	7'-9	7'-10
	1.5x6x16 ga	7'-9	8'-8	8'-11
6.00 (t=4.50) 64 PSF	1.5x6x22 ga	4'-7	5'-4	5'-5
	1.5x6x20 ga	5'-3	6'-2	6'-2
	1.5x6x18 ga	6'-5	7'-5	7'-6
	1.5x6x16 ga	7'-5	8'-4	8'-7

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2A-L
Construction Span Table
1.5x6 Composite Deck (F_y = 40 ksi) - 20 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 28 PSF	1.5x6x22 ga	5'-11	7'-0	7'-1
	1.5x6x20 ga	6'-11	8'-2	8'-3
	1.5x6x18 ga	8'-6	9'-11	10'-2
	1.5x6x16 ga	10'-0	11'-1	11'-5
4.00 (t=2.50) 33 PSF	1.5x6x22 ga	5'-8	6'-8	6'-9
	1.5x6x20 ga	6'-7	7'-9	7'-10
	1.5x6x18 ga	8'-1	9'-6	9'-7
	1.5x6x16 ga	9'-6	10'-7	10'-11
4.50 (t=3.00) 37 PSF	1.5x6x22 ga	5'-5	6'-5	6'-6
	1.5x6x20 ga	6'-4	7'-5	7'-6
	1.5x6x18 ga	7'-9	9'-1	9'-2
	1.5x6x16 ga	9'-1	10'-1	10'-5
4.75 (t=3.25) 40 PSF	1.5x6x22 ga	5'-4	6'-3	6'-4
	1.5x6x20 ga	6'-2	7'-3	7'-4
	1.5x6x18 ga	7'-7	8'-10	9'-0
	1.5x6x16 ga	8'-11	9'-11	10'-3
5.00 (t=3.50) 42 PSF	1.5x6x22 ga	5'-3	6'-2	6'-3
	1.5x6x20 ga	6'-1	7'-1	7'-2
	1.5x6x18 ga	7'-5	8'-8	8'-9
	1.5x6x16 ga	8'-8	9'-8	10'-0
5.75 (t=4.25) 49 PSF	1.5x6x22 ga	5'-0	5'-10	5'-11
	1.5x6x20 ga	5'-9	6'-9	6'-10
	1.5x6x18 ga	7'-0	8'-3	8'-4
	1.5x6x16 ga	8'-3	9'-2	9'-6

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2B-N
Construction Span Table
1.5x6 Inverted Composite Deck (F_y = 40 ksi) - 20 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 39 PSF	1.5x6INVx22 ga	5'-6	6'-5	6'-6
	1.5x6INVx20 ga	6'-6	7'-6	7'-8
	1.5x6INVx18 ga	7'-10	8'-9	9'-0
	1.5x6INVx16 ga	9'-0	9'-10	10'-2
4.00 (t=2.50) 46 PSF	1.5x6INVx22 ga	5'-3	6'-2	6'-3
	1.5x6INVx20 ga	6'-2	7'-2	7'-4
	1.5x6INVx18 ga	7'-5	8'-4	8'-7
	1.5x6INVx16 ga	8'-7	9'-5	9'-8
4.50 (t=3.00) 52 PSF	1.5x6INVx22 ga	5'-0	5'-11	6'-0
	1.5x6INVx20 ga	5'-11	6'-10	7'-0
	1.5x6INVx18 ga	7'-1	7'-11	8'-3
	1.5x6INVx16 ga	8'-2	9'-0	9'-3
5.00 (t=3.50) 58 PSF	1.5x6INVx22 ga	4'-10	5'-8	5'-9
	1.5x6INVx20 ga	5'-8	6'-7	6'-9
	1.5x6INVx18 ga	6'-10	7'-7	7'-10
	1.5x6INVx16 ga	7'-10	8'-7	8'-11
5.50 (t=4.00) 64 PSF	1.5x6INVx22 ga	4'-8	5'-6	5'-7
	1.5x6INVx20 ga	5'-6	6'-4	6'-6
	1.5x6INVx18 ga	6'-7	7'-4	7'-7
	1.5x6INVx16 ga	7'-7	8'-3	8'-7
6.00 (t=4.50) 70 PSF	1.5x6INVx22 ga	4'-6	5'-4	5'-4
	1.5x6INVx20 ga	5'-4	6'-1	6'-3
	1.5x6INVx18 ga	6'-4	7'-1	7'-4
	1.5x6INVx16 ga	7'-3	8'-0	8'-3

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2B-L
Construction Span Table
1.5x6 Inverted Composite Deck (F_y = 40 ksi) - 20 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 32 PSF	1.5x6INVx22 ga	5'-10	6'-11	7'-0
	1.5x6INVx20 ga	6'-11	8'-1	8'-3
	1.5x6INVx18 ga	8'-4	9'-4	9'-8
	1.5x6INVx16 ga	9'-8	10'-6	10'-11
4.00 (t=2.50) 37 PSF	1.5x6INVx22 ga	5'-7	6'-7	6'-8
	1.5x6INVx20 ga	6'-8	7'-8	7'-11
	1.5x6INVx18 ga	8'-0	8'-11	9'-3
	1.5x6INVx16 ga	9'-3	10'-1	10'-5
4.50 (t=3.00) 42 PSF	1.5x6INVx22 ga	5'-5	6'-4	6'-5
	1.5x6INVx20 ga	6'-4	7'-5	7'-7
	1.5x6INVx18 ga	7'-8	8'-7	8'-10
	1.5x6INVx16 ga	8'-10	9'-8	10'-0
4.75 (t=3.25) 44 PSF	1.5x6INVx22 ga	5'-3	6'-3	6'-4
	1.5x6INVx20 ga	6'-3	7'-3	7'-5
	1.5x6INVx18 ga	7'-6	8'-5	8'-8
	1.5x6INVx16 ga	8'-8	9'-6	9'-10
5.00 (t=3.50) 46 PSF	1.5x6INVx22 ga	5'-2	6'-1	6'-2
	1.5x6INVx20 ga	6'-2	7'-1	7'-3
	1.5x6INVx18 ga	7'-4	8'-3	8'-6
	1.5x6INVx16 ga	8'-6	9'-4	9'-7
5.75 (t=4.25) 54 PSF	1.5x6INVx22 ga	5'-0	5'-10	5'-11
	1.5x6INVx20 ga	5'-10	6'-9	6'-11
	1.5x6INVx18 ga	7'-0	7'-10	8'-1
	1.5x6INVx16 ga	8'-1	8'-10	9'-2

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2C-N
Construction Span Table
2x12 Composite Deck (F_y = 40 ksi) - 20 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
4.00 (t=2.00) 40 PSF	2x12x22 ga	6'-11	7'-8	8'-2
	2x12x20 ga	8'-4	9'-4	9'-8
	2x12x18 ga	10'-4	11'-1	11'-5
	2x12x16 ga	11'-2	12'-5	12'-10
4.50 (t=2.50) 46 PSF	2x12x22 ga	6'-7	6'-11	7'-9
	2x12x20 ga	7'-11	8'-10	9'-2
	2x12x18 ga	9'-10	10'-6	10'-11
	2x12x16 ga	10'-7	11'-9	12'-2
5.00 (t=3.00) 52 PSF	2x12x22 ga	6'-2	6'-4	7'-2
	2x12x20 ga	7'-7	8'-6	8'-9
	2x12x18 ga	9'-6	10'-1	10'-5
	2x12x16 ga	10'-2	11'-3	11'-8
5.50 (t=3.50) 58 PSF	2x12x22 ga	5'-6	5'-10	6'-7
	2x12x20 ga	7'-3	8'-1	8'-5
	2x12x18 ga	9'-1	9'-8	10'-0
	2x12x16 ga	9'-10	10'-10	11'-2
6.00 (t=4.00) 64 PSF	2x12x22 ga	5'-0	5'-5	6'-2
	2x12x20 ga	7'-0	7'-9	8'-1
	2x12x18 ga	8'-9	9'-3	9'-7
	2x12x16 ga	9'-6	10'-5	10'-9
6.50 (t=4.50) 70 PSF	2x12x22 ga	4'-6	5'-0	5'-8
	2x12x20 ga	6'-9	7'-3	7'-9
	2x12x18 ga	8'-6	8'-11	9'-3
	2x12x16 ga	9'-2	10'-0	10'-4

Minimum exterior bearing length required is 2.00 inches.
Minimum interior bearing length required is 4.00 inches.

TABLE 2C-L
Construction Span Table
2x12 Composite Deck (F_y = 40 ksi) - 20 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
4.00 (t=2.00) 32 PSF	2x12x22 ga	7'-5	8'-8	8'-9
	2x12x20 ga	8'-11	10'-0	10'-4
	2x12x18 ga	11'-1	11'-10	12'-3
	2x12x16 ga	11'-9	13'-3	13'-8
4.50 (t=2.50) 37 PSF	2x12x22 ga	7'-1	8'-0	8'-5
	2x12x20 ga	8'-6	9'-7	9'-11
	2x12x18 ga	10'-7	11'-4	11'-9
	2x12x16 ga	11'-4	12'-8	13'-1
5.00 (t=3.00) 42 PSF	2x12x22 ga	6'-9	7'-5	8'-0
	2x12x20 ga	8'-2	9'-2	9'-6
	2x12x18 ga	10'-2	10'-11	11'-3
	2x12x16 ga	10'-11	12'-2	12'-7
5.25 (t=3.25) 44 PSF	2x12x22 ga	6'-8	7'-1	7'-11
	2x12x20 ga	8'-0	9'-0	9'-3
	2x12x18 ga	10'-0	10'-8	11'-0
	2x12x16 ga	10'-9	11'-11	12'-4
5.50 (t=3.50) 47 PSF	2x12x22 ga	6'-6	6'-10	7'-9
	2x12x20 ga	7'-10	8'-10	9'-1
	2x12x18 ga	9'-10	10'-6	10'-10
	2x12x16 ga	10'-7	11'-9	12'-1
6.25 (t=4.25) 54 PSF	2x12x22 ga	5'-11	6'-2	7'-0
	2x12x20 ga	7'-5	8'-4	8'-7
	2x12x18 ga	9'-4	9'-11	10'-3
	2x12x16 ga	10'-1	11'-1	11'-6

Minimum exterior bearing length required is 2.00 inches.
Minimum interior bearing length required is 4.00 inches.

TABLE 2D-N
Construction Span Table
3x12 Composite Deck (F_y = 40 ksi) - 20 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
5.00 (t=2.00) 46 PSF	3x12x22 ga	7'-2	7'-7	8'-8
	3x12x20 ga	10'-9	10'-11	12'-2
	3x12x18 ga	12'-9	13'-9	14'-2
	3x12x16 ga	13'-5	15'-4	15'-10
5.50 (t=2.50) 52 PSF	3x12x22 ga	6'-3	6'-11	7'-10
	3x12x20 ga	10'-2	10'-0	11'-4
	3x12x18 ga	12'-4	13'-1	13'-7
	3x12x16 ga	13'-0	14'-8	15'-2
6.00 (t=3.00) 58 PSF	3x12x22 ga	5'-7	6'-5	7'-0
	3x12x20 ga	9'-9	9'-2	10'-6
	3x12x18 ga	12'-0	12'-7	13'-0
	3x12x16 ga	12'-8	14'-1	14'-7
6.50 (t=3.50) 64 PSF	3x12x22 ga	5'-0	5'-11	6'-4
	3x12x20 ga	9'-4	8'-6	9'-8
	3x12x18 ga	11'-7	12'-1	12'-6
	3x12x16 ga	12'-4	13'-7	14'-0
7.00 (t=4.00) 70 PSF	3x12x22 ga	4'-7	5'-6	5'-9
	3x12x20 ga	9'-0	7'-11	9'-0
	3x12x18 ga	11'-2	11'-8	12'-1
	3x12x16 ga	12'-1	13'-1	13'-6
7.50 (t=4.50) 76 PSF	3x12x22 ga	4'-3	5'-2	5'-3
	3x12x20 ga	8'-5	7'-5	8'-5
	3x12x18 ga	10'-9	11'-4	11'-8
	3x12x16 ga	11'-10	12'-8	13'-1

Minimum exterior bearing length required is 2.50 inches.
Minimum interior bearing length required is 5.00 inches.

Table 2D-L
Construction Span Table
3x12 Composite Deck (F_y = 40 ksi) - 20 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
5.00 (t=2.00) 37 PSF	3x12x22 ga	8'-11	8'-10	10'-0
	3x12x20 ga	11'-8	12'-8	13'-1
	3x12x18 ga	13'-5	14'-9	15'-3
	3x12x16 ga	14'-2	16'-6	17'-1
5.50 (t=2.50) 42 PSF	3x12x22 ga	7'-10	8'-1	9'-3
	3x12x20 ga	11'-1	11'-8	12'-6
	3x12x18 ga	13'-0	14'-2	14'-8
	3x12x16 ga	13'-9	15'-10	16'-4
6.00 (t=3.00) 47 PSF	3x12x22 ga	7'-0	7'-6	8'-6
	3x12x20 ga	10'-8	10'-10	12'-1
	3x12x18 ga	12'-8	13'-8	14'-1
	3x12x16 ga	13'-5	15'-3	15'-9
6.25 (t=3.25) 49 PSF	3x12x22 ga	6'-8	7'-3	8'-3
	3x12x20 ga	10'-5	10'-5	11'-10
	3x12x18 ga	12'-6	13'-5	13'-10
	3x12x16 ga	13'-3	15'-0	15'-6
6.50 (t=3.50) 52 PSF	3x12x22 ga	6'-4	7'-0	7'-11
	3x12x20 ga	10'-3	10'-1	11'-5
	3x12x18 ga	12'-4	13'-2	13'-7
	3x12x16 ga	13'-1	14'-9	15'-3
7.25 (t=4.25) 59 PSF	3x12x22 ga	5'-6	6'-4	6'-11
	3x12x20 ga	9'-8	9'-1	10'-4
	3x12x18 ga	12'-0	12'-6	12'-11
	3x12x16 ga	12'-8	14'-0	14'-6

Minimum exterior bearing length required is 2.50 inches.
Minimum interior bearing length required is 5.00 inches.

TABLE 2E-N
Construction Span Table
9/16x2.5 Non-Composite Deck (F_y = 60 ksi) - 20 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
2.00	9/16x2.5x26 ga	2'-9	3'-4	3'-5
(t=1.50)	9/16x2.5x24 ga	3'-6	4'-3	4'-4
23 PSF	9/16x2.5x22 ga	4'-2	5'-0	5'-1
2.50	9/16x2.5x26 ga	2'-8	3'-3	3'-3
(t=2.00)	9/16x2.5x24 ga	3'-5	4'-1	4'-1
29 PSF	9/16x2.5x22 ga	3'-11	4'-9	4'-10
3.00	9/16x2.5x26 ga	2'-7	3'-1	3'-2
(t=2.50)	9/16x2.5x24 ga	3'-3	3'-11	3'-11
35 PSF	9/16x2.5x22 ga	3'-8	4'-6	4'-7
3.50	9/16x2.5x26 ga	2'-6	3'-0	3'-0
(t=3.00)	9/16x2.5x24 ga	3'-2	3'-9	3'-9
41 PSF	9/16x2.5x22 ga	3'-6	4'-4	4'-5
4.00	9/16x2.5x26 ga	2'-5	2'-11	2'-11
(t=3.50)	9/16x2.5x24 ga	3'-0	3'-7	3'-8
47 PSF	9/16x2.5x22 ga	3'-4	4'-2	4'-3
4.50	9/16x2.5x26 ga	2'-4	2'-10	2'-10
(t=4.00)	9/16x2.5x24 ga	2'-11	3'-6	3'-6
53 PSF	9/16x2.5x22 ga	3'-3	4'-1	4'-1

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

Table 2E-L
Construction Span Table
9/16x2.5 Non-Composite Deck (F_y = 60 ksi) - 20 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
2.00	9/16x2.5x26 ga	2'-11	3'-6	3'-6
(t=1.50)	9/16x2.5x24 ga	3'-8	4'-5	4'-6
19 PSF	9/16x2.5x22 ga	4'-4	5'-3	5'-3
2.50	9/16x2.5x26 ga	2'-9	3'-4	3'-5
(t=2.00)	9/16x2.5x24 ga	3'-6	4'-3	4'-3
23 PSF	9/16x2.5x22 ga	4'-2	5'-0	5'-1
3.00	9/16x2.5x26 ga	2'-8	3'-3	3'-3
(t=2.50)	9/16x2.5x24 ga	3'-5	4'-1	4'-2
28 PSF	9/16x2.5x22 ga	4'-0	4'-9	4'-10
3.50	9/16x2.5x26 ga	2'-7	3'-2	3'-2
(t=3.00)	9/16x2.5x24 ga	3'-4	3'-11	4'-0
33 PSF	9/16x2.5x22 ga	3'-9	4'-7	4'-8
4.00	9/16x2.5x26 ga	2'-7	3'-1	3'-1
(t=3.50)	9/16x2.5x24 ga	3'-2	3'-10	3'-10
38 PSF	9/16x2.5x22 ga	3'-7	4'-5	4'-6
4.50	9/16x2.5x26 ga	2'-6	3'-0	3'-0
(t=4.00)	9/16x2.5x24 ga	3'-1	3'-8	3'-9
42 PSF	9/16x2.5x22 ga	3'-6	4'-4	4'-4

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2F-N
Construction Span Table
1x4 Non-Composite Deck (F_y = 60 ksi) - 20 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.00 (t=2.00) 31 PSF	1 x 4 Form - 26	3'-9	4'-6	4'-7
	1 x 4 Form - 24	5'-1	6'-0	6'-1
	1 x 4 Form - 22	5'-10	7'-1	7'-2
	1 x 4 Form - 20	6'-0	8'-0	7'-5
3.50 (t=2.50) 37 PSF	1 x 4 Form - 26	3'-8	4'-4	4'-4
	1 x 4 Form - 24	4'-10	5'-8	5'-9
	1 x 4 Form - 22	5'-6	6'-9	6'-9
	1 x 4 Form - 20	5'-8	7'-7	7'-0
4.00 (t=3.00) 43 PSF	1 x 4 Form - 26	3'-6	4'-2	4'-2
	1 x 4 Form - 24	4'-7	5'-5	5'-6
	1 x 4 Form - 22	5'-3	6'-5	6'-5
	1 x 4 Form - 20	5'-4	7'-3	6'-8
4.50 (t=3.50) 50 PSF	1 x 4 Form - 26	3'-5	4'-0	4'-1
	1 x 4 Form - 24	4'-5	5'-3	5'-4
	1 x 4 Form - 22	5'-0	6'-2	6'-2
	1 x 4 Form - 20	5'-2	6'-11	6'-4
5.00 (t=4.00) 56 PSF	1 x 4 Form - 26	3'-3	3'-10	3'-11
	1 x 4 Form - 24	4'-3	5'-1	5'-1
	1 x 4 Form - 22	4'-10	5'-11	5'-11
	1 x 4 Form - 20	4'-11	6'-8	6'-1
5.50 (t=4.50) 62 PSF	1 x 4 Form - 26	3'-2	3'-9	3'-10
	1 x 4 Form - 24	4'-1	4'-11	4'-11
	1 x 4 Form - 22	4'-8	5'-9	5'-9
	1 x 4 Form - 20	4'-9	6'-5	5'-11

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

Table 2F-L
Construction Span Table
1x4 Non-Composite Deck (F_y = 60 ksi) - 20 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 Span	2 Span	3 Span
3.00 (t=2.00) 24 PSF	1 x 4 Form - 26	4'-0	4'-9	4'-10
	1 x 4 Form - 24	5'-4	6'-4	6'-5
	1 x 4 Form - 22	6'-3	7'-7	7'-8
	1 x 4 Form - 20	6'-5	8'-8	7'-11
3.50 (t=2.50) 29 PSF	1 x 4 Form - 26	3'-10	4'-7	4'-7
	1 x 4 Form - 24	5'-1	6'-1	6'-2
	1 x 4 Form - 22	5'-11	7'-3	7'-4
	1 x 4 Form - 20	6'-1	8'-2	7'-6
4.00 (t=3.00) 33 PSF	1 x 4 Form - 26	3'-8	4'-5	4'-5
	1 x 4 Form - 24	4'-11	5'-10	5'-11
	1 x 4 Form - 22	5'-8	6'-11	6'-11
	1 x 4 Form - 20	5'-9	7'-9	7'-2
4.50 (t=3.50) 38 PSF	1 x 4 Form - 26	3'-7	4'-3	4'-4
	1 x 4 Form - 24	4'-9	5'-7	5'-8
	1 x 4 Form - 22	5'-5	6'-8	6'-8
	1 x 4 Form - 20	5'-6	7'-5	6'-10
5.00 (t=4.00) 43 PSF	1 x 4 Form - 26	3'-6	4'-2	4'-2
	1 x 4 Form - 24	4'-7	5'-5	5'-6
	1 x 4 Form - 22	5'-2	6'-5	6'-5
	1 x 4 Form - 20	5'-4	7'-2	6'-7
5.50 (t=4.50) 47 PSF	1 x 4 Form - 26	3'-5	4'-0	4'-1
	1 x 4 Form - 24	4'-5	5'-3	5'-4
	1 x 4 Form - 22	5'-0	6'-2	6'-2
	1 x 4 Form - 20	5'-2	6'-11	6'-5

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

Table 2G-N
Construction Span Table
1.5x6 Non-Composite Deck (F_y = 40 ksi) - 20 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 39 PSF	1.5x6 Form - 22 ga	5'-6	6'-5	6'-6
	1.5x6 Form - 20 ga	6'-6	7'-6	7'-8
	1.5x6 Form - 18 ga	7'-10	8'-9	9'-0
	1.5x6 Form - 16 ga	9'-0	9'-10	10'-2
4.00 (t=2.50) 46 PSF	1.5x6 Form - 22 ga	5'-3	6'-2	6'-3
	1.5x6 Form - 20 ga	6'-2	7'-2	7'-4
	1.5x6 Form - 18 ga	7'-5	8'-4	8'-7
	1.5x6 Form - 16 ga	8'-7	9'-5	9'-8
4.50 (t=3.00) 52 PSF	1.5x6 Form - 22 ga	5'-0	5'-11	6'-0
	1.5x6 Form - 20 ga	5'-11	6'-10	7'-0
	1.5x6 Form - 18 ga	7'-1	7'-11	8'-3
	1.5x6 Form - 16 ga	8'-2	9'-0	9'-3
5.00 (t=3.50) 58 PSF	1.5x6 Form - 22 ga	4'-10	5'-8	5'-9
	1.5x6 Form - 20 ga	5'-8	6'-7	6'-9
	1.5x6 Form - 18 ga	6'-10	7'-7	7'-10
	1.5x6 Form - 16 ga	7'-10	8'-7	8'-11
5.50 (t=4.00) 64 PSF	1.5x6 Form - 22 ga	4'-8	5'-6	5'-7
	1.5x6 Form - 20 ga	5'-6	6'-4	6'-6
	1.5x6 Form - 18 ga	6'-7	7'-4	7'-7
	1.5x6 Form - 16 ga	7'-7	8'-3	8'-7
6.00 (t=4.50) 70 PSF	1.5x6 Form - 22 ga	4'-6	5'-4	5'-4
	1.5x6 Form - 20 ga	5'-4	6'-1	6'-3
	1.5x6 Form - 18 ga	6'-4	7'-1	7'-4
	1.5x6 Form - 16 ga	7'-3	8'-0	8'-3

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2G-L
Construction Span Table
1.5x6 Non-Composite Deck (Fy = 40 ksi) - 20 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 32 PSF	1.5x6 Form - 22 ga	5'-10	6'-11	7'-0
	1.5x6 Form - 20 ga	6'-11	8'-1	8'-3
	1.5x6 Form - 18 ga	8'-4	9'-4	9'-8
	1.5x6 Form - 16 ga	9'-8	10'-6	10'-11
4.00 (t=2.50) 37 PSF	1.5x6 Form - 22 ga	5'-7	6'-7	6'-8
	1.5x6 Form - 20 ga	6'-8	7'-8	7'-11
	1.5x6 Form - 18 ga	8'-0	8'-11	9'-3
	1.5x6 Form - 16 ga	9'-3	10'-1	10'-5
4.50 (t=3.00) 42 PSF	1.5x6 Form - 22 ga	5'-5	6'-4	6'-5
	1.5x6 Form - 20 ga	6'-4	7'-5	7'-7
	1.5x6 Form - 18 ga	7'-8	8'-7	8'-10
	1.5x6 Form - 16 ga	8'-10	9'-8	10'-0
4.75 (t=3.25) 44 PSF	1.5x6 Form - 22 ga	5'-3	6'-3	6'-4
	1.5x6 Form - 20 ga	6'-3	7'-3	7'-5
	1.5x6 Form - 18 ga	7'-6	8'-5	8'-8
	1.5x6 Form - 16 ga	8'-8	9'-6	9'-10
5.00 (t=3.50) 46 PSF	1.5x6 Form - 22 ga	5'-2	6'-1	6'-2
	1.5x6 Form - 20 ga	6'-2	7'-1	7'-3
	1.5x6 Form - 18 ga	7'-4	8'-3	8'-6
	1.5x6 Form - 16 ga	8'-6	9'-4	9'-7
5.75 (t=4.25) 54 PSF	1.5x6 Form - 22 ga	5'-0	5'-10	5'-11
	1.5x6 Form - 20 ga	5'-10	6'-9	6'-11
	1.5x6 Form - 18 ga	7'-0	7'-10	8'-1
	1.5x6 Form - 16 ga	8'-1	8'-10	9'-2

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2H-N
Construction Span Table
1.5x6 Composite Deck (F_y = 40 ksi) - 50 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 34 PSF	1.5x6x22 ga	5'-7	5'-9	5'-11
	1.5x6x20 ga	6'-4	6'-6	6'-8
	1.5x6x18 ga	7'-4	7'-5	7'-8
	1.5x6x16 ga	8'-4	8'-4	8'-7
4.00 (t=2.50) 40 PSF	1.5x6x22 ga	5'-4	5'-6	5'-9
	1.5x6x20 ga	6'-1	6'-3	6'-6
	1.5x6x18 ga	7'-1	7'-2	7'-5
	1.5x6x16 ga	8'-0	8'-0	8'-4
4.50 (t=3.00) 46 PSF	1.5x6x22 ga	5'-1	5'-4	5'-6
	1.5x6x20 ga	5'-11	6'-1	6'-3
	1.5x6x18 ga	6'-10	6'-11	7'-2
	1.5x6x16 ga	7'-9	7'-9	8'-0
5.00 (t=3.50) 52 PSF	1.5x6x22 ga	4'-11	5'-2	5'-4
	1.5x6x20 ga	5'-8	5'-10	6'-1
	1.5x6x18 ga	6'-8	6'-9	7'-0
	1.5x6x16 ga	7'-6	7'-6	7'-9
5.50 (t=4.00) 58 PSF	1.5x6x22 ga	4'-8	5'-0	5'-2
	1.5x6x20 ga	5'-5	5'-8	5'-11
	1.5x6x18 ga	6'-6	6'-6	6'-9
	1.5x6x16 ga	7'-4	7'-4	7'-7
6.00 (t=4.50) 64 PSF	1.5x6x22 ga	4'-7	4'-11	5'-1
	1.5x6x20 ga	5'-3	5'-6	5'-9
	1.5x6x18 ga	6'-3	6'-4	6'-7
	1.5x6x16 ga	7'-1	7'-1	7'-4

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2H-L
Construction Span Table
1.5x6 Composite Deck (F_y = 40 ksi) - 50 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 28 PSF	1.5x6x22 ga	5'-11	6'-0	6'-2
	1.5x6x20 ga	6'-7	6'-9	7'-0
	1.5x6x18 ga	7'-8	7'-9	8'-0
	1.5x6x16 ga	8'-8	8'-8	8'-11
4.00 (t=2.50) 33 PSF	1.5x6x22 ga	5'-8	5'-10	6'-0
	1.5x6x20 ga	6'-5	6'-7	6'-9
	1.5x6x18 ga	7'-5	7'-6	7'-9
	1.5x6x16 ga	8'-4	8'-5	8'-8
4.50 (t=3.00) 37 PSF	1.5x6x22 ga	5'-5	5'-8	5'-10
	1.5x6x20 ga	6'-2	6'-4	6'-7
	1.5x6x18 ga	7'-2	7'-4	7'-7
	1.5x6x16 ga	8'-2	8'-2	8'-5
4.75 (t=3.25) 40 PSF	1.5x6x22 ga	5'-4	5'-7	5'-9
	1.5x6x20 ga	6'-1	6'-3	6'-6
	1.5x6x18 ga	7'-1	7'-2	7'-5
	1.5x6x16 ga	8'-0	8'-1	8'-4
5.00 (t=3.50) 42 PSF	1.5x6x22 ga	5'-3	5'-6	5'-8
	1.5x6x20 ga	6'-0	6'-2	6'-5
	1.5x6x18 ga	7'-0	7'-1	7'-4
	1.5x6x16 ga	7'-11	7'-11	8'-3
5.75 (t=4.25) 49 PSF	1.5x6x22 ga	5'-0	5'-3	5'-5
	1.5x6x20 ga	5'-9	5'-11	6'-2
	1.5x6x18 ga	6'-9	6'-10	7'-1
	1.5x6x16 ga	7'-8	7'-8	7'-11

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2I-N
Construction Span Table
1.5x6 Inverted Composite Deck (F_y = 40 ksi) - 50 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 39 PSF	1.5x6INVx22 ga	5'-6	5'-6	5'-8
	1.5x6INVx20 ga	6'-4	6'-1	6'-3
	1.5x6INVx18 ga	7'-3	7'-1	7'-4
	1.5x6INVx16 ga	8'-1	8'-0	8'-3
4.00 (t=2.50) 46 PSF	1.5x6INVx22 ga	5'-3	5'-3	5'-6
	1.5x6INVx20 ga	6'-2	5'-11	6'-1
	1.5x6INVx18 ga	7'-0	6'-10	7'-1
	1.5x6INVx16 ga	7'-10	7'-9	8'-0
4.50 (t=3.00) 52 PSF	1.5x6INVx22 ga	5'-0	5'-1	5'-3
	1.5x6INVx20 ga	5'-11	5'-8	5'-11
	1.5x6INVx18 ga	6'-10	6'-8	6'-10
	1.5x6INVx16 ga	7'-7	7'-6	7'-9
5.00 (t=3.50) 58 PSF	1.5x6INVx22 ga	4'-10	5'-0	5'-2
	1.5x6INVx20 ga	5'-8	5'-6	5'-9
	1.5x6INVx18 ga	6'-7	6'-5	6'-8
	1.5x6INVx16 ga	7'-5	7'-3	7'-6
5.50 (t=4.00) 64 PSF	1.5x6INVx22 ga	4'-8	4'-10	5'-0
	1.5x6INVx20 ga	5'-6	5'-4	5'-7
	1.5x6INVx18 ga	6'-5	6'-3	6'-6
	1.5x6INVx16 ga	7'-2	7'-1	7'-4
6.00 (t=4.50) 70 PSF	1.5x6INVx22 ga	4'-6	4'-8	4'-10
	1.5x6INVx20 ga	5'-4	5'-3	5'-5
	1.5x6INVx18 ga	6'-3	6'-1	6'-4
	1.5x6INVx16 ga	7'-0	6'-11	7'-2

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2I-L
Construction Span Table
1.5x6 Inverted Composite Deck (F_y = 40 ksi) – 50 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 32 PSF	1.5x6INVx22 ga	5'-10	5'-9	5'-11
	1.5x6INVx20 ga	6'-7	6'-4	6'-7
	1.5x6INVx18 ga	7'-7	7'-5	7'-8
	1.5x6INVx16 ga	8'-6	8'-4	8'-8
4.00 (t=2.50) 37 PSF	1.5x6INVx22 ga	5'-7	5'-7	5'-9
	1.5x6INVx20 ga	6'-5	6'-2	6'-5
	1.5x6INVx18 ga	7'-4	7'-2	7'-5
	1.5x6INVx16 ga	8'-3	8'-2	8'-5
4.50 (t=3.00) 42 PSF	1.5x6INVx22 ga	5'-5	5'-5	5'-7
	1.5x6INVx20 ga	6'-3	6'-0	6'-2
	1.5x6INVx18 ga	7'-2	7'-0	7'-3
	1.5x6INVx16 ga	8'-0	7'-11	8'-2
4.75 (t=3.25) 44 PSF	1.5x6INVx22 ga	5'-3	5'-4	5'-6
	1.5x6INVx20 ga	6'-2	5'-11	6'-2
	1.5x6INVx18 ga	7'-1	6'-11	7'-2
	1.5x6INVx16 ga	7'-11	7'-10	8'-1
5.00 (t=3.50) 46 PSF	1.5x6INVx22 ga	5'-2	5'-3	5'-5
	1.5x6INVx20 ga	6'-1	5'-10	6'-1
	1.5x6INVx18 ga	7'-0	6'-10	7'-1
	1.5x6INVx16 ga	7'-10	7'-8	8'-0
5.75 (t=4.25) 54 PSF	1.5x6INVx22 ga	5'-0	5'-1	5'-3
	1.5x6INVx20 ga	5'-10	5'-8	5'-10
	1.5x6INVx18 ga	6'-9	6'-7	6'-9
	1.5x6INVx16 ga	7'-6	7'-5	7'-8

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2J-N
Construction Span Table
2x12 Composite Deck (F_y = 40 ksi) – 50 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
4.00 (t=2.00) 40 PSF	2x12x22 ga	6'-8	5'-0	5'-9
	2x12x20 ga	7'-7	7'-3	7'-9
	2x12x18 ga	9'-2	8'-11	9'-3
	2x12x16 ga	10'-3	10'-1	10'-5
4.50 (t=2.50) 46 PSF	2x12x22 ga	6'-5	4'-8	5'-4
	2x12x20 ga	7'-4	6'-10	7'-6
	2x12x18 ga	8'-11	8'-8	8'-11
	2x12x16 ga	9'-11	9'-9	10'-0
5.00 (t=3.00) 52 PSF	2x12x22 ga	6'-2	4'-5	5'-0
	2x12x20 ga	7'-2	6'-5	7'-3
	2x12x18 ga	8'-7	8'-5	8'-8
	2x12x16 ga	9'-8	9'-5	9'-9
5.50 (t=3.50) 58 PSF	2x12x22 ga	5'-6	4'-2	4'-9
	2x12x20 ga	6'-11	6'-0	6'-10
	2x12x18 ga	8'-4	8'-2	8'-5
	2x12x16 ga	9'-4	9'-2	9'-5
6.00 (t=4.00) 64 PSF	2x12x22 ga	5'-0	3'-11	4'-6
	2x12x20 ga	6'-9	5'-8	6'-6
	2x12x18 ga	8'-2	7'-11	8'-2
	2x12x16 ga	9'-1	8'-11	9'-2
6.50 (t=4.50) 70 PSF	2x12x22 ga	4'-6	3'-9	4'-3
	2x12x20 ga	6'-7	5'-5	6'-2
	2x12x18 ga	7'-11	7'-8	7'-11
	2x12x16 ga	8'-11	8'-8	8'-11

Minimum exterior bearing length required is 2.00 inches.
Minimum interior bearing length required is 4.00 inches.

TABLE 2J-L
Construction Span Table
2x12 Composite Deck (F_y = 40 ksi) – 50 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
4.00 (t=2.00) 32 PSF	2x12x22 ga	6'-11	5'-6	6'-3
	2x12x20 ga	8'-0	7'-11	8'-2
	2x12x18 ga	9'-7	9'-4	9'-8
	2x12x16 ga	10'-9	10'-6	10'-10
4.50 (t=2.50) 37 PSF	2x12x22 ga	6'-9	5'-2	5'-11
	2x12x20 ga	7'-9	7'-6	7'-11
	2x12x18 ga	9'-4	9'-1	9'-5
	2x12x16 ga	10'-5	10'-2	10'-7
5.00 (t=3.00) 42 PSF	2x12x22 ga	6'-7	4'-11	5'-7
	2x12x20 ga	7'-6	7'-1	7'-8
	2x12x18 ga	9'-1	8'-10	9'-2
	2x12x16 ga	10'-2	9'-11	10'-3
5.25 (t=3.25) 44 PSF	2x12x22 ga	6'-6	4'-9	5'-5
	2x12x20 ga	7'-5	6'-11	7'-7
	2x12x18 ga	8'-11	8'-9	9'-0
	2x12x16 ga	10'-0	9'-10	10'-1
5.50 (t=3.50) 47 PSF	2x12x22 ga	6'-5	4'-8	5'-4
	2x12x20 ga	7'-4	6'-9	7'-6
	2x12x18 ga	8'-10	8'-7	8'-11
	2x12x16 ga	9'-11	9'-8	10'-0
6.25 (t=4.25) 54 PSF	2x12x22 ga	5'-11	4'-4	4'-11
	2x12x20 ga	7'-1	6'-3	7'-1
	2x12x18 ga	8'-6	8'-4	8'-7
	2x12x16 ga	9'-7	9'-4	9'-7

Minimum exterior bearing length required is 2.00 inches.
Minimum interior bearing length required is 4.00 inches.

TABLE 2K-N
Construction Span Table
3x12 Composite Deck (F_y = 40 ksi) - 50 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
5.00 (t=2.00) 46 PSF	3x12x22 ga	7'-0	5'-2	5'-10
	3x12x20 ga	9'-4	7'-5	8'-6
	3x12x18 ga	11'-2	11'-4	11'-8
	3x12x16 ga	12'-7	12'-8	13'-1
5.50 (t=2.50) 52 PSF	3x12x22 ga	6'-3	4'-10	5'-6
	3x12x20 ga	9'-1	7'-0	8'-0
	3x12x18 ga	10'-10	10'-11	11'-4
	3x12x16 ga	12'-2	12'-4	12'-8
6.00 (t=3.00) 58 PSF	3x12x22 ga	5'-7	4'-7	5'-2
	3x12x20 ga	8'-10	6'-7	7'-6
	3x12x18 ga	10'-7	10'-8	11'-0
	3x12x16 ga	11'-10	11'-11	12'-4
6.50 (t=3.50) 64 PSF	3x12x22 ga	5'-0	4'-4	4'-11
	3x12x20 ga	8'-6	6'-3	7'-1
	3x12x18 ga	10'-3	10'-4	10'-8
	3x12x16 ga	11'-6	11'-7	12'-0
7.00 (t=4.00) 70 PSF	3x12x22 ga	4'-7	4'-1	4'-8
	3x12x20 ga	8'-0	5'-11	6'-9
	3x12x18 ga	10'-0	10'-0	10'-5
	3x12x16 ga	11'-3	11'-4	11'-8
7.50 (t=4.50) 76 PSF	3x12x22 ga	4'-3	3'-11	4'-5
	3x12x20 ga	7'-8	5'-8	6'-5
	3x12x18 ga	9'-9	9'-6	10'-2
	3x12x16 ga	10'-11	11'-0	11'-5

Minimum exterior bearing length required is 2.50 inches.
Minimum interior bearing length required is 5.00 inches.

TABLE 2K-L
Construction Span Table
3x12 Composite Deck (F_y = 40 ksi) - 50 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
5.00 (t=2.00) 37 PSF	3x12x22 ga	7'-9	5'-8	6'-6
	3x12x20 ga	9'-10	8'-3	9'-4
	3x12x18 ga	11'-9	11'-11	12'-3
	3x12x16 ga	13'-2	13'-4	13'-9
5.50 (t=2.50) 42 PSF	3x12x22 ga	7'-4	5'-5	6'-2
	3x12x20 ga	9'-7	7'-9	8'-10
	3x12x18 ga	11'-5	11'-7	11'-11
	3x12x16 ga	12'-10	12'-11	13'-5
6.00 (t=3.00) 47 PSF	3x12x22 ga	7'-0	5'-1	5'-10
	3x12x20 ga	9'-4	7'-5	8'-5
	3x12x18 ga	11'-2	11'-3	11'-8
	3x12x16 ga	12'-6	12'-8	13'-1
6.25 (t=3.25) 49 PSF	3x12x22 ga	6'-8	5'-0	5'-8
	3x12x20 ga	9'-3	7'-2	8'-2
	3x12x18 ga	11'-0	11'-1	11'-6
	3x12x16 ga	12'-4	12'-6	12'-11
6.50 (t=3.50) 52 PSF	3x12x22 ga	6'-4	4'-10	5'-6
	3x12x20 ga	9'-1	7'-0	8'-0
	3x12x18 ga	10'-11	11'-0	11'-4
	3x12x16 ga	12'-2	12'-4	12'-9
7.25 (t=4.25) 59 PSF	3x12x22 ga	5'-6	4'-6	5'-2
	3x12x20 ga	8'-10	6'-7	7'-6
	3x12x18 ga	10'-6	10'-7	10'-11
	3x12x16 ga	11'-9	11'-11	12'-3

Minimum exterior bearing length required is 2.50 inches.
Minimum interior bearing length required is 5.00 inches.

TABLE 2L-N
Construction Span Table
9/16x2.5 Non-Composite Deck (F_y = 60 ksi) - 50 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
2.00	9/16x2.5x26 ga	2'-9	3'-4	3'-5
(t=1.50)	9/16x2.5x24 ga	3'-6	4'-3	4'-4
23 PSF	9/16x2.5x22 ga	4'-2	4'-9	4'-11
2.50	9/16x2.5x26 ga	2'-8	3'-3	3'-3
(t=2.00)	9/16x2.5x24 ga	3'-5	4'-1	4'-1
29 PSF	9/16x2.5x22 ga	3'-11	4'-7	4'-9
3.00	9/16x2.5x26 ga	2'-7	3'-1	3'-2
(t=2.50)	9/16x2.5x24 ga	3'-3	3'-11	3'-11
35 PSF	9/16x2.5x22 ga	3'-8	4'-5	4'-6
3.50	9/16x2.5x26 ga	2'-6	3'-0	3'-0
(t=3.00)	9/16x2.5x24 ga	3'-2	3'-9	3'-9
41 PSF	9/16x2.5x22 ga	3'-6	4'-3	4'-5
4.00	9/16x2.5x26 ga	2'-5	2'-11	2'-11
(t=3.50)	9/16x2.5x24 ga	3'-0	3'-7	3'-8
47 PSF	9/16x2.5x22 ga	3'-4	4'-1	4'-3
4.50	9/16x2.5x26 ga	2'-4	2'-10	2'-10
(t=4.00)	9/16x2.5x24 ga	2'-11	3'-6	3'-6
53 PSF	9/16x2.5x22 ga	3'-3	4'-0	4'-1

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2L-L
Construction Span Table
9/16x2.5 Non-Composite Deck (F_y = 60 ksi) - 50 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
2.00	9/16x2.5x26 ga	2'-11	3'-6	3'-6
(t=1.50)	9/16x2.5x24 ga	3'-8	4'-5	4'-6
19 PSF	9/16x2.5x22 ga	4'-4	4'-11	5'-1
2.50	9/16x2.5x26 ga	2'-9	3'-4	3'-5
(t=2.00)	9/16x2.5x24 ga	3'-6	4'-3	4'-3
23 PSF	9/16x2.5x22 ga	4'-2	4'-9	4'-11
3.00	9/16x2.5x26 ga	2'-8	3'-3	3'-3
(t=2.50)	9/16x2.5x24 ga	3'-5	4'-1	4'-2
28 PSF	9/16x2.5x22 ga	4'-0	4'-7	4'-9
3.50	9/16x2.5x26 ga	2'-7	3'-2	3'-2
(t=3.00)	9/16x2.5x24 ga	3'-4	3'-11	4'-0
33 PSF	9/16x2.5x22 ga	3'-9	4'-5	4'-7
4.00	9/16x2.5x26 ga	2'-7	3'-1	3'-1
(t=3.50)	9/16x2.5x24 ga	3'-2	3'-10	3'-10
38 PSF	9/16x2.5x22 ga	3'-7	4'-4	4'-6
4.50	9/16x2.5x26 ga	2'-6	3'-0	3'-0
(t=4.00)	9/16x2.5x24 ga	3'-1	3'-8	3'-9
42 PSF	9/16x2.5x22 ga	3'-6	4'-3	4'-4

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2M-N
Construction Span Table
1x4 Non-Composite Deck (F_y = 60 ksi) - 50 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 Span	2 Span	3 Span
3.00 (t=2.00) 31 PSF	1 x 4 Form - 26	3'-9	4'-6	4'-7
	1 x 4 Form - 24	5'-1	5'-4	5'-6
	1 x 4 Form - 22	5'-10	6'-0	6'-3
	1 x 4 Form - 20	6'-0	6'-8	6'-10
3.50 (t=2.50) 37 PSF	1 x 4 Form - 26	3'-8	4'-4	4'-4
	1 x 4 Form - 24	4'-10	5'-2	5'-4
	1 x 4 Form - 22	5'-6	5'-10	6'-0
	1 x 4 Form - 20	5'-8	6'-5	6'-7
4.00 (t=3.00) 43 PSF	1 x 4 Form - 26	3'-6	4'-2	4'-2
	1 x 4 Form - 24	4'-7	5'-0	5'-2
	1 x 4 Form - 22	5'-3	5'-7	5'-10
	1 x 4 Form - 20	5'-4	6'-2	6'-5
4.50 (t=3.50) 50 PSF	1 x 4 Form - 26	3'-5	4'-0	4'-1
	1 x 4 Form - 24	4'-5	4'-10	5'-0
	1 x 4 Form - 22	5'-0	5'-5	5'-8
	1 x 4 Form - 20	5'-2	6'-0	6'-2
5.00 (t=4.00) 56 PSF	1 x 4 Form - 26	3'-3	3'-10	3'-11
	1 x 4 Form - 24	4'-3	4'-8	4'-10
	1 x 4 Form - 22	4'-10	5'-3	5'-6
	1 x 4 Form - 20	4'-11	5'-10	6'-0
5.50 (t=4.50) 62 PSF	1 x 4 Form - 26	3'-2	3'-9	3'-10
	1 x 4 Form - 24	4'-1	4'-7	4'-8
	1 x 4 Form - 22	4'-8	5'-2	5'-4
	1 x 4 Form - 20	4'-9	5'-8	5'-10

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2M-L
Construction Span Table
1x4 Non-Composite Deck (F_y = 60 ksi) - 50 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 Span	2 Span	3 Span
3.00 (t=2.00) 24 PSF	1 x 4 Form - 26	4'-0	4'-8	4'-10
	1 x 4 Form - 24	5'-4	5'-7	5'-9
	1 x 4 Form - 22	6'-3	6'-3	6'-6
	1 x 4 Form - 20	6'-5	6'-11	7'-2
3.50 (t=2.50) 29 PSF	1 x 4 Form - 26	3'-10	4'-7	4'-7
	1 x 4 Form - 24	5'-1	5'-5	5'-7
	1 x 4 Form - 22	5'-11	6'-1	6'-3
	1 x 4 Form - 20	6'-1	6'-8	6'-11
4.00 (t=3.00) 33 PSF	1 x 4 Form - 26	3'-8	4'-5	4'-5
	1 x 4 Form - 24	4'-11	5'-3	5'-5
	1 x 4 Form - 22	5'-8	5'-11	6'-1
	1 x 4 Form - 20	5'-9	6'-6	6'-9
4.50 (t=3.50) 38 PSF	1 x 4 Form - 26	3'-7	4'-3	4'-4
	1 x 4 Form - 24	4'-9	5'-1	5'-3
	1 x 4 Form - 22	5'-5	5'-9	5'-11
	1 x 4 Form - 20	5'-6	6'-4	6'-6
5.00 (t=4.00) 43 PSF	1 x 4 Form - 26	3'-6	4'-2	4'-2
	1 x 4 Form - 24	4'-7	4'-11	5'-1
	1 x 4 Form - 22	5'-2	5'-7	5'-9
	1 x 4 Form - 20	5'-4	6'-2	6'-4
5.50 (t=4.50) 47 PSF	1 x 4 Form - 26	3'-5	4'-0	4'-1
	1 x 4 Form - 24	4'-5	4'-10	5'-0
	1 x 4 Form - 22	5'-0	5'-5	5'-8
	1 x 4 Form - 20	5'-2	6'-0	6'-3

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2N-N
Construction Span Table
1.5x6 Non-Composite Deck (F_y = 40 ksi) - 50 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 39 PSF	1.5x6 Form - 22 ga	5'-6	5'-6	5'-8
	1.5x6 Form - 20 ga	6'-4	6'-1	6'-3
	1.5x6 Form - 18 ga	7'-3	7'-1	7'-4
	1.5x6 Form - 16 ga	8'-1	8'-0	8'-3
4.00 (t=2.50) 46 PSF	1.5x6 Form - 22 ga	5'-3	5'-3	5'-6
	1.5x6 Form - 20 ga	6'-2	5'-11	6'-1
	1.5x6 Form - 18 ga	7'-0	6'-10	7'-1
	1.5x6 Form - 16 ga	7'-10	7'-9	8'-0
4.50 (t=3.00) 52 PSF	1.5x6 Form - 22 ga	5'-0	5'-1	5'-3
	1.5x6 Form - 20 ga	5'-11	5'-8	5'-11
	1.5x6 Form - 18 ga	6'-10	6'-8	6'-10
	1.5x6 Form - 16 ga	7'-7	7'-6	7'-9
5.00 (t=3.50) 58 PSF	1.5x6 Form - 22 ga	4'-10	5'-0	5'-2
	1.5x6 Form - 20 ga	5'-8	5'-6	5'-9
	1.5x6 Form - 18 ga	6'-7	6'-5	6'-8
	1.5x6 Form - 16 ga	7'-5	7'-3	7'-6
5.50 (t=4.00) 64 PSF	1.5x6 Form - 22 ga	4'-8	4'-10	5'-0
	1.5x6 Form - 20 ga	5'-6	5'-4	5'-7
	1.5x6 Form - 18 ga	6'-5	6'-3	6'-6
	1.5x6 Form - 16 ga	7'-2	7'-1	7'-4
6.00 (t=4.50) 70 PSF	1.5x6 Form - 22 ga	4'-6	4'-8	4'-10
	1.5x6 Form - 20 ga	5'-4	5'-3	5'-5
	1.5x6 Form - 18 ga	6'-3	6'-1	6'-4
	1.5x6 Form - 16 ga	7'-0	6'-11	7'-2

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2N-L
Construction Span Table
1.5x6 Non-Composite Deck (F_y = 40 ksi) - 50 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 32 PSF	1.5x6INVx22 ga	5'-10	5'-9	5'-11
	1.5x6INVx20 ga	6'-7	6'-4	6'-7
	1.5x6INVx18 ga	7'-7	7'-5	7'-8
	1.5x6INVx16 ga	8'-6	8'-4	8'-8
4.00 (t=2.50) 37 PSF	1.5x6INVx22 ga	5'-7	5'-7	5'-9
	1.5x6INVx20 ga	6'-5	6'-2	6'-5
	1.5x6INVx18 ga	7'-4	7'-2	7'-5
	1.5x6INVx16 ga	8'-3	8'-2	8'-5
4.50 (t=3.00) 42 PSF	1.5x6INVx22 ga	5'-5	5'-5	5'-7
	1.5x6INVx20 ga	6'-3	6'-0	6'-2
	1.5x6INVx18 ga	7'-2	7'-0	7'-3
	1.5x6INVx16 ga	8'-0	7'-11	8'-2
4.75 (t=3.25) 44 PSF	1.5x6INVx22 ga	5'-3	5'-4	5'-6
	1.5x6INVx20 ga	6'-2	5'-11	6'-2
	1.5x6INVx18 ga	7'-1	6'-11	7'-2
	1.5x6INVx16 ga	7'-11	7'-10	8'-1
5.00 (t=3.50) 46 PSF	1.5x6INVx22 ga	5'-2	5'-3	5'-5
	1.5x6INVx20 ga	6'-1	5'-10	6'-1
	1.5x6INVx18 ga	7'-0	6'-10	7'-1
	1.5x6INVx16 ga	7'-10	7'-8	8'-0
5.75 (t=4.25) 54 PSF	1.5x6INVx22 ga	5'-0	5'-1	5'-3
	1.5x6INVx20 ga	5'-10	5'-8	5'-10
	1.5x6INVx18 ga	6'-9	6'-7	6'-9
	1.5x6INVx16 ga	7'-6	7'-5	7'-8

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2O-N
Construction Span Table
1.5x6 Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 34 PSF	1.5x6x22 ga	5'-0	5'-0	5'-2
	1.5x6x20 ga	5'-6	5'-8	5'-10
	1.5x6x18 ga	6'-5	6'-6	6'-9
	1.5x6x16 ga	7'-3	7'-3	7'-6
4.00 (t=2.50) 40 PSF	1.5x6x22 ga	4'-10	4'-10	5'-0
	1.5x6x20 ga	5'-5	5'-6	5'-8
	1.5x6x18 ga	6'-3	6'-4	6'-7
	1.5x6x16 ga	7'-1	7'-1	7'-4
4.50 (t=3.00) 46 PSF	1.5x6x22 ga	4'-9	4'-9	4'-11
	1.5x6x20 ga	5'-3	5'-4	5'-7
	1.5x6x18 ga	6'-1	6'-2	6'-5
	1.5x6x16 ga	6'-11	6'-11	7'-2
5.00 (t=3.50) 52 PSF	1.5x6x22 ga	4'-7	4'-7	4'-9
	1.5x6x20 ga	5'-1	5'-3	5'-5
	1.5x6x18 ga	6'-0	6'-0	6'-3
	1.5x6x16 ga	6'-9	6'-9	7'-0
5.50 (t=4.00) 58 PSF	1.5x6x22 ga	4'-6	4'-6	4'-8
	1.5x6x20 ga	5'-0	5'-1	5'-3
	1.5x6x18 ga	5'-10	5'-11	6'-1
	1.5x6x16 ga	6'-7	6'-7	6'-10
6.00 (t=4.50) 64 PSF	1.5x6x22 ga	4'-5	4'-5	4'-7
	1.5x6x20 ga	4'-11	5'-0	5'-2
	1.5x6x18 ga	5'-8	5'-9	5'-11
	1.5x6x16 ga	6'-5	6'-5	6'-8

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2O-L
Construction Span Table
1.5x6 Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 28 PSF	1.5x6x22 ga	5'-2	5'-2	5'-4
	1.5x6x20 ga	5'-8	5'-10	6'-1
	1.5x6x18 ga	6'-8	6'-9	6'-11
	1.5x6x16 ga	7'-6	7'-6	7'-9
4.00 (t=2.50) 33 PSF	1.5x6x22 ga	5'-0	5'-1	5'-3
	1.5x6x20 ga	5'-7	5'-9	5'-11
	1.5x6x18 ga	6'-6	6'-7	6'-9
	1.5x6x16 ga	7'-4	7'-4	7'-7
4.50 (t=3.00) 37 PSF	1.5x6x22 ga	4'-11	4'-11	5'-1
	1.5x6x20 ga	5'-5	5'-7	5'-9
	1.5x6x18 ga	6'-4	6'-5	6'-8
	1.5x6x16 ga	7'-2	7'-2	7'-5
4.75 (t=3.25) 40 PSF	1.5x6x22 ga	4'-10	4'-11	5'-1
	1.5x6x20 ga	5'-5	5'-6	5'-8
	1.5x6x18 ga	6'-3	6'-4	6'-7
	1.5x6x16 ga	7'-1	7'-1	7'-4
5.00 (t=3.50) 42 PSF	1.5x6x22 ga	4'-10	4'-10	5'-0
	1.5x6x20 ga	5'-4	5'-6	5'-8
	1.5x6x18 ga	6'-3	6'-3	6'-6
	1.5x6x16 ga	7'-0	7'-0	7'-3
5.75 (t=4.25) 49 PSF	1.5x6x22 ga	4'-8	4'-8	4'-10
	1.5x6x20 ga	5'-2	5'-4	5'-6
	1.5x6x18 ga	6'-0	6'-1	6'-4
	1.5x6x16 ga	6'-10	6'-10	7'-1

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2P-N
Construction Span Table
1.5x6 Inverted Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 39 PSF	1.5x6INVx22 ga	4'-11	4'-10	5'-0
	1.5x6INVx20 ga	5'-7	5'-4	5'-6
	1.5x6INVx18 ga	6'-5	6'-3	6'-5
	1.5x6INVx16 ga	7'-2	7'-1	7'-4
4.00 (t=2.50) 46 PSF	1.5x6INVx22 ga	4'-10	4'-8	4'-10
	1.5x6INVx20 ga	5'-5	5'-3	5'-5
	1.5x6INVx18 ga	6'-3	6'-1	6'-3
	1.5x6INVx16 ga	7'-0	6'-11	7'-1
4.50 (t=3.00) 52 PSF	1.5x6INVx22 ga	4'-8	4'-7	4'-9
	1.5x6INVx20 ga	5'-4	5'-1	5'-3
	1.5x6INVx18 ga	6'-1	5'-11	6'-2
	1.5x6INVx16 ga	6'-10	6'-9	6'-11
5.00 (t=3.50) 58 PSF	1.5x6INVx22 ga	4'-7	4'-5	4'-7
	1.5x6INVx20 ga	5'-2	4'-11	5'-1
	1.5x6INVx18 ga	5'-11	5'-9	6'-0
	1.5x6INVx16 ga	6'-8	6'-7	6'-9
5.50 (t=4.00) 64 PSF	1.5x6INVx22 ga	4'-6	4'-4	4'-6
	1.5x6INVx20 ga	5'-1	4'-10	5'-0
	1.5x6INVx18 ga	5'-10	5'-8	5'-10
	1.5x6INVx16 ga	6'-6	6'-5	6'-7
6.00 (t=4.50) 70 PSF	1.5x6INVx22 ga	4'-5	4'-3	4'-5
	1.5x6INVx20 ga	5'-0	4'-9	4'-11
	1.5x6INVx18 ga	5'-8	5'-6	5'-9
	1.5x6INVx16 ga	6'-4	6'-3	6'-6

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2P-L
Construction Span Table
1.5x6 Inverted Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
3.50 (t=2.00) 32 PSF	1.5x6INVx22 ga	5'-1	5'-0	5'-2
	1.5x6INVx20 ga	5'-9	5'-6	5'-9
	1.5x6INVx18 ga	6'-8	6'-6	6'-8
	1.5x6INVx16 ga	7'-5	7'-4	7'-7
4.00 (t=2.50) 37 PSF	1.5x6INVx22 ga	5'-0	4'-10	5'-0
	1.5x6INVx20 ga	5'-8	5'-5	5'-7
	1.5x6INVx18 ga	6'-6	6'-4	6'-6
	1.5x6INVx16 ga	7'-3	7'-2	7'-5
4.50 (t=3.00) 42 PSF	1.5x6INVx22 ga	4'-11	4'-9	4'-11
	1.5x6INVx20 ga	5'-6	5'-4	5'-6
	1.5x6INVx18 ga	6'-4	6'-2	6'-5
	1.5x6INVx16 ga	7'-1	7'-0	7'-3
4.75 (t=3.25) 44 PSF	1.5x6INVx22 ga	4'-10	4'-8	4'-10
	1.5x6INVx20 ga	5'-6	5'-3	5'-5
	1.5x6INVx18 ga	6'-3	6'-1	6'-4
	1.5x6INVx16 ga	7'-0	6'-11	7'-2
5.00 (t=3.50) 46 PSF	1.5x6INVx22 ga	4'-10	4'-8	4'-10
	1.5x6INVx20 ga	5'-5	5'-2	5'-4
	1.5x6INVx18 ga	6'-3	6'-1	6'-3
	1.5x6INVx16 ga	6'-11	6'-10	7'-1
5.75 (t=4.25) 54 PSF	1.5x6INVx22 ga	4'-8	4'-6	4'-8
	1.5x6INVx20 ga	5'-3	5'-0	5'-2
	1.5x6INVx18 ga	6'-0	5'-11	6'-1
	1.5x6INVx16 ga	6'-9	6'-8	6'-11

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2Q-N
Construction Span Table
2x12 Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
4.00 (t=2.00) 40 PSF	2x12x22 ga	5'-7	3'-11	4'-5
	2x12x20 ga	6'-9	5'-8	6'-5
	2x12x18 ga	8'-1	7'-10	8'-2
	2x12x16 ga	9'-1	8'-10	9'-2
4.50 (t=2.50) 46 PSF	2x12x22 ga	5'-4	3'-8	4'-3
	2x12x20 ga	6'-7	5'-4	6'-1
	2x12x18 ga	7'-11	7'-8	7'-11
	2x12x16 ga	8'-10	8'-7	8'-11
5.00 (t=3.00) 52 PSF	2x12x22 ga	5'-1	3'-6	4'-0
	2x12x20 ga	6'-5	5'-1	5'-10
	2x12x18 ga	7'-8	7'-6	7'-9
	2x12x16 ga	8'-8	8'-5	8'-8
5.50 (t=3.50) 58 PSF	2x12x22 ga	4'-10	3'-4	3'-10
	2x12x20 ga	6'-3	4'-10	5'-6
	2x12x18 ga	7'-6	7'-3	7'-6
	2x12x16 ga	8'-5	8'-2	8'-6
6.00 (t=4.00) 64 PSF	2x12x22 ga	4'-7	3'-3	3'-8
	2x12x20 ga	6'-1	4'-8	5'-4
	2x12x18 ga	7'-4	7'-1	7'-4
	2x12x16 ga	8'-3	8'-0	8'-3
6.50 (t=4.50) 70 PSF	2x12x22 ga	4'-5	3'-1	3'-6
	2x12x20 ga	6'-0	4'-5	5'-1
	2x12x18 ga	7'-2	6'-11	7'-2
	2x12x16 ga	8'-1	7'-10	8'-1

Minimum exterior bearing length required is 2.00 inches.
Minimum interior bearing length required is 4.00 inches.

TABLE 2Q-L
Construction Span Table
2x12 Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
4.00 (t=2.00) 32 PSF	2x12x22 ga	6'-0	4'-2	4'-9
	2x12x20 ga	6'-11	6'-1	6'-11
	2x12x18 ga	8'-5	8'-2	8'-5
	2x12x16 ga	9'-5	9'-2	9'-6
4.50 (t=2.50) 37 PSF	2x12x22 ga	5'-9	4'-0	4'-7
	2x12x20 ga	6'-10	5'-10	6'-7
	2x12x18 ga	8'-2	8'-0	8'-3
	2x12x16 ga	9'-2	8'-11	9'-3
5.00 (t=3.00) 42 PSF	2x12x22 ga	5'-6	3'-10	4'-4
	2x12x20 ga	6'-8	5'-7	6'-4
	2x12x18 ga	8'-0	7'-10	8'-1
	2x12x16 ga	9'-0	8'-9	9'-1
5.25 (t=3.25) 44 PSF	2x12x22 ga	5'-5	3'-9	4'-3
	2x12x20 ga	6'-7	5'-5	6'-2
	2x12x18 ga	7'-11	7'-9	8'-0
	2x12x16 ga	8'-11	8'-8	8'-11
5.50 (t=3.50) 47 PSF	2x12x22 ga	5'-4	3'-8	4'-2
	2x12x20 ga	6'-6	5'-4	6'-1
	2x12x18 ga	7'-10	7'-8	7'-11
	2x12x16 ga	8'-10	8'-7	8'-10
6.25 (t=4.25) 54 PSF	2x12x22 ga	5'-0	3'-6	3'-11
	2x12x20 ga	6'-4	5'-0	5'-9
	2x12x18 ga	7'-8	7'-5	7'-8
	2x12x16 ga	8'-7	8'-4	8'-7

Minimum exterior bearing length required is 2.00 inches.
Minimum interior bearing length required is 4.00 inches.

TABLE 2R-N
Construction Span Table
3x12 Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
5.00 (t=2.00) 46 PSF	3x12x22 ga	5'-7	4'-1	4'-8
	3x12x20 ga	8'-0	5'-11	6'-8
	3x12x18 ga	10'-0	9'-11	10'-4
	3x12x16 ga	11'-2	11'-3	11'-8
5.50 (t=2.50) 52 PSF	3x12x22 ga	5'-3	3'-10	4'-5
	3x12x20 ga	7'-7	5'-7	6'-4
	3x12x18 ga	9'-9	9'-6	10'-1
	3x12x16 ga	10'-11	11'-0	11'-4
6.00 (t=3.00) 58 PSF	3x12x22 ga	5'-0	3'-8	4'-2
	3x12x20 ga	7'-3	5'-4	6'-1
	3x12x18 ga	9'-6	9'-0	9'-10
	3x12x16 ga	10'-8	10'-9	11'-1
6.50 (t=3.50) 64 PSF	3x12x22 ga	4'-10	3'-6	4'-0
	3x12x20 ga	6'-11	5'-1	5'-10
	3x12x18 ga	9'-3	8'-8	9'-8
	3x12x16 ga	10'-5	10'-6	10'-10
7.00 (t=4.00) 70 PSF	3x12x22 ga	4'-7	3'-5	3'-10
	3x12x20 ga	6'-7	4'-11	5'-7
	3x12x18 ga	9'-1	8'-3	9'-5
	3x12x16 ga	10'-2	10'-3	10'-7
7.50 (t=4.50) 76 PSF	3x12x22 ga	4'-3	3'-3	3'-8
	3x12x20 ga	6'-4	4'-8	5'-4
	3x12x18 ga	8'-11	7'-11	9'-0
	3x12x16 ga	10'-0	10'-1	10'-5

Minimum exterior bearing length required is 2.50 inches.
Minimum interior bearing length required is 5.00 inches.

TABLE 2R-L
Construction Span Table
3x12 Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
5.00 (t=2.00) 37 PSF	3x12x22 ga	6'-0	4'-5	5'-0
	3x12x20 ga	8'-7	6'-4	7'-3
	3x12x18 ga	10'-4	10'-5	10'-9
	3x12x16 ga	11'-7	11'-8	12'-1
5.50 (t=2.50) 42 PSF	3x12x22 ga	5'-9	4'-3	4'-10
	3x12x20 ga	8'-3	6'-1	6'-11
	3x12x18 ga	10'-2	10'-2	10'-7
	3x12x16 ga	11'-4	11'-6	11'-10
6.00 (t=3.00) 47 PSF	3x12x22 ga	5'-6	4'-1	4'-7
	3x12x20 ga	7'-11	5'-10	6'-8
	3x12x18 ga	9'-11	9'-11	10'-4
	3x12x16 ga	11'-2	11'-3	11'-7
6.25 (t=3.25) 49 PSF	3x12x22 ga	5'-5	4'-0	4'-6
	3x12x20 ga	7'-9	5'-9	6'-6
	3x12x18 ga	9'-10	9'-8	10'-3
	3x12x16 ga	11'-0	11'-1	11'-6
6.50 (t=3.50) 52 PSF	3x12x22 ga	5'-4	3'-11	4'-5
	3x12x20 ga	7'-7	5'-7	6'-5
	3x12x18 ga	9'-9	9'-6	10'-1
	3x12x16 ga	10'-11	11'-0	11'-4
7.25 (t=4.25) 59 PSF	3x12x22 ga	5'-0	3'-8	4'-2
	3x12x20 ga	7'-2	5'-4	6'-0
	3x12x18 ga	9'-6	9'-0	9'-10
	3x12x16 ga	10'-8	10'-8	11'-1

Minimum exterior bearing length required is 2.50 inches.
Minimum interior bearing length required is 5.00 inches.

TABLE 2S-N
Construction Span Table
9/16x2.5 Non-Composite Deck (F_y = 60 ksi) - 75 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
2.00	9/16x2.5x26 ga	2'-9	3'-3	3'-4
(t=1.50)	9/16x2.5x24 ga	3'-6	3'-8	3'-10
23 PSF	9/16x2.5x22 ga	4'-1	4'-1	4'-3
2.50	9/16x2.5x26 ga	2'-8	3'-1	3'-3
(t=2.00)	9/16x2.5x24 ga	3'-5	3'-7	3'-8
29 PSF	9/16x2.5x22 ga	3'-11	4'-0	4'-1
3.00	9/16x2.5x26 ga	2'-7	3'-0	3'-2
(t=2.50)	9/16x2.5x24 ga	3'-3	3'-6	3'-7
35 PSF	9/16x2.5x22 ga	3'-8	3'-10	4'-0
3.50	9/16x2.5x26 ga	2'-6	2'-11	3'-0
(t=3.00)	9/16x2.5x24 ga	3'-2	3'-5	3'-6
41 PSF	9/16x2.5x22 ga	3'-6	3'-9	3'-11
4.00	9/16x2.5x26 ga	2'-5	2'-10	2'-11
(t=3.50)	9/16x2.5x24 ga	3'-0	3'-4	3'-5
47 PSF	9/16x2.5x22 ga	3'-4	3'-8	3'-9
4.50	9/16x2.5x26 ga	2'-4	2'-10	2'-10
(t=4.00)	9/16x2.5x24 ga	2'-11	3'-3	3'-4
53 PSF	9/16x2.5x22 ga	3'-3	3'-7	3'-8

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2S-L
Construction Span Table
9/16x2.5 Non-Composite Deck (F_y = 60 ksi) - 75 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 span	2 span	3 span
2.00	9/16x2.5x26 ga	2'-11	3'-3	3'-5
(t=1.50)	9/16x2.5x24 ga	3'-8	3'-9	3'-11
19 PSF	9/16x2.5x22 ga	4'-2	4'-2	4'-4
2.50	9/16x2.5x26 ga	2'-9	3'-2	3'-4
(t=2.00)	9/16x2.5x24 ga	3'-6	3'-8	3'-10
23 PSF	9/16x2.5x22 ga	4'-1	4'-1	4'-3
3.00	9/16x2.5x26 ga	2'-8	3'-2	3'-3
(t=2.50)	9/16x2.5x24 ga	3'-5	3'-7	3'-9
28 PSF	9/16x2.5x22 ga	4'-0	4'-0	4'-1
3.50	9/16x2.5x26 ga	2'-7	3'-1	3'-2
(t=3.00)	9/16x2.5x24 ga	3'-4	3'-6	3'-8
33 PSF	9/16x2.5x22 ga	3'-9	3'-11	4'-0
4.00	9/16x2.5x26 ga	2'-7	3'-0	3'-1
(t=3.50)	9/16x2.5x24 ga	3'-2	3'-5	3'-7
38 PSF	9/16x2.5x22 ga	3'-7	3'-10	3'-11
4.50	9/16x2.5x26 ga	2'-6	2'-11	3'-0
(t=4.00)	9/16x2.5x24 ga	3'-1	3'-4	3'-6
42 PSF	9/16x2.5x22 ga	3'-6	3'-9	3'-10

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2T-N
Construction Span Table
1x4 Non-Composite Deck (F_y = 60 ksi) - 75 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 Span	2 Span	3 Span
3.00 (t=2.00) 31 PSF	1 x 4 Form - 26	3'-9	3'-11	4'-1
	1 x 4 Form - 24	4'-8	4'-8	4'-10
	1 x 4 Form - 22	5'-3	5'-3	5'-5
	1 x 4 Form - 20	5'-9	5'-10	6'-0
3.50 (t=2.50) 37 PSF	1 x 4 Form - 26	3'-8	3'-10	3'-11
	1 x 4 Form - 24	4'-6	4'-6	4'-8
	1 x 4 Form - 22	5'-1	5'-1	5'-3
	1 x 4 Form - 20	5'-8	5'-8	5'-10
4.00 (t=3.00) 43 PSF	1 x 4 Form - 26	3'-6	3'-9	3'-10
	1 x 4 Form - 24	4'-5	4'-5	4'-7
	1 x 4 Form - 22	5'-0	5'-0	5'-2
	1 x 4 Form - 20	5'-4	5'-6	5'-8
4.50 (t=3.50) 50 PSF	1 x 4 Form - 26	3'-5	3'-8	3'-9
	1 x 4 Form - 24	4'-4	4'-4	4'-5
	1 x 4 Form - 22	4'-10	4'-10	5'-0
	1 x 4 Form - 20	5'-2	5'-4	5'-6
5.00 (t=4.00) 56 PSF	1 x 4 Form - 26	3'-3	3'-6	3'-8
	1 x 4 Form - 24	4'-2	4'-2	4'-4
	1 x 4 Form - 22	4'-9	4'-9	4'-11
	1 x 4 Form - 20	4'-11	5'-3	5'-5
5.50 (t=4.50) 62 PSF	1 x 4 Form - 26	3'-2	3'-5	3'-7
	1 x 4 Form - 24	4'-1	4'-1	4'-3
	1 x 4 Form - 22	4'-8	4'-8	4'-10
	1 x 4 Form - 20	4'-9	5'-1	5'-3

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2T-L
Construction Span Table
1x4 Non-Composite Deck (F_y = 60 ksi) - 75 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 Span	2 Span	3 Span
3.00 (t=2.00) 24 PSF	1 x 4 Form - 26	4'-0	4'-1	4'-2
	1 x 4 Form - 24	4'-10	4'-10	5'-0
	1 x 4 Form - 22	5'-5	5'-5	5'-7
	1 x 4 Form - 20	6'-0	6'-0	6'-2
3.50 (t=2.50) 29 PSF	1 x 4 Form - 26	3'-10	4'-0	4'-1
	1 x 4 Form - 24	4'-8	4'-8	4'-10
	1 x 4 Form - 22	5'-3	5'-4	5'-6
	1 x 4 Form - 20	5'-10	5'-10	6'-0
4.00 (t=3.00) 33 PSF	1 x 4 Form - 26	3'-8	3'-10	4'-0
	1 x 4 Form - 24	4'-7	4'-7	4'-9
	1 x 4 Form - 22	5'-2	5'-2	5'-4
	1 x 4 Form - 20	5'-8	5'-8	5'-11
4.50 (t=3.50) 38 PSF	1 x 4 Form - 26	3'-7	3'-9	3'-11
	1 x 4 Form - 24	4'-6	4'-6	4'-8
	1 x 4 Form - 22	5'-1	5'-1	5'-3
	1 x 4 Form - 20	5'-6	5'-7	5'-9
5.00 (t=4.00) 43 PSF	1 x 4 Form - 26	3'-6	3'-8	3'-10
	1 x 4 Form - 24	4'-5	4'-5	4'-7
	1 x 4 Form - 22	5'-0	5'-0	5'-2
	1 x 4 Form - 20	5'-4	5'-6	5'-8
5.50 (t=4.50) 47 PSF	1 x 4 Form - 26	3'-5	3'-8	3'-9
	1 x 4 Form - 24	4'-4	4'-4	4'-6
	1 x 4 Form - 22	4'-10	4'-10	5'-0
	1 x 4 Form - 20	5'-2	5'-4	5'-7

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2U-N
Construction Span Table
1.5x6 Non-Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Normal Weight Concrete (145 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 Span	2 Span	3 Span
3.50 (t=2.00) 39 PSF	1.5x6 Form - 22 ga	4'-11	4'-10	5'-0
	1.5x6 Form - 20 ga	5'-7	5'-4	5'-6
	1.5x6 Form - 18 ga	6'-5	6'-3	6'-5
	1.5x6 Form - 16 ga	7'-2	7'-1	7'-4
4.00 (t=2.50) 46 PSF	1.5x6 Form - 22 ga	4'-10	4'-8	4'-10
	1.5x6 Form - 20 ga	5'-5	5'-3	5'-5
	1.5x6 Form - 18 ga	6'-3	6'-1	6'-3
	1.5x6 Form - 16 ga	7'-0	6'-11	7'-1
4.50 (t=3.00) 52 PSF	1.5x6 Form - 22 ga	4'-8	4'-7	4'-9
	1.5x6 Form - 20 ga	5'-4	5'-1	5'-3
	1.5x6 Form - 18 ga	6'-1	5'-11	6'-2
	1.5x6 Form - 16 ga	6'-10	6'-9	6'-11
5.00 (t=3.50) 58 PSF	1.5x6 Form - 22 ga	4'-7	4'-5	4'-7
	1.5x6 Form - 20 ga	5'-2	4'-11	5'-1
	1.5x6 Form - 18 ga	5'-11	5'-9	6'-0
	1.5x6 Form - 16 ga	6'-8	6'-7	6'-9
5.50 (t=4.00) 64 PSF	1.5x6 Form - 22 ga	4'-6	4'-4	4'-6
	1.5x6 Form - 20 ga	5'-1	4'-10	5'-0
	1.5x6 Form - 18 ga	5'-10	5'-8	5'-10
	1.5x6 Form - 16 ga	6'-6	6'-5	6'-7
6.00 (t=4.50) 70 PSF	1.5x6 Form - 22 ga	4'-5	4'-3	4'-5
	1.5x6 Form - 20 ga	5'-0	4'-9	4'-11
	1.5x6 Form - 18 ga	5'-8	5'-6	5'-9
	1.5x6 Form - 16 ga	6'-4	6'-3	6'-6

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

TABLE 2U-L
Construction Span Table
1.5x6 Non-Composite Deck (F_y = 40 ksi) - 75 psf Construction Load

Lightweight Concrete (115 pcf)

Total Slab Depth	Deck Type	Maximum Unshored Clear Span		
		1 Span	2 Span	3 Span
3.50 (t=2.00) 32 PSF	1.5x6 Form - 22 ga	5'-1	5'-0	5'-2
	1.5x6 Form - 20 ga	5'-9	5'-6	5'-9
	1.5x6 Form - 18 ga	6'-8	6'-6	6'-8
	1.5x6 Form - 16 ga	7'-5	7'-4	7'-7
4.00 (t=2.50) 37 PSF	1.5x6 Form - 22 ga	5'-0	4'-10	5'-0
	1.5x6 Form - 20 ga	5'-8	5'-5	5'-7
	1.5x6 Form - 18 ga	6'-6	6'-4	6'-6
	1.5x6 Form - 16 ga	7'-3	7'-2	7'-5
4.50 (t=3.00) 42 PSF	1.5x6 Form - 22 ga	4'-11	4'-9	4'-11
	1.5x6 Form - 20 ga	5'-6	5'-4	5'-6
	1.5x6 Form - 18 ga	6'-4	6'-2	6'-5
	1.5x6 Form - 16 ga	7'-1	7'-0	7'-3
4.75 (t=3.25) 44 PSF	1.5x6 Form - 22 ga	4'-10	4'-8	4'-10
	1.5x6 Form - 20 ga	5'-6	5'-3	5'-5
	1.5x6 Form - 18 ga	6'-3	6'-1	6'-4
	1.5x6 Form - 16 ga	7'-0	6'-11	7'-2
5.00 (t=3.50) 46 PSF	1.5x6 Form - 22 ga	4'-10	4'-8	4'-10
	1.5x6 Form - 20 ga	5'-5	5'-2	5'-4
	1.5x6 Form - 18 ga	6'-3	6'-1	6'-3
	1.5x6 Form - 16 ga	6'-11	6'-10	7'-1
5.75 (t=4.25) 54 PSF	1.5x6 Form - 22 ga	4'-8	4'-6	4'-8
	1.5x6 Form - 20 ga	5'-3	5'-0	5'-2
	1.5x6 Form - 18 ga	6'-0	5'-11	6'-1
	1.5x6 Form - 16 ga	6'-9	6'-8	6'-11

Minimum exterior bearing length required is 1.50 inches.
Minimum interior bearing length required is 3.00 inches.

Tables 2 Notes:

1. Load tables are calculated using Section Properties as shown in Table 1 with steel yield strengths as shown. Individual deck manufacturers may supply deck using other steel yield strengths.
2. All section properties and ASD (Ω = 1.67) and LRFD (Φ = 0.90) uniform loads are calculated in accordance with ANSI/SDI C-2017, Section 2.4.A.1 or ANSI/SDI NC-2017, Section 2.4.A.1.
3. Span length assumes clear spans. Center-to-center spacing of supports can be used for design as a conservative assumption.
4. All construction load spans are calculated using loads and load combinations in accordance with ANSI/SDI C-2017, Section 2.4.A. or ANSI/SDI NC-2017, Section 2.4.A.
    a. 20 psf is the minimum required construction load. 50 psf and 75 psf construction load spans are provided for instances when construction operations require greater construction loads.
5. Bending Moment formulae used for flexural stress limitations are in accordance with ANSI/SDI C-2017, Appendix A or ANSI/SDI NC-2017, Appendix A.
6. Deflection formulae for deflection limitation are in accordance with ANSI/SDI C-2017, Appendix A or ANSI/SDI NC-2017, Appendix A.

Table 3 – Composite Deck-Slab Moment of Inertia

TABLE 3A – 1.5x6 Composite Deck-Slab Moment of Inertia
Normal Weight Concrete (145 pcf)

Slab Depth (inches)	I_u 22 ga	I_u 20 ga	I_u 18 ga	I_u 16 ga	I_{cr} 22 ga	I_{cr} 20 ga	I_{cr} 18 ga	I_{cr} 16 ga
4	5.25	5.64	6.31	6.99	2.74	3.15	3.82	4.46
4.5	7.55	8.04	8.91	9.79	3.76	4.33	5.28	6.17
4.75	8.94	9.49	10.46	11.45	4.34	5.00	6.11	7.16
5	10.50	11.11	12.20	13.29	4.96	5.73	7.01	8.23
5.5	14.19	14.93	16.25	17.60	6.36	7.36	9.03	10.62
5.75	16.33	17.15	18.60	20.07	7.13	8.26	10.15	11.95
6	18.69	19.58	21.16	22.78	7.94	9.21	11.34	13.37
6.5	24.10	25.15	27.01	28.92	9.72	11.29	13.94	16.47
6.75	27.17	28.30	30.31	32.38	10.68	12.42	15.35	18.16
7	30.49	31.71	33.88	36.11	11.69	13.60	16.83	19.94

Slab Depth (inches)	I_d 22 ga	I_d 20 ga	I_d 18 ga	I_d 16 ga
4	3.99	4.39	5.07	5.72
4.5	5.65	6.19	7.10	7.98
4.75	6.64	7.25	8.29	9.30
5	7.73	8.42	9.61	10.76
5.5	10.27	11.15	12.64	14.11
5.75	11.73	12.70	14.37	16.01
6	13.32	14.40	16.25	18.07
6.5	16.91	18.22	20.47	22.70
6.75	18.92	20.36	22.83	25.27
7	21.09	22.66	25.36	28.02

Table 3A Notes:

1. This table applies to all yield strength steel and 3000 psi concrete (n=9).
2. All section properties are calculated in accordance with ANSI/SDI C-2017, Appendix 4.
3. Slab Depth = Overall depth of deck-slab, inclusive of deck.

   I_u = Uncracked section moment of inertia, in^4/ft of deck width

   I_{cr} = Cracked section moment of inertia, in^4/ft of deck width

   I_d = Design moment of inertia, in^4/ft of deck width

TABLE 3B – 1.5x6 Inverted Composite Deck-Slab Moment of Inertia
Normal Weight Concrete (145 pcf)

Slab Depth (inches)	I_u 22 ga	I_u 20 ga	I_u 18 ga	I_u 16 ga	I_{cr} 22 ga	I_{cr} 20 ga	I_{cr} 18 ga	I_{cr} 16 ga
4	7.25	7.71	8.52	9.33	3.12	3.59	4.37	5.10
4.5	10.09	10.67	11.70	12.74	4.22	4.86	5.94	6.95
4.75	11.77	12.42	13.57	14.73	4.83	5.58	6.83	8.01
5	13.64	14.36	15.63	16.93	5.50	6.36	7.79	9.14
5.5	17.98	18.85	20.40	21.97	6.97	8.07	9.92	11.68
5.75	20.48	21.43	23.12	24.84	7.77	9.02	11.09	13.08
6	23.20	24.24	26.08	27.96	8.63	10.02	12.34	14.57
6.5	29.39	30.60	32.76	34.97	10.49	12.19	15.06	17.81
6.75	32.87	34.17	36.50	38.89	11.49	13.36	16.53	19.57
7	36.62	38.02	40.52	43.09	12.54	14.60	18.07	21.42

Slab Depth (inches)	I_d 22 ga	I_d 20 ga	I_d 18 ga	I_d 16 ga
4	5.19	5.65	6.45	7.22
4.5	7.15	7.77	8.82	9.85
4.75	8.30	9.00	10.20	11.37
5	9.57	10.36	11.71	13.04
5.5	12.47	13.46	15.16	16.83
5.75	14.13	15.22	17.11	18.96
6	15.92	17.13	19.21	21.26
6.5	19.94	21.39	23.91	26.39
6.75	22.18	23.77	26.51	29.23
7	24.58	26.31	29.30	32.26

Table 3B Notes:

1. This table applies to all yield strength steel and 3000 psi concrete (n=9).
2. All section properties are calculated in accordance with ANSI/SDI C-2017, Appendix 4.
3. Slab Depth = Overall depth of deck-slab, inclusive of deck.

   I_u = Uncracked section moment of inertia, in^4/ft of deck width

   I_{cr} = Cracked section moment of inertia, in^4/ft of deck width

   I_d = Design moment of inertia, in^4/ft of deck width

TABLE 3C – 2x12 Composite Deck-Slab Moment of Inertia
Normal Weight Concrete (145 pcf)

Slab Depth (inches)	I_u 22 ga	I_u 20 ga	I_u 18 ga	I_u 16 ga	I_{cr} 22 ga	I_{cr} 20 ga	I_{cr} 18 ga	I_{cr} 16 ga
4.5	7.96	8.50	9.45	10.41	3.41	3.95	4.84	5.69
5	10.81	11.48	12.65	13.85	4.50	5.22	6.42	7.55
5.25	12.49	13.23	14.53	15.85	5.12	5.94	7.30	8.61
5.5	14.37	15.17	16.60	18.05	5.77	6.71	8.26	9.74
6	18.72	19.68	21.38	23.12	7.22	8.40	10.37	12.26
6.25	21.23	22.27	24.11	26.00	8.02	9.33	11.53	13.64
6.5	23.97	25.09	27.08	29.13	8.85	10.31	12.76	15.11
7	30.18	31.47	33.78	36.16	10.67	12.44	15.42	18.31
7.25	33.67	35.06	37.53	40.08	11.64	13.59	16.86	20.03
7.5	37.44	38.92	41.57	44.30	12.67	14.79	18.37	21.85

Slab Depth (inches)	I_d 22 ga	I_d 20 ga	I_d 18 ga	I_d 16 ga
4.5	5.69	6.23	7.15	8.05
5	7.66	8.35	9.53	10.70
5.25	8.80	9.58	10.91	12.23
5.5	10.07	10.94	12.43	13.90
6	12.97	14.04	15.87	17.69
6.25	14.62	15.80	17.82	19.82
6.5	16.41	17.70	19.92	22.12
7	20.42	21.96	24.60	27.23
7.25	22.66	24.32	27.20	30.06
7.5	25.05	26.85	29.97	33.07

Table 3C Notes:

1. This table applies to all yield strength steel and 3000 psi concrete (n=9).
2. All section properties are calculated in accordance with ANSI/SDI C-2017, Appendix 4.
3. Slab Depth = Overall depth of deck-slab, inclusive of deck.

   I_u = Uncracked section moment of inertia, in^4/ft of deck width

   I_{cr} = Cracked section moment of inertia, in^4/ft of deck width

   I_d = Design moment of inertia, in^4/ft of deck width

TABLE 3D – 3x12 Composite Deck-Slab Moment of Inertia
Normal Weight Concrete (145 pcf)

Slab Depth (inches)	I_u 22 ga	I_u 20 ga	I_u 18 ga	I_u 16 ga	I_{cr} 22 ga	I_{cr} 20 ga	I_{cr} 18 ga	I_{cr} 16 ga
5.5	13.98	14.93	16.61	18.30	5.36	6.24	7.71	9.11
6	17.68	18.81	20.81	22.84	6.77	7.88	9.73	11.51
6.25	19.81	21.04	23.22	25.43	7.54	8.78	10.86	12.84
6.5	22.16	23.49	25.84	28.24	8.37	9.75	12.06	14.27
7	27.51	29.05	31.78	34.58	10.18	11.86	14.69	17.40
7.25	30.54	32.19	35.13	38.13	11.16	13.01	16.12	19.11
7.5	33.83	35.59	38.73	41.94	12.19	14.22	17.63	20.91
8	41.19	43.19	46.76	50.43	14.41	16.82	20.88	24.81
8.25	45.30	47.42	51.21	55.11	15.60	18.21	22.63	26.90
8.5	49.69	51.94	55.97	60.11	16.84	19.67	24.46	29.09

Slab Depth (inches)	I_d 22 ga	I_d 20 ga	I_d 18 ga	I_d 16 ga
5.5	9.67	10.59	12.16	13.70
6	12.22	13.34	15.27	17.17
6.25	13.68	14.91	17.04	19.13
6.5	15.26	16.62	18.95	21.25
7	18.85	20.46	23.24	25.99
7.25	20.85	22.60	25.62	28.62
7.5	23.01	24.90	28.18	31.43
8	27.80	30.01	33.82	37.62
8.25	30.45	32.82	36.92	41.01
8.5	33.27	35.81	40.21	44.60

Table 3D Notes:

1. This table applies to all yield strength steel and 3000 psi concrete (n=9).
2. All section properties are calculated in accordance with ANSI/SDI C-2017, Appendix 4.
3. Slab Depth = Overall depth of deck-slab, inclusive of deck.

   I_u = Uncracked section moment of inertia, in^4/ft of deck width

   I_{cr} = Cracked section moment of inertia, in^4/ft of deck width

   I_d = Design moment of inertia, in^4/ft of deck width

TABLE 3E – 1.5x6 Composite Deck-Slab Moment of Inertia
Lightweight Concrete (115 pcf)

Slab Depth (inches)	I_u 22 ga	I_u 20 ga	I_u 18 ga	I_u 16 ga	I_{cr} 22 ga	I_{cr} 20 ga	I_{cr} 18 ga	I_{cr} 16 ga
4	4.00	4.35	4.95	5.53	2.40	2.73	3.27	3.76
4.5	5.66	6.11	6.88	7.64	3.32	3.78	4.54	5.24
4.75	6.65	7.15	8.02	8.88	3.84	4.39	5.27	6.09
5	7.75	8.32	9.29	10.25	4.41	5.04	6.07	7.02
5.5	10.34	11.03	12.23	13.42	5.67	6.50	7.86	9.11
5.75	11.84	12.59	13.91	15.23	6.37	7.31	8.85	10.28
6	13.47	14.30	15.75	17.19	7.12	8.18	9.91	11.53
6.5	17.21	18.19	19.91	21.63	8.75	10.07	12.24	14.28
6.75	19.32	20.38	22.24	24.11	9.63	11.09	13.51	15.77
7	21.60	22.75	24.76	26.78	10.56	12.18	14.84	17.36

Slab Depth (inches)	I_d 22 ga	I_d 20 ga	I_d 18 ga	I_d 16 ga
4	3.20	3.54	4.11	4.65
4.5	4.49	4.95	5.71	6.44
4.75	5.24	5.77	6.65	7.49
5	6.08	6.68	7.68	8.64
5.5	8.01	8.77	10.04	11.27
5.75	9.10	9.95	11.38	12.75
6	10.30	11.24	12.83	14.36
6.5	12.98	14.13	16.07	17.95
6.75	14.48	15.74	17.87	19.94
7	16.08	17.46	19.80	22.07

Table 3E Notes:

1. This table applies to all yield strength steel and 3000 psi concrete (n=14).
2. All section properties are calculated in accordance with ANSI/SDI C-2017, Appendix 4.
3. Slab Depth = Overall depth of deck-slab, inclusive of deck.

   I_u = Uncracked section moment of inertia, in^4/ft of deck width

   I_{cr} = Cracked section moment of inertia, in^4/ft of deck width

   I_d = Design moment of inertia, in^4/ft of deck width

TABLE 3F – 1.5x6 Inverted Composite Deck-Slab Moment of Inertia
Lightweight Concrete (115 pcf)

Slab Depth (inches)	I_u 22 ga	I_u 20 ga	I_u 18 ga	I_u 16 ga	I_{cr} 22 ga	I_{cr} 20 ga	I_{cr} 18 ga	I_{cr} 16 ga
4	5.41	5.83	6.55	7.25	2.75	3.13	3.75	4.31
4.5	7.44	7.97	8.90	9.81	3.73	4.26	5.12	5.91
4.75	8.63	9.23	10.27	11.29	4.29	4.90	5.90	6.83
5	9.95	10.61	11.77	12.91	4.89	5.60	6.75	7.82
5.5	12.99	13.79	15.21	16.61	6.23	7.15	8.65	10.04
5.75	14.72	15.61	17.16	18.70	6.97	8.00	9.69	11.27
6	16.61	17.58	19.27	20.96	7.75	8.91	10.81	12.59
6.5	20.88	22.02	24.01	26.01	9.45	10.88	13.25	15.47
6.75	23.27	24.50	26.65	28.82	10.37	11.95	14.57	17.03
7	25.84	27.16	29.48	31.82	11.34	13.08	15.96	18.68

Slab Depth (inches)	I_d 22 ga	I_d 20 ga	I_d 18 ga	I_d 16 ga
4	4.08	4.48	5.15	5.78
4.5	5.59	6.12	7.01	7.86
4.75	6.46	7.07	8.08	9.06
5	7.42	8.11	9.26	10.37
5.5	9.61	10.47	11.93	13.33
5.75	10.84	11.80	13.42	14.99
6	12.18	13.24	15.04	16.77
6.5	15.17	16.45	18.63	20.74
6.75	16.82	18.23	20.61	22.92
7	18.59	20.12	22.72	25.25

Table 3F Notes:

1. This table applies to all yield strength steel and 3000 psi concrete (n=14).
2. All section properties are calculated in accordance with ANSI/SDI C-2017, Appendix 4.
3. Slab Depth = Overall depth of deck-slab, inclusive of deck.

   I_u = Uncracked section moment of inertia, in^4/ft of deck width

   I_{cr} = Cracked section moment of inertia, in^4/ft of deck width

   I_d = Design moment of inertia, in^4/ft of deck width

Table 3G – 2x12 Composite Deck-Slab Moment of Inertia
Lightweight Concrete (115 pcf)

Slab Depth (inches)	I_u 22 ga	I_u 20 ga	I_u 18 ga	I_u 16 ga	I_{cr} 22 ga	I_{cr} 20 ga	I_{cr} 18 ga	I_{cr} 16 ga
4.5	5.99	6.49	7.35	8.19	3.03	3.48	4.21	4.88
5	8.03	8.65	9.72	10.78	4.02	4.62	5.59	6.50
5.25	9.22	9.91	11.09	12.28	4.58	5.26	6.38	7.42
5.5	10.55	11.30	12.61	13.91	5.18	5.96	7.23	8.42
6	13.60	14.50	16.06	17.63	6.50	7.49	9.11	10.64
6.25	15.34	16.32	18.02	19.73	7.23	8.33	10.15	11.86
6.5	17.24	18.29	20.14	22.00	8.00	9.23	11.26	13.17
7	21.52	22.74	24.89	27.06	9.67	11.17	13.66	16.02
7.25	23.92	25.23	27.54	29.88	10.57	12.22	14.96	17.56
7.5	26.50	27.90	30.38	32.88	11.51	13.33	16.33	19.18

Slab Depth (inches)	I_d 22 ga	I_d 20 ga	I_d 18 ga	I_d 16 ga
4.5	4.51	4.99	5.78	6.54
5	6.03	6.64	7.66	8.64
5.25	6.90	7.59	8.74	9.85
5.5	7.86	8.63	9.92	11.16
6	10.05	10.99	12.59	14.13
6.25	11.28	12.33	14.09	15.80
6.5	12.62	13.76	15.70	17.58
7	15.59	16.96	19.28	21.54
7.25	17.24	18.73	21.25	23.72
7.5	19.01	20.61	23.35	26.03

Table 3G Notes:

1. This table applies to all yield strength steel and 3000 psi concrete (n=14).
2. All section properties are calculated in accordance with ANSI/SDI C-2017, Appendix 4.
3. Slab Depth = Overall depth of deck-slab, inclusive of deck.

   I_u = Uncracked section moment of inertia, in^4/ft of deck width

   I_{cr} = Cracked section moment of inertia, in^4/ft of deck width

   I_d = Design moment of inertia, in^4/ft of deck width

TABLE 3H – 3x12 Composite Deck-Slab Moment of Inertia
Lightweight Concrete (115 pcf)

Slab Depth (inches)	I_u 22 ga	I_u 20 ga	I_u 18 ga	I_u 16 ga	I_{cr} 22 ga	I_{cr} 20 ga	I_{cr} 18 ga	I_{cr} 16 ga
5.5	10.51	11.39	12.92	14.44	4.81	5.55	6.77	7.92
6	13.18	14.24	16.08	17.91	6.08	7.01	8.55	10.00
6.25	14.71	15.86	17.87	19.86	6.78	7.83	9.55	11.16
6.5	16.39	17.63	19.80	21.97	7.53	8.70	10.61	12.41
7	20.18	21.62	24.16	26.69	9.18	10.61	12.96	15.17
7.25	22.31	23.86	26.58	29.32	10.08	11.65	14.24	16.68
7.5	24.61	26.27	29.19	32.12	11.03	12.75	15.59	18.28
8	29.74	31.63	34.96	38.32	13.07	15.12	18.52	21.74
8.25	32.58	34.59	38.14	41.72	14.16	16.39	20.10	23.61
8.5	35.62	37.75	41.52	45.33	15.31	17.73	21.75	25.57

Slab Depth (inches)	I_d 22 ga	I_d 20 ga	I_d 18 ga	I_d 16 ga
5.5	7.66	8.47	9.85	11.18
6	9.63	10.63	12.32	13.95
6.25	10.75	11.85	13.71	15.51
6.5	11.96	13.16	15.21	17.19
7	14.68	16.12	18.56	20.93
7.25	16.19	17.75	20.41	23.00
7.5	17.82	19.51	22.39	25.20
8	21.40	23.37	26.74	30.03
8.25	23.37	25.49	29.12	32.66
8.5	25.46	27.74	31.64	35.45

Table 3H Notes:

1. This table applies to all yield strength steel and 3000 psi concrete (n=14).
2. All section properties are calculated in accordance with ANSI/SDI C-2017, Appendix 4.
3. Slab Depth = Overall depth of deck-slab, inclusive of deck.

   I_u = Uncracked section moment of inertia, in^4/ft of deck width

   I_{cr} = Cracked section moment of inertia, in^4/ft of deck width

   I_d = Design moment of inertia, in^4/ft of deck width

Table 4 – Composite Deck-Slab Yield Moment

TABLE 4A – 1.5x6 Composite Deck-Slab Factored Yield Moment

	Factored Yield Moment – ΦM_y (inch-kip per foot)							
	F_y = 40 ksi f'_c = 3000 psi Normal Weight Concrete (n=9)				F_y = 40 ksi f'_c = 3000 psi Lightweight Concrete (n=14)			
Slab Depth (inches)	**22 ga**	**20 ga**	**18 ga**	**16 ga**	**22 ga**	**20 ga**	**18 ga**	**16 ga**
4	32.99	39.18	50.12	61.24	31.32	37.03	47.02	57.08
4.5	39.81	47.37	60.77	74.46	37.96	44.98	57.32	69.79
4.75	43.29	51.56	66.23	81.25	41.37	49.07	62.61	76.35
5	46.82	55.80	71.76	88.13	44.82	53.21	67.99	83.02
5.5	53.96	64.40	83.00	102.13	51.82	61.62	78.96	96.63
5.75	57.57	68.75	88.69	109.23	55.37	65.89	84.52	103.55
6	61.20	73.13	94.42	116.38	58.94	70.18	90.13	110.53
6.5	68.52	81.95	105.98	130.82	66.15	78.86	101.46	124.66
6.75	72.21	86.40	111.81	138.11	69.78	83.23	107.18	131.79
7	75.90	90.86	117.66	145.42	73.42	87.62	112.93	138.96

TABLE 4B – 1.5x6 Inverted Composite Deck-Slab Factored Yield Moment

	Factored Yield Moment – ΦM_y (inch-kip per foot)							
	F_y = 40 ksi f'_c = 3000 psi Normal Weight Concrete (n=9)				F_y = 40 ksi f'_c = 3000 psi Lightweight Concrete (n=14)			
Slab Depth (inches)	**22 ga**	**20 ga**	**18 ga**	**16 ga**	**22 ga**	**20 ga**	**18 ga**	**16 ga**
4	38.26	45.59	58.62	71.98	36.61	43.45	55.54	67.83
4.5	45.29	54.03	69.63	85.67	43.47	51.69	66.23	81.08
4.75	48.85	58.33	75.23	92.65	46.97	55.88	71.69	87.86
5	52.45	62.66	80.89	99.70	50.49	60.12	77.22	94.73
5.5	59.71	71.41	92.34	113.99	57.63	68.71	88.42	108.67
5.75	63.37	75.82	98.12	121.21	61.23	73.05	94.08	115.72
6	67.05	80.26	103.94	128.47	64.86	77.41	99.78	122.83
6.5	74.45	89.19	115.64	143.10	72.15	86.19	111.28	137.16
6.75	78.17	93.67	121.53	150.46	75.82	90.61	117.06	144.38
7	81.90	98.17	127.43	157.85	79.50	95.05	122.87	151.63

Table 4 Notes:

1. Yield Moment is calculated in accordance with ANSI/SDI C-2017, Appendix 2 and 3.
2. Slab Depth = Overall depth of deck-slab, inclusive of deck.
3. $\Phi = 0.85$

TABLE 4C – 2x12 Composite Deck-Slab Factored Yield Moment

	Factored Yield Moment – ΦM_y (inch-kip per foot)							
	F_y = 40 ksi f'_c = 3000 psi Normal Weight Concrete (n=9)				F_y = 40 ksi f'_c = 3000 psi Lightweight Concrete (n=14)			
Slab Depth (inches)	**22 ga**	**20 ga**	**18 ga**	**16 ga**	**22 ga**	**20 ga**	**18 ga**	**16 ga**
4.5	35.44	42.30	54.35	66.69	33.86	40.27	51.43	62.77
5	41.73	49.84	64.16	78.85	39.99	47.59	60.90	74.45
5.25	44.95	53.71	69.19	85.11	43.13	51.35	65.78	80.49
5.5	48.21	57.62	74.29	91.45	46.32	55.17	70.74	86.63
6	54.82	65.57	84.68	104.39	52.80	62.95	80.86	99.20
6.25	58.16	69.59	89.94	110.95	56.08	66.89	86.00	105.59
6.5	61.53	73.65	95.25	117.58	59.39	70.87	91.19	112.05
7	68.33	81.84	105.97	130.97	66.08	78.92	101.70	125.13
7.25	71.75	85.97	111.38	137.73	69.45	82.97	107.00	131.75
7.5	75.19	90.11	116.82	144.52	72.84	87.05	112.34	138.40

TABLE 4D – 3x12 Composite Deck-Slab Factored Yield Moment

	Factored Yield Moment – ΦM_y (inch-kip per foot)							
	F_y = 40 ksi f'_c = 3000 psi Normal Weight Concrete (n=9)				F_y = 40 ksi f'_c = 3000 psi Lightweight Concrete (n=14)			
Slab Depth (inches)	**22 ga**	**20 ga**	**18 ga**	**16 ga**	**22 ga**	**20 ga**	**18 ga**	**16 ga**
5.5	44.47	53.17	68.56	84.23	42.52	50.68	65.01	79.50
6	51.16	61.16	78.88	96.97	48.99	58.38	74.89	91.61
6.25	54.59	65.27	84.21	103.57	52.33	62.36	80.01	97.92
6.5	58.09	69.46	89.64	110.29	55.73	66.41	85.25	104.37
7	65.21	78.00	100.75	124.08	62.67	74.72	96.00	117.65
7.25	68.83	82.35	106.41	131.12	66.21	78.96	101.50	124.46
7.5	72.49	86.74	112.14	138.25	69.79	83.25	107.07	131.36
8	79.89	95.65	123.76	152.72	77.05	91.96	118.39	145.41
8.25	83.63	100.15	129.64	160.05	80.73	96.37	124.13	152.54
8.5	87.40	104.68	135.57	167.44	84.43	100.82	129.92	159.74

Table 4 Notes:

1. Yield Moment is calculated in accordance with ANSI/SDI C-2017, Appendix 2 and 3.
2. Slab Depth = Overall depth of deck-slab, inclusive of deck.
3. $\Phi = 0.85$

Table 5 – Bare Deck Shear and Web Crippling

TABLE 5A – Bare Deck Shear Strength – F_y = 40 ksi

		Shear (lbs)	
Profile	**Gage Number**	**ASD Ω = 1.60**	**LRFD Φ=0.95**
1.5x6	22	1669	2537
1.5x6	20	2003	3045
1.5x6	18	2617	3979
1.5x6	16	3203	4868
2x12	22	1241	1887
2x12	20	1496	2275
2x12	18	1973	2999
2x12	16	2437	3704
3x12	22	1510	2296
3x12	20	2224	3381
3x12	18	3312	5034
3x12	16	4110	6247

Table 5A Notes:

1. All section properties and ASD and LRFD shears are calculated in accordance with ANSI/SDI C-2017, Section 2.4.A.1, and are per foot of width.

TABLE 5B – Bare Deck Web Crippling Strength – F_y = 40 ksi

Profile	Gage Number	Web Crippling - ASD (lbs)			
		Ω = 1.70 OFE	Ω = 1.75 OFI	Ω = 1.80 TFE	Ω = 1.75 TFI
1.5x6	22	649	1077	623	1331
1.5x6	20	926	1565	955	1958
1.5x6	18	1575	2715	1776	3446
1.5x6	16	2374	4147	2844	5308
2x12	22	319	555	289	672
2x12	20	456	804	446	988
2x12	18	775	1389	835	1738
2x12	16	1169	2113	1341	2674
3x12	22	334	613	282	717
3x12	20	479	887	440	1058
3x12	18	820	1527	836	1866
3x12	16	1239	2318	1355	2874

Profile	Gage Number	Web Crippling - LRFD (lbs)			
		Φ=0.90 OFE	Φ=0.85 OFI	Φ=0.85 TFE	Φ=0.85 TFI
1.5x6	22	993	1602	954	1981
1.5x6	20	1417	2327	1460	2912
1.5x6	18	2409	4039	2717	5126
1.5x6	16	3632	6169	4351	7895
2x12	22	488	826	443	1000
2x12	20	697	1196	682	1470
2x12	18	1186	2066	1277	2586
2x12	16	1789	3143	2052	3977
3x12	22	510	912	432	1067
3x12	20	733	1319	674	1573
3x12	18	1254	2271	1280	2776
3x12	16	1896	3448	2073	4275

Table 5B Notes:

1. All section properties and ASD and LRFD reactions are calculated in accordance with ANSI/SDI C-2017, Section 2.4.A.1, and are per foot of width.
2. Web crippling designations: OFE = One Flange End Loaded; OFI = One Flange Interior Loaded; TFE = Two Flange End Loaded; TFI = Two Flange Interior Loaded.
3. Web crippling loads are calculated using the following minimum bearing lengths: 1.5x6: 1.5” exterior / 3” interior; 2x12: 2” exterior / 4” interior; 3x12: 2.5” exterior / 5” interior.

TABLE 5C – Web Crippling Strength for Varied Bearing Lengths

F_y = 40 ksi			OFE	OFI	TFE	TFI
1.5 x 6	22	A	396	702	561	756
		B	1.46	0.99	0.82	1.22
	20	A	601	1082	901	1186
		B	1.32	0.90	0.74	1.11
	18	A	1115	2045	1791	2288
		B	1.14	0.78	0.64	0.96
	16	A	1792	3323	3009	3772
		B	1.02	0.70	0.57	0.86
2 x 12	22	A	177	326	242	341
		B	1.46	0.99	0.82	1.22
	20	A	270	503	392	537
		B	1.32	0.90	0.74	1.11
	18	A	504	951	788	1042
		B	1.14	0.78	0.64	0.96
	16	A	813	1547	1334	1722
		B	1.02	0.70	0.57	0.86
3 x 12	22	A	172	333	221	336
		B	1.46	0.99	0.82	1.22
	20	A	263	515	365	531
		B	1.32	0.90	0.74	1.11
	18	A	496	974	747	1036
		B	1.14	0.78	0.64	0.96
	16	A	804	1586	1278	1720
		B	1.02	0.70	0.57	0.86
	Ω (ASD)		1.70	1.75	1.80	1.75
	Φ (LRFD)		0.90	0.85	0.85	0.85

Table 5C Notes:

1. All section properties are calculated in accordance with ANSI/SDI C-2017, Section 2.4.A.1, and are per foot of width.
2. Web crippling designations: OFE = One Flange End Loaded; OFI = One Flange Interior Loaded; TFE = Two Flange End Loaded; TFI = Two Flange Interior Loaded
3. Nominal web crippling strength is calculated using the following equation:

$$P_n = A\left(1 + B\sqrt{N}\right) \quad \text{(lbs)}$$

Where: A and B are constants from Table 5C.

N is the deck bearing length in inches, not less than 3/4 inch and not greater than 2.90 inch for 1.5 x 6 deck, 4.45 inch for 2 x 12 deck or 7.45 inch for 3 x 12 deck. Longer bearing lengths are permitted but do not provide greater strength.

4. ASD strength is calculated as P_n / Ω; LRFD strength is calculated as ϕP_n.

Table 6 – Concrete Deck-Slab Superimposed Loads

TABLE 6A
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	39	400	400	353	296	251	215	186
4.5	45	400	400	400	359	305	261	225
4.75	48	400	400	400	391	332	285	246
5	51	400	400	400	400	360	309	267
5.5	57	400	400	400	400	400	357	309
5.75	60	400	400	400	400	400	381	330
6	63	400	400	400	400	400	400	351
6.5	69	400	400	400	400	400	400	394
6.75	72	400	400	400	400	400	400	400
7	75	400	400	400	400	400	400	400

1.5 x 6	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	161	140	123	108	95	84	75	66
4.5	196	171	150	132	117	103	92	81
4.75	214	187	164	144	128	113	100	89
5	232	203	178	157	139	123	109	97
5.5	268	235	206	182	161	143	127	113
5.75	287	251	221	195	173	153	136	122
6	306	268	235	208	184	163	146	130
6.5	343	301	265	234	207	184	164	147
6.75	362	317	279	247	219	195	173	155
7	381	334	294	260	231	205	183	163

TABLE 6A
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	39	400	400	400	357	304	261	226
4.5	45	400	400	400	400	369	317	275
4.75	48	400	400	400	400	400	346	300
5	51	400	400	400	400	400	375	325
5.5	57	400	400	400	400	400	400	377
5.75	60	400	400	400	400	400	400	400
6	63	400	400	400	400	400	400	400
6.5	69	400	400	400	400	400	400	400
6.75	72	400	400	400	400	400	400	400
7	75	400	400	400	400	400	400	400

1.5 x 6	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	197	172	152	134	119	106	94	84
4.5	239	210	185	164	145	129	116	103
4.75	261	229	202	179	159	142	126	113
5	284	249	219	194	173	154	138	123
5.5	329	289	255	226	201	179	160	144
5.75	351	309	272	241	215	192	172	154
6	374	329	290	257	229	205	183	164
6.5	400	370	327	290	258	230	206	185
6.75	400	390	345	306	273	244	218	196
7	400	400	363	322	287	257	230	207

TABLE 6A
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	39	400	400	400	400	397	342	297
4.5	45	400	400	400	400	400	400	362
4.75	48	400	400	400	400	400	400	395
5	51	400	400	400	400	400	400	400
5.5	57	400	400	400	400	400	400	400
5.75	60	400	400	400	400	400	400	400
6	63	400	400	400	400	400	400	400
6.5	69	400	400	400	400	400	400	400
6.75	72	400	400	400	400	400	400	400
7	75	400	400	400	400	400	400	400

1.5 x 6	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	197	260	229	202	180	160	143	129
4.5	239	317	279	247	219	196	176	158
4.75	261	346	305	270	240	214	192	173
5	284	376	331	293	261	233	209	188
5.5	329	400	384	340	303	271	243	219
5.75	351	400	400	364	325	290	260	234
6	374	400	400	389	346	310	278	250
6.5	400	400	400	400	390	349	313	282
6.75	400	400	400	400	400	369	331	298
7	400	400	400	400	400	388	349	314

TABLE 6A
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	39	400	400	400	400	400	400	369
4.5	45	400	400	400	400	400	400	400
4.75	48	400	400	400	400	400	400	400
5	51	400	400	400	400	400	400	400
5.5	57	400	400	400	400	400	400	400
5.75	60	400	400	400	400	400	400	400
6	63	400	400	400	400	400	400	400
6.5	69	400	400	400	400	400	400	400
6.75	72	400	400	400	400	400	400	400
7	75	400	400	400	400	400	400	400

1.5 x 6	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	324	286	254	226	202	182	164	148
4.5	396	349	310	276	248	223	201	182
4.75	400	382	339	303	271	244	220	199
5	400	400	369	329	295	265	239	217
5.5	400	400	400	383	343	309	279	253
5.75	400	400	400	400	368	331	299	271
6	400	400	400	400	393	354	319	289
6.5	400	400	400	400	400	399	360	327
6.75	400	400	400	400	400	400	381	346
7	400	400	400	400	400	400	400	365

TABLE 6B
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6 INV	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	44	400	400	400	344	292	250	216
4.5	50	400	400	400	400	348	298	257
4.75	53	400	400	400	400	376	322	278
5	56	400	400	400	400	400	346	299
5.5	62	400	400	400	400	400	396	342
5.75	65	400	400	400	400	400	400	364
6	68	400	400	400	400	400	400	386
6.5	74	400	400	400	400	400	400	400
6.75	77	400	400	400	400	400	400	400
7	80	400	400	400	400	400	400	400

1.5 x 6 INV	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	188	164	144	126	112	99	88	78
4.5	224	195	172	151	134	118	105	94
4.75	242	212	186	164	145	128	114	102
5	260	228	200	177	156	139	123	110
5.5	298	261	229	202	179	159	142	126
5.75	317	277	244	215	191	169	151	135
6	336	294	259	228	202	180	160	143
6.5	374	327	288	255	226	201	179	160
6.75	393	344	303	268	238	211	189	168
7	400	361	318	281	250	222	198	177

TABLE 6B
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6 INV	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	44	400	400	400	400	355	305	264
4.5	50	400	400	400	400	400	363	314
4.75	53	400	400	400	400	400	392	340
5	56	400	400	400	400	400	400	366
5.5	62	400	400	400	400	400	400	400
5.75	65	400	400	400	400	400	400	400
6	68	400	400	400	400	400	400	400
6.5	74	400	400	400	400	400	400	400
6.75	77	400	400	400	400	400	400	400
7	80	400	400	400	400	400	400	400

1.5 x 6 INV	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	230	202	177	157	139	124	111	99
4.5	274	240	212	188	167	149	133	119
4.75	297	260	230	203	181	161	144	129
5	319	280	247	219	195	174	155	139
5.5	365	321	283	251	223	199	178	160
5.75	389	341	301	267	238	212	190	171
6	400	362	320	283	252	225	202	181
6.5	400	400	356	316	282	252	225	203
6.75	400	400	375	333	296	265	237	213
7	400	400	393	349	311	278	249	224

TABLE 6B
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6 INV	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	44	400	400	400	400	400	400	349
4.5	50	400	400	400	400	400	400	400
4.75	53	400	400	400	400	400	400	400
5	56	400	400	400	400	400	400	400
5.5	62	400	400	400	400	400	400	400
5.75	65	400	400	400	400	400	400	400
6	68	400	400	400	400	400	400	400
6.5	74	400	400	400	400	400	400	400
6.75	77	400	400	400	400	400	400	400
7	80	400	400	400	400	400	400	400

1.5 x 6 INV	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	305	269	238	211	189	169	152	137
4.5	364	321	284	253	226	202	182	164
4.75	394	347	308	274	245	219	197	178
5	400	374	331	295	264	237	213	192
5.5	400	400	380	338	302	271	244	221
5.75	400	400	400	360	322	289	260	235
6	400	400	400	382	342	307	276	250
6.5	400	400	400	400	382	343	309	279
6.75	400	400	400	400	400	361	325	294
7	400	400	400	400	400	379	341	309

TABLE 6B
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6 INV	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	44	400	400	400	400	400	400	354
4.5	50	400	400	400	400	400	400	400
4.75	53	400	400	400	400	400	400	400
5	56	400	400	400	400	400	400	400
5.5	62	400	400	400	400	400	400	400
5.75	65	400	400	400	400	400	400	400
6	68	400	400	400	400	400	400	400
6.5	74	400	400	400	400	400	400	400
6.75	77	400	400	400	400	400	400	400
7	80	400	400	400	400	400	400	400

1.5 x 6 INV	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	309	272	241	214	191	171	154	139
4.5	370	326	289	257	230	206	185	167
4.75	400	353	313	279	249	223	201	181
5	400	381	338	301	269	241	217	196
5.5	400	400	388	345	309	277	250	226
5.75	400	400	400	368	329	296	266	241
6	400	400	400	391	350	314	283	256
6.5	400	400	400	400	391	351	316	286
6.75	400	400	400	400	400	370	333	301
7	400	400	400	400	400	388	350	317

TABLE 6C
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

2 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	45	400	376	316	268	229	197	171
5	51	400	400	373	317	271	233	202
5.25	54	400	400	400	342	292	252	219
5.5	57	400	400	400	367	314	271	235
6	63	400	400	400	400	359	310	269
6.25	66	400	400	400	400	381	329	286
6.5	69	400	400	400	400	400	349	303
7	75	400	400	400	400	400	389	338
7.25	78	400	400	400	400	400	400	355
7.5	81	400	400	400	400	400	400	373

2 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	149	130	114	100	88	78	69	61
5	176	154	136	119	105	93	83	73
5.25	191	167	147	129	114	101	90	79
5.5	205	180	158	139	123	109	97	86
6	235	206	181	160	142	125	111	99
6.25	250	219	193	170	151	134	119	106
6.5	265	232	205	181	160	142	126	112
7	295	259	228	202	179	159	141	126
7.25	311	273	240	213	189	168	149	133
7.5	326	286	253	223	198	176	157	140

TABLE 6C
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

2 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	45	400	400	383	326	280	242	210
5	51	400	400	400	386	331	286	249
5.25	54	400	400	400	400	357	309	269
5.5	57	400	400	400	400	384	332	290
6	63	400	400	400	400	400	380	331
6.25	66	400	400	400	400	400	400	352
6.5	69	400	400	400	400	400	400	373
7	75	400	400	400	400	400	400	400
7.25	78	400	400	400	400	400	400	400
7.5	81	400	400	400	400	400	400	400

2 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	184	162	143	126	112	100	89	79
5	218	192	169	150	133	119	106	95
5.25	236	207	183	162	144	129	115	103
5.5	254	223	197	175	156	139	124	111
6	290	255	226	201	179	159	142	128
6.25	308	272	240	214	190	170	152	136
6.5	327	288	255	227	202	180	161	145
7	365	322	285	253	226	202	181	162
7.25	384	338	300	266	238	212	190	171
7.5	400	355	315	280	250	223	200	180

TABLE 6C
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

2 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	45	400	400	400	400	369	320	280
5	51	400	400	400	400	400	379	332
5.25	54	400	400	400	400	400	400	359
5.5	57	400	400	400	400	400	400	386
6	63	400	400	400	400	400	400	400
6.25	66	400	400	400	400	400	400	400
6.5	69	400	400	400	400	400	400	400
7	75	400	400	400	400	400	400	400
7.25	78	400	400	400	400	400	400	400
7.5	81	400	400	400	400	400	400	400

2 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	246	217	193	172	153	137	124	111
5	292	258	229	204	183	164	147	133
5.25	315	279	248	221	198	177	160	144
5.5	339	300	267	238	213	191	172	155
6	388	344	306	273	244	220	198	179
6.25	400	366	325	290	260	234	211	190
6.5	400	388	345	308	276	248	224	202
7	400	400	385	344	309	278	250	226
7.25	400	400	400	362	325	292	264	239
7.5	400	400	400	381	342	307	277	251

TABLE 6C
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

2 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	45	400	400	400	400	400	400	351
5	51	400	400	400	400	400	400	400
5.25	54	400	400	400	400	400	400	400
5.5	57	400	400	400	400	400	400	400
6	63	400	400	400	400	400	400	400
6.25	66	400	400	400	400	400	400	400
6.5	69	400	400	400	400	400	400	400
7	75	400	400	400	400	400	400	400
7.25	78	400	400	400	400	400	400	400
7.5	81	400	400	400	400	400	400	400

2 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	309	274	244	218	196	176	159	144
5	367	326	290	260	233	210	190	172
5.25	397	352	314	281	253	228	206	186
5.5	400	379	338	303	272	245	222	201
6	400	400	388	347	312	282	255	231
6.25	400	400	400	370	333	300	272	246
6.5	400	400	400	393	353	319	288	262
7	400	400	400	400	395	356	323	293
7.25	400	400	400	400	400	375	340	309
7.5	400	400	400	400	400	395	357	325

TABLE 6D
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

3 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	51	340	291	251	218	191	167	147
6	57	392	336	290	252	220	193	170
6.25	60	400	359	310	270	236	207	182
6.5	63	400	383	331	288	252	221	195
7	69	400	400	373	324	284	249	220
7.25	72	400	400	394	343	300	264	233
7.5	75	400	400	400	362	317	278	246
8	81	400	400	400	400	350	308	272
8.25	84	400	400	400	400	367	323	285
8.5	87	400	400	400	400	384	338	299

3 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	130	115	102	90	80	71	63	56
6	151	133	118	105	94	83	74	66
6.25	161	143	127	113	101	90	80	71
6.5	172	153	136	121	108	96	86	76
7	195	173	154	137	122	109	97	87
7.25	206	183	163	145	130	116	103	92
7.5	218	193	172	153	137	122	109	98
8	241	214	191	170	152	136	122	109
8.25	253	225	200	179	160	143	128	115
8.5	265	236	210	188	168	150	135	121

TABLE 6D
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

3 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	51	400	356	308	268	235	207	183
6	57	400	400	355	310	272	240	212
6.25	60	400	400	380	331	291	256	227
6.5	63	400	400	400	353	310	273	242
7	69	400	400	400	398	349	308	273
7.25	72	400	400	400	400	370	326	289
7.5	75	400	400	400	400	390	344	305
8	81	400	400	400	400	400	381	338
8.25	84	400	400	400	400	400	399	354
8.5	87	400	400	400	400	400	400	371

3 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	163	145	129	116	104	93	83	75
6	188	168	150	134	120	108	97	87
6.25	202	180	161	144	129	116	104	94
6.5	215	192	172	154	138	124	112	100
7	243	217	194	174	156	141	127	114
7.25	257	230	205	184	166	149	134	121
7.5	272	242	217	195	175	158	142	128
8	301	269	241	216	194	175	158	143
8.25	315	282	253	227	204	184	166	150
8.5	330	295	265	238	214	193	174	157

TABLE 6D
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

3 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	51	400	400	400	357	314	278	247
6	57	400	400	400	400	363	321	286
6.25	60	400	400	400	400	388	344	306
6.5	63	400	400	400	400	400	367	326
7	69	400	400	400	400	400	400	368
7.25	72	400	400	400	400	400	400	389
7.5	75	400	400	400	400	400	400	400
8	81	400	400	400	400	400	400	400
8.25	84	400	400	400	400	400	400	400
8.5	87	400	400	400	400	400	400	400

3 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	221	198	178	160	145	131	118	107
6	255	229	206	185	168	152	138	125
6.25	273	245	220	199	180	163	148	134
6.5	292	261	235	212	192	174	158	143
7	329	295	266	240	217	197	179	162
7.25	348	312	281	254	230	208	189	172
7.5	368	330	297	268	243	220	200	182
8	400	365	329	297	269	244	222	202
8.25	400	383	345	312	283	257	233	213
8.5	400	400	362	327	296	269	245	223

TABLE 6D
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

3 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	51	400	400	400	400	395	351	313
6	57	400	400	400	400	400	400	361
6.25	60	400	400	400	400	400	400	387
6.5	63	400	400	400	400	400	400	400
7	69	400	400	400	400	400	400	400
7.25	72	400	400	400	400	400	400	400
7.5	75	400	400	400	400	400	400	400
8	81	400	400	400	400	400	400	400
8.25	84	400	400	400	400	400	400	400
8.5	87	400	400	400	400	400	400	400

3 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	280	252	227	205	186	169	154	141
6	324	291	263	238	216	196	179	163
6.25	346	312	281	255	231	210	192	175
6.5	370	333	300	272	247	225	205	187
7	400	376	339	307	279	254	232	212
7.25	400	398	359	325	296	269	246	225
7.5	400	400	379	344	312	285	260	238
8	400	400	400	381	346	316	288	264
8.25	400	400	400	400	364	332	303	277
8.5	400	400	400	400	381	348	318	291

TABLE 6E
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	30	400	400	359	303	258	222	192
4.5	35	400	400	400	366	312	269	233
4.75	37	400	400	400	399	340	293	254
5	39	400	400	400	400	369	318	276
5.5	44	400	400	400	400	400	367	318
5.75	46	400	400	400	400	400	392	340
6	49	400	400	400	400	400	400	362
6.5	53	400	400	400	400	400	400	400
6.75	55	400	400	400	400	400	400	400
7	57	400	400	400	400	400	400	400

1.5 x 6	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	168	147	130	115	102	91	81	73
4.5	203	179	158	140	124	111	99	89
4.75	222	195	172	153	136	121	109	98
5	241	212	187	166	148	132	118	106
5.5	278	245	216	192	171	153	137	123
5.75	297	262	231	205	183	164	147	132
6	316	278	246	218	195	174	156	140
6.5	355	313	277	246	219	196	176	159
6.75	375	330	292	260	232	207	186	168
7	395	348	308	274	244	219	196	177

TABLE 6E
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	30	400	400	400	364	311	268	233
4.5	35	400	400	400	400	377	325	282
4.75	37	400	400	400	400	400	354	308
5	39	400	400	400	400	400	384	334
5.5	44	400	400	400	400	400	400	386
5.75	46	400	400	400	400	400	400	400
6	49	400	400	400	400	400	400	400
6.5	53	400	400	400	400	400	400	400
6.75	55	400	400	400	400	400	400	400
7	57	400	400	400	400	400	400	400

1.5 x 6	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	203	179	158	141	126	112	101	91
4.5	247	217	192	171	153	137	123	111
4.75	270	237	210	187	167	150	135	121
5	293	258	228	203	182	163	147	132
5.5	338	298	264	235	210	189	170	153
5.75	362	319	283	252	225	202	182	164
6	385	339	301	268	240	215	194	175
6.5	400	382	339	302	270	242	218	197
6.75	400	400	358	319	285	256	231	209
7	400	400	377	336	301	270	244	220

TABLE 6E
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	30	400	400	400	400	400	349	304
4.5	35	400	400	400	400	400	400	369
4.75	37	400	400	400	400	400	400	400
5	39	400	400	400	400	400	400	400
5.5	44	400	400	400	400	400	400	400
5.75	46	400	400	400	400	400	400	400
6	49	400	400	400	400	400	400	400
6.5	53	400	400	400	400	400	400	400
6.75	55	400	400	400	400	400	400	400
7	57	400	400	400	400	400	400	400

1.5 x 6	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	267	235	209	186	167	150	135	123
4.5	324	286	254	227	203	183	165	150
4.75	354	313	278	248	223	200	181	164
5	385	340	302	270	242	218	197	178
5.5	400	394	350	313	281	253	228	207
5.75	400	400	375	335	301	271	245	222
6	400	400	399	357	320	288	261	236
6.5	400	400	400	400	361	325	294	267
6.75	400	400	400	400	381	344	311	282
7	400	400	400	400	400	362	328	298

TABLE 6E
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	30	400	400	400	400	400	400	376
4.5	35	400	400	400	400	400	400	400
4.75	37	400	400	400	400	400	400	400
5	39	400	400	400	400	400	400	400
5.5	44	400	400	400	400	400	400	400
5.75	46	400	400	400	400	400	400	400
6	49	400	400	400	400	400	400	400
6.5	53	400	400	400	400	400	400	400
6.75	55	400	400	400	400	400	400	400
7	57	400	400	400	400	400	400	400

1.5 x 6	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	331	293	260	233	209	188	170	155
4.5	400	357	318	284	255	230	208	189
4.75	400	390	347	311	279	252	228	207
5	400	400	378	338	304	274	248	226
5.5	400	400	400	393	353	319	289	263
5.75	400	400	400	400	378	342	310	282
6	400	400	400	400	400	364	330	300
6.5	400	400	400	400	400	400	372	339
6.75	400	400	400	400	400	400	394	358
7	400	400	400	400	400	400	400	378

TABLE 6F
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6 INV	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	34	400	400	398	336	286	246	213
4.5	39	400	400	400	399	340	293	254
4.75	41	400	400	400	400	369	317	275
5	43	400	400	400	400	397	342	296
5.5	48	400	400	400	400	400	391	339
5.75	50	400	400	400	400	400	400	361
6	52	400	400	400	400	400	400	383
6.5	57	400	400	400	400	400	400	400
6.75	59	400	400	400	400	400	400	400
7	61	400	400	400	400	400	400	400

1.5 x 6 INV	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	186	163	144	127	113	101	90	80
4.5	221	194	171	152	135	120	108	97
4.75	240	211	186	165	147	131	117	105
5	259	227	201	178	159	142	127	114
5.5	296	260	230	204	182	162	146	131
5.75	316	277	245	218	194	173	155	140
6	335	295	260	231	206	184	165	149
6.5	373	328	290	258	230	206	185	166
6.75	393	346	306	272	242	217	195	175
7	400	363	321	285	255	228	205	184

TABLE 6F
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6 INV	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	34	400	400	400	400	344	296	257
4.5	39	400	400	400	400	400	354	307
4.75	41	400	400	400	400	400	383	333
5	43	400	400	400	400	400	400	359
5.5	48	400	400	400	400	400	400	400
5.75	50	400	400	400	400	400	400	400
6	52	400	400	400	400	400	400	400
6.5	57	400	400	400	400	400	400	400
6.75	59	400	400	400	400	400	400	400
7	61	400	400	400	400	400	400	400

1.5 x 6 INV	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	225	198	175	156	139	124	111	100
4.5	269	237	209	186	166	149	134	120
4.75	292	257	227	202	180	162	145	131
5	314	277	245	218	195	175	157	142
5.5	360	317	281	250	224	201	180	163
5.75	384	338	300	267	239	214	193	174
6	400	359	318	284	254	228	205	185
6.5	400	400	355	316	283	254	229	207
6.75	400	400	374	333	298	268	241	218
7	400	400	393	350	313	282	254	229

TABLE 6F
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6 INV	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	34	400	400	400	400	400	386	336
4.5	39	400	400	400	400	400	400	400
4.75	41	400	400	400	400	400	400	400
5	43	400	400	400	400	400	400	400
5.5	48	400	400	400	400	400	400	400
5.75	50	400	400	400	400	400	400	400
6	52	400	400	400	400	400	400	400
6.5	57	400	400	400	400	400	400	400
6.75	59	400	400	400	400	400	400	400
7	61	400	400	400	400	400	400	400

1.5 x 6 INV	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	295	260	231	206	184	166	149	135
4.5	353	311	277	247	221	199	179	162
4.75	383	338	300	268	240	216	195	177
5	400	365	324	289	260	234	211	191
5.5	400	400	372	332	298	268	243	220
5.75	400	400	397	355	318	286	259	235
6	400	400	400	377	338	305	275	250
6.5	400	400	400	400	378	340	308	279
6.75	400	400	400	400	398	359	325	294
7	400	400	400	400	400	377	341	310

TABLE 6F
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

1.5 x 6 INV	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	34	400	400	400	400	400	400	400
4.5	39	400	400	400	400	400	400	400
4.75	41	400	400	400	400	400	400	400
5	43	400	400	400	400	400	400	400
5.5	48	400	400	400	400	400	400	400
5.75	50	400	400	400	400	400	400	400
6	52	400	400	400	400	400	400	400
6.5	57	400	400	400	400	400	400	400
6.75	59	400	400	400	400	400	400	400
7	61	400	400	400	400	400	400	400

1.5 x 6 INV	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	366	323	288	257	231	208	188	171
4.5	400	388	345	309	277	250	226	205
4.75	400	400	375	335	301	272	246	223
5	400	400	400	362	326	294	266	242
5.5	400	400	400	400	375	338	306	278
5.75	400	400	400	400	400	361	327	297
6	400	400	400	400	400	384	348	316
6.5	400	400	400	400	400	400	389	354
6.75	400	400	400	400	400	400	400	374
7	400	400	400	400	400	400	400	393

TABLE 6G
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

2 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	35	400	366	308	262	225	194	169
5	39	400	400	365	311	267	231	201
5.25	42	400	400	394	335	288	249	217
5.5	44	400	400	400	361	310	269	234
6	48	400	400	400	400	355	308	268
6.25	51	400	400	400	400	377	327	285
6.5	53	400	400	400	400	400	347	303
7	57	400	400	400	400	400	387	338
7.25	60	400	400	400	400	400	400	356
7.5	63	400	400	400	400	400	400	373

2 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	148	130	115	102	90	80	72	64
5	176	155	137	122	108	97	86	77
5.25	190	168	148	132	117	104	93	84
5.5	205	181	160	142	126	113	101	91
6	236	208	184	164	146	130	117	105
6.25	250	221	195	174	155	138	124	111
6.5	266	234	208	185	165	147	132	119
7	297	262	233	207	185	165	148	133
7.25	312	276	244	217	194	174	156	140
7.5	327	289	256	228	204	182	164	147

TABLE 6G
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

2 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	35	400	400	371	316	272	236	206
5	39	400	400	400	375	323	281	245
5.25	42	400	400	400	400	349	303	265
5.5	44	400	400	400	400	376	326	285
6	48	400	400	400	400	400	374	327
6.25	51	400	400	400	400	400	397	348
6.5	53	400	400	400	400	400	400	369
7	57	400	400	400	400	400	400	400
7.25	60	400	400	400	400	400	400	400
7.5	63	400	400	400	400	400	400	400

2 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	181	160	142	126	112	101	90	81
5	216	190	169	151	135	121	108	98
5.25	233	206	182	163	145	130	117	105
5.5	251	222	197	176	157	141	127	114
6	288	255	226	202	181	162	146	132
6.25	306	271	240	215	192	173	155	140
6.5	325	287	256	228	204	184	165	149
7	363	322	286	255	229	206	186	168
7.25	382	338	301	269	241	216	195	176
7.5	400	355	315	282	253	227	205	185

TABLE 6G
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

2 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	35	400	400	400	400	355	309	270
5	39	400	400	400	400	400	367	322
5.25	42	400	400	400	400	400	397	348
5.5	44	400	400	400	400	400	400	375
6	48	400	400	400	400	400	400	400
6.25	51	400	400	400	400	400	400	400
6.5	53	400	400	400	400	400	400	400
7	57	400	400	400	400	400	400	400
7.25	60	400	400	400	400	400	400	400
7.5	63	400	400	400	400	400	400	400

2 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	238	211	188	168	151	136	123	111
5	284	252	224	201	180	163	147	133
5.25	307	272	243	217	195	176	159	144
5.5	331	294	262	234	211	190	172	156
6	380	337	301	270	242	219	198	180
6.25	400	359	320	287	258	233	211	191
6.5	400	381	340	305	274	248	224	203
7	400	400	381	342	307	278	252	228
7.25	400	400	400	359	323	292	265	240
7.5	400	400	400	377	340	307	278	252

TABLE 6G
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

2 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	35	400	400	400	400	400	382	336
5	39	400	400	400	400	400	400	400
5.25	42	400	400	400	400	400	400	400
5.5	44	400	400	400	400	400	400	400
6	48	400	400	400	400	400	400	400
6.25	51	400	400	400	400	400	400	400
6.5	53	400	400	400	400	400	400	400
7	57	400	400	400	400	400	400	400
7.25	60	400	400	400	400	400	400	400
7.5	63	400	400	400	400	400	400	400

2 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	297	264	235	211	190	172	155	141
5	354	314	281	252	227	205	186	169
5.25	383	340	304	273	246	222	201	183
5.5	400	367	328	294	265	240	218	198
6	400	400	377	339	306	277	251	229
6.25	400	400	400	361	325	294	267	243
6.5	400	400	400	384	346	313	284	259
7	400	400	400	400	388	351	319	291
7.25	400	400	400	400	400	370	336	306
7.5	400	400	400	400	400	389	353	322

TABLE 6H
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

3 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	39	332	286	248	216	189	167	148
6	44	384	330	286	250	219	193	171
6.25	46	400	353	306	267	235	207	184
6.5	48	400	377	327	285	251	221	196
7	53	400	400	368	322	283	250	221
7.25	55	400	400	390	341	299	264	235
7.5	57	400	400	400	360	316	279	248
8	62	400	400	400	398	350	309	275
8.25	64	400	400	400	400	367	325	288
8.5	67	400	400	400	400	384	340	302

3 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	131	117	105	94	84	76	68	61
6	152	136	121	109	98	88	79	71
6.25	163	146	130	117	105	95	85	77
6.5	175	156	140	125	113	101	91	82
7	197	176	158	142	127	115	104	93
7.25	209	187	167	150	135	122	110	100
7.5	221	198	177	159	143	129	117	106
8	245	219	196	176	159	143	130	117
8.25	257	230	206	186	167	151	137	124
8.5	269	240	216	194	175	158	143	129

TABLE 6H
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

3 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	39	400	346	301	263	231	205	182
6	44	400	399	347	304	267	237	210
6.25	46	400	400	371	325	286	253	225
6.5	48	400	400	396	347	306	271	241
7	53	400	400	400	391	345	305	272
7.25	55	400	400	400	400	365	323	288
7.5	57	400	400	400	400	386	342	304
8	62	400	400	400	400	400	378	337
8.25	64	400	400	400	400	400	397	354
8.5	67	400	400	400	400	400	400	370

3 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	162	145	130	117	106	96	87	78
6	188	168	151	136	123	111	100	91
6.25	201	180	162	146	132	119	108	98
6.5	215	193	173	156	141	128	116	105
7	243	218	196	176	160	144	131	119
7.25	257	231	208	187	169	153	139	127
7.5	272	244	220	198	179	163	148	134
8	301	270	243	220	199	180	164	149
8.25	316	284	256	231	209	190	172	157
8.5	331	297	267	241	219	198	180	164

TABLE 6H
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

3 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	39	400	400	394	346	305	271	242
6	44	400	400	400	399	352	313	279
6.25	46	400	400	400	400	377	335	299
6.5	48	400	400	400	400	400	358	319
7	53	400	400	400	400	400	400	360
7.25	55	400	400	400	400	400	400	382
7.5	57	400	400	400	400	400	400	400
8	62	400	400	400	400	400	400	400
8.25	64	400	400	400	400	400	400	400
8.5	67	400	400	400	400	400	400	400

3 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	216	195	176	159	144	131	119	109
6	250	225	203	184	167	152	138	126
6.25	268	241	218	197	179	163	148	136
6.5	286	258	233	211	191	174	159	145
7	323	291	263	238	216	197	180	164
7.25	342	308	279	252	229	209	191	175
7.5	362	326	295	267	243	221	202	185
8	400	361	326	296	269	245	224	205
8.25	400	379	343	311	283	258	236	216
8.5	400	397	359	326	296	270	247	226

TABLE 6H
Composite Deck-Slab Allowable Superimposed Load (ASD), psf

3 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	39	400	400	400	400	380	338	302
6	44	400	400	400	400	400	390	349
6.25	46	400	400	400	400	400	400	373
6.5	48	400	400	400	400	400	400	399
7	53	400	400	400	400	400	400	400
7.25	55	400	400	400	400	400	400	400
7.5	57	400	400	400	400	400	400	400
8	62	400	400	400	400	400	400	400
8.25	64	400	400	400	400	400	400	400
8.5	67	400	400	400	400	400	400	400

3 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	271	245	221	201	183	167	153	140
6	313	282	256	232	211	193	176	162
6.25	336	303	274	249	227	207	189	174
6.5	358	323	293	266	242	221	203	186
7	400	365	331	301	274	250	229	210
7.25	400	387	351	319	291	266	243	223
7.5	400	400	371	337	308	281	258	236
8	400	400	400	374	341	312	286	263
8.25	400	400	400	393	359	328	301	276
8.5	400	400	400	400	376	344	315	289

TABLE 6l
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	39	640	640	564	474	402	344	297
4.5	45	640	640	640	574	488	418	361
4.75	48	640	640	640	626	531	456	393
5	51	640	640	640	640	576	494	426
5.5	57	640	640	640	640	640	571	494
5.75	60	640	640	640	640	640	610	528
6	63	640	640	640	640	640	640	562
6.5	69	640	640	640	640	640	640	631
6.75	72	640	640	640	640	640	640	640
7	75	640	640	640	640	640	640	640

1.5 x 6	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	258	225	197	173	153	135	119	106
4.5	313	274	240	211	187	165	147	130
4.75	342	299	262	231	204	181	161	143
5	371	324	285	251	222	197	175	156
5.5	429	376	330	291	258	229	204	181
5.75	459	402	353	312	276	245	218	195
6	489	428	376	332	294	262	233	208
6.5	549	481	423	374	332	295	263	234
6.75	580	508	447	395	350	311	278	248
7	610	535	471	416	369	328	293	261

TABLE 6l
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	39	640	640	640	571	486	418	361
4.5	45	640	640	640	640	591	507	439
4.75	48	640	640	640	640	640	554	480
5	51	640	640	640	640	640	600	520
5.5	57	640	640	640	640	640	640	602
5.75	60	640	640	640	640	640	640	640
6	63	640	640	640	640	640	640	640
6.5	69	640	640	640	640	640	640	640
6.75	72	640	640	640	640	640	640	640
7	75	640	640	640	640	640	640	640

1.5 x 6	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	315	276	243	214	190	169	151	135
4.5	383	336	296	262	232	207	185	165
4.75	418	367	323	286	254	226	202	181
5	454	398	351	311	276	246	220	197
5.5	526	462	407	361	321	286	256	230
5.75	562	494	436	386	344	307	275	246
6	599	526	465	412	367	327	293	263
6.5	640	592	523	464	413	369	330	297
6.75	640	625	552	490	436	390	349	314
7	640	640	581	516	459	411	368	331

TABLE 6l
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	39	640	640	640	640	635	547	475
4.5	45	640	640	640	640	640	640	579
4.75	48	640	640	640	640	640	640	632
5	51	640	640	640	640	640	640	640
5.5	57	640	640	640	640	640	640	640
5.75	60	640	640	640	640	640	640	640
6	63	640	640	640	640	640	640	640
6.5	69	640	640	640	640	640	640	640
6.75	72	640	640	640	640	640	640	640
7	75	640	640	640	640	640	640	640

1.5 x 6	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	416	366	323	287	256	229	206	185
4.5	507	446	395	351	313	281	252	227
4.75	554	488	432	384	343	307	276	249
5	601	529	469	417	373	334	301	271
5.5	640	615	545	485	433	389	350	316
5.75	640	640	583	519	464	417	375	339
6	640	640	622	554	495	445	400	362
6.5	640	640	640	624	558	501	451	408
6.75	640	640	640	640	590	530	477	431
7	640	640	640	640	621	558	503	455

TABLE 6l
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	39	640	640	640	640	640	640	591
4.5	45	640	640	640	640	640	640	640
4.75	48	640	640	640	640	640	640	640
5	51	640	640	640	640	640	640	640
5.5	57	640	640	640	640	640	640	640
5.75	60	640	640	640	640	640	640	640
6	63	640	640	640	640	640	640	640
6.5	69	640	640	640	640	640	640	640
6.75	72	640	640	640	640	640	640	640
7	75	640	640	640	640	640	640	640

1.5 x 6	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	518	457	406	361	324	291	262	237
4.5	633	559	496	442	396	356	321	291
4.75	640	611	543	484	434	390	352	319
5	640	640	590	526	472	424	383	347
5.5	640	640	640	612	549	494	446	404
5.75	640	640	640	640	588	530	479	434
6	640	640	640	640	628	566	511	463
6.5	640	640	640	640	640	638	577	523
6.75	640	640	640	640	640	640	610	553
7	640	640	640	640	640	640	640	583

TABLE 6J
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6 INV	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	44	640	640	640	551	468	401	346
4.5	50	640	640	640	640	556	477	412
4.75	53	640	640	640	640	601	515	445
5	56	640	640	640	640	640	554	479
5.5	62	640	640	640	640	640	633	548
5.75	65	640	640	640	640	640	640	582
6	68	640	640	640	640	640	640	617
6.5	74	640	640	640	640	640	640	640
6.75	77	640	640	640	640	640	640	640
7	80	640	640	640	640	640	640	640

1.5 x 6 INV	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	300	262	230	202	179	158	140	124
4.5	358	313	275	242	214	190	168	150
4.75	387	338	297	262	232	206	183	163
5	417	364	320	282	250	222	197	176
5.5	477	417	367	324	287	255	227	202
5.75	507	444	390	344	305	271	241	215
6	537	470	414	365	324	288	256	229
6.5	598	524	461	408	361	321	287	256
6.75	629	551	485	429	380	338	302	270
7	640	578	509	450	399	355	317	283

TABLE 6J
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6 INV	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	44	640	640	640	640	568	488	422
4.5	50	640	640	640	640	640	580	503
4.75	53	640	640	640	640	640	628	544
5	56	640	640	640	640	640	640	585
5.5	62	640	640	640	640	640	640	640
5.75	65	640	640	640	640	640	640	640
6	68	640	640	640	640	640	640	640
6.5	74	640	640	640	640	640	640	640
6.75	77	640	640	640	640	640	640	640
7	80	640	640	640	640	640	640	640

1.5 x 6 INV	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	368	322	284	251	223	198	177	158
4.5	439	385	339	300	267	238	212	190
4.75	475	416	367	325	289	258	230	206
5	511	448	396	351	312	278	249	223
5.5	584	513	453	402	357	319	286	256
5.75	622	546	482	427	380	340	304	273
6	640	579	511	453	404	361	323	290
6.5	640	640	570	506	450	403	361	324
6.75	640	640	600	532	474	424	380	341
7	640	640	629	558	498	445	399	359

TABLE 6J
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6 INV	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	44	640	640	640	640	640	640	558
4.5	50	640	640	640	640	640	640	640
4.75	53	640	640	640	640	640	640	640
5	56	640	640	640	640	640	640	640
5.5	62	640	640	640	640	640	640	640
5.75	65	640	640	640	640	640	640	640
6	68	640	640	640	640	640	640	640
6.5	74	640	640	640	640	640	640	640
6.75	77	640	640	640	640	640	640	640
7	80	640	640	640	640	640	640	640

1.5 x 6 INV	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	488	430	380	338	302	270	243	219
4.5	582	513	454	404	361	324	291	262
4.75	631	556	492	438	391	351	316	285
5	640	599	530	472	422	378	341	307
5.5	640	640	608	541	484	434	391	353
5.75	640	640	640	576	515	463	417	376
6	640	640	640	611	547	491	442	400
6.5	640	640	640	640	610	548	494	447
6.75	640	640	640	640	640	577	520	470
7	640	640	640	640	640	606	546	494

TABLE 6J
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6 INV	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	44	640	640	640	640	640	640	640
4.5	50	640	640	640	640	640	640	640
4.75	53	640	640	640	640	640	640	640
5	56	640	640	640	640	640	640	640
5.5	62	640	640	640	640	640	640	640
5.75	65	640	640	640	640	640	640	640
6	68	640	640	640	640	640	640	640
6.5	74	640	640	640	640	640	640	640
6.75	77	640	640	640	640	640	640	640
7	80	640	640	640	640	640	640	640

1.5 x 6 INV	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	611	540	479	427	382	344	310	280
4.5	640	640	573	511	458	412	372	337
4.75	640	640	621	554	497	447	403	365
5	640	640	640	597	536	482	435	394
5.5	640	640	640	640	615	554	500	453
5.75	640	640	640	640	640	590	533	483
6	640	640	640	640	640	626	566	513
6.5	640	640	640	640	640	640	633	574
6.75	640	640	640	640	640	640	640	604
7	640	640	640	640	640	640	640	635

TABLE 6K
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

2 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	45	640	602	505	428	366	315	273
5	51	640	640	597	507	433	374	324
5.25	54	640	640	640	547	468	403	350
5.5	57	640	640	640	587	503	434	376
6	63	640	640	640	640	574	495	430
6.25	66	640	640	640	640	610	527	457
6.5	69	640	640	640	640	640	558	485
7	75	640	640	640	640	640	622	540
7.25	78	640	640	640	640	640	640	568
7.5	81	640	640	640	640	640	640	597

2 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	238	208	182	160	141	125	110	97
5	282	247	217	191	169	149	132	117
5.25	305	267	235	207	183	162	143	127
5.5	328	288	253	223	197	175	155	137
6	376	329	290	256	226	201	178	158
6.25	399	350	309	272	241	214	190	169
6.5	424	372	327	289	256	227	202	180
7	472	415	366	323	286	254	226	202
7.25	497	436	385	340	302	268	239	213
7.5	522	458	404	357	317	282	251	224

TABLE 6K
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

2 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	45	640	640	613	522	447	387	336
5	51	640	640	640	617	530	458	399
5.25	54	640	640	640	640	572	495	431
5.5	57	640	640	640	640	614	532	463
6	63	640	640	640	640	640	607	529
6.25	66	640	640	640	640	640	640	563
6.5	69	640	640	640	640	640	640	597
7	75	640	640	640	640	640	640	640
7.25	78	640	640	640	640	640	640	640
7.5	81	640	640	640	640	640	640	640

2 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	294	258	228	202	179	159	142	126
5	349	307	271	240	213	190	170	151
5.25	377	332	293	260	231	206	184	164
5.5	406	357	316	280	249	222	198	177
6	464	409	362	321	286	255	228	204
6.25	494	435	385	342	304	272	243	218
6.5	523	461	408	363	323	288	258	231
7	584	515	456	405	361	323	289	259
7.25	614	541	480	426	380	340	304	273
7.5	640	568	504	448	399	357	320	287

TABLE 6K
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

2 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	45	640	640	640	640	590	512	447
5	51	640	640	640	640	640	607	531
5.25	54	640	640	640	640	640	640	574
5.5	57	640	640	640	640	640	640	617
6	63	640	640	640	640	640	640	640
6.25	66	640	640	640	640	640	640	640
6.5	69	640	640	640	640	640	640	640
7	75	640	640	640	640	640	640	640
7.25	78	640	640	640	640	640	640	640
7.5	81	640	640	640	640	640	640	640

2 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	393	347	308	275	245	220	198	178
5	467	413	367	327	292	262	236	213
5.25	505	446	396	354	316	284	256	230
5.5	543	480	427	381	341	306	276	249
6	621	550	489	436	391	351	316	286
6.25	640	585	520	465	416	374	337	305
6.5	640	621	552	493	442	397	358	324
7	640	640	616	551	494	444	401	362
7.25	640	640	640	580	520	468	422	382
7.5	640	640	640	609	546	492	444	401

TABLE 6K
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

2 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	45	640	640	640	640	640	640	561
5	51	640	640	640	640	640	640	640
5.25	54	640	640	640	640	640	640	640
5.5	57	640	640	640	640	640	640	640
6	63	640	640	640	640	640	640	640
6.25	66	640	640	640	640	640	640	640
6.5	69	640	640	640	640	640	640	640
7	75	640	640	640	640	640	640	640
7.25	78	640	640	640	640	640	640	640
7.5	81	640	640	640	640	640	640	640

2 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	495	439	391	349	313	282	255	231
5	588	521	464	416	373	336	304	275
5.25	636	564	503	450	404	364	329	298
5.5	640	607	541	485	435	393	355	322
6	640	640	620	556	500	451	408	370
6.25	640	640	640	592	532	480	434	394
6.5	640	640	640	628	565	510	462	419
7	640	640	640	640	632	570	516	469
7.25	640	640	640	640	640	601	544	494
7.5	640	640	640	640	640	631	572	519

TABLE 6L
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

3 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	51	544	466	402	349	305	267	235
6	57	628	538	464	404	353	309	273
6.25	60	640	575	497	432	377	331	292
6.5	63	640	613	529	460	402	353	312
7	69	640	640	596	519	454	399	352
7.25	72	640	640	631	549	480	422	372
7.5	75	640	640	640	579	507	445	393
8	81	640	640	640	640	560	493	435
8.25	84	640	640	640	640	588	517	457
8.5	87	640	640	640	640	615	541	478

3 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	208	184	163	145	129	114	101	90
6	241	213	189	168	150	133	119	106
6.25	258	229	203	181	161	143	128	114
6.5	276	244	217	193	172	154	137	122
7	312	276	246	219	195	174	156	139
7.25	330	293	261	232	207	185	165	148
7.5	348	309	275	246	219	196	175	157
8	386	343	306	273	244	218	195	175
8.25	405	360	321	286	256	229	205	184
8.5	424	377	336	300	269	240	215	193

TABLE 6L
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

3 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	51	640	569	493	429	376	332	293
6	57	640	640	569	496	435	383	339
6.25	60	640	640	608	530	465	410	363
6.5	63	640	640	640	565	496	437	387
7	69	640	640	640	637	559	493	437
7.25	72	640	640	640	640	591	522	463
7.5	75	640	640	640	640	624	551	488
8	81	640	640	640	640	640	609	540
8.25	84	640	640	640	640	640	639	567
8.5	87	640	640	640	640	640	640	593

3 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	260	232	207	185	166	149	133	120
6	301	269	240	215	193	173	155	140
6.25	323	288	257	230	207	185	167	150
6.5	344	307	275	246	221	198	178	161
7	389	347	310	278	250	225	203	183
7.25	412	367	329	295	265	238	215	194
7.5	435	388	347	312	280	252	227	205
8	481	430	385	346	311	280	253	228
8.25	505	451	404	363	327	294	266	240
8.5	529	472	423	380	342	309	279	252

TABLE 6L
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

3 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	51	640	640	640	571	503	445	396
6	57	640	640	640	640	581	514	457
6.25	60	640	640	640	640	621	550	489
6.5	63	640	640	640	640	640	587	522
7	69	640	640	640	640	640	640	589
7.25	72	640	640	640	640	640	640	623
7.5	75	640	640	640	640	640	640	640
8	81	640	640	640	640	640	640	640
8.25	84	640	640	640	640	640	640	640
8.5	87	640	640	640	640	640	640	640

3 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	353	317	284	256	231	209	190	172
6	409	366	329	297	268	243	220	200
6.25	437	392	352	318	287	260	236	214
6.5	466	418	376	339	307	278	252	229
7	526	472	425	384	347	315	286	260
7.25	557	500	450	406	368	333	303	276
7.5	588	528	475	429	388	352	320	291
8	640	585	527	476	431	391	356	324
8.25	640	613	553	499	452	411	373	340
8.5	640	640	579	523	474	430	392	357

TABLE 6L
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

3 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	51	640	640	640	640	632	561	500
6	57	640	640	640	640	640	640	578
6.25	60	640	640	640	640	640	640	618
6.5	63	640	640	640	640	640	640	640
7	69	640	640	640	640	640	640	640
7.25	72	640	640	640	640	640	640	640
7.5	75	640	640	640	640	640	640	640
8	81	640	640	640	640	640	640	640
8.25	84	640	640	640	640	640	640	640
8.5	87	640	640	640	640	640	640	640

3 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Normal Weight Concrete (145 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	448	403	363	329	298	271	247	225
6	518	466	420	381	345	314	286	261
6.25	554	499	450	407	370	337	307	280
6.5	591	532	480	435	395	359	328	300
7	640	601	543	492	447	407	371	339
7.25	640	636	575	521	473	431	393	360
7.5	640	640	607	550	500	455	416	380
8	640	640	640	610	554	505	461	422
8.25	640	640	640	640	582	531	485	444
8.5	640	640	640	640	610	556	508	465

TABLE 6M
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	30	640	640	575	485	413	355	308
4.5	35	640	640	640	586	500	430	373
4.75	37	640	640	640	639	545	469	407
5	39	640	640	640	640	590	508	441
5.5	44	640	640	640	640	640	587	509
5.75	46	640	640	640	640	640	627	544
6	49	640	640	640	640	640	640	579
6.5	53	640	640	640	640	640	640	640
6.75	55	640	640	640	640	640	640	640
7	57	640	640	640	640	640	640	640

1.5 x 6	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	268	235	208	184	163	146	130	117
4.5	325	286	252	223	199	177	159	142
4.75	355	312	275	244	217	194	174	156
5	385	339	299	265	236	211	189	170
5.5	445	391	346	307	273	244	219	197
5.75	476	419	370	329	293	262	235	211
6	506	445	393	349	311	278	250	225
6.5	569	500	443	393	351	314	282	254
6.75	600	528	467	415	371	332	298	268
7	632	556	492	438	391	350	314	283

TABLE 6M
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	30	640	640	640	582	497	428	372
4.5	35	640	640	640	640	603	519	451
4.75	37	640	640	640	640	640	567	493
5	39	640	640	640	640	640	615	534
5.5	44	640	640	640	640	640	640	618
5.75	46	640	640	640	640	640	640	640
6	49	640	640	640	640	640	640	640
6.5	53	640	640	640	640	640	640	640
6.75	55	640	640	640	640	640	640	640
7	57	640	640	640	640	640	640	640

1.5 x 6	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	326	286	253	225	201	180	162	145
4.5	395	348	308	274	244	219	197	177
4.75	431	380	336	299	267	240	216	194
5	468	412	365	325	291	261	234	212
5.5	541	477	423	377	337	302	272	245
5.75	579	511	453	403	361	324	291	263
6	616	543	481	429	383	344	310	280
6.5	640	611	542	483	432	388	350	316
6.75	640	640	572	510	456	410	370	334
7	640	640	603	537	481	432	390	352

TABLE 6M
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	30	640	640	640	640	640	558	486
4.5	35	640	640	640	640	640	640	591
4.75	37	640	640	640	640	640	640	640
5	39	640	640	640	640	640	640	640
5.5	44	640	640	640	640	640	640	640
5.75	46	640	640	640	640	640	640	640
6	49	640	640	640	640	640	640	640
6.5	53	640	640	640	640	640	640	640
6.75	55	640	640	640	640	640	640	640
7	57	640	640	640	640	640	640	640

1.5 x 6	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	426	376	334	298	267	240	217	196
4.5	519	458	407	363	325	293	264	239
4.75	567	501	445	397	356	321	289	262
5	615	544	483	432	387	349	315	285
5.5	640	630	560	501	449	404	366	331
5.75	640	640	600	536	481	433	392	355
6	640	640	639	571	512	461	417	378
6.5	640	640	640	640	577	520	471	427
6.75	640	640	640	640	610	550	498	452
7	640	640	640	640	640	580	525	476

TABLE 6M
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	30	640	640	640	640	640	640	602
4.5	35	640	640	640	640	640	640	640
4.75	37	640	640	640	640	640	640	640
5	39	640	640	640	640	640	640	640
5.5	44	640	640	640	640	640	640	640
5.75	46	640	640	640	640	640	640	640
6	49	640	640	640	640	640	640	640
6.5	53	640	640	640	640	640	640	640
6.75	55	640	640	640	640	640	640	640
7	57	640	640	640	640	640	640	640

1.5 x 6	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	529	468	416	372	334	301	273	248
4.5	640	571	508	454	408	368	333	303
4.75	640	624	556	497	447	403	365	332
5	640	640	604	541	486	439	397	361
5.5	640	640	640	628	565	510	462	420
5.75	640	640	640	640	605	547	495	450
6	640	640	640	640	640	582	528	480
6.5	640	640	640	640	640	640	596	542
6.75	640	640	640	640	640	640	630	573
7	640	640	640	640	640	640	640	605

TABLE 6N
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6 INV	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	34	640	640	637	537	457	393	341
4.5	39	640	640	640	639	545	468	406
4.75	41	640	640	640	640	590	507	440
5	43	640	640	640	640	635	547	474
5.5	48	640	640	640	640	640	625	543
5.75	50	640	640	640	640	640	640	578
6	52	640	640	640	640	640	640	613
6.5	57	640	640	640	640	640	640	640
6.75	59	640	640	640	640	640	640	640
7	61	640	640	640	640	640	640	640

1.5 x 6 INV	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	297	260	230	203	181	161	144	129
4.5	354	311	274	243	216	193	172	154
4.75	384	337	298	264	235	210	188	168
5	414	364	321	285	254	227	203	182
5.5	474	417	368	327	291	260	233	209
5.75	505	444	392	348	310	277	249	223
6	536	471	417	370	330	295	265	238
6.5	597	525	465	413	368	329	295	266
6.75	629	553	489	435	388	347	311	280
7	640	581	514	457	408	365	328	295

TABLE 6N
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6 INV	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	34	640	640	640	640	550	474	412
4.5	39	640	640	640	640	640	566	492
4.75	41	640	640	640	640	640	613	533
5	43	640	640	640	640	640	640	575
5.5	48	640	640	640	640	640	640	640
5.75	50	640	640	640	640	640	640	640
6	52	640	640	640	640	640	640	640
6.5	57	640	640	640	640	640	640	640
6.75	59	640	640	640	640	640	640	640
7	61	640	640	640	640	640	640	640

1.5 x 6 INV	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	360	317	280	249	222	199	178	160
4.5	430	379	335	298	266	238	214	192
4.75	466	411	364	323	289	259	233	210
5	503	443	393	349	312	280	251	227
5.5	576	508	450	400	358	321	289	260
5.75	614	541	480	427	382	342	308	278
6	640	575	509	454	406	364	328	296
6.5	640	640	568	506	453	406	366	331
6.75	640	640	599	533	477	428	386	349
7	640	640	629	560	502	450	406	367

TABLE 6N
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6 INV	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	34	640	640	640	640	640	617	538
4.5	39	640	640	640	640	640	640	640
4.75	41	640	640	640	640	640	640	640
5	43	640	640	640	640	640	640	640
5.5	48	640	640	640	640	640	640	640
5.75	50	640	640	640	640	640	640	640
6	52	640	640	640	640	640	640	640
6.5	57	640	640	640	640	640	640	640
6.75	59	640	640	640	640	640	640	640
7	61	640	640	640	640	640	640	640

1.5 x 6 INV	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	472	416	369	329	295	265	239	216
4.5	564	498	442	395	354	318	287	260
4.75	612	541	480	429	384	346	312	283
5	640	584	519	463	415	374	338	306
5.5	640	640	596	532	477	430	388	352
5.75	640	640	635	567	509	458	414	376
6	640	640	640	603	541	487	441	400
6.5	640	640	640	640	604	545	493	447
6.75	640	640	640	640	637	574	519	471
7	640	640	640	640	640	604	546	496

TABLE 6N
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

1.5 x 6 INV	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-0**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**
4	34	640	640	640	640	640	640	640
4.5	39	640	640	640	640	640	640	640
4.75	41	640	640	640	640	640	640	640
5	43	640	640	640	640	640	640	640
5.5	48	640	640	640	640	640	640	640
5.75	50	640	640	640	640	640	640	640
6	52	640	640	640	640	640	640	640
6.5	57	640	640	640	640	640	640	640
6.75	59	640	640	640	640	640	640	640
7	61	640	640	640	640	640	640	640

1.5 x 6 INV	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**8'-6**	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**
4	585	517	460	411	369	333	301	273
4.5	640	621	552	494	443	400	362	329
4.75	640	640	600	537	482	435	394	358
5	640	640	640	580	521	470	426	387
5.5	640	640	640	640	599	541	490	445
5.75	640	640	640	640	640	578	523	476
6	640	640	640	640	640	614	557	506
6.5	640	640	640	640	640	640	623	567
6.75	640	640	640	640	640	640	640	598
7	640	640	640	640	640	640	640	629

TABLE 6O
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

2 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	35	640	585	492	419	359	311	270
5	39	640	640	584	497	427	370	322
5.25	42	640	640	630	536	461	399	348
5.5	44	640	640	640	577	496	430	375
6	48	640	640	640	640	568	492	430
6.25	51	640	640	640	640	603	523	456
6.5	53	640	640	640	640	640	555	484
7	57	640	640	640	640	640	620	541
7.25	60	640	640	640	640	640	640	569
7.5	63	640	640	640	640	640	640	597

2 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	237	208	184	163	145	129	115	102
5	282	249	220	195	174	155	138	124
5.25	305	268	237	210	187	167	149	134
5.5	328	289	256	227	202	181	162	145
6	377	332	294	262	233	209	187	168
6.25	400	353	313	278	248	221	198	178
6.5	425	375	332	296	264	236	211	190
7	475	420	372	331	296	265	238	214
7.25	500	441	391	348	311	278	250	224
7.5	524	462	410	365	326	292	262	235

TABLE 6O
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

2 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	35	640	640	593	506	435	377	330
5	39	640	640	640	601	517	449	392
5.25	42	640	640	640	640	558	485	423
5.5	44	640	640	640	640	601	522	456
6	48	640	640	640	640	640	598	523
6.25	51	640	640	640	640	640	636	556
6.5	53	640	640	640	640	640	640	590
7	57	640	640	640	640	640	640	640
7.25	60	640	640	640	640	640	640	640
7.5	63	640	640	640	640	640	640	640

2 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	289	255	226	202	180	161	144	130
5	345	305	270	241	215	193	174	156
5.25	372	329	292	260	233	208	187	169
5.5	401	355	315	281	251	225	203	183
6	460	407	362	323	289	260	234	211
6.25	489	433	385	343	307	276	248	224
6.5	520	460	409	365	327	294	265	239
7	581	515	458	409	366	329	297	268
7.25	611	541	481	430	385	346	312	282
7.5	640	567	505	451	404	363	327	296

TABLE 6O
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

2 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	35	640	640	640	640	568	494	433
5	39	640	640	640	640	640	588	515
5.25	42	640	640	640	640	640	635	557
5.5	44	640	640	640	640	640	640	600
6	48	640	640	640	640	640	640	640
6.25	51	640	640	640	640	640	640	640
6.5	53	640	640	640	640	640	640	640
7	57	640	640	640	640	640	640	640
7.25	60	640	640	640	640	640	640	640
7.5	63	640	640	640	640	640	640	640

2 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	381	338	301	269	241	217	196	177
5	454	403	359	321	289	260	235	213
5.25	491	435	388	347	312	281	254	230
5.5	529	470	419	375	337	304	275	249
6	608	540	481	431	388	350	317	287
6.25	640	574	512	459	413	372	337	306
6.5	640	610	544	488	439	396	359	325
7	640	640	610	547	492	444	402	366
7.25	640	640	640	575	518	467	423	385
7.5	640	640	640	604	543	491	444	404

TABLE 6O
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

2 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**5'-6**	**6'-0**	**6'-6**	**7'-0**	**7'-6**	**8'-0**	**8'-6**
4.5	35	640	640	640	640	640	612	537
5	39	640	640	640	640	640	640	640
5.25	42	640	640	640	640	640	640	640
5.5	44	640	640	640	640	640	640	640
6	48	640	640	640	640	640	640	640
6.25	51	640	640	640	640	640	640	640
6.5	53	640	640	640	640	640	640	640
7	57	640	640	640	640	640	640	640
7.25	60	640	640	640	640	640	640	640
7.5	63	640	640	640	640	640	640	640

2 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**9'-0**	**9'-6**	**10'-0**	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**
4.5	475	422	376	338	304	274	249	226
5	566	503	450	403	363	329	298	271
5.25	612	544	486	436	393	355	322	293
5.5	640	587	525	471	425	384	348	317
6	640	640	604	542	489	442	402	366
6.25	640	640	640	577	521	471	428	389
6.5	640	640	640	614	554	501	455	414
7	640	640	640	640	621	562	511	466
7.25	640	640	640	640	640	592	538	490
7.5	640	640	640	640	640	622	565	515

TABLE 6P
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

3 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	39	532	457	396	346	303	267	237
6	44	614	528	458	399	350	309	274
6.25	46	640	565	490	428	375	331	294
6.5	48	640	603	523	457	401	354	314
7	53	640	640	589	515	452	399	354
7.25	55	640	640	624	545	479	423	375
7.5	57	640	640	640	576	506	447	397
8	62	640	640	640	637	560	495	439
8.25	64	640	640	640	640	588	520	461
8.5	67	640	640	640	640	614	543	482

3 x 12	22 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	210	187	168	150	135	121	109	98
6	243	217	194	174	156	140	126	114
6.25	261	233	209	187	168	151	136	123
6.5	279	249	223	200	180	162	146	132
7	315	282	252	227	204	184	166	150
7.25	334	299	268	241	217	195	176	159
7.5	354	316	283	255	229	207	187	169
8	392	350	314	282	254	230	207	188
8.25	411	368	330	297	268	242	218	198
8.5	430	385	345	310	280	253	228	207

TABLE 6P
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

3 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	39	640	554	481	421	370	328	291
6	44	640	639	555	486	428	378	336
6.25	46	640	640	594	520	458	405	361
6.5	48	640	640	634	555	489	433	385
7	53	640	640	640	626	551	488	435
7.25	55	640	640	640	640	584	517	460
7.5	57	640	640	640	640	617	547	487
8	62	640	640	640	640	640	605	539
8.25	64	640	640	640	640	640	635	566
8.5	67	640	640	640	640	640	640	592

3 x 12	20 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	260	232	209	188	169	153	139	126
6	300	269	241	217	196	177	161	146
6.25	322	288	259	233	211	191	173	157
6.5	344	308	277	250	226	204	185	168
7	388	348	313	282	255	231	210	191
7.25	411	369	332	300	271	245	223	203
7.5	435	390	351	317	287	260	236	215
8	482	432	389	351	318	288	262	238
8.25	506	454	409	369	334	303	276	251
8.5	529	475	428	386	350	317	288	263

TABLE 6P
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

3 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	39	640	640	630	553	488	433	387
6	44	640	640	640	638	564	500	446
6.25	46	640	640	640	640	603	536	478
6.5	48	640	640	640	640	640	572	511
7	53	640	640	640	640	640	640	576
7.25	55	640	640	640	640	640	640	611
7.5	57	640	640	640	640	640	640	640
8	62	640	640	640	640	640	640	640
8.25	64	640	640	640	640	640	640	640
8.5	67	640	640	640	640	640	640	640

3 x 12	18 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	346	311	281	254	231	210	191	174
6	400	360	325	294	267	243	221	202
6.25	429	386	348	315	286	260	237	217
6.5	458	412	372	337	306	279	254	232
7	517	465	420	381	346	315	288	263
7.25	548	493	446	404	367	334	305	279
7.5	579	521	471	427	388	354	323	296
8	640	578	522	474	431	393	359	328
8.25	640	607	549	498	453	413	377	345
8.5	640	635	575	521	474	432	395	362

TABLE 6P
Composite Deck-Slab Factored Superimposed Load (LRFD), psf

3 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**Weight (psf)**	**7'-0**	**7'-6**	**8'-0**	**8'-6**	**9'-0**	**9'-6**	**10'-0**
5.5	39	640	640	640	640	608	540	483
6	44	640	640	640	640	640	624	558
6.25	46	640	640	640	640	640	640	598
6.5	48	640	640	640	640	640	640	638
7	53	640	640	640	640	640	640	640
7.25	55	640	640	640	640	640	640	640
7.5	57	640	640	640	640	640	640	640
8	62	640	640	640	640	640	640	640
8.25	64	640	640	640	640	640	640	640
8.5	67	640	640	640	640	640	640	640

3 x 12	16 ga	F_y 40 ksi		f'_c 3000 psi		Lightweight Concrete (115 pcf)		
Slab Thickness (Inches)	**10'-6**	**11'-0**	**11'-6**	**12'-0**	**12'-6**	**13'-0**	**13'-6**	**14'-0**
5.5	434	391	354	321	292	267	244	224
6	501	452	409	371	338	309	282	259
6.25	537	484	438	398	363	331	303	278
6.5	574	517	469	426	388	354	324	297
7	640	585	529	481	438	401	367	337
7.25	640	620	561	510	465	425	389	357
7.5	640	640	594	540	492	450	412	378
8	640	640	640	599	546	499	457	420
8.25	640	640	640	629	574	525	481	442
8.5	640	640	640	640	601	550	504	463

Table 7 – Reinforced Concrete Slab Superimposed Loads

TABLE 7A
Reinforced Concrete Slab Allowable Superimposed Load (ASD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	2'-0	2'-6	3'-0	3'-6
2	6x6-W1.4xW1.4 *	0.028	230	147	102	75
2	6x6-W2.1xW2.1 *	0.042	340	217	151	111
2	6x6-W2.9xW2.9	0.058	400	295	205	151
2	6x6-W4.0xW4.0	0.080	400	398	276	203
2	6x6-W6.0xW6.0	0.120	400	400	397	292
2-1/2	6x6-W1.4xW1.4 *	0.028	289	185	128	94
2-1/2	6x6-W2.1xW2.1 *	0.042	400	274	190	140
2-1/2	6x6-W2.9xW2.9	0.058	400	374	260	191
2-1/2	6x6-W4.0xW4.0	0.080	400	400	351	258
2-1/2	6x6-W6.0xW6.0	0.120	400	400	400	374
3	6x6-W1.4xW1.4 *	0.028	348	223	155	114
3	6x6-W2.1xW2.1 *	0.042	400	331	230	169
3	6x6-W2.9xW2.9 *	0.058	400	400	314	231
3	6x6-W4.0xW4.0	0.080	400	400	400	313
3	4x4-W2.9xW2.9	0.087	400	400	400	339
3	4x4-W4.0xW4.0	0.120	400	400	400	400

TABLE 7A
Reinforced Concrete Slab Allowable Superimposed Load (ASD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	4'-0	4'-6	5'-0	5'-6	6'-0
2	6x6-W1.4xW1.4 *	0.028	57				
2	6x6-W2.1xW2.1 *	0.042	85				
2	6x6-W2.9xW2.9	0.058	115				
2	6x6-W4.0xW4.0	0.080	156				
2	6x6-W6.0xW6.0	0.120	223				
2-1/2	6x6-W1.4xW1.4 *	0.028	72	57	46		
2-1/2	6x6-W2.1xW2.1 *	0.042	107	85	69		
2-1/2	6x6-W2.9xW2.9	0.058	146	115	93		
2-1/2	6x6-W4.0xW4.0	0.080	198	156	127		
2-1/2	6x6-W6.0xW6.0	0.120	287	226	183		
3	6x6-W1.4xW1.4 *	0.028	87	69	56	46	39
3	6x6-W2.1xW2.1 *	0.042	129	102	83	68	57
3	6x6-W2.9xW2.9 *	0.058	177	140	113	93	78
3	6x6-W4.0xW4.0	0.080	240	190	154	127	107
3	4x4-W2.9xW2.9	0.087	260	205	166	137	115
3	4x4-W4.0xW4.0	0.120	350	276	**224**	**5'-6**	**6'-0**

TABLE 7A
Reinforced Concrete Slab Allowable Superimposed Load (ASD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	4'-0	4'-6	5'-0	5'-6
3-1/2	6x6-W2.1xW2.1 *	0.042	151	120	97	80
3-1/2	6x6-W2.9xW2.9 *	0.058	207	164	133	110
3-1/2	4x4-W2.9xW2.9	0.087	306	241	196	162
3-1/2	4x4-W4.0xW4.0	0.120	400	326	264	219
3-1/2	#3 at 6" o.c.	0.220	400	400	400	377
4	6x6-W2.1xW2.1 *	0.042	174	137	111	92
4	6x6-W2.9xW2.9 *	0.058	238	188	152	126
4	4x4-W2.9xW2.9	0.087	351	278	225	186
4	4x4-W4.0xW4.0	0.120	400	376	305	252
4	#3 at 6" o.c.	0.220	400	400	400	400
4-1/2	6x6-W2.1xW2.1 *	0.042	196	155	125	104
4-1/2	6x6-W2.9xW2.9 *	0.058	268	212	172	142
4-1/2	4x4-W2.9xW2.9 *	0.087	397	314	254	210
4-1/2	4x4-W4.0xW4.0	0.120	400	400	345	285
4-1/2	#3 at 6" o.c.	0.220	400	400	400	400

TABLE 7A
Reinforced Concrete Slab Allowable Superimposed Load (ASD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	6'-0	6'-6	7'-0	7'-6	8'-0
3-1/2	6x6-W2.1xW2.1 *	0.042	67	57	49		
3-1/2	6x6-W2.9xW2.9 *	0.058	92	78	68		
3-1/2	4x4-W2.9xW2.9	0.087	136	116	100		
3-1/2	4x4-W4.0xW4.0	0.120	184	156	135		
3-1/2	#3 at 6" o.c.	0.220	316	270	233		
4	6x6-W2.1xW2.1 *	0.042	77	66	57	49	43
4	6x6-W2.9xW2.9 *	0.058	106	90	78	68	59
4	4x4-W2.9xW2.9	0.087	156	133	115	100	88
4	4x4-W4.0xW4.0	0.120	212	180	156	136	119
4	#3 at 6" o.c.	0.220	368	314	270	236	207
4-1/2	6x6-W2.1xW2.1 *	0.042	87	74	64	56	49
4-1/2	6x6-W2.9xW2.9 *	0.058	119	102	88	76	67
4-1/2	4x4-W2.9xW2.9 *	0.087	177	150	130	113	99
4-1/2	4x4-W4.0xW4.0	0.120	240	204	176	154	135
4-1/2	#3 at 6" o.c.	0.220	400	358	308	269	236

TABLE 7A
Reinforced Concrete Slab Allowable Superimposed Load (ASD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	6'-0	6'-6	7'-0	7'-6
5	6x6-W2.1xW2.1 *	0.042	97	82	71	62
5	6x6-W2.9xW2.9 *	0.058	133	113	98	85
5	4x4-W2.9xW2.9 *	0.087	197	168	145	126
5	4x4-W4.0xW4.0	0.120	268	228	197	172
5	#3 at 6" o.c.	0.220	400	400	346	302
5-1/2	6x6-W2.1xW2.1 *	0.042	107	91	78	68
5-1/2	6x6-W2.9xW2.9 *	0.058	146	125	108	94
5-1/2	4x4-W2.9xW2.9 *	0.087	217	185	160	139
5-1/2	4x4-W4.0xW4.0	0.120	296	252	218	190
5-1/2	#3 at 6" o.c.	0.220	400	400	384	335
6	6x6-W2.1xW2.1 *	0.042	117	99	86	75
6	6x6-W2.9xW2.9 *	0.058	160	136	118	102
6	4x4-W2.9xW2.9 *	0.087	238	203	175	152
6	4x4-W4.0xW4.0 *	0.120	324	276	238	208
6	#3 at 6" o.c.	0.220	400	400	400	368
6	#4 at 6" o.c.	0.400	400	400	400	400

TABLE 7A
Reinforced Concrete Slab Allowable Superimposed Load (ASD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	8'-0	8'-6	9'-0	9'-6	10'-0
5	6x6-W2.1xW2.1 *	0.042	54	48	43	39	35
5	6x6-W2.9xW2.9 *	0.058	75	66	59	53	48
5	4x4-W2.9xW2.9 *	0.087	111	98	88	79	71
5	4x4-W4.0xW4.0	0.120	151	134	119	107	96
5	#3 at 6" o.c.	0.220	265	235	209	188	170
5-1/2	6x6-W2.1xW2.1 *	0.042	60	53	47	43	38
5-1/2	6x6-W2.9xW2.9 *	0.058	82	73	65	58	53
5-1/2	4x4-W2.9xW2.9 *	0.087	122	108	97	87	78
5-1/2	4x4-W4.0xW4.0	0.120	167	148	132	118	107
5-1/2	#3 at 6" o.c.	0.220	294	260	232	209	188
6	6x6-W2.1xW2.1 *	0.042	66	58	52	46	42
6	6x6-W2.9xW2.9 *	0.058	90	80	71	64	58
6	4x4-W2.9xW2.9 *	0.087	134	118	106	95	86
6	4x4-W4.0xW4.0 *	0.120	182	162	144	129	117
6	#3 at 6" o.c.	0.220	323	286	255	229	207
6	#4 at 6" o.c.	0.400	400	400	400	390	352

TABLE 7B
Reinforced Concrete Slab Ultimate Superimposed Load (USD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	2'-0	2'-6	3'-0	3'-6
2	6x6-W1.4xW1.4 *	0.028	368	235	163	120
2	6x6-W2.1xW2.1 *	0.042	544	348	242	178
2	6x6-W2.9xW2.9	0.058	640	473	328	241
2	6x6-W4.0xW4.0	0.080	640	637	442	325
2	6x6-W6.0xW6.0	0.120	640	640	635	467
2-1/2	6x6-W1.4xW1.4 *	0.028	462	296	205	151
2-1/2	6x6-W2.1xW2.1 *	0.042	640	439	305	224
2-1/2	6x6-W2.9xW2.9	0.058	640	598	415	305
2-1/2	6x6-W4.0xW4.0	0.080	640	640	562	413
2-1/2	6x6-W6.0xW6.0	0.120	640	640	640	599
3	6x6-W1.4xW1.4 *	0.028	557	356	247	182
3	6x6-W2.1xW2.1 *	0.042	640	529	368	270
3	6x6-W2.9xW2.9 *	0.058	640	640	502	369
3	6x6-W4.0xW4.0	0.080	640	640	640	501
3	4x4-W2.9xW2.9	0.087	640	640	640	543
3	4x4-W4.0xW4.0	0.120	640	640	640	640

TABLE 7B
Reinforced Concrete Slab Ultimate Superimposed Load (USD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	4'-0	4'-6	5'-0	5'-6	6'-0
2	6x6-W1.4xW1.4 *	0.028	92				
2	6x6-W2.1xW2.1 *	0.042	136				
2	6x6-W2.9xW2.9	0.058	185				
2	6x6-W4.0xW4.0	0.080	249				
2	6x6-W6.0xW6.0	0.120	357				
2-1/2	6x6-W1.4xW1.4 *	0.028	116	91	74		
2-1/2	6x6-W2.1xW2.1 *	0.042	171	135	110		
2-1/2	6x6-W2.9xW2.9	0.058	234	185	149		
2-1/2	6x6-W4.0xW4.0	0.080	316	250	202		
2-1/2	6x6-W6.0xW6.0	0.120	459	362	294		
3	6x6-W1.4xW1.4 *	0.028	139	110	89	74	62
3	6x6-W2.1xW2.1 *	0.042	207	163	132	109	92
3	6x6-W2.9xW2.9 *	0.058	282	223	181	149	126
3	6x6-W4.0xW4.0	0.080	384	303	246	203	171
3	4x4-W2.9xW2.9	0.087	415	328	266	220	185
3	4x4-W4.0xW4.0	0.120	560	442	358	296	249

TABLE 7B
Reinforced Concrete Slab Ultimate Superimposed Load (USD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	4'-0	4'-6	5'-0	5'-6
3-1/2	6x6-W2.1xW2.1 *	0.042	242	191	155	128
3-1/2	6x6-W2.9xW2.9 *	0.058	331	262	212	175
3-1/2	4x4-W2.9xW2.9	0.087	489	386	313	259
3-1/2	4x4-W4.0xW4.0	0.120	640	522	423	350
3-1/2	#3 at 6" o.c.	0.220	640	640	640	603
4	6x6-W2.1xW2.1 *	0.042	278	219	178	147
4	6x6-W2.9xW2.9 *	0.058	380	301	243	201
4	4x4-W2.9xW2.9	0.087	562	444	360	297
4	4x4-W4.0xW4.0	0.120	640	602	488	403
4	#3 at 6" o.c.	0.220	640	640	640	640
4-1/2	6x6-W2.1xW2.1 *	0.042	313	247	200	166
4-1/2	6x6-W2.9xW2.9 *	0.058	429	339	275	227
4-1/2	4x4-W2.9xW2.9 *	0.087	636	502	407	336
4-1/2	4x4-W4.0xW4.0	0.120	640	640	553	457
4-1/2	#3 at 6" o.c.	0.220	640	640	640	640

TABLE 7B
Reinforced Concrete Slab Ultimate Superimposed Load (USD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	6'-0	6'-6	7'-0	7'-6	8'-0
3-1/2	6x6-W2.1xW2.1 *	0.042	108	92	79		
3-1/2	6x6-W2.9xW2.9 *	0.058	147	126	108		
3-1/2	4x4-W2.9xW2.9	0.087	217	185	160		
3-1/2	4x4-W4.0xW4.0	0.120	294	250	216		
3-1/2	#3 at 6" o.c.	0.220	506	431	372		
4	6x6-W2.1xW2.1 *	0.042	123	105	91	79	69
4	6x6-W2.9xW2.9 *	0.058	169	144	124	108	95
4	4x4-W2.9xW2.9	0.087	250	213	184	160	141
4	4x4-W4.0xW4.0	0.120	339	289	249	217	191
4	#3 at 6" o.c.	0.220	589	502	433	377	331
4-1/2	6x6-W2.1xW2.1 *	0.042	139	119	102	89	78
4-1/2	6x6-W2.9xW2.9 *	0.058	191	163	140	122	107
4-1/2	4x4-W2.9xW2.9 *	0.087	282	241	208	181	159
4-1/2	4x4-W4.0xW4.0	0.120	384	327	282	246	216
4-1/2	#3 at 6" o.c.	0.220	640	572	493	430	378

TABLE 7B
Reinforced Concrete Slab Ultimate Superimposed Load (USD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	6'-0	6'-6	7'-0	7'-6
5	6x6-W2.1xW2.1 *	0.042	155	132	114	99
5	6x6-W2.9xW2.9 *	0.058	213	181	156	136
5	4x4-W2.9xW2.9 *	0.087	315	269	232	202
5	4x4-W4.0xW4.0	0.120	429	365	315	274
5	#3 at 6" o.c.	0.220	640	640	554	482
5-1/2	6x6-W2.1xW2.1 *	0.042	171	145	125	109
5-1/2	6x6-W2.9xW2.9 *	0.058	234	200	172	150
5-1/2	4x4-W2.9xW2.9 *	0.087	348	296	255	223
5-1/2	4x4-W4.0xW4.0	0.120	474	404	348	303
5-1/2	#3 at 6" o.c.	0.220	640	640	614	535
6	6x6-W2.1xW2.1 *	0.042	186	159	137	119
6	6x6-W2.9xW2.9 *	0.058	256	218	188	164
6	4x4-W2.9xW2.9 *	0.087	380	324	279	243
6	4x4-W4.0xW4.0 *	0.120	519	442	381	332
6	#3 at 6" o.c.	0.220	640	640	640	588
6	#4 at 6" o.c.	0.400	640	640	640	640

TABLE 7B
Reinforced Concrete Slab Ultimate Superimposed Load (USD), psf

Slab Thickness (in)	Reinforcement	A_s (in^2/ ft)	8'-0	8'-6	9'-0	9'-6	10'-0
5	6x6-W2.1xW2.1 *	0.042	87	77	69	62	56
5	6x6-W2.9xW2.9 *	0.058	120	106	94	85	77
5	4x4-W2.9xW2.9 *	0.087	177	157	140	126	113
5	4x4-W4.0xW4.0	0.120	241	214	191	171	154
5	#3 at 6" o.c.	0.220	424	376	335	301	271
5-1/2	6x6-W2.1xW2.1 *	0.042	96	85	76	68	61
5-1/2	6x6-W2.9xW2.9 *	0.058	132	117	104	93	84
5-1/2	4x4-W2.9xW2.9 *	0.087	196	173	155	139	125
5-1/2	4x4-W4.0xW4.0	0.120	267	236	211	189	171
5-1/2	#3 at 6" o.c.	0.220	470	417	372	334	301
6	6x6-W2.1xW2.1 *	0.042	105	93	83	74	67
6	6x6-W2.9xW2.9 *	0.058	144	128	114	102	92
6	4x4-W2.9xW2.9 *	0.087	214	190	169	152	137
6	4x4-W4.0xW4.0 *	0.120	292	259	231	207	187
6	#3 at 6" o.c.	0.220	517	458	408	367	331
6	#4 at 6" o.c.	0.400	640	640	640	624	563

Table 7A and 7B Notes:

1. Slabs that are temporarily shored must have the slab weight deducted from the tabulated live load regardless of the type of finish.

2. Steel deck that is not galvanized is not considered to be permanent and the weight of the slab must be deducted from the slab permitted load.

3. These tables are based on a three-span condition using a moment of $wL^2/12$ as permitted by ACI 318-14, Section 6.5, for spans of 10 feet or less. Other conditions or spans may require further analysis.

4. The slabs shown in these tables comply with ACI 318-14 requirements for temperature and shrinkage reinforcement (Section 24.4) and deflection (Table 7.3.1.1), except where an asterisk (*) is shown.

5. These tables assume the following material properties:
   f'_c = 3000 psi F_y = 60,000 psi

6. These slabs consider the reinforcing to be located at the mid-depth of the slab.

Table 8 – Composite Deck-Slab Shear Capacity

TABLE 8A - 1.5x6 Deck

Slab Thickness (In)	F_y = 40 ksi – Normal Weight Concrete (145 pcf)				F_y = 40 ksi – Lightweight Concrete (115 pcf)			
	Φ V_n (22 ga)	Φ V_n (20 ga)	Φ V_n (18 ga)	Φ V_n (16 ga)	Φ V_n (22 ga)	Φ V_n (20 ga)	Φ V_n (18 ga)	Φ V_n (16 ga)
4	2588	2588	2588	2588	1941	1941	1941	1941
4.5	3019	3019	3019	3019	2264	2264	2264	2264
4.75	3250	3250	3250	3250	2438	2438	2438	2438
5	3492	3492	3492	3492	2619	2619	2619	2619
5.5	4005	4005	4005	4005	3004	3004	3004	3004
5.75	4277	4277	4277	4277	3208	3208	3208	3208
6	4550	4560	4560	4560	3420	3420	3420	3420
6.5	4848	5155	5155	5155	3867	3867	3867	3867
6.75	5005	5459	5469	5469	4102	4102	4102	4102
7	5166	5621	5792	5792	4344	4344	4344	4344

TABLE 8B - 2x12 Deck

Slab Thickness (In)	F_y = 40 ksi – Normal Weight Concrete (145 pcf)				F_y = 40 ksi – Lightweight Concrete (115 pcf)			
	Φ V_n (22 ga)	Φ V_n (20 ga)	Φ V_n (18 ga)	Φ V_n (16 ga)	Φ V_n (22 ga)	Φ V_n (20 ga)	Φ V_n (18 ga)	Φ V_n (16 ga)
4.5	4368	4716	5361	5361	3698	4021	4021	4021
5	4769	5116	5764	6162	3999	4346	4621	4621
5.25	4977	5324	5972	6578	4155	4502	4933	4933
5.5	5190	5537	6185	6816	4315	4662	5253	5253
6	5632	5979	6627	7258	4646	4993	5641	5915
6.25	5860	6207	6855	7486	4817	5164	5812	6258
6.5	6094	6441	7089	7720	4992	5339	5988	6609
7	6576	6924	7572	8203	5354	5701	6350	6981
7.25	6772	7119	7767	8398	5501	5848	6496	7127
7.5	6967	7314	7962	8593	5647	5994	6642	7273

TABLE 8C - 3x12 Deck

Slab Thickness (In)	F_y = 40 ksi – Normal Weight Concrete (145 pcf)				F_y = 40 ksi – Lightweight Concrete (115 pcf)			
	Φ V_n (22 ga)	**Φ V_n (20 ga)**	**Φ V_n (18 ga)**	**Φ V_n (16 ga)**	**Φ V_n (22 ga)**	**Φ V_n (20 ga)**	**Φ V_n (18 ga)**	**Φ V_n (16 ga)**
5.5	5181	6126	6364	6364	4386	4773	4773	4773
6	5573	6518	7148	7148	4680	5361	5361	5361
6.25	5776	6721	7553	7553	4831	5664	5664	5664
6.5	5982	6927	7966	7966	4987	5932	5974	5974
7	6408	7354	8818	8818	5306	6251	6614	6614
7.25	6628	7573	9062	9257	5471	6416	6943	6943
7.5	6852	7797	9286	9705	5639	6584	7279	7279
8	7312	8257	9746	10626	5984	6929	7969	7969
8.25	7549	8494	9983	11053	6161	7107	8324	8324
8.5	7790	8735	10224	11294	6342	7287	8686	8686

Table 8 Notes:

1. These tables assume f'_c = 3000 psi.
2. Slab thickness is overall slab thickness, including the deck.
3. Tabulated loads are in pounds per linear foot of deck-slab.

Table 9 – Arc Spot Weld Data

TABLE 9A – Arc Spot Weld Data - Uplift

Case	Gage Number	Design Thickness (in)	ASD (lbs) Ω = 2.50				LRFD (lbs) Φ = 0.60			
			Visible Weld Diameter (in)							
			1/2	5/8	3/4	1	1/2	5/8	3/4	1
1	22	0.0295	347	439	531	716	520	659	797	1074
	20	0.0358	415	527	639	863	623	791	959	1294
	18	0.0474	536	684	833	1129	804	1027	1249	1693
	16	0.0598	658	845	1032	1406	987	1267	1548	2108
2	22	0.0295	650	835	1019	1388	976	1252	1529	2082
	20	0.0358	767	991	1214	1500	1150	1486	1822	2250
	18	0.0474	814	1257	1500	1500	1221	1885	2250	2250
	16	0.0598	549	1256	1500	1500	823	1884	2250	2250
3	22	0.0295	243	307	372	501	364	461	558	752
	20	0.0358	291	369	447	604	436	554	671	906
	18	0.0474	375	479	583	790	563	719	874	1185
	16	0.0598	461	591	722	984	691	887	1083	1476

TABLE 9B – Arc Spot Weld Data - Shear

Case	Gage Number	ASD (lbs) Ω = 2.55 (2.20)				LRFD (lbs) Φ = 0.60 (0.70)			
		Weld Visible Diameter (in)							
		1/2	5/8	3/4	1	1/2	5/8	3/4	1
1	22	718	909	961	1009	1099	1391	1470	1544
	20	860	1092	1324	1436	1316	1671	2025	2197
	18	(1215)	1417	1724	2337	(1871)	2168	2638	3576
	16	(1088)	(1898)	2137	2910	(1676)	(2923)	3269	4453
2 / 3	22	673	864	955	1003	1030	1322	1461	1535
	20	794	1026	1257	1427	1215	1569	1924	2184
	18	(694)	(1401)	1608	2221	(1068)	(2157)	2460	3398
	16	(468)	(1070)	(1919)	2725	(720)	(1648)	(2955)	4170

Table 9 Notes:

1. Assumes F_y = 40 ksi and F_u = 50 ksi.
2. Assumes F_{xx} = 60 ksi.
3. Information in Tables 9.1 and 9.2 is developed in accordance with Section E of AISI S100.



CASE 1
Weld through single sheet thickness



CASE 2
Weld through double sheet thickness



CASE 3
Weld at edge of sheet sidelap

Table 10 – Screw Data

TABLE 10.1 Screw Dimensional, Tensile Strength, and Shear Strength

Screw Size	Major Diameter d (inches)	Head or Washer Diameter d_w (inches)	Average Tested Tensile Strength (lbs)	Tension ASD (Ω=3.00) (lbs)	Tension LRFD (Φ=0.50) (lbs)	Average Tested Shear Strength (lbs)	Shear ASD (Ω=3.00) (lbs)	Shear LRFD (Φ=0.50) (lbs)
#10	**0.190**	0.400” or 0.415”	2560	853	1280	1536	512	768
#12	**0.216**	0.400” or 0.430”	3620	1207	1810	2172	724	1086
#14	**0.240**	0.480” or 0.520”	4432	1477	2216	2659	886	1330
1/4"	**0.250**	0.480” or 0.520”	4810	1603	2405	2886	962	1443

TABLE 10.2 Screw Pull-Out Strength (lbs) (F_u = 50 ksi)

	Pull-Out - lbs (ASD) Ω = 3.00									
Base Sheet Steel Gage	**1/4"**	**3/16"**	**10**	**1/8"**	**12**	**14**	**16**	**18**	**20**	**22**
Steel Thickness (inches)	**0.2500**	**0.1875**	**0.1345**	**0.1250**	**0.1046**	**0.0747**	**0.0598**	**0.0474**	**0.0358**	**0.0295**
#10	673	505	362	336	282	201	161	128	96	79
#12	765	574	412	383	320	229	183	145	110	90
#14	850	638	457	425	356	254	203	161	122	100
1/4"	885	664	476	443	370	265	212	168	127	104
	Pull-Out - lbs (LRFD) Φ = 0.50									
#10	1009	757	543	505	422	302	241	191	145	119
#12	1148	861	617	574	480	343	274	218	164	135
#14	1275	956	686	638	533	381	305	242	183	150
1/4"	1328	996	715	664	556	397	318	252	190	157

TABLE 10.3 Screw Pull-Over Strength (lbs)

Top Sheet Steel Gage	16	18	20	22	24	26	28
Steel Thickness (inches)	0.0598	0.0474	0.0358	0.0295	0.0238	0.0179	0.0149
Steel F_u (ksi)	50	50	50	50	62	62	62
Screw Washer or Head d_w	Pull-Over - lbs (ASD) Ω = 3.00						
0.400"	598	474	358	295	295	222	185
0.415"	620	492	371	306	306	230	192
0.430"	643	510	385	317	317	239	199
0.480"	718	569	430	354	354	266	222
0.500"	748	593	448	369	369	277	231
Screw Washer or Head d_w	Pull-Over - lbs (LRFD) Φ = 0.50						
0.400"	897	711	537	443	443	333	277
0.415"	931	738	557	459	459	345	288
0.430"	964	764	577	476	476	358	298
0.480"	1076	853	644	531	531	400	333
0.500"	1121	889	671	553	553	416	346

TABLE 10.4 Screw Connection Shear Strength (lbs)

Steel Gage	10	12	14	16	18	20	22
Steel Thickness (inches)	0.1345	0.1046	0.0747	0.0598	0.0474	0.0358	0.0295
Steel F_u (ksi)	50	50	50	50	50	50	50
	Shear - lbs (ASD) Ω = 3.00						
#10	1150	894	639	511	405	306	252
#12	1307	1017	726	581	461	348	287
#14	1453	1130	807	646	512	387	319
1/4"	1513	1177	840	673	533	403	332
	Shear - lbs (LRFD) Φ = 0.50						
#10	1725	1341	958	767	608	459	378
#12	1961	1525	1089	872	691	522	430
#14	2179	1695	1210	969	768	580	478
1/4"	2270	1765	1261	1009	800	604	498

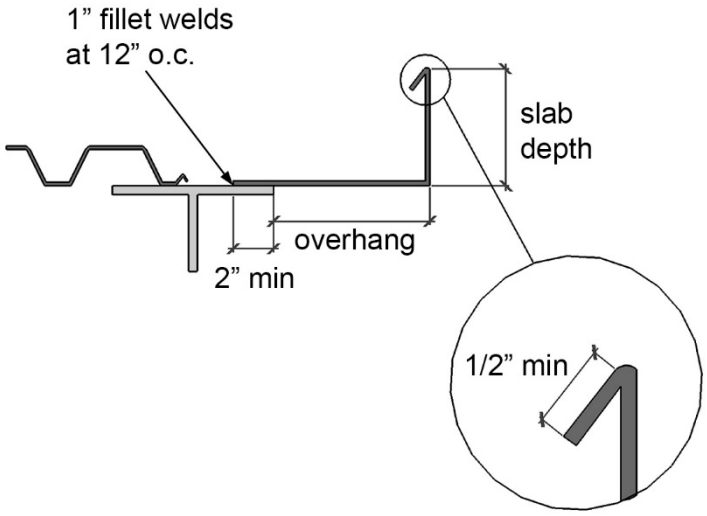
Table 10 Notes:

1. Individual screw manufacturers may have design data that differs from what is shown in Table 10. Refer to the individual manufacturers' research and evaluation reports for design criteria specific to an individual screw.
2. Information in Tables 10.2,10.3, and 10.4 is developed in accordance with Chapter J of AISI S100.
3. Table 10.2 and Table 10.4 are applicable to structural screws with support steel thickness greater than 2.5 times deck thickness.
4. Table 10.4 is based upon the calculated capacity of the screw in bearing, tilting, or combined bearing and tilting. Shaded cells in Table 10.4 indicate cases where the calculated shear capacity calculated by these sheet-based limits may exceed the shear capacity of the screw. Refer to the individual manufacturers' research and evaluation reports for design criteria specific to an individual screw.

Table 11 – Pour Stop Gage Selection Table

Slab Depth, in	Overhang, in												
	0	1	2	3	4	5	6	7	8	9	10	11	12
4.00	20	20	20	20	18	18	16	14	14	12	12	10	10
4.25	20	20	20	18	18	16	16	14	12	12	12	10	10
4.50	20	20	20	18	18	16	16	14	12	12	12	10	10
4.75	20	20	18	18	16	16	14	14	12	12	10	10	10
5.00	20	20	18	18	16	16	14	14	12	12	10	10	
5.25	20	20	18	16	16	14	14	12	12	12	10	10	
5.50	20	18	18	16	16	14	14	12	12	12	10	10	
5.75	20	18	18	16	14	14	12	12	12	12	10	10	
6.00	20	18	16	16	14	14	12	12	12	12	10	10	
6.25	18	18	16	16	14	14	12	12	12	10	10	10	
6.50	18	16	16	14	14	12	12	12	12	10	10		
6.75	18	16	16	14	14	12	12	12	10	10	10		
7.00	18	16	14	14	12	12	12	12	10	10	10		
7.25	16	16	14	14	12	12	12	10	10	10	10		
7.50	16	14	14	12	12	12	12	10	10	10			
7.75	16	14	14	12	12	12	12	10	10	10			
8.00	16	14	12	12	12	12	10	10	10				
8.25	14	14	12	12	12	12	10	10	10				
8.50	14	14	12	12	12	10	10	10					
8.75	14	12	12	12	12	10	10	10					
9.00	14	12	12	12	10	10	10	10					
9.25	14	12	12	12	10	10	10						
9.50	12	12	12	10	10	10	10						
9.75	12	12	12	10	10	10							
10.00	12	12	10	10	10	10							
10.25	12	12	10	10	10								
10.50	12	12	10	10	10								
10.75	12	10	10	10									
11.00	12	10	10	10									
11.25	12	10	10										
11.50	12	10	10										
11.75	10	10	10										
12.00	10	10											

Table 11 Notes:



Type	Thickness Inches
20	0.0358
18	0.0474
16	0.0598
14	0.0747
12	0.1046
11	0.1196
10	0.1345

Table 12 – Girder Fillers

Slab Thickness (in)	Span (in)	Type	Thickness (In)
≤ 12	≤ 5	20	0.0358
	5.1 ≤ L ≤ 5.5	16	0.0598
	5.6 ≤ L ≤ 9	14	0.0747

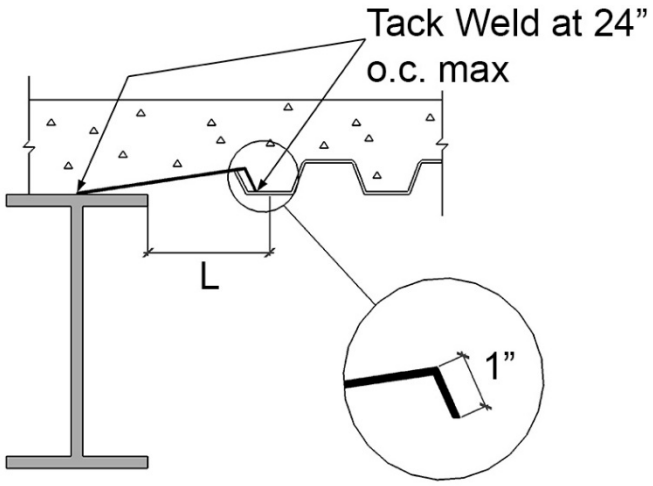


Table 13 – Concrete Slab Fire Separation

TABLE 13.1

9/16 x 2-1/2 Form Deck			
Cover (in)	**Total Slab Depth, in.**	**Effective Thickness (in)**	**Control**
2	2.56	2.3	C
2-1/4	2.81	2.5	C
2-1/2	3.06	2.8	C
2-3/4	3.31	3.0	C
3	3.56	3.3	C
3-1/4	3.81	3.5	C
3-1/2	4.06	3.8	C
3-3/4	4.31	4.0	C
4	4.56	4.3	C
4-1/4	4.81	4.5	C
4-1/2	5.06	4.8	C
4-3/4	5.31	5.0	C
5	5.56	5.3	C
5-1/4	5.81	5.5	C
5-1/2	6.06	5.8	C
5-3/4	6.31	6.0	C
6	6.56	6.3	C
6-1/4	6.81	6.5	C
6-1/2	7.06	6.8	C
6-3/4	7.31	7.0	C
7	7.56	7.3	C

TABLE 13.2

1 X 4 Form Deck			
Cover (in)	**Total Slab Depth, in.**	**Effective Thickness (in)**	**Control**
2	3.00	2.5	B
2-1/4	3.25	2.8	C
2-1/2	3.50	3.0	C
2-3/4	3.75	3.3	C
3	4.00	3.5	C
3-1/4	4.25	3.8	C
3-1/2	4.50	4.0	C
3-3/4	4.75	4.3	C
4	5.00	4.5	C
4-1/4	5.25	4.8	C
4-1/2	5.50	5.0	C
4-3/4	5.75	5.3	C
5	6.00	5.5	C
5-1/4	6.25	5.8	C
5-1/2	6.50	6.0	C
5-3/4	6.75	6.3	C
6	7.00	6.5	C
6-1/4	7.25	6.8	C
6-1/2	7.50	7.0	C
6-3/4	7.75	7.3	C
7	8.00	7.5	C

TABLE 13.3

1.5 x 6 Form Deck				
Cover (in)	Total Slab Depth, in.	Effective Thickness (in)		Control
		1.5 x 6 Form Deck Inverted	1.5 x 6 Form Deck	
2	3.50	2.2	2.5	B
2-1/4	3.75	2.5	2.8	B
2-1/2	4.00	2.7	3.0	B
2-3/4	4.25	3.0	3.3	B
3	4.50	3.2	3.5	B
3-1/4	4.75	3.5	3.9	C
3-1/2	5.00	3.8	4.2	C
3-3/4	5.25	4.1	4.5	C
4	5.50	4.4	4.9	C
4-1/4	5.75	4.7	5.1	C
4-1/2	6.00	5.0	5.4	C
4-3/4	6.25	5.3	5.6	C
5	6.50	5.6	5.9	C
5-1/4	6.75	5.9	6.1	C
5-1/2	7.00	6.2	6.4	C
5-3/4	7.25	6.4	6.6	C
6	7.50	6.7	6.9	C
6-1/4	7.75	6.9	7.1	C
6-1/2	8.00	7.2	7.4	C
6-3/4	8.25	7.4	7.6	C
7	8.50	7.7	7.9	C

TABLE 13.4

2 x 12 Form Deck			
Cover (in)	**Total Slab Depth, in.**	**Effective Thickness (in)**	**Control**
2	4.00	2.0	B
2-1/4	4.25	2.3	B
2-1/2	4.50	2.5	B
2-3/4	4.75	2.8	B
3	5.00	3.0	B
3-1/4	5.25	3.3	B
3-1/2	5.50	3.7	B
3-3/4	5.75	4.0	B
4	6.00	4.3	B
4-1/4	6.25	4.7	C
4-1/2	6.50	5.0	C
4-3/4	6.75	5.3	C
5	7.00	5.7	C
5-1/4	7.25	6.0	C
5-1/2	7.50	6.3	C
5-3/4	7.75	6.7	C
6	8.00	7.0	C
6-1/4	8.25	7.3	C
6-1/2	8.50	7.5	C
6-3/4	8.75	7.8	C
7	9.00	8.0	C

TABLE 13.5

3 x 12 Form Deck			
Cover (in)	**Total Slab Depth, in.**	**Effective Thickness (in)**	**Control**
2	5.00	2.0	B
2-1/4	5.25	2.3	B
2-1/2	5.50	2.5	B
2-3/4	5.75	2.8	B
3	6.00	3.0	B
3-1/4	6.25	3.4	B
3-1/2	6.50	3.8	B
3-3/4	6.75	4.1	B
4	7.00	4.5	B
4-1/4	7.25	4.9	B
4-1/2	7.50	5.3	B
4-3/4	7.75	5.6	B
5	8.00	6.0	B
5-1/4	8.25	6.4	B
5-1/2	8.50	6.8	B
5-3/4	8.75	7.1	B
6	9.00	7.5	B
6-1/4	9.25	7.8	C
6-1/2	9.50	8.0	C
6-3/4	9.75	8.3	C
7	10.00	8.5	C

Concrete Aggregate Type	Minimum equivalent thickness (in) for fire resistance rating (hours)				
	1 hr.	1.5 hr.	2 hr.	3 hr.	4 hr.
Siliceous	3.5	4.3	5.0	6.2	7.0
Carbonate	3.2	4.0	4.6	5.7	6.6
Sand-lightweight	2.7	3.3	3.8	4.6	5.4
Lightweight	2.5	3.1	3.6	4.4	5.1

A. Where the spacing of ribs or undulations is equal to or greater than four times the minimum thickness, the equivalent thickness is the minimum thickness.

B. Where the spacing of ribs or undulations is equal to or less than two times the minimum thickness, the equivalent thickness is calculated by dividing the net cross-sectional area by the panel width. The maximum thickness used to calculate the net cross-sectional area shall not exceed two times the minimum thickness.

C. Where the spacing of ribs or undulations exceeds two times the minimum thickness but is less than four times the minimum thickness, the equivalent thickness is calculated from the following formula:

$$t + [(4t/s) - 1] (t_e - t)$$

where:

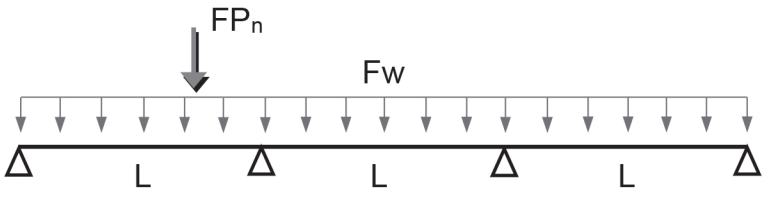
s = spacing of ribs or undulations

t = minimum thickness

t_e = equivalent thickness calculated in accordance with item B

Table 14 – Maximum Allowable (ASD) Moving Concentrated Load

Moving concentrated load tables are based upon load re-distribution (b_e) and influence zones per ANSI/SDI C-2017, Section 2.4.B.11, and iterative computer models of indeterminate spans. Multiple concentrated loads or overlapping influence zones require a more detailed analysis. All concentrated load tables were developed using criteria and limit states listed below:



Multiple span analysis

b_e = min (b_e, b_{ev})

f'c = 3 ksi

F_y WWR = 60 ksi

F_y deck varies (40 or 60 ksi)

d = tc/2

Fw_L = 1.6 (40 plf) = 64 plf

FP_n = 1.6

$M \leq \phi M_u$

$V \leq \phi V_u = \phi V_c + \phi V_s \leq 2\phi V_c$

$I_e = 0.25 I_g$ (I_e deck = 0)

Δ = L/360

N (OFI, TFI) = 4 inches

N (OFE, TFE) = 2 inches

B varies (see table footnotes)

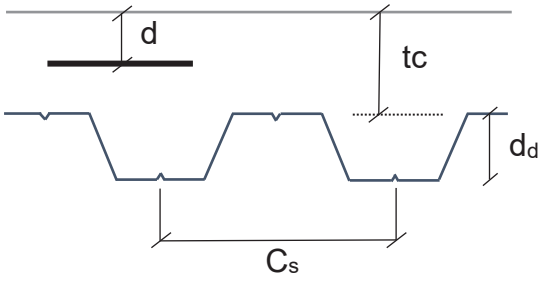
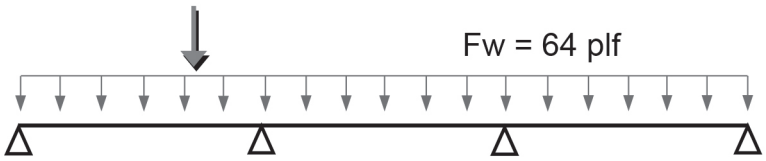


Table 14.1 – Form deck concentrated load capacity using concrete topping (tc) only assuming the deck is a "Stay-In-Place" form with no service load capacity. Deck profile and gage is irrelevant, and concrete within the deck flutes is non-structural. I_e is based upon tc only.

Tables 14.2 to 14.12 – Form deck concentrated load capacity including concrete topping (tc) + concrete within the deck flutes + flexural or shear capacity of the deck. I_e includes concrete within the flutes, but excludes any deck stiffness.

TABLE 14.1
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping Only



WWR	tc	Span, ft								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
6x6-W2.1xW2.1	2.5	397	327	266	211	160	100	-	-	-
	3	520	435	364	301	244	189	129	-	-
	3.5	650	551	469	397	332	271	213	148	21
6x6-W2.9xW2.9	2.5	578	490	417	352	293	238	-	-	-
	3	748	642	554	479	410	347	288	-	-
	3.5	930	803	700	612	534	463	397	333	272
4x4-W2.9xW2.9	2.5	893	776	680	598	525	458	-	-	-
	3	1150	1005	888	789	703	625	553	-	-
	3.5	1423	1248	1109	992	892	802	720	644	571

Table criteria:

L_{max} < 24 tc/12

1.6 (40 psf) + 1.6 (P) for concrete topping only.

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

Δ = L/360

Form deck supports construction and dead load only.

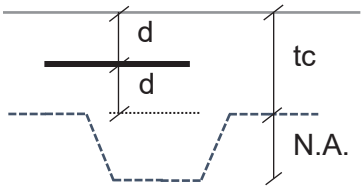
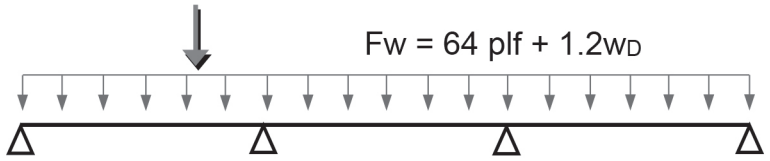


TABLE 14.2
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



9/16 form + WWR	tc	Span, ft								
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
26 gage	2.5	2094	1460	1126	911	754	**628**	**521**	**425**	**337**
6x6-W2.1xW2.1	3	2445	1702	1312	1061	878	**733**	**610**	**502**	**402**
	3.5	2825	1960	1508	1219	1010	**844**	**705**	**582**	**470**
26 gage	2.5	2514	1760	1367	1116	934	**791**	**671**	**566**	**469**
6x6-W2.9xW2.9	3	2980	2085	1616	1320	1106	**940**	**800**	**678**	**568**
	3.5	3485	2430	1883	1536	1289	**1096**	**936**	**797**	**672**
26 gage	2.5	3240	2283	1785	1472	1248	**1073**	**933**	**809**	**699**
4x4-W2.9xW2.9	3	3925	2755	2153	1775	1508	**1301**	**1133**	**988**	**860**
	3.5	4650	3260	2545	2097	1782	**1540**	**1344**	**1177**	**1028**

Table criteria:

9/16 x 26 gage form deck

$L_{max} < 24\ (tc + d_d)/12$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

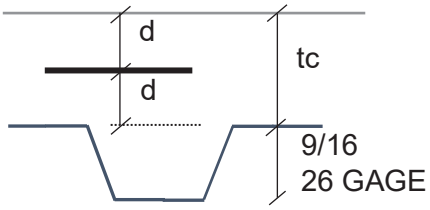
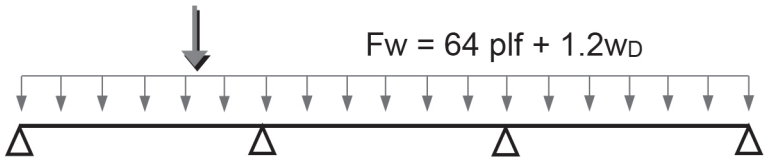


TABLE 14.3
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



9/16 form + WWR	tc	Span, ft								
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
24 gage	2.5	2343	1638	1268	1032	861	725	**610**	**508**	**418**
6x6-W2.1xW2.1	3	2710	1890	1461	1188	990	834	**703**	**588**	**482**
	3.5	3100	2156	1665	1350	1125	949	**801**	**671**	**553**
24 gage	2.5	2763	1938	1510	1236	1041	888	**760**	**649**	**547**
6x6-W2.9xW2.9	3	3245	2272	1767	1438	1218	1040	**893**	**764**	**648**
	3.5	3760	2628	2040	1669	1405	1200	**1031**	**886**	**755**
24 gage	2.5	3300	2465	1930	1594	1356	1173	**1023**	**892**	**778**
4x4-W2.9xW2.9	3	4070	2945	2304	1902	1619	1402	**1226**	**1074**	**940**
	3.5	4900	3455	2702	2230	1898	1645	**1440**	**1265**	**1112**

Table criteria:

9/16 - 24 gage form deck

$L_{max} < 24\ (tc + d_d)/12)$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

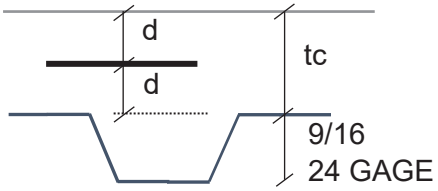
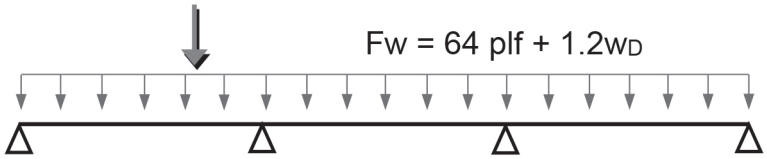


TABLE 14.4
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



9/16 form + WWR	tc	Span, ft								
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
22 gage	2.5	2615	1834	1426	1166	978	831	707	599	**500**
6x6-W2.1xW2.1	3	2998	2094	1625	1326	1112	944	804	681	**570**
	3.5	3400	2372	1835	1495	1252	1062	905	**768**	**644**
22 gage	2.5	3036	2135	1666	1370	1158	994	858	738	**633**
6x6-W2.9xW2.9	3	3535	2477	1930	1585	1340	1150	993	858	**737**
	3.5	4063	2842	2210	1813	1531	1314	1136	**983**	**846**
22 gage	2.5	3535	2658	2086	1727	1474	1278	1120	984	**863**
4x4-W2.9xW2.9	3	4070	3148	2467	2041	1741	1512	1326	1168	**1029**
	3.5	4900	3672	2872	2374	2024	1758	1544	**1362**	**1202**

Table criteria:

9/16 - 22 gage form deck

$L_{max} < 24\ (tc + d_d)/12)$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

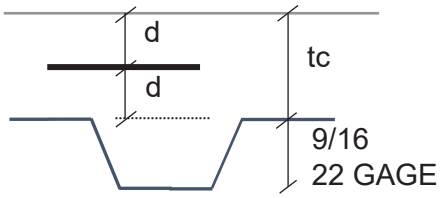
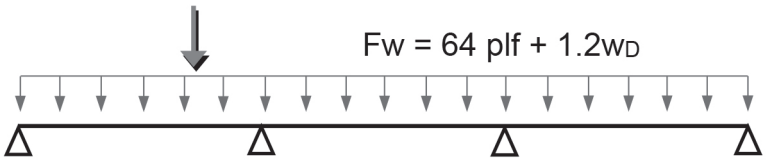


TABLE 14.5
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



1.0 form + WWR	tc	Span, ft								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
26 gage	2.5	984	835	710	600	**499**	**405**	-	-	-
6x6-W2.1xW2.1	3	1118	948	806	**682**	**569**	**464**	**363**	**265**	**156**
	3.5	1258	1067	907	**769**	**643**	**526**	**414**	**306**	**200**
26 gage	2.5	1165	998	860	740	**632**	**531**	-	-	-
6x6-W2.9xW2.9	3	1346	1154	996	**859**	**736**	**622**	**514**	**410**	**309**
	3.5	1538	1319	1139	**984**	**845**	**717**	**597**	**482**	**369**
26 gage	2.5	1480	1283	1123	985	**862**	**750**	-	-	-
4x4-W2.9xW2.9	3	1747	1516	1329	**1169**	**1028**	**899**	**779**	**664**	**553**
	3.5	2031	1763	1546	**1363**	**1202**	**1055**	**920**	**791**	**667**

Table criteria:

1.0 - 26 gage form deck

$L_{max} < 24\ (tc + d_d)/12)$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

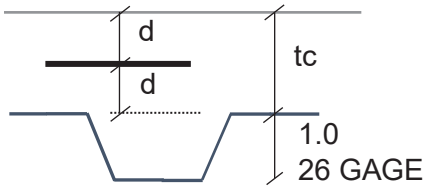
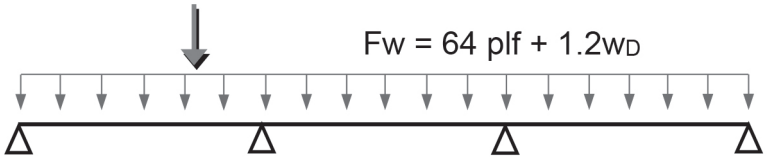


TABLE 14.6

Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



1.0 form + WWR	tc	Span, ft								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
24 gage	2.5	1291	1112	965	838	724	618	-	-	-
6x6-W2.1xW2.1	3	1436	1235	1071	928	801	684	**573**	**467**	**363**
	3.5	1589	1365	1181	1023	882	**752**	**629**	**513**	**399**
24 gage	2.5	1471	1276	1116	978	856	744	-	-	-
6x6-W2.9xW2.9	3	1665	1442	1260	1105	967	842	**724**	**611**	**502**
	3.5	1868	1616	1412	1238	1084	**943**	**813**	**688**	**568**
24 gage	2.5	1785	1560	1378	1223	1087	963	-	-	-
4x4-W2.9xW2.9	3	2066	1804	1593	1415	1259	1118	**988**	**865**	**747**
	3.5	2360	2061	1820	1617	1440	**1282**	**1135**	**997**	**866**

Table criteria:

1.0 - 24 gage form deck

$L_{max} < 24\ (tc + d_d)/12)$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

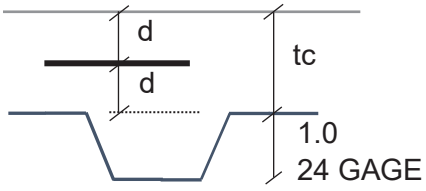
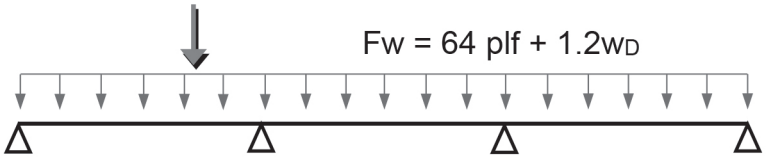


TABLE 14.7
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



1.0 form + WWR	tc	Span, ft								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
22 gage	2.5	1552	1349	1183	1040	915	800	-	-	-
6x6-W2.1xW2.1	3	1708	1480	1295	1138	998	871	752	638	**528**
	3.5	1871	1619	1413	1238	1085	945	814	**689**	**569**
22 gage	2.5	1733	1512	1333	1181	1047	926	-	-	-
6x6-W2.9xW2.9	3	1936	1687	1485	1315	1165	1029	902	783	**667**
	3.5	2149	1870	1645	1454	1287	1136	996	**864**	**737**
22 gage	2.5	2047	1796	1595	1426	1277	1144	-	-	-
4x4-W2.9xW2.9	3	2335	2049	1818	1625	1456	1306	1167	1036	**912**
	3.5	2640	2315	2053	1834	1644	1474	1319	**1173**	**1035**

Table criteria:

1.0 - 22 gage form deck

$L_{max} < 24\ (tc + d_d)/12)$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

$f'c = 3$ ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

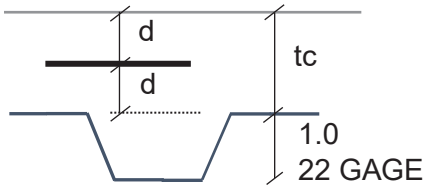
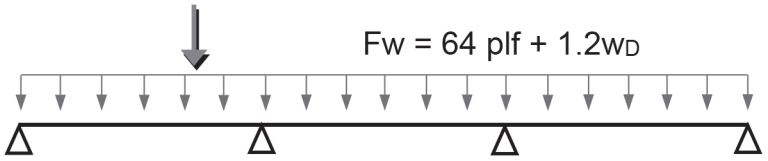


TABLE 14.8
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



1.0 form + WWR	tc	Span, ft								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
20 gage	2.5	1816	1587	1403	1246	1108	983	-	-	-
6x6-W2.1xW2.1	3	1982	1729	1524	1350	1198	1060	932	811	695
	3.5	2156	1875	1649	1458	1291	1139	999	867	740
20 gage	2.5	1995	1751	1553	1386	1241	1109	-	-	-
6x6-W2.9xW2.9	3	2211	1935	1713	1527	1364	1218	1083	956	834
	3.5	2435	2126	1880	1673	1493	1331	1182	1042	909
20 gage	2.5	2310	2036	1816	1631	1471	1328	-	-	-
4x4-W2.9xW2.9	3	2612	2297	2046	1837	1656	1495	1347	1209	1079
	3.5	2925	2571	2288	2053	1850	1669	1504	1351	1206

Table criteria:

1.0 - 20 gage form deck

$L_{max} < 24\ (tc + d_d)/12)$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

$f'c = 3$ ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

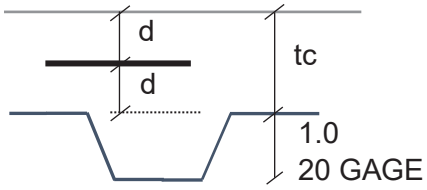
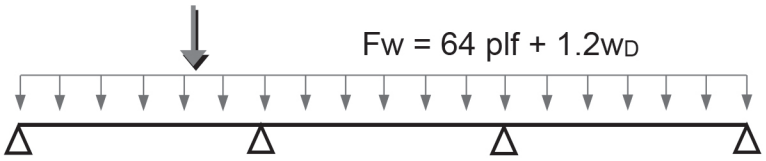


TABLE 14.9
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



1.5 form + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
22 gage	2.5	1119	977	850	733	623	**517**	-	-	-
6x6-W2.1xW2.1	3	1230	1072	931	802	681	**565**	**703**	**588**	-
	3.5	1345	1171	1016	874	**741**	**614**	**490**	**369**	**249**
22 gage	2.5	1269	1117	982	859	743	**633**	-	-	-
6x6-W2.9xW2.9	3	1419	1249	1098	960	832	**709**	**591**	**475**	-
	3.5	1577	1386	1218	1066	**924**	**789**	**659**	**532**	**407**
22 gage	2.5	1532	1362	1213	1078	953	**834**	-	-	-
4x4-W2.9xW2.9	3	1752	1559	1390	1237	1096	**963**	**836**	**712**	-
	3.5	1984	1765	1575	1404	**1246**	**1098**	**957**	**820**	**687**

Table criteria:

1.5 - 22 gage form deck

$L_{max} < 24\ (tc + d_d)/12)$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

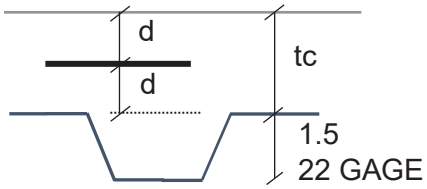
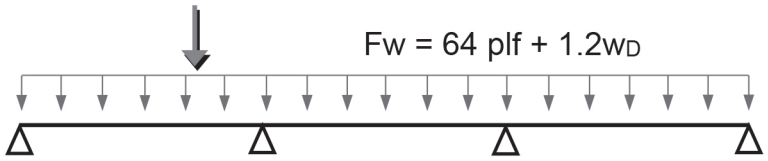


TABLE 14.10
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



1.5 form + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
20 gage	2.5	1358	1200	1060	933	813	700	-	-	-
6x6-W2.1xW2.1	3	1477	1302	1148	1008	877	753	632	**515**	-
	3.5	1601	1409	1239	1086	942	807	**676**	**548**	**423**
20 gage	2.5	1508	1340	1192	1058	933	816	-	-	-
6x6-W2.9xW2.9	3	1667	1479	1314	1165	1028	897	772	**650**	-
	3.5	1832	1624	1442	1277	1125	982	**845**	**712**	**581**
20 gage	2.5	1771	1585	1423	1277	1143	1017	-	-	-
4x4-W2.9xW2.9	3	2000	1789	1606	1442	1292	1151	1017	**887**	-
	3.5	2240	2003	1798	1615	1447	1291	**1143**	**1000**	**860**

Table criteria:

1.5 - 20 gage form deck

$L_{max} < 24\ (tc + d_d)/12)$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

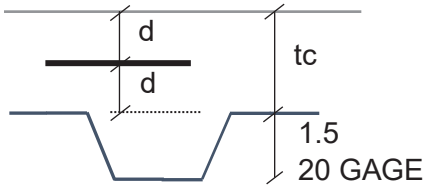
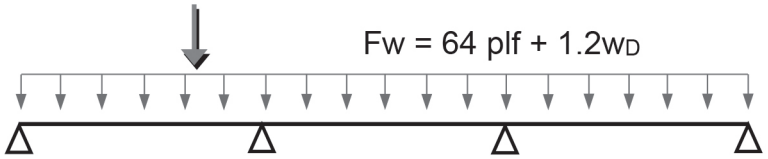


TABLE 14.11
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



1.5 form + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
18 gage	2.5	1750	1567	1406	1261	1128	1002	-	-	-
6x6-W2.1xW2.1	3	1884	1681	1505	1346	1200	1063	932	806	682
	3.5	2022	1800	1607	1434	1275	1126	984	846	**712**
18 gage	2.5	1901	1707	1538	1387	1248	1118	-	-	-
6x6-W2.9xW2.9	3	2073	1858	1671	1504	1351	1208	1072	941	-
	3.5	2253	2015	1809	1626	1458	1301	1153	1010	**870**
18 gage	2.5	2164	1952	1769	1606	1457	1319	-	-	-
4x4-W2.9xW2.9	3	2405	2168	1963	1781	1616	1462	1317	1177	-
	3.5	2660	2395	2166	1964	1780	1610	1450	1297	**1149**

Table criteria:

1.5 - 18 gage form deck

$L_{max} < 24\ (tc + d_d)/12)$

$1.2\ (w_d) + 1.6\ (40\ psf) + 1.6\ (P)$

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25\ I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

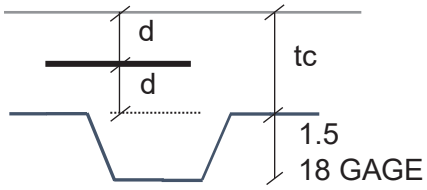
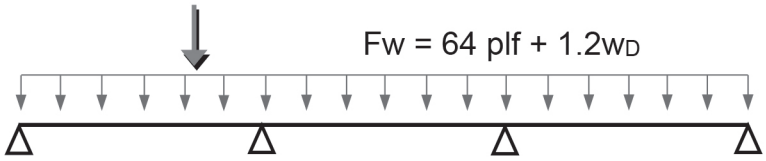


TABLE 14.12
Maximum Allowable (ASD) Concentrated Moving Load, lbs
Concrete Topping + Concrete in the Flutes + Deck



1.5 form + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
16 gage	2.5	2177	1964	1780	1616	1466	1327	-	-	-
6x6-W2.1xW2.1	3	2326	2093	1891	1712	1549	1397	1253	1115	-
	3.5	2479	2225	2006	1811	1634	1469	1313	1164	1019
16 gage	2.5	2329	2105	1913	1742	1587	1442	-	-	-
6x6-W2.9xW2.9	3	2516	2270	2058	1870	1700	1542	1393	1250	-
	3.5	2710	2440	2208	2003	1817	1644	1482	1327	1177
16 gage	2.5	2591	2366	2143	1961	1796	1644	-	-	-
4x4-W2.9xW2.9	3	2848	2580	2350	2147	1964	1796	1637	1487	-
	3.5	3118	2818	2565	2341	2139	1953	1780	1615	1456

Table criteria:

1.5 - 16 gage form deck

$L_{max} < 24 (tc + d_d)/12)$

$1.2 (w_d) + 1.6 (40 psf) + 1.6 (P)$

f'c = 3 ksi

F_y WWR = 60 ksi located at tc/2.

B = 12 inches for calculating b_e.

$I_e = 0.25 I_g$

$\Delta = L/360$

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

Galvanized deck recommended

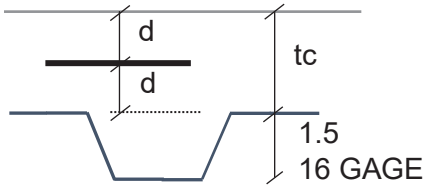
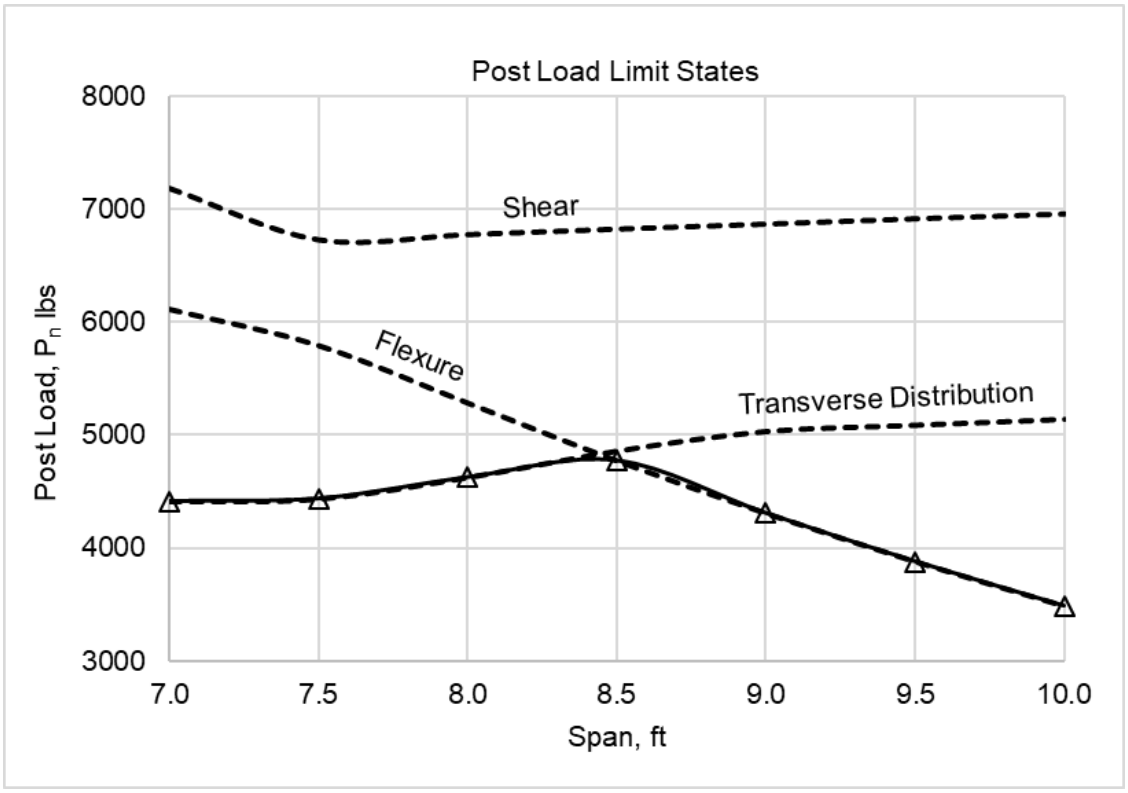


Table 15 – Maximum Nominal Moving Concentrated Load Charts
Single Span Deck-Slabs

Moving concentrated load tables for single moving post loads were developed from iterative computer models adjusting for distribution widths b_e and w. Tabulated results for P_n should be used with discretion, since capacity vs span is non-linear; P_n may reduce with span as illustrated in the graphic below (deflection and punching shear curves not shown).



2x12x20 + 3” + 4x4-W2.9xW2.9

Fixed variables for P_n post load tables:

$d_{WWR} = t_c/2$
f'_c = 3 ksi, 145 pcf
F_y WWR = 60 ksi
F_y deck = 40 ksi
$\Delta \leq L/360$
B = 12” for single post loads
Concurrent live load = 40 psf
LRFD P_n load factor = 1.6

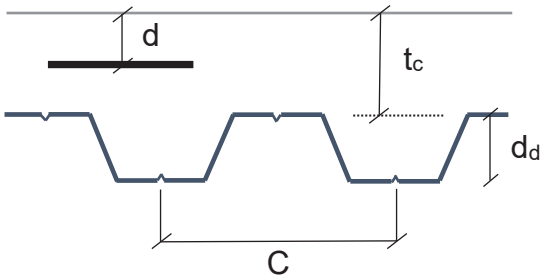
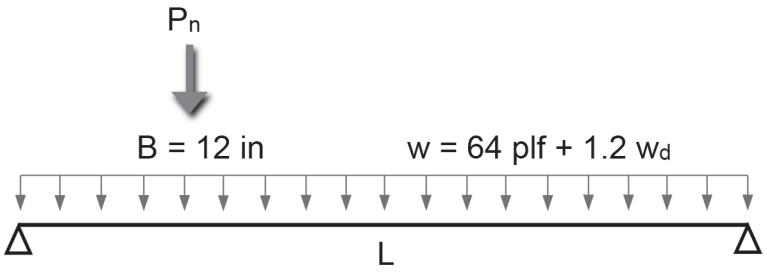


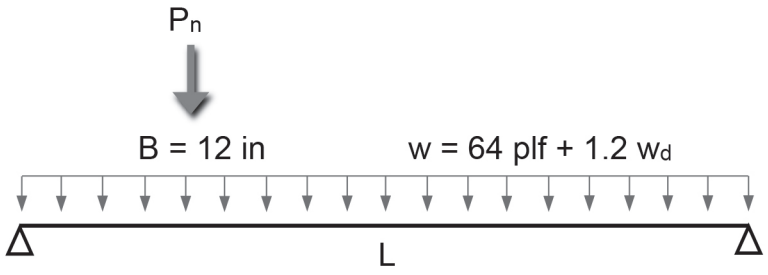
TABLE 15.1
Maximum Nominal Concentrated Post Load, P_n lbs
1.5 x 6 x 22 gage (0.0295) Deck-Slab



1.5 deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
22 gage	2.5	1720	1790	1800	1820	1830	**1840**	**1850**	**1860**	**1860**
6x6-W2.1xW2.1	3	2020	2090	2130	2150	2170	**2180**	**2190**	**2200**	**2210**
	3.5	2290	2380	2450	2470	**2490**	**2510**	**2530**	**2540**	**2560**
22 gage	2.5	2350	2430	2460	2480	2490	**2510**	**2520**	**2530**	**2540**
6x6-W2.9xW2.9	3	2750	2860	2910	2940	2960	**2980**	**3000**	**3010**	**3030**
	3.5	3140	3260	3350	3380	**3410**	**3440**	**3460**	**3480**	**3500**
22 gage	2.5	3440	3560	3600	3630	3650	**3520**	**3280**	**3050**	**2810**
4x4-W2.9xW2.9	3	4050	4210	4290	4320	4350	**4380**	**4180**	**3910**	**3650**
	3.5	4630	4810	4940	4990	**5030**	**5070**	**5100**	**4830**	**4530**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

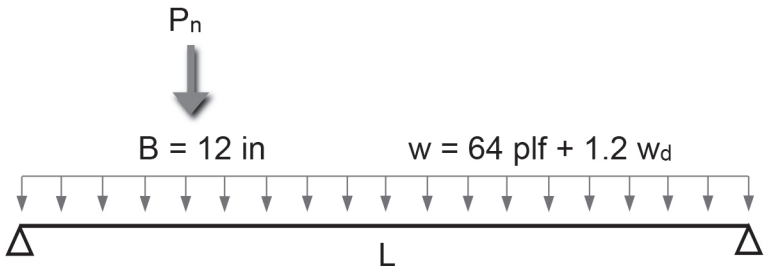
TABLE 15.2
Maximum Nominal Concentrated Post Load, P_n lbs
1.5 x 6 x 20 gage (0.0358) Deck-Slab



1.5 deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
20 gage	2.5	1720	1780	1800	1820	1830	1840	1850	**1860**	**1860**
6x6-W2.1xW2.1	3	2020	2090	2130	2150	2170	2180	2190	**2200**	**2210**
	3.5	2290	2380	2450	2470	2490	2510	**2530**	**2540**	**2560**
20 gage	2.5	2350	2430	2460	2480	2490	2510	2520	**2530**	**2540**
6x6-W2.9xW2.9	3	2750	2860	2910	2940	2960	2980	3000	**3010**	**3030**
	3.5	3140	3260	3350	3380	3410	3440	**3460**	**3480**	**3500**
20 gage	2.5	3440	3560	3600	3630	3650	3670	3690	**3710**	**3610**
4x4-W2.9xW2.9	3	4050	4210	4290	4320	4350	4380	4410	**4430**	**4450**
	3.5	4630	4810	4940	4990	5030	5070	**5100**	**5130**	**5160**

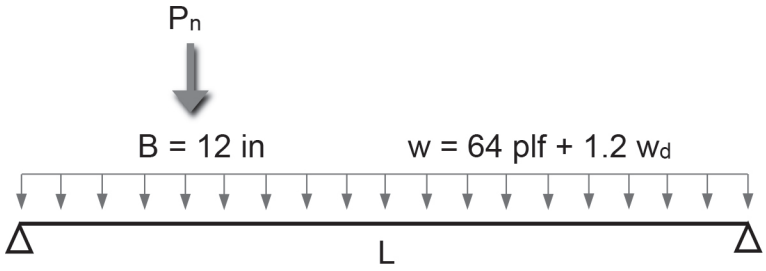
Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

TABLE 15.3
Maximum Nominal Concentrated Post Load, P_n lbs
1.5 x 6 x 18 gage (0.0474) Deck-Slab



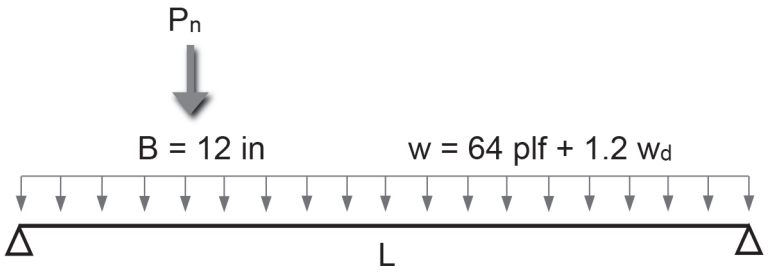
1.5 deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
18 gage	2.5	1720	1780	1800	1820	1830	1840	1850	1860	1860
6x6-W2.1xW2.1	3	2020	2090	2130	2150	2170	2180	2190	2200	2210
	3.5	2290	2380	2450	2470	2490	2510	2530	2540	2560
18 gage	2.5	2350	2430	2460	2480	2490	2510	2520	2530	2540
6x6-W2.9xW2.9	3	2750	2860	2910	2940	2960	2980	3000	3010	3030
	3.5	3140	3260	3350	3380	3410	3440	3460	3480	3500
18 gage	2.5	3440	3560	3600	3630	3650	3670	3690	3710	3720
4x4-W2.9xW2.9	3	4050	4210	4290	4320	4350	4380	4410	4430	4450
	3.5	4630	4810	4940	4990	5030	5070	5100	5130	5160

TABLE 15.4
Maximum Nominal Concentrated Post Load, P_n lbs
1.5 x 6 x 16 gage (0.0598) Deck-Slab



1.5 deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
16 gage	2.5	1720	1780	1800	1820	1830	1840	1850	1860	1860
6x6-W2.1xW2.1	3	2020	2090	2130	2150	2170	2180	2190	2200	2210
	3.5	2290	2380	2450	2470	2490	2510	2530	2540	2560
16 gage	2.5	2350	2430	2460	2480	2490	2510	2520	2530	2540
6x6-W2.9xW2.9	3	2750	2860	2910	2940	2960	2980	3000	3010	3030
	3.5	3140	3260	3350	3380	3410	3440	3460	3480	3500
16 gage	2.5	3440	3560	3600	3630	3650	3670	3690	3710	3720
4x4-W2.9xW2.9	3	4050	4210	4290	4320	4350	4380	4410	4430	4450
	3.5	4630	4810	4940	4990	5030	5070	5100	5130	5160

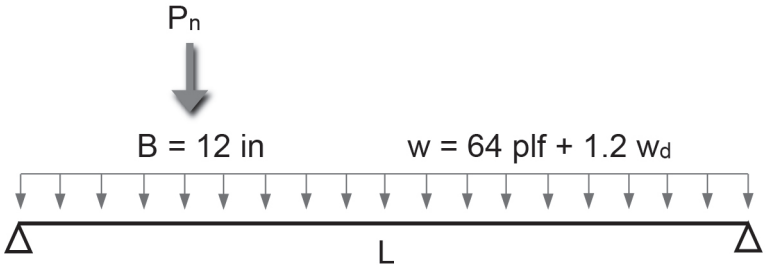
TABLE 15.5
Maximum Nominal Concentrated Post Load, P_n lbs
1.5 x 6 Inverted x 22 gage (0.0295) Deck-Slab



1.5 Inverted deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
22 gage	2.5	1720	1780	1800	1820	1830	**1840**	**1850**	**1860**	**1860**
6x6-W2.1xW2.1	3	2020	2090	2130	2150	2170	**2180**	**2190**	**2200**	**2210**
	3.5	2290	2380	2450	2470	**2490**	**2510**	**2530**	**2540**	**2560**
22 gage	2.5	2350	2430	2460	2480	2490	**2510**	**2520**	**2530**	**2540**
6x6-W2.9xW2.9	3	2750	2860	2910	2940	2960	**2980**	**3000**	**3010**	**3030**
	3.5	3140	3260	3350	3380	**3410**	**3440**	**3460**	**3480**	**3500**
22 gage	2.5	3440	3560	3600	3630	3650	**3670**	**3690**	**3660**	**3400**
4x4-W2.9xW2.9	3	4050	4210	4290	4320	4350	**4380**	**4410**	**4430**	**4270**
	3.5	4630	4810	4940	4990	**5030**	**5070**	**5100**	**5130**	**5160**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

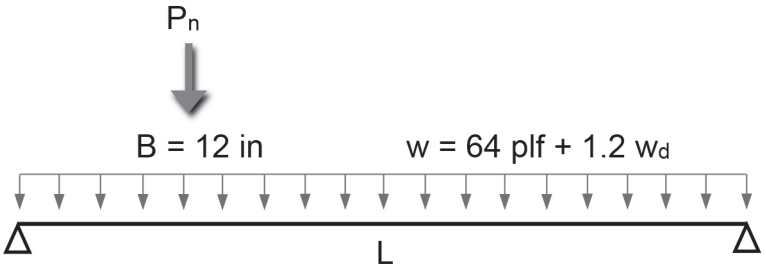
TABLE 15.6
Maximum Nominal Concentrated Post Load, P_n lbs
1.5 x 6 x 20 gage (0.0358) Inverted Deck-Slab



1.5 Inverted deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
20 gage	2.5	1720	1780	1800	1820	1830	1840	1850	**1860**	**1860**
6x6-W2.1xW2.1	3	2020	2090	2130	2150	2170	2180	2190	**2200**	**2210**
	3.5	2290	2380	2450	2470	2490	2510	**2530**	**2540**	**2560**
20 gage	2.5	2350	2430	2460	2480	2490	2510	2520	**2530**	**2540**
6x6-W2.9xW2.9	3	2750	2860	2910	2940	2960	2980	3000	**3010**	**3030**
	3.5	3140	3260	3350	3380	3410	3440	**3460**	**3480**	**3500**
20 gage	2.5	3440	3560	3600	3630	3650	3670	3690	**3710**	**3720**
4x4-W2.9xW2.9	3	4050	4210	4290	4320	4350	4380	4410	**4430**	**4450**
	3.5	4630	4810	4940	4990	5030	5070	**5100**	**5130**	**5160**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

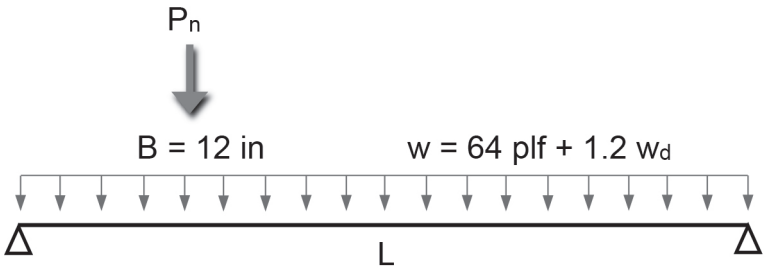
TABLE 15.7
Maximum Nominal Concentrated Post Load, P_n lbs
1.5 x 6 x 18 gage (0.0474) Inverted Deck-Slab



1.5 Inverted deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
18 gage	2.5	1720	1780	1800	1820	1830	1840	1850	1860	1860
6x6-W2.1xW2.1	3	2020	2090	2130	2150	2170	2180	2190	2200	2210
	3.5	2290	2380	2450	2470	2490	2510	2530	2540	**2560**
18 gage	2.5	2350	2430	2460	2480	2490	2510	2520	2530	2540
6x6-W2.9xW2.9	3	2750	2860	2910	2940	2960	2980	3000	3010	3030
	3.5	3140	3260	3350	3380	3410	3440	3460	3480	**3500**
18 gage	2.5	3440	3560	3600	3630	3650	3670	3690	3710	3720
4x4-W2.9xW2.9	3	4050	4210	4290	4320	4350	4380	4410	4430	4450
	3.5	4630	4810	4940	4990	5030	5070	5100	5130	**5160**

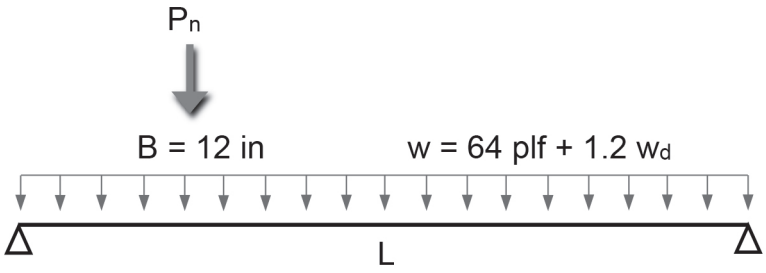
Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

TABLE 15.8
Maximum Nominal Concentrated Post Load, P_n lbs
1.5 x 6 x 16 gage (0.0598) Inverted Deck-Slab



1.5 Inverted deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
16 gage	2.5	1720	1780	1800	1820	1830	1840	1850	1860	1860
6x6-W2.1xW2.1	3	2020	2090	2130	2150	2170	2180	2190	2200	2210
	3.5	2290	2380	2450	2470	2490	2510	2530	2540	2560
16 gage	2.5	2350	2430	2460	2480	2490	2510	2520	2530	2540
6x6-W2.9xW2.9	3	2750	2860	2910	2940	2960	2980	3000	3010	3030
	3.5	3140	3260	3350	3380	3410	3440	3460	3480	3500
16 gage	2.5	3440	3560	3600	3630	3650	3670	3690	3710	3720
4x4-W2.9xW2.9	3	4050	4210	4290	4320	4350	4380	4410	4430	4450
	3.5	4630	4810	4940	4990	5030	5070	5100	5130	5160

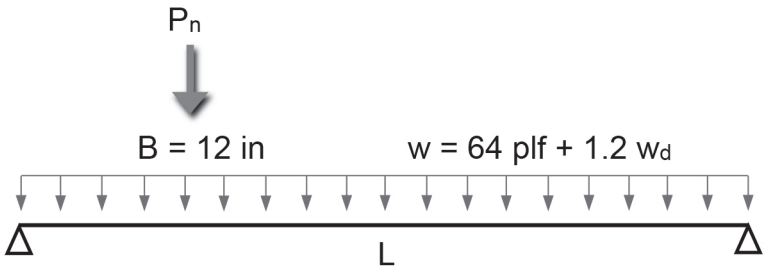
TABLE 15.9
Maximum Nominal Concentrated Post Load, P_n lbs
2.0 x 12 x 22 gage (0.0295) Deck-Slab



2.0 deck-slab + WWR	tc	Span, ft								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
22 gage	2.5	1800	1820	1830	1840	1850	1950	**2060**	**2080**	**2110**
6x6-W2.1xW2.1	3	2130	2150	2170	2180	2190	**2200**	**2300**	**2410**	**2500**
	3.5	2450	2470	2490	2500	**2530**	**2540**	**2560**	**2670**	**2790**
22 gage	2.5	2460	2480	2490	2500	2520	2660	**2800**	**2760**	**2430**
6x6-W2.9xW2.9	3	2910	2940	2960	2980	3000	**3010**	**3140**	**3300**	**3280**
	3.5	3350	3380	3410	3440	**3460**	**3480**	**3500**	**3650**	**3820**
22 gage	2.5	3600	3630	3650	3670	3700	3510	**3120**	**2760**	**2430**
4x4-W2.9xW2.9	3	4290	4320	4350	4380	4410	**4430**	**4120**	**3680**	**3280**
	3.5	4940	4990	5030	5070	**5100**	**5130**	**5160**	**4680**	**4190**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

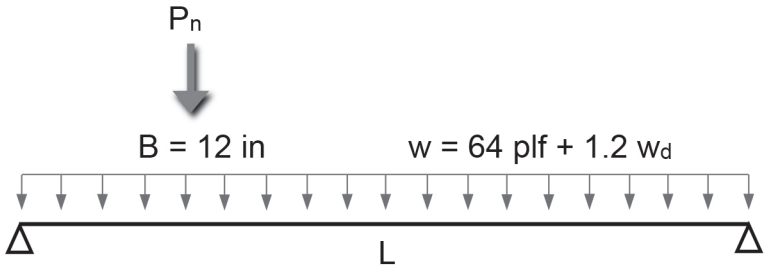
TABLE 15.10
Maximum Nominal Concentrated Post Load, P_n lbs
2.0 x 12 x 20 gage (0.0358) Deck-Slab



2.0 deck-slab + WWR	tc	Span, ft								
		7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
20 gage	2.5	1850	1950	2060	2080	2110	**2130**	**2170**	**2210**	**1990**
6x6-W2.1xW2.1	3	2190	2200	2300	2410	**2500**	**2530**	**2550**	**2580**	**2650**
	3.5	2530	2540	2560	**2670**	**2790**	**2910**	**2940**	**2970**	**3010**
20 gage	2.5	2520	2660	2800	2840	2870	**2880**	**2560**	**2270**	**1990**
6x6-W2.9xW2.9	3	3000	3010	3140	3300	**3420**	**3450**	**3480**	**3110**	**2770**
	3.5	3460	3480	3500	**3650**	**3820**	**3990**	**4030**	**4040**	**3630**
20 gage	2.5	3700	3900	4010	3600	3230	**2880**	**2560**	**2270**	**1990**
4x4-W2.9xW2.9	3	4410	4430	4620	4770	**4300**	**3880**	**3480**	**3110**	**2770**
	3.5	5100	5130	5160	**5390**	**5460**	**4950**	**4480**	**4040**	**3630**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

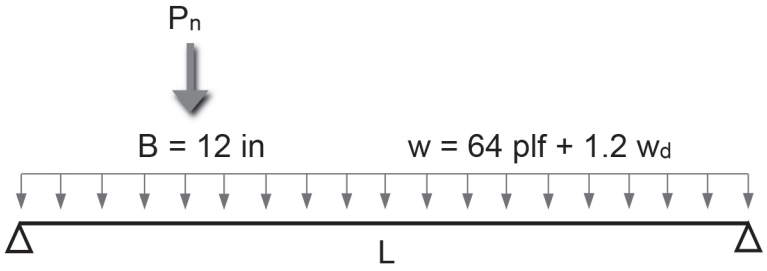
TABLE 15.11
Maximum Nominal Concentrated Post Load, P_n lbs
2.0 x 12 x 18 gage (0.0474) Deck-Slab



2.0 deck-slab + WWR	tc	Span, ft								
		7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
18 gage	2.5	1850	1950	2060	2080	2110	2130	2170	2210	**2240**
6x6-W2.1xW2.1	3	2190	2200	2300	2410	2500	2530	2550	**2580**	**2620**
	3.5	2530	2540	2560	2670	2790	2910	2940	**2970**	**3010**
18 gage	2.5	2520	2660	2800	2840	2870	2910	2960	3010	**3060**
6x6-W2.9xW2.9	3	3000	3010	3140	3300	3420	3450	3490	**3530**	**3580**
	3.5	3460	3480	3500	3650	3820	3990	4030	**4070**	**4120**
18 gage	2.5	3700	3900	4110	4160	4210	4170	3780	3430	**3100**
4x4-W2.9xW2.9	3	4410	4430	4620	4850	5030	5080	5040	**4600**	**4180**
	3.5	5100	5130	5160	5390	5640	5880	5950	**5860**	**5370**

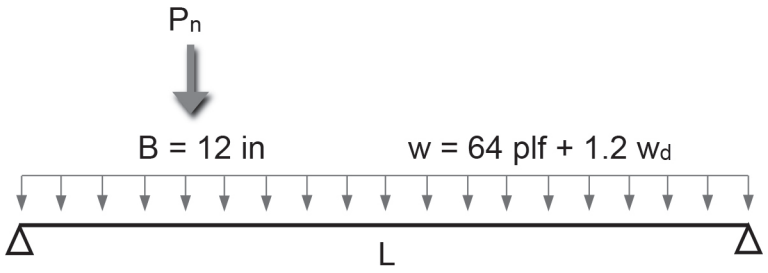
Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

TABLE 15.12
Maximum Nominal Concentrated Post Load, P_n lbs
2.0 x 12 x 16 gage (0.0598) Deck-Slab



2.0 deck-slab + WWR	tc	Span, ft								
		7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
16 gage	2.5	1850	1950	2060	2080	2110	2130	2170	2210	2240
6x6-W2.1xW2.1	3	2190	2200	2300	2410	2500	2530	2550	2580	2620
	3.5	2530	2540	2560	2670	2790	2910	2940	2970	3010
16 gage	2.5	2520	2660	2800	2840	2870	2910	2960	3010	3060
6x6-W2.9xW2.9	3	3000	3010	3140	3300	3420	3450	3490	3530	3580
	3.5	3460	3480	3500	3650	3820	3990	4030	4070	4120
16 gage	2.5	3700	3900	4110	4160	4210	4260	4330	4410	4260
4x4-W2.9xW2.9	3	4410	4430	4620	4850	5030	5080	5130	5200	5270
	3.5	5100	5130	5160	5390	5640	5880	5950	6010	6080

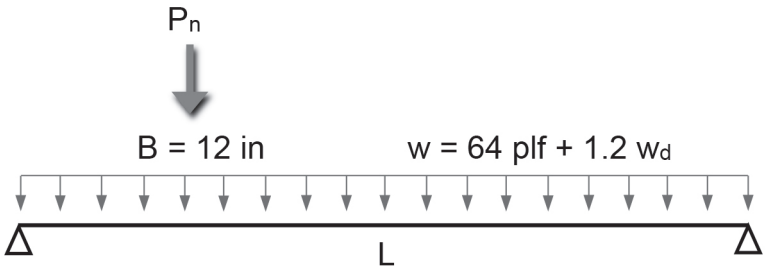
TABLE 15.13
Maximum Nominal Concentrated Post Load, P_n lbs
3.0 x 12 x 22 gage (0.0295) Deck-Slab



3.0 deck-slab + WWR	tc	Span, ft								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
22 gage	2.5	1930	1960	2000	2040	**2080**	**2130**	**2190**	**2240**	**2180**
6x6-W2.1xW2.1	3	2210	2320	2360	**2400**	**2440**	**2480**	**2530**	**2590**	**2660**
	3.5	2490	**2550**	**2700**	**2760**	**2800**	**2850**	**2890**	**2950**	**3000**
22 gage	2.5	2630	2680	2730	2780	**2840**	**2910**	**2760**	**2460**	**2180**
6x6-W2.9xW2.9	3	3020	3170	3230	**3280**	**3330**	**3390**	**3460**	**3260**	**2920**
	3.5	3410	**3490**	**3700**	**3780**	**3840**	**3890**	**3960**	**4040**	**3730**
22 gage	2.5	3850	3920	3990	3820	**3430**	**3080**	**2760**	**2460**	**2180**
4x4-W2.9xW2.9	3	4440	4660	4750	**4830**	**4470**	**4030**	**3630**	**3260**	**2920**
	3.5	5030	**5150**	**5450**	**5570**	**5580**	**5060**	**4570**	**4130**	**3730**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

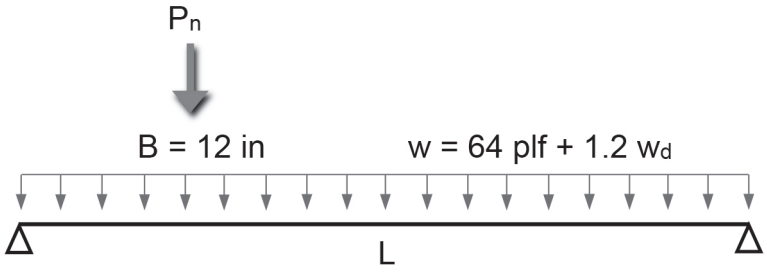
TABLE 15.14
Maximum Nominal Concentrated Post Load, P_n lbs
3.0 x 12 x 20 gage (0.0358) Deck-Slab



3.0 deck-slab + WWR	tc	Span, ft								
		7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
20 gage	2.5	2000	2040	2080	2130	2190	2240	2290	2360	2320
6x6-W2.1xW2.1	3	2360	2400	2440	2480	2530	2590	2660	2690	**2770**
	3.5	2700	2760	2800	2850	2890	2950	**3000**	**3050**	**3130**
20 gage	2.5	2730	2780	2840	2910	2990	3060	2880	2590	2320
6x6-W2.9xW2.9	3	3230	3280	3330	3390	3460	3540	3630	3440	**3110**
	3.5	3700	3780	3840	3890	3960	4040	**4110**	**4180**	**3980**
20 gage	2.5	3990	4070	4160	3900	3530	3190	2880	2590	2320
4x4-W2.9xW2.9	3	4750	4830	4900	4990	4610	4190	3800	3440	**3110**
	3.5	5460	5570	5660	5750	5780	5270	**4810**	**4380**	**3980**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

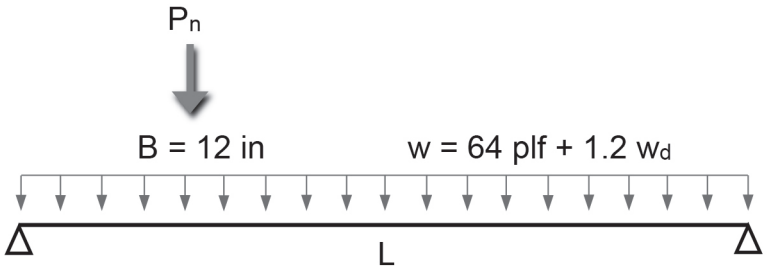
TABLE 15.15
Maximum Nominal Concentrated Post Load, P_n lbs
3.0 x 12 x 18 gage (0.0474) Deck-Slab



3.0 deck-slab + WWR	tc	Span, ft								
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
18 gage	2.5	2190	2240	2290	2360	2410	2470	2540	2570	2350
6x6-W2.1xW2.1	3	2530	2590	2660	2690	2770	2810	2910	2940	3030
	3.5	2890	2950	3000	3050	3130	3180	3260	3300	**3410**
18 gage	2.5	2990	3060	3120	3220	3280	3160	2880	2610	2350
6x6-W2.9xW2.9	3	3460	3540	3630	3680	3790	3850	3840	3510	3190
	3.5	3960	4040	4110	4180	4280	4350	4460	4500	**4120**
18 gage	2.5	4380	4480	4150	3800	3470	3160	2880	2610	2350
4x4-W2.9xW2.9	3	5090	5210	5350	4980	4570	4190	3840	3510	3190
	3.5	5840	5960	6060	6160	5780	5320	4900	4500	**4120**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

TABLE 15.16
Maximum Nominal Concentrated Post Load, P_n lbs
3.0 x 12 x 16 gage (0.0598) Deck-Slab

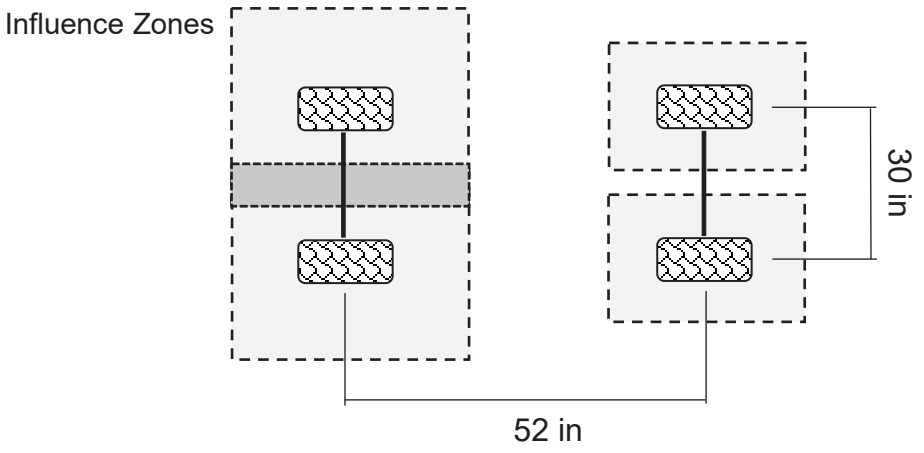


3.0 deck-slab + WWR	tc	Span, ft								
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
16 gage	2.5	2190	2240	2290	2360	2410	2470	2540	2570	2650
6x6-W2.1xW2.1	3	2530	2590	2660	2690	2770	2810	2910	2940	3030
	3.5	2890	2950	3000	3050	3130	3180	3260	3300	3410
16 gage	2.5	2990	3060	3120	3220	3280	3370	3470	3510	3330
6x6-W2.9xW2.9	3	3460	3540	3630	3680	3790	3850	3980	4020	4140
	3.5	3960	4040	4110	4180	4280	4350	4460	4520	4670
16 gage	2.5	4380	4480	4580	4720	4630	4280	3940	3630	3330
4x4-W2.9xW2.9	3	5090	5210	5350	5410	5580	5610	5190	4810	4440
	3.5	5840	5960	6060	6160	6320	6420	6570	6100	5660

Table 16 – Maximum Nominal Scissor Lift Wheel Load
Single Span Deck-Slabs

Scissor lifts on elevated slabs are common during construction and maintenance, but design methodology is not intuitive and requires iterative computer software. The following P_n wheel load tables combine load distribution methodology, influence zone corrections and traditional engineering mechanics to solve one common industry question . . . "*What size scissor lift can a given slab support*".

Tabulated results for P_n should be used with discretion, since capacity vs span is non-linear, influence zone widths are empirical, axle loads are often unbalanced and impact factors may reduce maximum total scissor lift plus platform weights. The design professional should be consulted for appropriate reduction factors.



Fixed variables for P_n scissor lift wheel load tables:

$d_{WWR} = t_c/2$
f'_c = 3 ksi, 145 pcf
F_y WWR = 60 ksi
F_y deck = 40 ksi
$\Delta \leq L/360$
B = 4" wheel
Concurrent live load = 40 psf
LRFD P_n load factor = 1.6
Wheelbase = 52 in x 30 in
ϕ_w = 0.75 (weak axis flexural resistance factor)

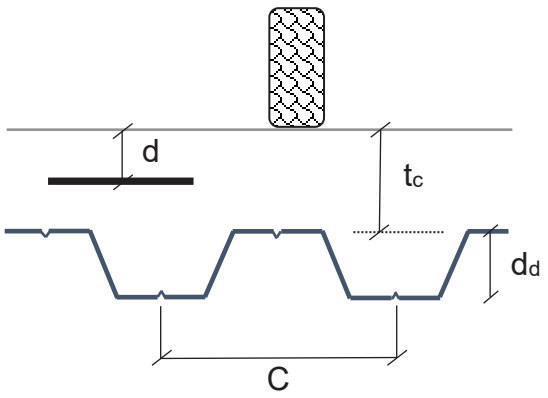
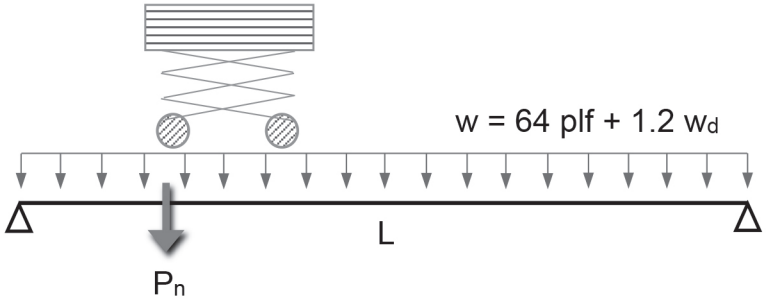


TABLE 16.1
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
1.5 x 6 x 22 gage (0.0295) Deck-Slab



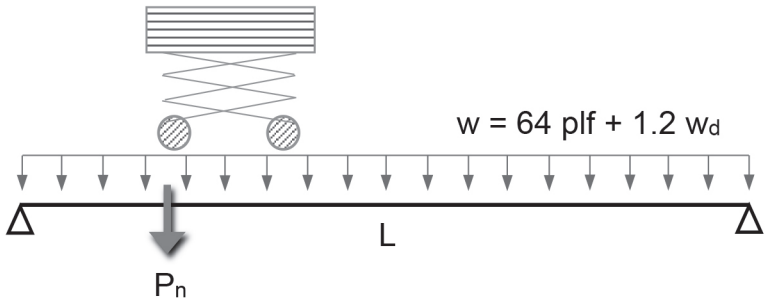
1.5 deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
22 gage	2.5	1710	1480	1390	1320	1260	**1220**	**1190**	**1160**	**1140**
6x6-W2.1xW2.1	3	2010	1740	1630	1550	1490	**1450**	**1410**	**1380**	**1350**
	3.5	2280	1990	1870	1780	**1710**	**1660**	**1620**	**1590**	**1560**
22 gage	2.5	2330	2030	1890	1800	1730	**1670**	**1620**	**1590**	**1540**
6x6-W2.9xW2.9	3	2740	2380	2230	2120	2040	**1980**	**1930**	**1880**	**1850**
	3.5	3130	2720	2560	2440	**2350**	**2280**	**2220**	**2170**	**2130**
22 gage	2.5	2840	2310	2260	2210	2180	**2060**	**1890**	**1710**	**1540**
4x4-W2.9xW2.9	3	3730	3090	3010	2950	2860	**2630**	**2420**	**2190**	**1990**
	3.5	4610	3960	3770	3600	**3460**	**3230**	**2980**	**2710**	**2470**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.2
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
1.5 x 6 x 20 gage (0.0358) Deck-Slab



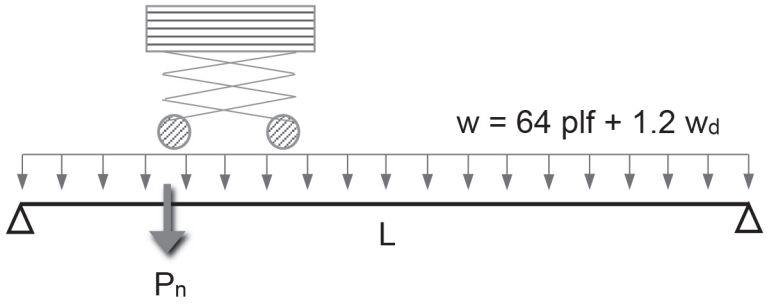
1.5 deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
20 gage	2.5	1710	1480	1390	1320	1260	1220	1190	**1160**	**1140**
6x6-W2.1xW2.1	3	2010	1740	1630	1550	1490	1450	1410	**1380**	**1350**
	3.5	2280	1990	1870	1780	1710	1660	**1620**	**1590**	**1560**
20 gage	2.5	2330	2030	1890	1800	1730	1670	1620	**1590**	**1560**
6x6-W2.9xW2.9	3	2740	2380	2230	2120	2040	1980	1930	**1880**	**1850**
	3.5	3130	2720	2560	2440	2350	2280	**2220**	**2170**	**2130**
20 gage	2.5	2840	2310	2260	2210	2180	2150	2120	**2100**	**1970**
4x4-W2.9xW2.9	3	3730	3090	3010	2950	2900	2870	2830	**2760**	**2520**
	3.5	4610	4020	3770	3600	3460	3360	**3270**	**3210**	**3110**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.3
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
1.5 x 6 x 18 gage (0.0474) Deck-Slab

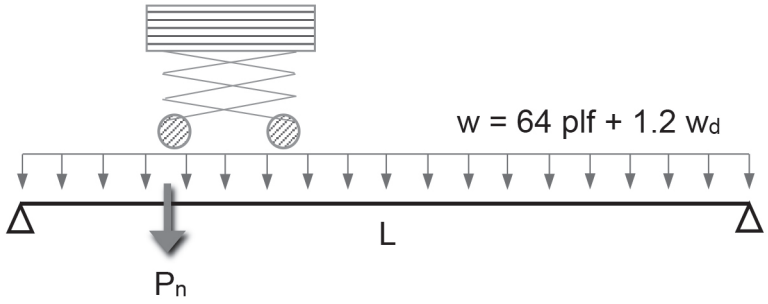


1.5 deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
18 gage	2.5	1710	1480	1390	1320	1260	1220	1190	1160	1140
6x6-W2.1xW2.1	3	2010	1740	1630	1550	1490	1450	1410	1380	1350
	3.5	2280	1990	1870	1780	1710	1660	1620	1590	1560
18 gage	2.5	2330	2030	1890	1800	1730	1670	1620	1590	1560
6x6-W2.9xW2.9	3	2740	2380	2230	2120	2040	1980	1930	1880	1850
	3.5	3130	2720	2560	2440	2350	2280	2220	2170	2130
18 gage	2.5	2840	2310	2260	2210	2180	2150	2120	2100	2070
4x4-W2.9xW2.9	3	3730	3090	3010	2950	2900	2860	2830	2770	2720
	3.5	4610	4020	3770	3600	3460	3360	3270	3210	3150

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.4
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
1.5 x 6 x 16 gage (0.0598) Deck-Slab

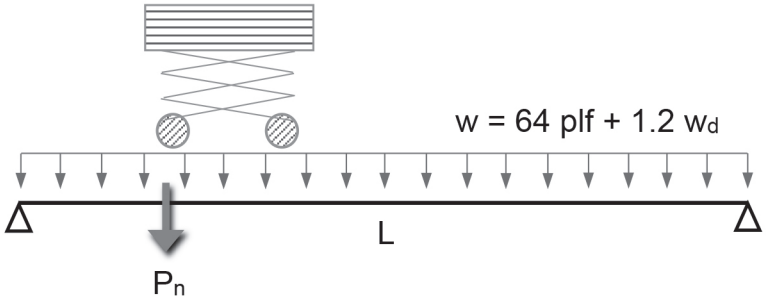


1.5 deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
16 gage	2.5	1710	1480	1390	1320	1260	1220	1190	1160	1140
6x6-W2.1xW2.1	3	2010	1740	1630	1550	1490	1450	1410	1380	1350
	3.5	2280	1990	1870	1780	1710	1660	1620	1590	1560
16 gage	2.5	2330	2030	1890	1800	1730	1670	1620	1590	1560
6x6-W2.9xW2.9	3	2740	2380	2230	2120	2040	1980	1930	1880	1850
	3.5	3130	2720	2560	2440	2350	2280	2220	2170	2130
16 gage	2.5	2840	2310	2250	2210	2180	2150	2120	2100	2070
4x4-W2.9xW2.9	3	3730	3090	3010	2950	2900	2860	2820	2770	2720
	3.5	4610	4020	3770	3600	3460	3360	3270	3210	3150

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.5
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
1.5 x 6 Inverted x 22 gage (0.0295) Deck-Slab



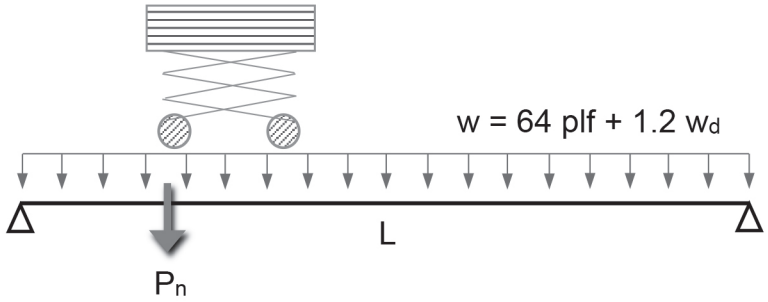
1.5 Inverted deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
22 gage	2.5	2420	1480	1390	1320	1260	**1220**	**1190**	**1160**	**1140**
6x6-W2.1xW2.1	3	2840	1740	1630	1550	1490	**1450**	**1410**	**1380**	**1350**
	3.5	3230	1990	1870	1780	**1710**	**1660**	**1620**	**1590**	**1560**
22 gage	2.5	3330	2030	1890	1800	1730	**1670**	**1620**	**1590**	**1560**
6x6-W2.9xW2.9	3	3880	2380	2230	2120	2040	**1980**	**1930**	**1880**	**1850**
	3.5	4420	2720	2560	2440	**2350**	**2280**	**2220**	**2170**	**2130**
22 gage	2.5	3770	2970	2770	2630	2530	**2450**	**2250**	**2050**	**1860**
4x4-W2.9xW2.9	3	4510	3510	3290	3130	3010	**2910**	**2810**	**2560**	**2330**
	3.5	5250	4020	3770	3600	**3460**	**3360**	**3270**	**3090**	**2830**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.6
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
1.5 x 6 Inverted x 20 gage (0.0358) Deck-Slab



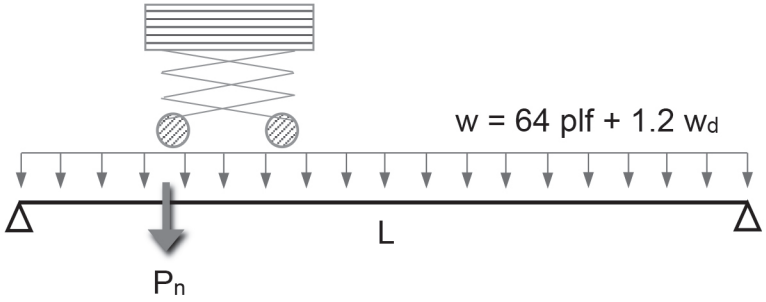
1.5 Inverted deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
20 gage	2.5	2420	1480	1390	1320	1260	1220	1190	**1160**	**1140**
6x6-W2.1xW2.1	3	2840	1740	1630	1550	1490	1450	1410	**1380**	**1350**
	3.5	3230	1990	1870	1780	1710	1660	**1620**	**1590**	**1560**
20 gage	2.5	3300	2030	1890	1800	1730	1670	1620	**1590**	**1560**
6x6-W2.9xW2.9	3	3880	2380	2230	2120	2040	1980	1930	**1880**	**1850**
	3.5	4420	2720	2560	2440	2350	2280	**2220**	**2170**	**2130**
20 gage	2.5	3770	2970	2770	2630	2530	2450	2380	**2320**	**2280**
4x4-W2.9xW2.9	3	4770	3510	3290	3130	3010	2910	2840	**2770**	**2720**
	3.5	5760	4020	3770	3600	3460	3360	**3270**	**3210**	**3150**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.7
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
1.5 x 6 Inverted x 18 gage (0.0474) Deck-Slab



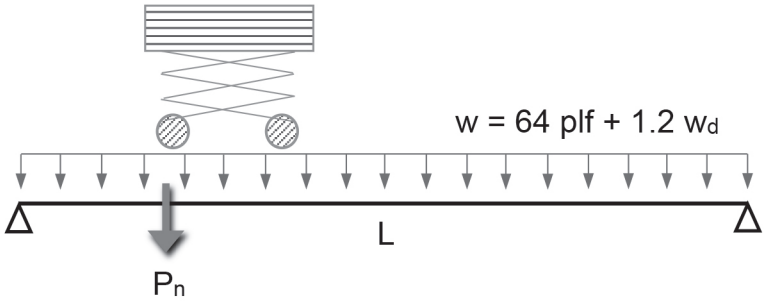
1.5 Inverted deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
18 gage	2.5	2420	1480	1390	1320	1260	1228	1190	1160	1140
6x6-W2.1xW2.1	3	2840	1740	1630	1550	1490	1450	1410	1380	1350
	3.5	3230	1990	1870	1780	1710	1660	1620	1590	**1560**
18 gage	2.5	3300	2030	1890	1800	1730	1670	1620	1590	1560
6x6-W2.9xW2.9	3	3880	2380	2230	2120	2040	1980	1930	1880	1850
	3.5	4420	2720	2560	2440	2350	2280	2220	2170	**2130**
18 gage	2.5	3770	2970	2770	2630	2530	2450	2380	2320	2280
4x4-W2.9xW2.9	3	4760	3510	3290	3130	3010	2910	2840	2770	2720
	3.5	5890	4020	3770	3600	3460	3360	3270	3210	**3150**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.8
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
1.5 x 6 Inverted x 16 gage (0.0598) Deck-Slab

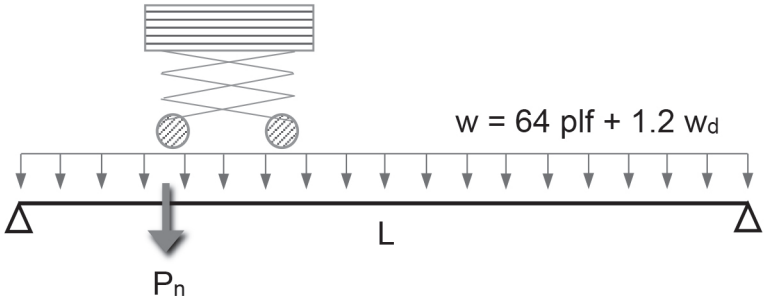


1.5 Inverted deck-slab + WWR	tc	Span, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
16 gage	2.5	2420	1480	1390	1320	1260	1220	1190	1160	1140
6x6-W2.1xW2.1	3	2840	1740	1630	1550	1490	1450	1410	1380	1350
	3.5	3230	1990	1870	1780	1710	1660	1620	1590	1560
16 gage	2.5	3300	2030	1890	1800	1730	1670	1620	1590	1560
6x6-W2.9xW2.9	3	3880	2380	2230	2120	2040	1980	1930	1880	1850
	3.5	4420	2720	2560	2440	2350	2280	2220	2170	2130
16 gage	2.5	3770	2970	2770	2630	2530	2450	2380	2320	2280
4x4-W2.9xW2.9	3	4760	3510	3290	3130	3010	2910	2840	2770	2720
	3.5	5890	4020	3770	3600	3460	3360	3270	3210	3150

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.9
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
2.0 x 12 x 22 gage (0.0295) Deck-Slab



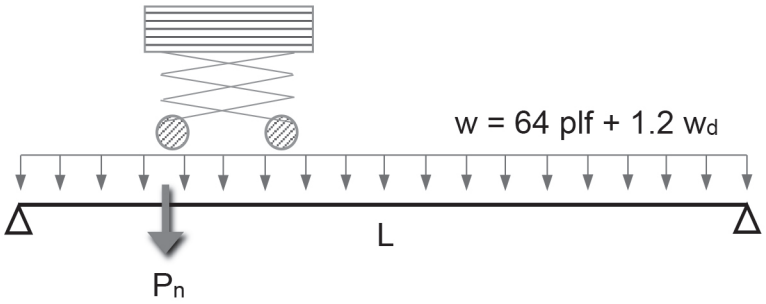
2.0 deck-slab + WWR	tc	Span, ft								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
22 gage	2.5	1390	1320	1260	1220	1190	1160	**1140**	**1140**	**1180**
6x6-W2.1xW2.1	3	1630	1550	1490	1450	1410	**1380**	**1350**	**1330**	**1320**
	3.5	1870	1780	1710	1660	**1620**	**1590**	**1560**	**1530**	**1510**
22 gage	2.5	1890	1800	1730	1670	1620	1590	**1560**	**1560**	**1490**
6x6-W2.9xW2.9	3	2230	2120	2040	1980	1930	**1880**	**1850**	**1820**	**1810**
	3.5	2560	2440	2350	2280	**2220**	**2170**	**2130**	**2100**	**2070**
22 gage	2.5	2720	2630	2530	2450	2280	2070	**1880**	**1690**	**1490**
4x4-W2.9xW2.9	3	3260	3130	3010	2910	2820	**2560**	**2340**	**2130**	**1930**
	3.5	3770	3600	3460	3360	**3270**	**3080**	**2820**	**2580**	**2360**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.10
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
2.0 x 12 x 20 gage (0.0358) Deck-Slab



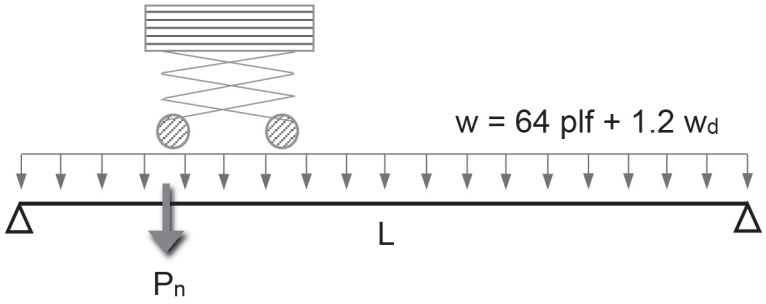
2.0 deck-slab + WWR	tc	Span, ft								
		7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
20 gage	2.5	1190	1160	1140	1140	1180	**1230**	**1320**	**1320**	**1140**
6x6-W2.1xW2.1	3	1410	1380	1350	1330	**1320**	**1380**	**1470**	**1560**	**1530**
	3.5	1620	1590	1560	**1530**	**1510**	**1530**	**1630**	**1730**	**1830**
20 gage	2.5	1620	1590	1560	1560	1610	**1680**	**1520**	**1320**	**1140**
6x6-W2.9xW2.9	3	1930	1890	1850	1820	**1810**	**1890**	**1990**	**1740**	**1530**
	3.5	2220	2170	2130	**2100**	**2070**	**2090**	**2230**	**2200**	**1950**
20 gage	2.5	2380	2320	2280	2200	1980	**1740**	**1520**	**1320**	**1140**
4x4-W2.9xW2.9	3	2840	2780	2720	2680	**2530**	**2260**	**1990**	**1740**	**1530**
	3.5	3270	3210	3150	**3100**	**3060**	**2790**	**2490**	**2200**	**1950**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.11
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
2.0 x 12 x 18 gage (0.0474) Deck-Slab



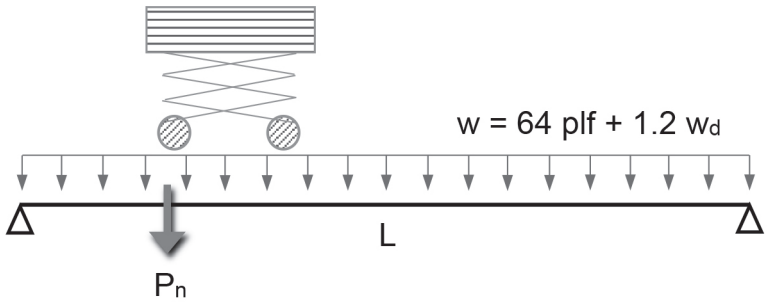
2.0 deck-slab + WWR	tc	Span, ft								
		7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
18 gage	2.5	1190	1160	1140	1140	1180	1230	1320	1400	**1430**
6x6-W2.1xW2.1	3	1410	1380	1350	1330	1320	1380	1470	**1560**	**1660**
	3.5	1620	1590	1560	1530	1510	1530	1630	**1730**	**1830**
18 gage	2.5	1620	1590	1560	1560	1610	1680	1800	1910	**1770**
6x6-W2.9xW2.9	3	1930	1880	1850	1820	1810	1890	2010	**2140**	**2260**
	3.5	2220	2170	2130	2100	2070	2090	2230	**2360**	**2500**
18 gage	2.5	2380	2320	2280	2280	2360	2470	2230	1990	**1770**
4x4-W2.9xW2.9	3	2840	2770	2720	2680	2660	2780	2870	**2570**	**2310**
	3.5	3270	3210	3150	3100	3060	3080	3280	**3190**	**2880**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.12
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
2.0 x 12 x 16 gage (0.0598) Deck-Slab

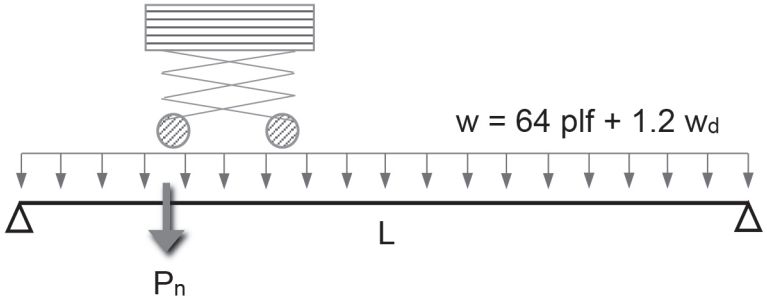


2.0 deck-slab + WWR	tc	Span, ft								
		7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
16 gage	2.5	1190	1160	1140	1140	1180	1230	1320	1400	1430
6x6-W2.1xW2.1	3	1410	1380	1350	1330	1320	1380	1470	1560	1660
	3.5	1620	1590	1560	1530	1510	1530	1630	1730	1830
16 gage	2.5	1620	1590	1560	1560	1610	1680	1800	1910	1950
6x6-W2.9xW2.9	3	1930	1880	1850	1820	1810	1890	2010	2140	2260
	3.5	2220	2170	2130	2100	2070	2090	2230	2360	2500
16 gage	2.5	2380	2320	2280	2280	2360	2470	2630	2630	2430
4x4-W2.9xW2.9	3	2840	2770	2720	2680	2660	2780	2960	3140	3130
	3.5	3270	3210	3150	3100	3060	3080	3280	3490	3690

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.13
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
3.0 x 12 x 22 gage (0.0295) Deck-Slab



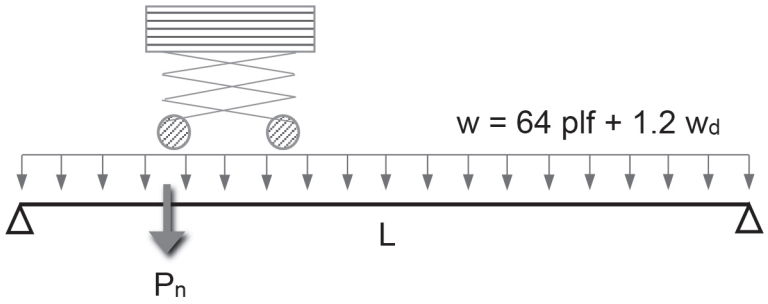
3.0 deck-slab + WWR	tc	Span, ft								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
22 gage	2.5	1260	1220	1260	1300	**1350**	**1340**	**1330**	**1330**	**1370**
6x6-W2.1xW2.1	3	1490	1450	1410	**1430**	**1480**	**1530**	**1570**	**1580**	**1620**
	3.5	1710	**1660**	**1620**	**1590**	**1610**	**1670**	**1730**	**1800**	**1860**
22 gage	2.5	1730	1670	1720	1780	**1840**	**1830**	**1810**	**1640**	**1430**
6x6-W2.9xW2.9	3	2040	1980	1930	**1960**	**2020**	**2090**	**2150**	**2080**	**1820**
	3.5	2350	**2280**	**2220**	**2170**	**2210**	**2280**	**2360**	**2470**	**2250**
22 gage	2.5	2530	2450	2520	2590	**2330**	**2100**	**1870**	**1640**	**1430**
4x4-W2.9xW2.9	3	3010	2910	2840	**2880**	**2940**	**2660**	**2360**	**2080**	**1820**
	3.5	3460	**3360**	**3270**	**3210**	**3250**	**3210**	**2900**	**2550**	**2250**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.14
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
3.0 x 12 x 20 gage (0.0358) Deck-Slab



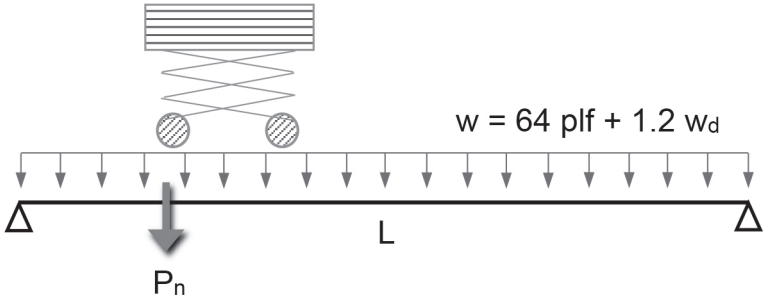
3.0 deck-slab + WWR	tc	Span, ft								
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
20 gage	2.5	1330	1330	1370	1410	1450	**1290**	**1120**	**970**	**820**
6x6-W2.1xW2.1	3	1570	1580	1620	1660	**1700**	**1670**	**1480**	**1290**	**1120**
	3.5	1730	1800	1860	**1910**	**1950**	**1990**	**1860**	**1650**	**1450**
20 gage	2.5	1810	1820	1870	1660	1470	**1290**	**1120**	**970**	**820**
6x6-W2.9xW2.9	3	2150	2150	2210	2110	**1880**	**1670**	**1480**	**1290**	**1120**
	3.5	2360	2470	2540	**2590**	**2320**	**2080**	**1860**	**1650**	**1450**
20 gage	2.5	2390	2130	1880	1660	1470	**1290**	**1120**	**970**	**820**
4x4-W2.9xW2.9	3	3000	2670	2370	2110	**1880**	**1670**	**1480**	**1290**	**1120**
	3.5	3480	3250	2900	**2590**	**2320**	**2080**	**1860**	**1650**	**1450**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.15
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
3.0 x 12 x 18 gage (0.0474) Deck-Slab



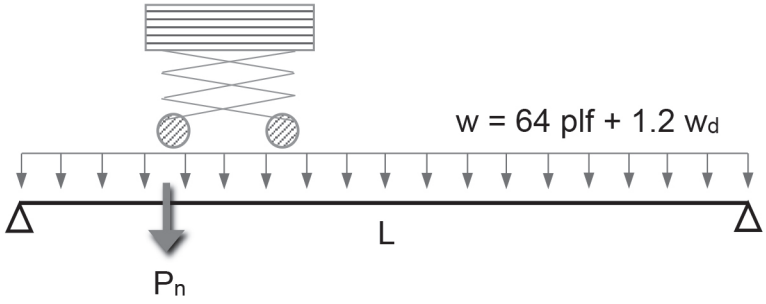
3.0 deck-slab + WWR	tc	Span, ft								
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
18 gage	2.5	1330	1330	1370	1410	1450	1490	1540	1570	1390
6x6-W2.1xW2.1	3	1570	1580	1620	1660	1700	1740	1780	1830	1820
	3.5	1730	1800	1860	1910	1950	1990	2030	2080	**2140**
18 gage	2.5	1810	1820	1870	1920	1980	1980	1760	1570	1390
6x6-W2.9xW2.9	3	2150	2150	2210	2270	2320	2380	2270	2040	1820
	3.5	2360	2470	2540	2610	2670	2730	2780	2540	**2290**
18 gage	2.5	2660	2670	2700	2430	2200	1980	1760	1570	1390
4x4-W2.9xW2.9	3	3160	3170	3260	3050	2760	2510	2270	2040	1820
	3.5	3480	3640	3750	3710	3370	3070	2800	2540	**2290**

Shaded cells require shoring with W2 = 20 psf or P = 150 lbs

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

TABLE 16.16
Maximum Nominal Scissor Lift Wheel Load, P_n lbs
3.0 x 12 x 16 gage (0.0598) Deck-Slab



3.0 deck-slab + WWR	tc	Span, ft								
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
16 gage	2.5	1330	1330	1370	1410	1450	1490	1540	1570	1620
6x6-W2.1xW2.1	3	1570	1580	1620	1660	1700	1740	1780	1830	1880
	3.5	1730	1800	1860	1910	1950	1990	2030	2080	2140
16 gage	2.5	1810	1820	1870	1920	1980	2030	2110	2150	1970
6x6-W2.9xW2.9	3	2150	2150	2210	2270	2320	2380	2430	2500	2530
	3.5	2360	2470	2540	2610	2670	2730	2780	2850	2940
16 gage	2.5	2660	2670	2740	2820	2900	2660	2410	2180	1970
4x4-W2.9xW2.9	3	3160	3170	3260	3330	3410	3350	3060	2780	2530
	3.5	3480	3640	3750	3850	3940	4030	3750	3440	3140

If load distribution per axle = 60/40, Lift + Platform = $\frac{2P_n}{60\%}$

If impact is 25%, Lift + Platform = $\frac{4P_n}{75\%}$

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EXAMPLES

SECTION 6

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Example 1: Unshored Construction Span Calculation

Given: Calculate the maximum unshored clear span for the three-span condition of 2 x 12, 20 gage deck, with a 4-1/2" total slab thickness. Use an Allowable Strength Design (ASD) solution.

The deck properties are as follows, as found in Tables 1 and 5:

2x12 composite deck; 20 gage (t = 0.0358"); F_y = 40 ksi

A_s = 0.537 in^2 / foot

I_p = 0.3765 in^4 / foot

I_n = 0.3671 in^4 / foot

S_p = 0.3246 in^3 / foot

S_n = 0.3295 in^3 / foot

M_p/Ω = 7775 inch-lbs / foot

M_n/Ω = 7892 inch-lbs / foot

V/Ω = 1496 lbs / foot

Web Crippling – One Flange End – 2" bearing R/Ω = 456 lbs / foot

Web Crippling – One Flange Interior – 4" bearing R/Ω = 804 lbs / foot

The concrete properties are as follows:

f'_c = 3000 psi; normal weight concrete, density = 145 pcf.

modular ratio, $n = E_s / E_c = 9$

Solution:

Refer to ANSI/SDI C-2017, Appendix 1 for construction loading critical cases:

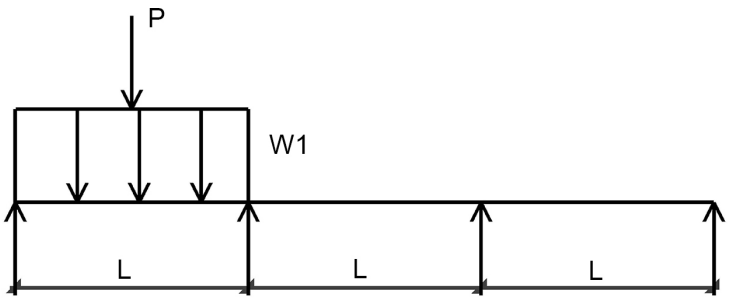
$P = P_{lc}$ = 150 lbs

$W1 = w_{dc} + w_{dd}$ = 44 + 1.8 = 45.8 psf

$W2 = w_{lc}$ = 20 psf

For Bending Moments and Shear:

Load Case 1

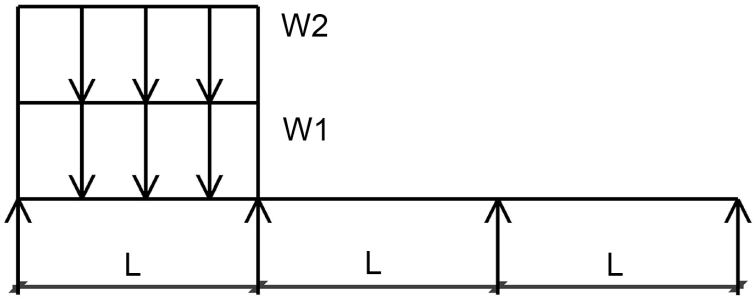


$$+M = 0.2PL + 0.094(W1)(L^2)$$

$$7775 = +M = 0.20(150)(L) + \frac{0.094(45.8)(L^2)}{12}$$

$$L = 108.7 \text{ in} = 9.06 \text{ ft}$$

Load Case 2

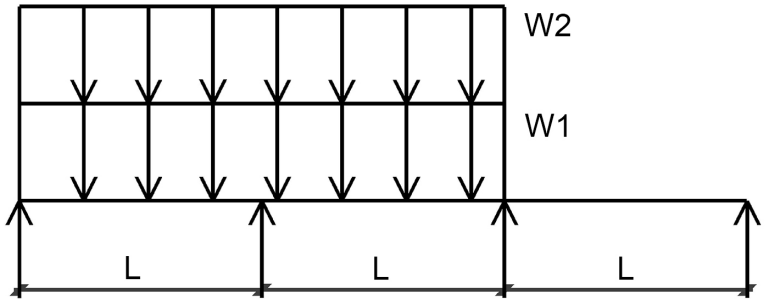


$$+M = 0.094(W1 + W2)(L^2)$$

$$7775 = -M = \frac{0.094L^2(45.8 + 20)}{12}$$

$$L = 122.8 \text{ in} = 10.23 \text{ ft}$$

Load Case 3



$$-M = 0.117(W1 + W2)(L^2)$$

$$7892 = -M = \frac{0.117L^2(45.8 + 20)}{12}$$

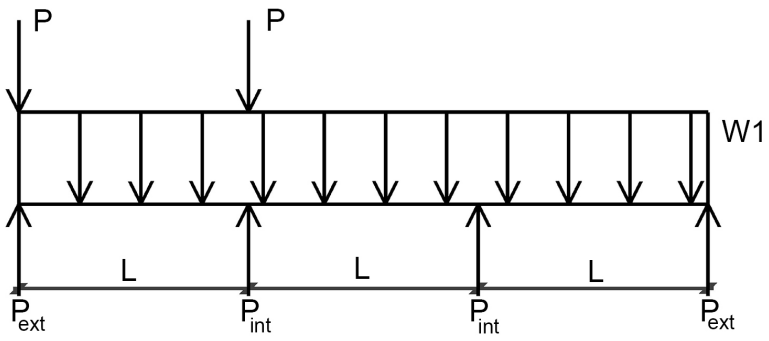
$$L = 110.09 \text{ in} = 9.24 \text{ ft}$$

$$V = 0.617(W1 + W2)L = 0.6(45.8 + 20)L = 1496$$

$$L = 36.85 \text{ ft}$$

For Support Reactions:

Load Case 4



$$P_{ext} = 0.4(W1)L + P$$

$$P_{int} = 1.1(W1)L + P$$

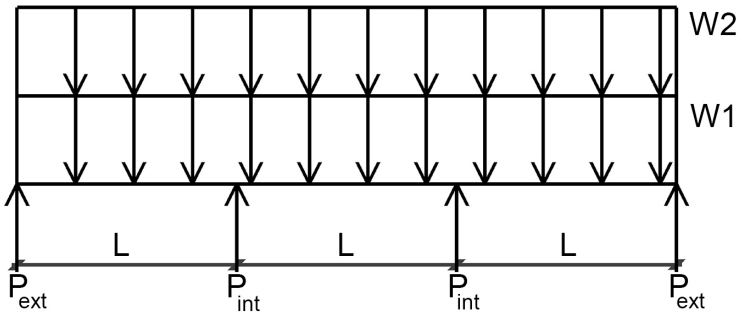
$$P_{int} = 1.1(W1)L + P = 1.1(45.8)L + 150 = 804$$

$$L = 13.04 \text{ ft}$$

$$R_{ext} = 0.4(W1)L + P = 0.4(45.8)L + 150 = 456$$

$$L = 16.75 \text{ ft}$$

Load Case 5



$$P_{ext} = 0.4(W1 + W2)L$$

$$P_{int} = 1.1(W1 + W2)L$$

$$P_{int} = 1.1(W1 + W2)L = 1.1(45.8 + 20)L = 804$$

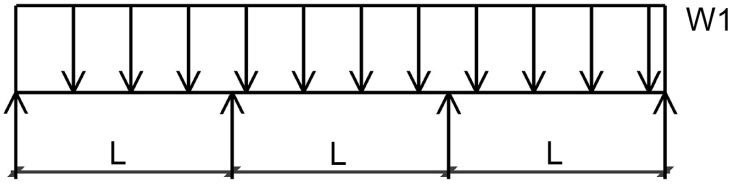
$$L = 11.15 \text{ ft}$$

$$P_{ext} = 0.4(W1 + W2)L = 0.4(45.8 + 20)L = 456$$

$$L = 17.36 \text{ ft}$$

For Deflections:

Load Case 6



$$\Delta = \frac{0.0069(W1)(L^4)}{EI_d}$$

$$\Delta_{max} = \frac{L}{180}$$

$$\Delta = \frac{Lx12}{180} = \frac{0.0069(45.8)\times L^4 \times (1728)}{29.5\times 10^6 \times \frac{(0.3765+0.3671)}{2}}$$

$$L = 11.02 \text{ ft}$$

$$\Delta_{max} = 0.75\text{in}$$

$$\Delta = 0.75 = \frac{0.0069(45.8)\times L^4 \times (1728)}{29.5\times 10^6 \times \frac{(0.3765+0.3671)}{2}}$$

$$L = 11.08 \text{ ft}$$

Looking at Load Case 3, shear alone will not control, but the interaction of shear and bending could. The AISI S-100 equation for interaction is:

$$\sqrt{\left(\frac{M_{applied}}{M_n/\Omega}\right)^2+\left(\frac{V_{applied}}{V_n/\Omega}\right)^2}\le 1.0 \qquad \text{(AISI S100, Equation H2-1)}$$

$$M_{applied}=0.117\times L^2\left(45.8+20\right)\times 12=92.38L^2\ \text{in}-\text{lb}$$

$$V_{applied}=0.617L\left(45.8+20\right)=40.60L$$

$$\sqrt{\left(\frac{92.38L^2}{7892}\right)^2+\left(\frac{40.60L}{1496}\right)^2}=1.0$$

$$L=9.10\ \text{ft}$$

These “hand” calculations show the maximum unshored span is 9’-1” and controlled by positive bending. The computer generated tables show a maximum unshored span of 9’-2”.

Example 2: Unshored Construction Span Calculation for Unequal Spans

Given: 2 x 12, 20 gage deck, with a 4-1/2" total slab thickness is installed on a three-span condition with unequal spans of 10'-0" / 4'-0" / 10'-0" on beams with flange widths of 6 inches without shoring. Are the construction clear spans of 9'-6" / 3'-6" / 9'-6" acceptable? Use an Allowable Strength Design (ASD) solution.

The deck properties are as follows, as found in Tables 1 and 5:

2x12 composite deck; 20 gage (t = 0.0358"); F_y = 40 ksi

A_s = 0.537 in^2 / foot

I_p = 0.3765 in^4 / foot

I_n = 0.3671 in^4 / foot

S_p = 0.3246 in^3 / foot

S_n = 0.3295 in^3 / foot

M_p/Ω = 7775 inch-lbs / foot

M_n/Ω = 7892 inch-lbs / foot

V/Ω = 1496 lbs / foot

Solution:

Web Crippling is Calculated using Table 5B with End Bearing = 3" and Interior Bearing = 6"

OFE N = 3" A = 270 B = 1.32 Ω = 1.70

$$P_n = A(1 + B\sqrt{N}) = 270(1 + 1.32\sqrt{3}) = 887$$

P_n/Ω = 887 / 1.70 = 522 lbs

TFE N = 3" A = 392 B = 0.74 Ω = 1.80

$$P_n = A(1 + B\sqrt{N}) = 392(1 + 0.74\sqrt{3}) = 1288$$

P_n/Ω = 1288 / 1.80 = 716 lbs

OFI N = 6" A = 503 B = 0.90 Ω = 1.75

$$P_n = A(1 + B\sqrt{N}) = 503(1 + 0.90\sqrt{6}) = 1612$$

P_n/Ω = 1612 / 1.75 = 921 lbs

TFI N = 6" A = 537 B = 1.11 Ω = 1.75

$$P_n = A(1 + B\sqrt{N}) = 537(1 + 1.11\sqrt{6}) = 1997$$

P_n/Ω = 1997 / 1.75 = 1141 lbs

The concrete properties are as follows:

f'_c = 3000 psi; normal weight concrete, density = 145 pcf.

modular ratio, $n = E_s / E_c = 9$

Refer to ANSI/SDI C-2017, Appendix 1 for construction loading diagrams. Rational structural analysis using continuous beam software was used to generate moments, shears, reactions, and deflections for these Load Cases. Note that because the spans are not equal, the equations contained in Appendix 1 are not applicable.

The moment and shear values reported here are at the center of the supports, and are conservative. The values for moment and shear at the edge of the supporting beams (3 inches from the centerline) could be used.

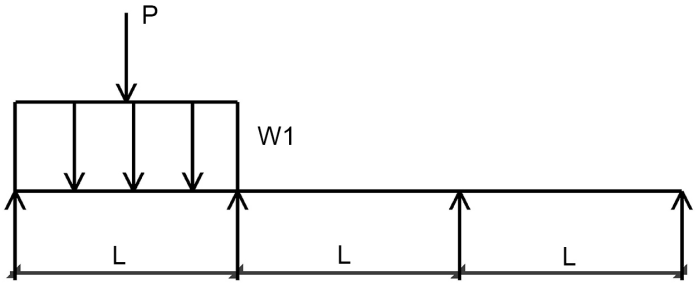
$P = P_{lc}$ = 150 lbs

$W1 = w_{dc} + w_{dd}$ = 1.8 + 44 = 45.8 psf

$W2 = w_{lc}$ = 20 psf

For Bending Moments and Shear:

Load Case 1



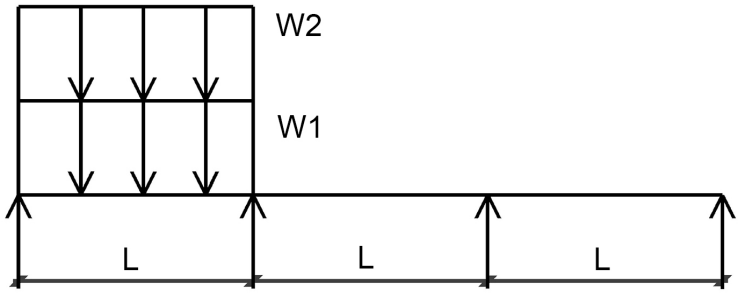
V = 336 lbs at second support

M+ = 7632 in-lbs at 5 feet from first support

(Controls and is less than allowable of 7775 in-lbs)

M- = 7464 in-lbs at second support

Load Case 2

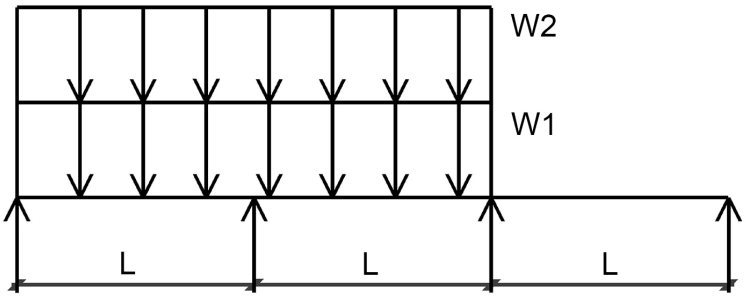


V = 389 lbs at second support

M+ = 6588 in-lbs at 4 feet from first support

M- = 7200 in-lbs at second support

Load Case 3



V = 392 lbs at second support

(Controls and is less than allowable of 1496 lbs)

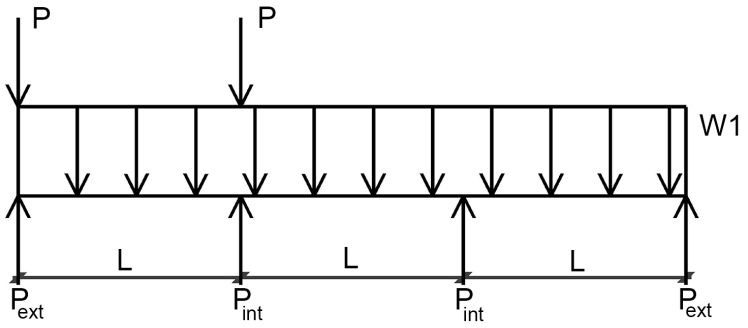
M+ = 6432 in-lbs at 4 feet from first support

M- = 7608 in-lbs at second support

(Controls and is less than allowable of 7892 in-lbs)

For Support Reactions:

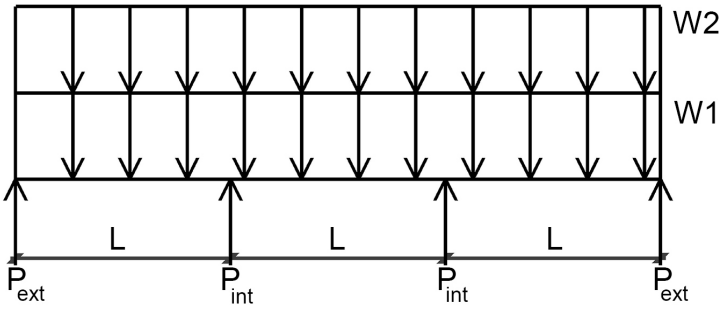
Load Case 4



P_{ext} = 274 lbs (Controls for Two Flange End – TFE and is less than allowable of 716 lbs)

P_{int} = 525 lbs (Controls for Two Flange Interior – TFI and is less than allowable of 1141 lbs)

Load Case 5

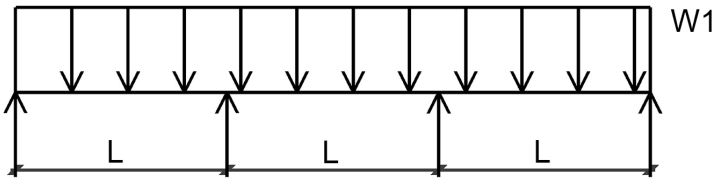


R_{ext} = 191 lbs (Controls for One Flange End – OFE and is less than allowable of 522 lbs)

R_{int} = 358 lbs (Controls for One Flange Interior – OFI and is less than allowable of 921 lbs)

For Deflections:

Load Case 6



Deflection = 0.21 inches = L/566

(Limit is lesser of 0.75 inches and L/180 - OK)

Looking at Load Case 3, shear alone will not control, but the interaction of shear and bending could. The AISI S-100 equation for interaction is:

$$\sqrt{\left(\frac{M_{applied}}{M_n/\Omega}\right)^2 + \left(\frac{V_{applied}}{V_n/\Omega}\right)^2} \leq 1.0$$

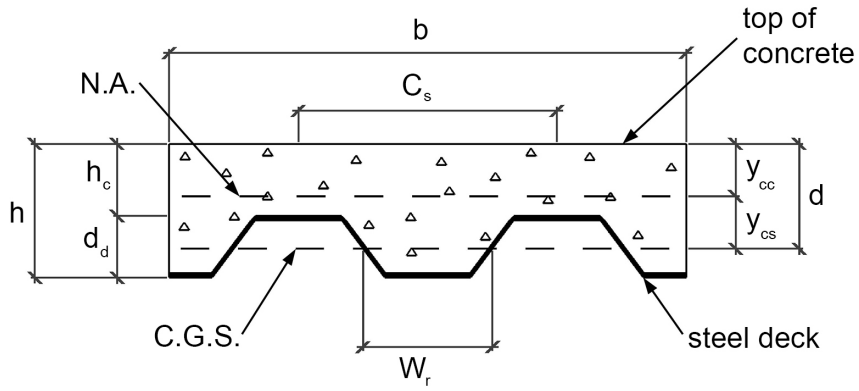
$$\sqrt{\left(\frac{7608}{7892}\right)^2 + \left(\frac{392}{1496}\right)^2} = 0.998 - \text{OK}$$

If the bending/shear interaction check failed slightly, it could have been rechecked using the lower moment and lower shear at the face of the supports.

These calculations show that the clear span of 9'-6" meets the requirements for construction loadings.

Example 3: Composite Section Properties

Given: Calculate the composite section properties and the allowable uniform load for the deck slab combination of Example 1. The clear span is 9 ft. No negative bending reinforcement is used over the beams, so the composite slab will be a simple span. A_s and I are per foot of width. Determine the "cracked" I. This calculation is the standard calculation that assumes all concrete below the neutral axis is cracked. The concrete is transformed into equivalent steel.



A_s = 0.537 in^2

I_{sf}= 0.3765 in^4

C.G.S. = Centroidal neutral axis of full, unreduced cross section of steel deck, in.

N.A. = Neutral axis of transformed composite section

C_s	=	Pitch of deck ribs, in.	= 12 inches
W_r	=	Average deck rib width, in.	= 6 inches
d_d	=	depth of deck, in.	= 2 inches
h	=	overall slab depth, in.	= 4.5 inches
h_c	=	Depth of concrete above steel deck, in.	= 2.5 inches

Solution:

Moment of Inertia of the cracked cross section:

For the cracked moment of inertia:

$$y_{cc} = d\left\{\sqrt{2\rho n + (\rho n)^2} - \rho n\right\} \le h_c \qquad \text{(ANSI/SDI C-2017 Eq. A4-1)}$$

$$= 3.50\left\{\sqrt{(2)(0.01278)(9) + \left[(0.01278)(9)\right]^2} - (0.01278)(9)\right\} = 1.32 \text{ in}$$

Where:

ρ = $\dfrac{A_s}{bd} = \dfrac{0.537}{(12)(3.5)} = 0.01278$

A_s = area of steel deck per unit slab width, in.^{2} = 0.537 in^2

b = unit slab width, 12 inches in imperial units = 12 inches

d = distance from top of concrete to centroid of steel deck
= 3.50 inches

n = modular ratio = $\dfrac{E_s}{E_c} = 9$

E_s = 29,500 ksi

E_c = modulus of elasticity of concrete

E_c = $(w_c)^{1.5}(f'_c)^{0.5}$ ksi

w_c = Concrete unit weight, pcf

f'_c = Concrete strength, ksi

y_{cs} = d - y_{cc} where y_{cc} is determined from ANSI/SDI C-2017 Eq. A4-1
= 3.50 – 1.32 = 2.18 inches

The cracked moment of inertia transformed to steel, I_{cr}, shall be calculated using ANSI/SDI C-2017 Eq. A4-2:

$$I_{cr} = \frac{b}{3n}(y_{cc})^3 + A_s(y_{cs})^2 + I_{sf}$$

$$= \frac{12}{3(9)}(1.32)^3 + (0.537)(2.18)^2 + 0.3765 = 3.95 \text{ in}^4$$

Where:

I_{sf} = moment of inertia of the full (unreduced) steel deck per unit slab width,
= 0.3765 in^4

Moment of Inertia of the Uncracked Section

For the uncracked moment of inertia:

$$y_{cc} = \frac{0.5(b)(h_c)^2 + nA_s d + W_r d_d (h - 0.5d_d)\frac{b}{C_s}}{bh_c + nA_s + W_r d_d \frac{b}{C_s}} \quad \text{(ANSI/SDI C-2017 Eq. A5-3)}$$

$$= \frac{0.5(12)(2.5)^2 + 9(0.537)(3.50) + (6)(2)(4.5-1)\left(\frac{12}{12}\right)}{(12)(2.5) + (9)(0.537) + (6)(2)\left(\frac{12}{12}\right)} = 2.06 \text{ in}$$

The uncracked moment of inertia transformed to steel, I_u, is calculated using ANSI/SDI C-2017 Eq. A5-4.

y_{cs} = d - y_{cc} where y_{cc} shall be determined from Equation A5-3.

= 3.50 – 2.06 = 1.44 inches

I_u =

$$\frac{b(h_c)^3}{12n} + \frac{bh_c}{n}(y_{cc} - 0.5h_c)^2 + I_{sf} + A_s(y_{cs})^2 + \frac{W_r bd_d}{nC_s}\left[\frac{d_d{}^2}{12} + (h - y_{cc} - 0.5d_d)^2\right]$$

$$\frac{12(2.5)^3}{12(9)} + \frac{12(2.5)}{9}(2.06 - 1.25)^2 + 0.3765 + 0.537(1.44)^2 + \frac{6(12)(2)}{9(12)}\left[\frac{2^2}{12} + (4.5 - 2.06 - 1)^2\right]$$

= 8.62 in^4

Moment of Inertia of the Composite Section

The moment of inertia of the composite section considered effective for deflection computations is calculated by ANSI/SDI C-2017 Eq. A5-5.

$$I_d = \frac{I_u + I_{cr}}{2}$$

$$= \frac{8.62 + 3.95}{2} = 6.28 \text{ in}^4$$

Example 4: Concentrated Load

Given: Check the ability of the composite deck-slab from Example 1 to carry a 2000 lbs concentrated live load over an area of 4.5" x 4.5"; the load can occur at any location in the span. No other live load will be acting at the same time. Assume that there is no negative bending reinforcing steel in the slab over the supports. Solve using LRFD.

(1) Design Loads:

(a) Dead Load $W_{DL} = W_{concrete} + W_{deck} = 46$ psf

(b) Construction Live Load = $W_{LL, const} = 20$ psf

(c) Total Construction Load = $W_{const} = W_{DL} + W_{LL, const} = 66$ psf

(d) Concentrated Live Load = P = 2000 lbs (non-concurrent with uniform live load)

(e) Uniform Live Load = $W_{LL} = 100$ psf (non-concurrent with concentrated live load)

(2) Deck Properties:

(a) Deck Type: 2" x 12" x 20 gage

(b) $F_y = 40$ ksi

(c) Slab depth, h = 4.5 inches

(d) Concrete Thickness, $t_c = 2.5$ inches

(e) Concrete Compressive Strength, $f'_c = 3000$ psi

(f) Concrete Unit Weight, $\gamma_c = 145$pcf

(g) Clear Span (minimum 3 span condition), L = 9 ft

(h) Concentrated Load footprint, $b_2 = b_3 = 4.5$ inches

Solution:

Since there is no reinforcing steel, the composite slab is considered to be a simple span.

$$b_m = b_2 + 2t_c + 2t_t \qquad \text{(ANSI/SDI C-2017 Eq. 2.4.10)}$$

Where t_c is concrete cover over the top of the deck, and t_t is the thickness of any topping above structural concrete.

h is the total deck-slab thickness exclusive of the topping

In this case:

h = 4.5 inches

$t_c = 2.5$ inches

t_t = 0 inches

b_m = 4.5 + 2(2.25) + 0 = 9.5 inches

For moment, and for determining the distribution steel, put the load in the center of the span.

$$b_e = b_m + 2\left(1 - \frac{x}{L}\right)(x)$$ (ANSI/SDI C-2017 Eq. 2.4.11)

Where x is the location of the load, which is $\frac{L}{2}$

$$b_e = 9.5 + 2\left(1 - \frac{54}{108}\right)(54) = 63.5 \text{ in}$$

But b_e is not to exceed $106.8\left(\frac{t_c}{h}\right)$ in inches.

$$106.8\left(\frac{2.5}{4.5}\right) = 59 \text{ in}$$

b_e = 59 inches

For checking vertical shear, put the load one slab depth away from the beam, (x = h)

$$b_{ve} = b_m + \left(1 - \frac{h}{L}\right)(x) = 9.5 + \left(1 - \frac{4.5}{108}\right)(4.5) = 13.8 \text{ in} \le 59 \text{ in}$$

For moment use b_e = 59 inches, and for shear use b_{ve} = 13.8 inches

Determine Design Shear Strength

b_{ve} = 13.8 inches

Unfactored concentrated load per foot of deck-slab width, developed by P, plf

$$w_{pv} = \frac{P}{b_{ve}} = 1739.13 \text{ plf}$$

Total factored shear,

$V_u = 1.2(W_{DL})L + 1.6(W_{pv}) = (1.2 \times 46 \times 9) + (1.6 \times 1739) = 3279$ plf

ΦV_n = 4716 plf (Table 8)

4716 plf ≥ 3279 plf OK

Determine Design Bending Strength for the composite deck-slab.

b_e = 59 inches

Unfactored Uniform Load developed by $P_1 w_{pb} = \frac{P}{b_e} = \frac{2000}{\left(\frac{59}{12}\right)} = 406.78$ plf

Total factored positive moment near mid-span, calculated as a simple span :

$M_{pos(P)}$ = $0.125(1.2W_{DL})(L^2) + 0.25(1.6W_{pb})(L) = 0.125(1.2 \times 46 \times 9^2)$
+ $0.25(1.6 \times 407 \times 9)$

$M_{pos(P)}$ = 2024 ft-lbs

$M_{pos(WLL)}$ = $0.125(1.2W_{DL} + 1.6W_{LL})(L^2)$

= $0.125(1.2 \times 46 + 1.6 \times 100)(9^2)$

$M_{pos(WLL)}$ = 2179 ft-lbs

ΦM_y = 42.3 in-kips = 3525 ft-lb (Table 4)

3525 ≥ 2179 ft-lbs OK

Required Distribution Steel

Weak-axis moment to be resisted by distribution steel at midspan:

$W = \frac{L}{2} + b_3 = 58.5$ in ≤ 108 in (ANSI/SDI C-2017 Eq. 2.4.14)

b_e = 59 in

$$M_{weakaxis} = \frac{12Pb_2}{15w} = \frac{12(1.6)(2000)(59)}{15(58.5)} = 2583 \text{ in} - \text{lbs / ft}$$

Try 6 x 6 – W2.1 x W2.1 welded wire reinforcement

A_s = 0.042 in^2/ft

b = 12 in

d = $t_c/2$ = 1.25 in (assumed at mid-depth of slab)

$$a = \frac{F_y A_s}{\Phi(b)(f'_c)} = \frac{60(0.042)}{0.90(12)(3)} = 0.078 \text{ in}$$

$$\Phi M_n = \Phi F_y A_s \left(d - \frac{a}{2}\right) = 0.90(60)(0.042)\left(1.25 - \frac{0.078}{2}\right) = 2.746 \text{ in} - \text{kips / ft}$$

2583 in-lbs/ft < 2746 inch-lbs/ft OK

Determine Deflection

Average moment of inertia for positive region:

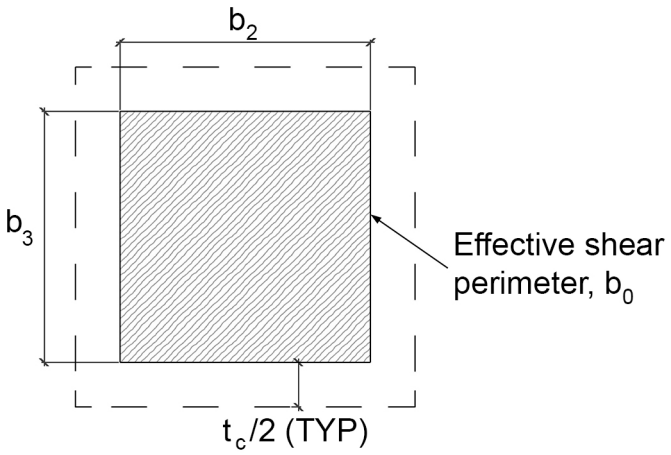
I_d = 6.23 in^4 (Table 3C)

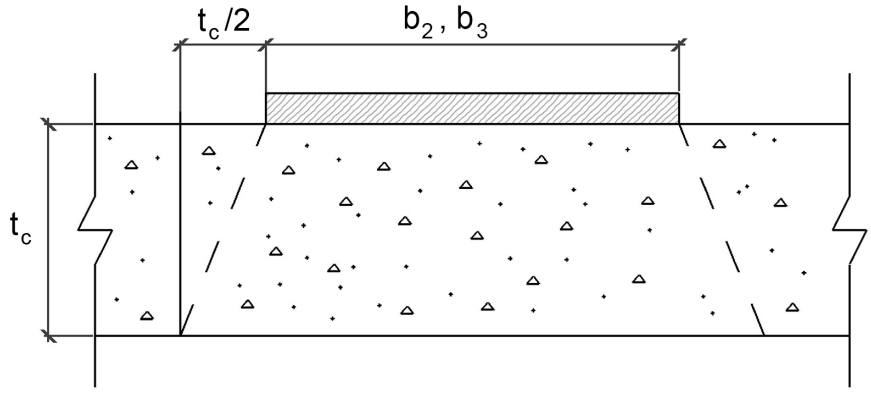
Deflection due to concentrated load at midspan:

$$\Delta = \frac{w_{pb}L^3}{48E_sI_d} = \frac{406.78\left(108^3\right)}{48\left(29{,}500{,}000\right)\left(6.23\right)} = 0.058 \text{ in}$$

$$\frac{L}{\Delta} = 1862 \quad \text{OK}$$

Punching Shear Near Beam





$b_2 = b_3 = 4.5$ inches

$t_c = h_c = 2.5$ inches

$f'_c = 3000$ psi

ANSI/SDI C-2017, Section 2.4B.10, provides the punching shear resistance as:

$$V_{pr} = \left(2 + {}^{4}\!/_{\beta_c}\right)\Phi_v\sqrt{f'_c}\,b_o h_c \le 4\Phi_v\sqrt{f'_c}\,b_o h_c \qquad \text{(ANSI/SDI C-2017 Eq. 2.4.9a)}$$

β_c = ratio of long side to short side of concentrated load

= 4.5/4.5 = 1.0

ANSI/SDI C-2017 (Section 2.4.B.10) states the effective shear perimeter need not approach closer than $\frac{t_c}{2}$ to the edge of the applied load.

$b_o = 2(b_2+t_c) + 2(b_3+t_c) = 2(4.5+2.5) + 2(4.5+2.5) = 28$ inches

The permitted shear is:

$$V_{pr} = \left(2 + {}^{4}\!/_{1}\right)0.75\sqrt{3000}\,(28)(2.5) \le 4(0.75)\sqrt{3000}\,(28)(2.5) = 11502 \text{ lbs}$$

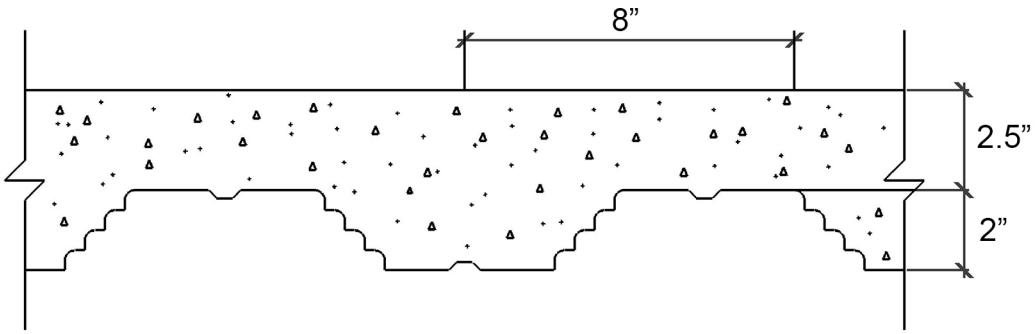
1.6 P = 1.6(2000) = 3200 lbs < 11502 lbs OK

Results:

Slab:	4.5 inch normalweight concrete, f'_c = 3 ksi
Deck:	2 x 12 x 20 gage, F_y = 40 ksi
Distribution Steel	6 x 6 – W2.1 x W2.1 WWR, located at slab mid-depth

Example 5: Wall Load Parallel to Deck Span

Given: Check the adequacy of a 4.5 inch total slab thickness on 2" x 12" x 18 gage composite deck for carrying an 8 inch CMU wall running parallel to the deck ribs. The 10 ft high wall is installed over the entire 8 ft. clear deck span which. The wall weighs 50 psf. No negative bending reinforcing is used in the slab (consider the slab as single span).



Solution:

From the Tables:

ΦM_y = 54.35 inch-kips (Table 4C)

ΦV_n = 5361 lbs/ft (Table 8B)

$W_{concrete}$ = 44 psf

W_{deck} = 1.8 psf

W_{DL} = 44 + 1.8 = 45.8 Use 46 psf (Table 2E)

$b_m = b_2 + 2t_c + t_t = 8 + 2(2.5) + 0 = 13$ inches

To calculate b_e for a line load on a deck-slab locate x at the quarter-point of the span wall. (x = L/4 = 24 inches)

Single span case:

$$b_e = b_m + 2\left(1 - \frac{x}{L}\right)(x) = 13 + 2(1 - 0.25)(24) = 49 \text{ in}$$

But b_e is not to exceed:

$$8.9\left(\frac{2.5}{4.5}\right)(12) = 59 \text{ in}$$

Use b_e = 49 in

W is the load distribution width parallel to the ribs. In this case, since the wall spans the entire distance between beams, W = 96 inches.

Determine the total service level superimposed uniform load, W_L, that can be supported by the composite slab:

W_L = total service level superimposed uniform load on the slab

$$\Phi_s M_y = \frac{(1.6w_l + 1.2W_{DL})(L)^2(12)}{8} = \frac{(1.6w_l + 1.2\times 46)(8)^2(12)}{8} = 54.350 \text{ in} - \text{kips}$$

Solving for W_L provides W_L = 319 psf

The 10 ft high wall is dead load, and 10 x 50 = 500 plf. The distributed wall load is:

$$500 \times \frac{12}{49} = 122 \text{ psf} \le 319 \qquad \text{OK}$$

The previous check shows the composite slab is more than adequate for carrying the wall, so solve for the allowable live load that the composite slab can carry in addition to carrying the wall:

$$54350 = \frac{\left[1.6W_{LL} + 1.2(46 + 122)\right](8)^2(12)}{8}$$

W_{LL} = 228 psf

If the design load on the slab is 80 psf (a typical code office load) then the slab has an overcapacity of 228 – 80 = 148 psf. Since the wall may transmit loads from an upper floor or roof, the available service level capacity for live load surcharge would be:

$$\frac{(49\times 12)(148)}{144} = 604 \text{ plf}$$

Rigid walls, such as those made by concrete blocks, will “arch”. If the Designer wants to take advantage of arching, use an appropriate rational model.

Check the adequacy of the SDI minimum temperature and shrinkage welded wire reinforcing (WWR) (ANSI/SDI C-2017, Section 2.4.B.15) as transverse reinforcing. The weak direction moment is:

$$M_{wa} = \frac{12Pb_e}{15W}$$

Consider that the weight of the wall is distributing and there is no surcharge on the wall.

P = 500(8) = 4000 lbs

$$M_{wa} = \frac{12Pb_e}{15W} = \frac{12(4000)(49)}{(15)(96)}$$

$$M_{wa} = 1632 \text{ in} - \text{lbs / ft}$$

Assume the 6 x 6 - W2.1 x W2.1 WWR is located at mid-depth of the concrete above the deck, so that d is 2.5 inch/2 = 1.25 inches

$$a = \frac{A_s F_y}{0.85(f'_c)(b)}$$

Where F_y of WWR is taken as 60 ksi

A_s is 0.042 in^2/ft

b in the equation is 12 inches (per ft)

$$a = \frac{A_s F_y}{0.85(f'_c)(b)} = \frac{0.042(60000)}{(0.85 \times 3000 \times 12)} = 0.082 \text{ in}$$

The weak direction moment capacity is then:

$$\Phi M_{wa} = 0.90 A_s F_y \left(d - \frac{a}{2} \right)$$

$$\Phi M_{wa} = 0.90(0.042)(60000)\left(1.25 - \frac{0.082}{2} \right) = 2741 \text{ in} - \text{lbs}$$

1632 x 1.2 = 1958 inch-lbs ≤ 2741 inch-lbs

If a surcharge is on the wall, additional reinforcing could be needed.

Check shear:

ΦV_n = 5361 lbs

If the wall load plus the 80 psf live load is present:

$$b_e \text{ for shear (x is at quarter point)} = b_m + \left(1 - \frac{x}{L}\right)(x)$$

b_e = 13 + 0.75 x 24 = 31 inches

$$V_{applied} = \frac{\left[1.6(80) + 1.2\left(500 \times \frac{12}{31} + 144\right)\right](8)}{2} = 1652 \text{ lbs} \le 5361 \text{ lbs} \quad \text{OK}$$

If there were a surcharge on the wall it would also need to be considered in the shear calculation.

Example 6: Composite Floor Slab with a Line Load Perpendicular to Span

Given: Design a composite steel floor deck with a clear span of 10'-0" to support an 80 psf live load and a 650 plf concentrated line dead load. The line load runs perpendicular to the deck span and is located 2 ft from the left support. Concrete strength is f'_c = 3000 psi.

Solution:

(1) Lightweight concrete with a thickness of 3.25" above the deck is selected for fire rating purposes.

(2) Try a 3 x 12, 20 gage, 40 ksi composite deck. From Table 6P, it can be seen that the weight of the slab and deck is 46 psf, and the deck can support a factored LRFD uniform load of 361 psf. Per Table 2H, the 3-span construction span for this deck is 11'-10".

(3) Determine if the deck can safely support a uniform live load of 80 psf and a uniform dead load of 46 psf, with the concentrated line load of 650 plf:

Factored uniform load	=	[1.2(46) + 1.6(80)]	=	183.2 psf
Factored concentrated load	=	1.2(650)	=	780 pounds
Factored left reaction	=	(183.2)(5) + (780)(8/10)	=	1540 lbs
Factored right reaction	=	(183.2)(5) + (780)(2/10)	=	1072 lbs

Using statics the point of zero shear is located 5.85 ft from the right support. This is the location of the maximum design moment:

Factored design moment = (0.5)(5.85)(1072) = 3136 ft-lbs = 37.63 in-k

The factored yield moment for this deck-slab (Table 4D) is 62.36 inch-kips.

Check the deck-slab for shear

The line load is continuous thus b_e = 12 inches and V = 1540 lbs/ft (left reaction)

Per Table 8C, ΦV_n = 5664 lbs/ft

Therefore the 3 x 12, 20 gage deck is adequate.

Example 7: Form Deck and Slab Design

Given: Design a form deck and concrete slab for a three-span condition where the clear span is 4'-8". The design superimposed live load is 100 psf. The deck will be galvanized, so the concrete slab will be designed for only the superimposed live loads.

The slab must be able to provide a 2 hour fire separation. The concrete is 3000 psi normal weight concrete with siliceous aggregate.

Solution:

Check fire separation:

Per Table 13, the minimum required equivalent thickness is 5.0 inches.

Using 1.5 x 6 deck, a total slab thickness of 5.75 inches will provide an equivalent thickness of 5.1 inches.

Check construction spans:

Per Table 2M, a 22 gage deck will span 5'-7" with a 5.5 inch total slab thickness and 5'-4" with a 6 inch total slab thickness. By interpolation, the allowable construction span is 5'-5 1/2".

Slab design:

The thickness of the deck is:

5.75 – 1.50 = 4.25 inches

Assume the reinforcing is centered in this thickness.

Referring to Table 7A, a 6 x 6 – W2.1 x W2.1 WWR will carry the following superimposed allowable loads on a 5'-0" span.

t = 4 inches, w = 111 psf

t = 4.5 inches, w = 125 psf

By observation the 6 x 6 – W2.1 x W2.1 WWR is adequate for strength, but does not meet ACI318-14 temperature and shrinkage steel requirements. If this is required, use 4 x 4 – W4.0 x W4.0 WWR.

Alternately, this slab can be designed directly as a reinforced concrete slab.

$$M_u = (1.6)\left(\frac{wL^2}{10}\right) = (1.6)\left(\frac{100(4.67)^2}{10}\right) = 349 \text{ ft} - \text{lbs} = 4187 \text{ in} - \text{lbs}$$

If A_s = 0.035 inch^2/ft

$$\Phi M_n = \Phi A_s F_y\left(d - \frac{a}{2}\right) = 0.90(0.035)(60)\left(2.25 - \frac{0.07}{2}\right) = 4187 \text{ in} - \text{lbs} \qquad \text{OK}$$

Use 6 x 6 – W2.1 x W2.1 WWR (A_s = 0.042 inch^2/ft)

Example 8: Negative Moment Reinforcing for Continuous Spans

Given: 3 span, 2", 20 gage composite deck on equal spans of 8'-0". Total slab thickness is 5". Concrete f'_c = 3000 psi. Superimposed uniform service load is 100 psf. Design negative moment reinforcing over supports to enable composite deck-slab to act as three continuous spans.

Solution:

Using ACI 318-14 moment equations found in Section 6.5, the negative moment at the first interior support is:

$$M_u = \frac{w_u \ell^2}{10} M$$

$W_u = 1.6(100) = 160$ psf

$$M_u = \frac{160(8)^2}{10} = 1024 \text{ ft} - \text{lb / ft}$$

Assume that reinforcing is located 1" from top of slab.

Solution Option A:

Assume only the concrete above the top of the deck is used. Using reinforced concrete theory:

d = 2"

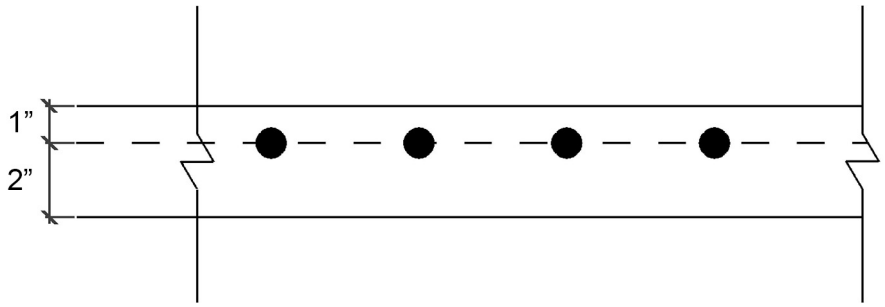
b = 12"

a = 0.27"

$$A_{s_{strength}} = 0.12 \frac{in^2}{ft} \quad \leftarrow \text{Controls}$$

$$A_{s_{min}} = 0.08 \frac{in^2}{ft}$$

Use W4.0xW4.0 – 4 x 4 WWR ($0.12 \frac{in^2}{ft}$)



Solution Option B:

Assume the concrete between the deck ribs acts in compression.

d = 4”

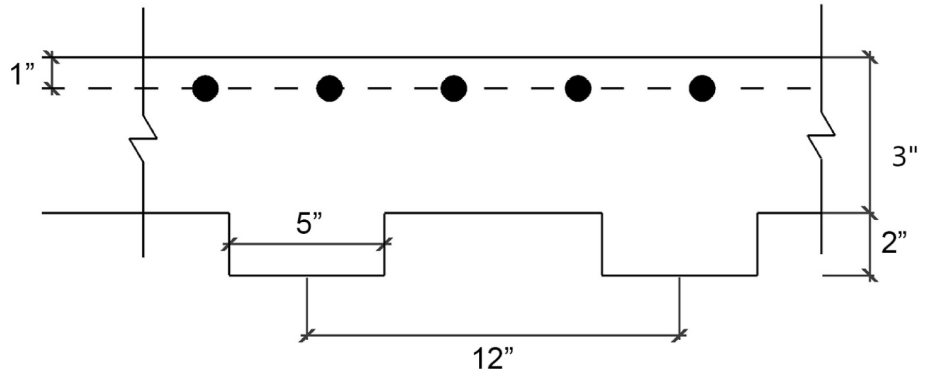
b = 12”

a = 0.24”

$$A_{s_{strength}} = 0.06\frac{in^2}{ft}$$

$$A_{s_{min}} = 0.07\frac{in^2}{ft} \qquad \leftarrow \text{Controls}$$

Use W4.0 x W4.0 – 6 x 6 WWR (A_s= $0.07\frac{in^2}{ft}$)



For either solution, suggested concrete industry practices (*Simplified Design of Reinforced Concrete Buildings of Moderate Size and Height*, Portland Cement Association) indicate that this negative reinforcing extend 30% of the span length in to the spans beyond the face of support.

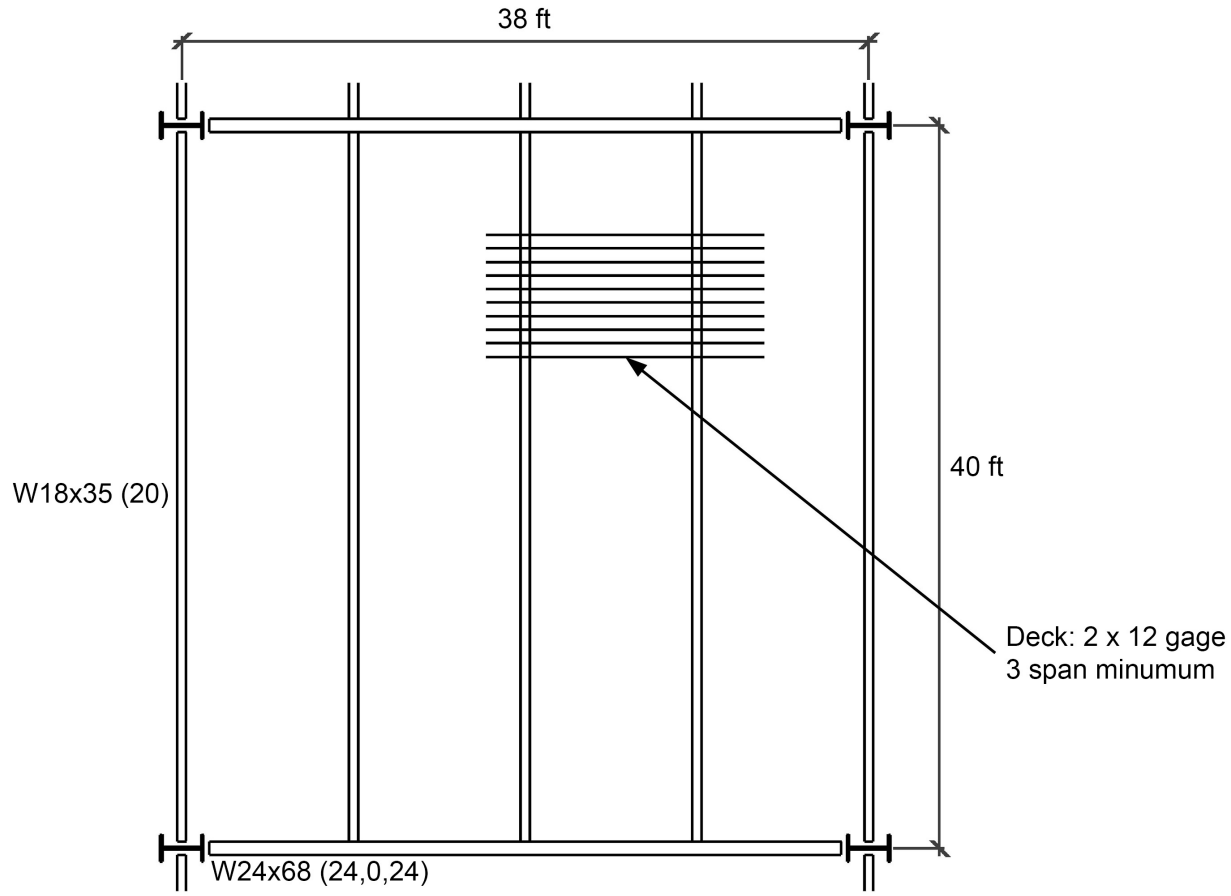
Assuming an 8” supporting beam flange:

$$(0.30)(8') \times 2 + \frac{8}{12} = 5.47 \text{ ft}$$

Install 6 ft wide WWR, centered on supporting beam. Note that while this may reduce negative moment cracking over the support, it will not completely eliminate this cracking.

Example 9: Flexural Cracking

Given: Floor system shown in the following diagram. Concrete is 3000 psi and normal weight (145 pcf). Concrete depth over deck is 2.5 inches, total depth is 4.5 inches. Deck is 2 x 12 x 20 gage. Investigate concrete cracking due to flexure.



Solution:

Check flexure over W18 x 35 beams.

From Example 3,

I_u = 8.62inch^4

Y_{cc} = 2.06 inches (distance from top of slab to elastic neutral axis)

The uncracked moment of inertia, I_u, is calculated relative to the steel stiffness.

To convert this to a value relative to concrete stiffness:

I_{uc} = I_u x n = 8.62 x 9 = 77.6 inch^4

$$S_{xc} = \frac{I_{uc}}{y_{cc}} = \frac{77.6}{2.06} = 37.7 \text{ in}^3$$

Per ACI 318-14, the modulus of rupture of concrete may be calculated as follows:

$$f_r = 7.5\sqrt{f'_c} = 7.5\sqrt{3000} = 411 \text{ psi} \quad \text{(ACI 318 Eq. 19.2.3.1)}$$

Conservatively, the moment of inertia of the deck-slab can be calculated without the contribution of the deck. Setting $I_D = 0$, $A_s = 0$ and n = 1:

I_{uc} = 63.02 inch^4

Y_{cc} = 1.89 inches

$$S_{xc} = \frac{I_{uc}}{y_{cc}} = \frac{63.02}{1.89} = 33.3 \text{ in}^4$$

For this example, the contribution of the deck will be ignored. The W18 x 35 beams have a flange width of 6 inches, resulting in a deck clear span of 9 ft. Prior to cracking of the concrete, assume the deck-slab is continuous over the beams, therefore:

$$M_{neg} = \frac{wL^2}{10}$$

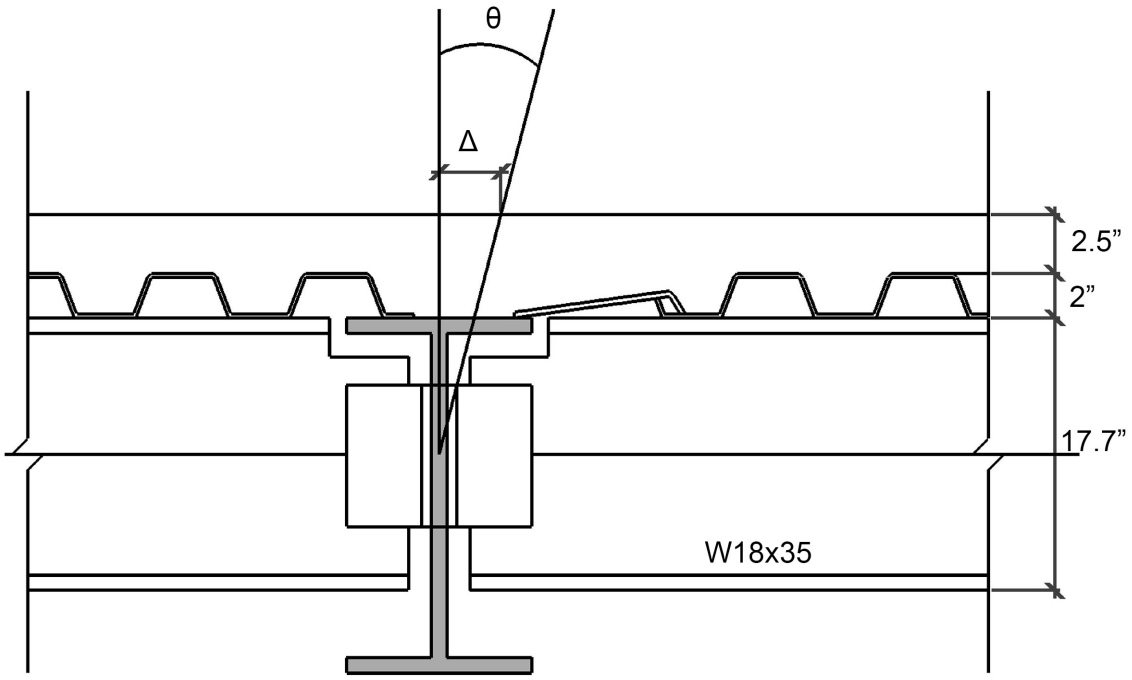
The slab design live load was 60 psf. If we assume full superimposed live load on the slab, then:

$$M = \frac{wL^2}{10} = \frac{60(9)^2}{10} = 486 \text{ ft} - \text{lbs / ft} = 5832 \text{ in} - \text{lbs / ft}$$

$$f_b = \frac{M}{S} = \frac{5832}{33.3} = 175 \text{ psi}$$

Since $f_b << f_r$, it is unlikely that the slab will crack under full superimposed live load.

Check flexure over girders.



The rotation at the end of a simply supported beam is:

$$\Theta = \frac{wL^3}{24EI}$$

For the $W18 \times 35$ composite beam

I_{tr} = 1277 inch^4

E = 29000 ksi

L = 40 ft

If we assume a partial superimposed live load of 20 psf, with the beams at 9.5 ft on center:

$$\Theta = \frac{\left(20 \times \frac{9.5}{12}\right)(40 \times 12)^3}{(24)(29000000)(1277)} = 0.00197 \text{ radians}$$

The total rotation at the girder centerline is:

2θ = 0.00394 radians

$$\Theta = \frac{\Delta}{\frac{17.7}{2} + 2 + 2.5} = 0.00197 \text{ radians}$$

Δ = 0.0263 inches

$2\Delta = 0.0526$ inches

If $f_r = 411$psi and $E_c = 3{,}122{,}000$ psi

$$\varepsilon_c = \frac{f_r}{E_c} = \frac{411}{3{,}122{,}000} = 0.0001316 \text{ in/in}$$

The concrete is restrained from movement perpendicular to the girder by the deck ribs. If we assume that the total deformation of 0.0526 inches is restricted to occur over a 12 inch length, then the concrete strain over the girder is:

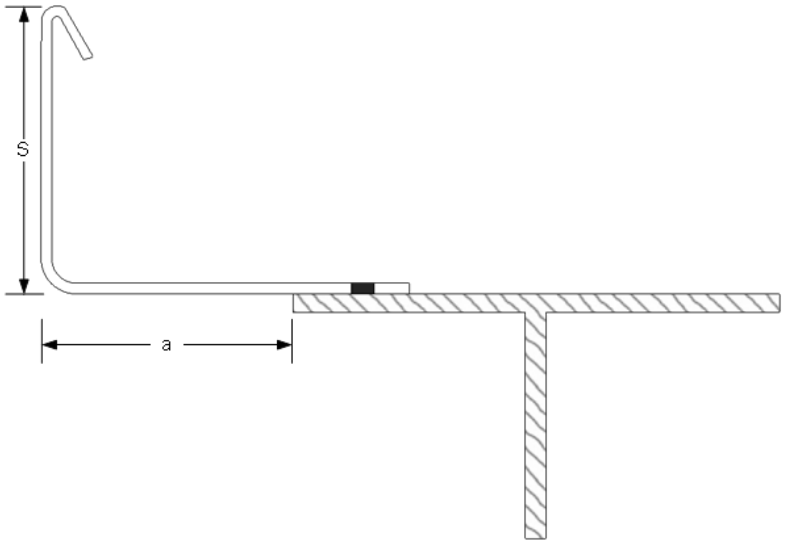
$$\varepsilon = \frac{0.0526}{12} = 0.0044 \text{ in/in}$$

$\varepsilon >> \varepsilon_c$ (approximately 33 times cracking strain)

Flexural cracking over girder must be expected. Because reinforcing steel does not become active until after the concrete section cracks, providing negative reinforcement over girders will not prevent cracking.

Example 10: Pour Stop Design

Given: Requirement to design a pour stop for an 8 inch concrete slab depth with an overhang of 4 inches. The steel yield strength is 33 ksi.



Solution:

S	=	Concrete Depth (in.)	=	8 inches
A	=	Pour Stop Overhang	=	4 inches
W	=	Unit concrete weight	=	150 pcf
w_{lc}	=	Uniform construction live load	=	20 psf

Check a 10 gage (0.1345 inch) thick pour stop angle.

t = 0.1345 inches

$$I = \frac{bt^3}{12} = \frac{12(0.1345)^3}{12} = 0.002433 \text{ in}^4$$

$$S = \frac{bt^2}{6} = \frac{12(0.1345)^2}{6} = 0.03618 \text{ in}^3$$

E = 29,500,000 psi

EI = 29,500,000 (0.002433) = 71777 lb. – in^2

Vertical Legs:

$$M_{max} = \frac{WS^3}{864} = \frac{150(8)^3}{864} = 88.88 \text{ in} - \text{lb} / \text{ft}$$

$$\Delta T_v = \frac{WS^5}{4320EI} + S(\sin\Phi) = \frac{150(8)^5}{4320(71777)} + 8(\sin(0.00619)) = 0.0832 \text{ in}$$

$$\Phi = \frac{Ma}{EI} + \frac{W_1 a^3}{6EI} = \frac{88.88(4)}{71777} + \frac{8.33(4)^3}{6(71777)} = 0.00619 \text{ radians}$$

Horizontal Legs:

$$W_1 = \frac{SW}{144} = \frac{8(150)}{144} = 8.33$$

$$M_{max} = \frac{WS^3}{864} + \frac{W_1 a^2}{2} = \frac{150(8)^3}{864} + \frac{8.33(4)^2}{2} = 155.52 \text{ in} - \text{lb} / \text{ft}$$

$$\Delta T_h = \frac{Ma^2}{2EI} + \frac{W_1 a^4}{8EI} = \frac{155.52(4)^2}{2(71777)} + \frac{8.33(4)^4}{8(71777)} = 0.0210 \text{ in}$$

The maximum allowable deflection, reduced by factor of 1.2 per Section 2.8 is:

$$\Delta_{max} = 0.25/1.20 = 0.2083 \text{ in} \quad > \quad 0.0832 \text{ in} \quad \text{OK}$$

$F_b = 0.6\ F_y = 0.6(33000) = 19800$ psi

$$f_b = M/S = 155.52/0.03618 = 4298 \text{ psi} \quad < \quad 19800 \text{ psi} \quad \text{OK}$$

Example 11: Concrete Volume Increase

Given:

3x12, 20 gage composite deck, spanning 11 feet. Total slab depth is 5-1/2 inches.

Required:

Calculate the increase in concrete volume for normal weight and lightweight concrete.

Solution:

From Table 1A, the positive moment of inertia for this deck is 0.92 in^4 and the negative moment of inertia is 0.93 in^4. Conservatively we will use the lower value.

The volume of concrete required for an undeflected deck would be:

$$V = \frac{t}{12} + C_v = \frac{5.5 - 3}{12} + 0.125 = 0.333 \text{ ft}^3 \text{ per square foot}$$

Normal weight concrete:

Using Figure 4.2, the intersection of I = 0.92 in^4 and L = 11 feet shows an increase in volume of approximately 3.25%

The total volume of concrete, increased for the deck deflection would be:

0.333 x 1.0325 = 0.344 ft^3 per square foot

Lightweight concrete:

Using Figure 4.3, the intersection of I = 0.92 in^4 and L = 11 feet shows an increase in volume of approximately 2.5%

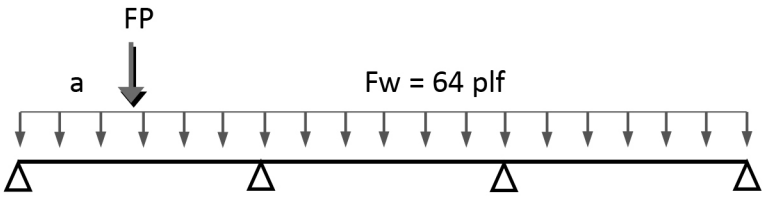
The total volume of concrete, increased for the deck deflection would be:

0.333 x 1.025 = 0.341 ft^3 per square foot

Note: It can be seen that the deflection of the deck is a minor source of increased concrete volume.

Example 12: Moving Load on Form Deck – Slab above Top of Deck

Example Problem using Table 14.1



Given: 1 x 4 form deck spanning 5-0
3 in normal weight concrete topping t_c, 3 ksi
6x6 – W2.9xW2.9 WWR at $t_c/2$
Load footprint = 12 in x 12 in
LL = 40 psf (40 plf / ft width)

Find: Maximum concentrated live load anywhere along the span.

Solution 1: From Table 14.1, P_{max} = 410 lbs assuming a load factor of 1.6.
If load factor = 1.2. P_{max} = 410*(1.6/1.2) = 547 lbs

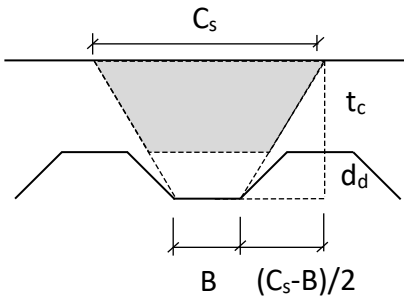
Solution 2: Solution 2 locates the load at "reasonable" locations for maximum stress with load distribution, b_e. Exact load locations for maximum stress are indeterminate. Solution 2 demonstrates how Table 14.1 was generated.

Commentary: Table 14.1 assumes the deck is a stay-in-place form supporting construction and concrete dead loads. Only the concrete topping supports service loads.

Check Shear:

Shear is unlikely to limit concentrated load capacity, but shear area of the concrete topping can be defined knowing the bottom flange width B, pitch C_s, topping t_c, and deck depth d_d. In cases where deck geometry is unknown, using $B = d_d$ and $C_s = 4d_d$ provides reasonable shear areas.

$$\text{Area / ft} = \left[C_s t_c - \frac{(C_s - B) t_c^{\,2}}{2(t_c + d_d)} \right] \frac{12}{C_s}$$



$$\text{Area / ft} = \left[4\text{ in}(3\text{ in}) - \frac{(4\text{ in} - 1\text{ in})3\text{ in}^2}{2(3\text{ in} + 1\text{ in})} \right] \frac{12}{4\text{ in}} = 25.875\text{ in}^2\text{ / ft width}$$

$$\Phi V_{u(\text{Topping})} = \Phi_v 2 A_c \sqrt{f'_c} = 0.75(2)(25.875\text{ in}^2\text{ / ft})\sqrt{3000\text{ psi}} = 2126\text{ plf}$$

Locate FP at a = 4.9 ft for maximum shear, and use t_c in lieu of h for load distribution.

$$b_{ev} = (B + 2t_c) + (1 - \frac{t_c}{L})x = 19.1\text{ in} = 1.59\text{ ft}$$

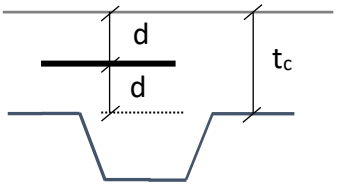
$$\Phi V_{u(\text{Topping})} = 2126\text{ plf} = 0.6wL + \frac{FP_n}{b_e}$$

$$2126\text{ plf} = 0.6(1.6)(40\text{ plf})(5\text{ ft}) + \frac{1.6P_n}{1.59\text{ ft}}$$

$$P_{n(\text{Shear})} = 1922\text{ lbs}$$

Commentary: If shear ultimately limits P_n, additional capacity may be available from a more detailed analysis of concrete area and deck shear.

Check Flexure (Positive Bending):



$$a = \frac{A_s F_y}{12\beta f'_c} = \frac{0.058\ in^2/ft(60\ ksi)}{12(0.85)(3\ ksi)} = 0.114$$

$$\Phi M_{u(Topping)} = \Phi_b A_s F_y \left(\frac{t_c}{2} - \frac{a}{2}\right) = 0.9\left(0.058\frac{in^2}{ft}\right)(60\ ksi)\left(\frac{3\ in}{2} - \frac{0.114\ in}{2}\right)\frac{1000}{12}$$

$$\Phi M_{u(Topping)} = 377\ ft\,lbs/ft\ width$$

Load location, a, for maximum flexure is indeterminate and varies with concurrent uniform load and distribution width, b_e. Using a = 0.4L and M ≈ 0.21 FP_nL / b_e is reasonable, but implies the need for conservative load distribution. Table 14.1 was developed using the minimum distribution widths of shear and flexure.

$$b_{ev} = (B + 2t_c) + (1 - 0.4)(24\ in) = 32.4\ in = 2.7\ ft$$

$$b_e = (B + 2t_c) + 2(1 - 0.4)(24\ in) = 46.8\ in = 3.9\ ft \qquad \text{Use } b_e = 2.7\ ft$$

$$\Phi M_{u(Topping)} = 377\ ft\,lbs/ft\ width = 0.08wL^2 + \frac{0.21FP_nL}{b_e}$$

$$377\ ft - lbs/ft\ width = 0.08(1.6)(40\ psi)(5\ ft)^2 + \frac{0.21(1.6)P_n(5\ ft)}{2.7\ ft} \qquad P_n = 400lbs$$

Check Flexure (Negative Bending):

Load location for maximum negative bending is also indeterminate, but unlikely to control when the WWR is located at tc/2. Using a = 0.63L and $-M \approx 0.105\ FP_nL / b_e$ is reasonable. Again, minimum distribution width is prudent.

$$-\Phi M_u = 377\ \text{ft lbs/ ft width} = 0.10wL^2 + \frac{0.105FP_nL}{b_e}$$

$$377\text{ft} - \text{lbs / ft width} = 0.10(1.6)(40\ \text{psf})(5\ \text{ft})^2 + \frac{0.105(1.6)P_n(5\ \text{ft})}{2.67\ \text{ft}} \qquad P_n = 690\ \text{lbs}$$

Check Flexure (Transverse Bending):

P_n capacity from transverse bending ϕM_{wa} is traditionally calculated from empirical equations with P_n located at L/2 and uniform loads resisted by positive bending $+\phi M_u$. Using these assumptions, maximizing b_e distribution width is recommended.

$$\Phi M_{wa} = \Phi w A_s F_y \left(\frac{t_c}{2} - \frac{a}{2}\right) = 0.85\left(0.058\frac{\text{in}^2}{\text{ft}}\right)(60\ \text{ksi})\left(\frac{3\ \text{in}}{2} - \frac{0.114\ \text{in}}{2}\right)\frac{1000}{12}$$

$$\Phi M_{wa} = 355.7\ \text{ft lbs/ft width}$$

$$b_{ev} = (B + 2t_c) + (1 - 0.5)(30\ \text{in}) = 33.0\ \text{in} = 2.75\ \text{ft}$$

$$b_e = (B + 2t_c) + 2(1 - 0.5)(30\ \text{in}) = 48.0\ \text{in} = 4.0\ \text{ft} \qquad \text{Use } b_e = 4.0\ \text{ft}$$

$$w = \frac{L}{2} + B = \frac{60\ \text{in}}{2} + 12\ \text{in} = 42\ \text{in} = 3.5\ \text{ft}$$

$$\Phi M_w = \frac{FP_nb_e}{15w} = \frac{(1.6)P_n(4.0\ \text{ft})}{15(3.5\ \text{ft})} \qquad P_n = 2917\ \text{lbs}$$

Commentary: Transverse bending capacity is unlikely to limit P_n using WWR since A_s resisting positive bending and A_s resisting transverse bending are equal.

Check Deflection:

L/360 deflection is unlikely to limit concentrated load capacity, so a conservative estimate for I_e of the concrete topping expedites calculations. This estimate is applicable when $t_c < L/24$.

Uncracked Section:

$$0.25I_g = 0.25\frac{bt_c^{\ 3}}{12} = 0.25\frac{12\text{ in}(3\text{ in})^3}{12} = 6.75\text{ in}^4\text{ / ft width}$$

Load location for maximum deflection with concurrent uniform live load is indeterminate. Iterative computer models using $1.0P_n$ = 2800 lbs at a = 2.25 ft results in a deflection of L/360. If more detailed deflection analysis is required or long-term creep a concern, I_{avg} should be calculated based on cracked and un-cracked properties, P and appropriate uniform loads.

$$I_g = \frac{bt_c^{\ 3}}{12} = \frac{12\text{ in}(3\text{ in})^3}{12} = 27\text{ in}^4\text{ / ft width}$$

$$y_t = 1.5\text{ in}$$

$$f_r = 7.5\lambda\sqrt{f'_c} = 7.5(1.0)\sqrt{3000\text{ psi}} = 411\text{ psi}$$

$$M_{cr} = \frac{f_r I_g}{y_t} = \frac{411\text{ psi }(27\text{ in}^4)}{1.5\text{ in}} = 7398\text{ in}-\text{lbs}$$

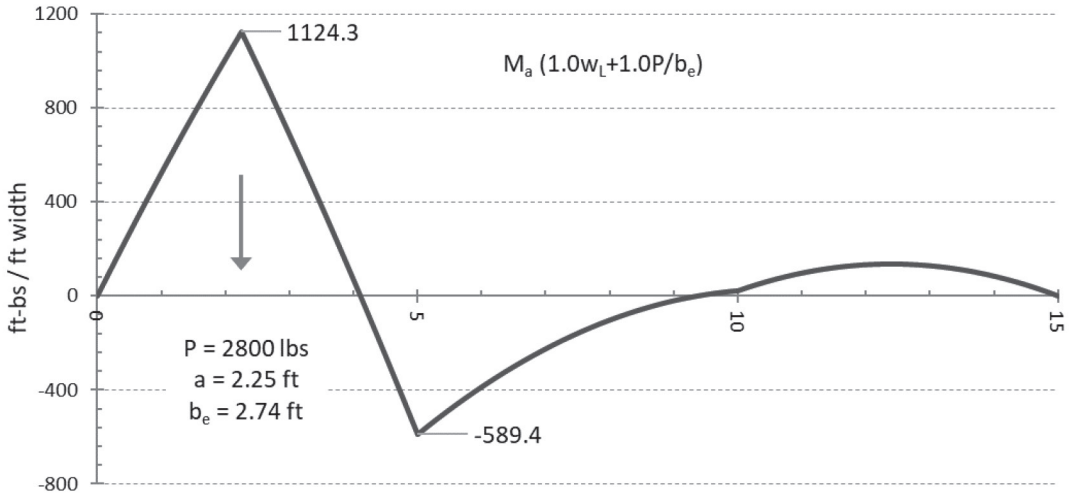
Cracked Section:

$$k_d = \frac{-nA_s + \sqrt{(nA_s)^2 - 4(6)(-nA_s d)}}{2(6)}$$

$$= \frac{-9.35(0.058) + \sqrt{[9.35(0.058)]^2 - 24(-9.35)(0.058)(1.5)}}{12} = 0.326$$

$$I_{cr} = \frac{12(k_d)^3}{3} + nA_s(d - k_d)^2 = 4(0.326\text{ in})^3 + 9.35(0.058\text{ in}^2)(1.5 - 0.326\text{ in})^2$$

$$= 0.886\text{ in}^4$$



$$I_e = \left(\frac{M_{cr}}{M_a}\right)^3 I_g + \left(1 - \left(\frac{M_{cr}}{M_a}\right)^3\right) I_{cr}$$

$$+I_e = \left(\frac{7398}{12(1124.3)}\right)^3 27.0 + \left(1 - \left(\frac{7398}{12(1124.3)}\right)^3\right) 0.886 = 5.192\text{ in}^4\text{ / ft width}$$

$$-I_e = \left(\frac{7398}{12(589.4)}\right)^3 27.0 + \left(1 - \left(\frac{7398}{12(589.4)}\right)^3\right) 0.886$$

$$= 30.77\text{ in}^4\text{ / ft width (Use } I_g\text{)}$$

$$I_{avg} = \frac{5.192 + 27}{2} = 16.1\text{ in}^4\text{ / ft width}$$

$I_{avg} > 0.25\ I_g$ and no further iterations are required

Check Shear Bending Interaction:

P_{max} = min(1922,400,690,2917,2800) = 400 lbs from positive bending

Locate load at a = 0.625L = 3.13 ft.

b_e = min(b_e, b_{ev}) = 2.67ft

P / ft width = 150 lbs

From computer models, -M = 281.6 ft-lbs

From computer models, -V = 366 lbs

ϕM_u =377 ft-lbs/ft-width

ϕV_u = 2464 lbs/ft-width

$$\sqrt{\left(\frac{M}{\Phi M_u}\right)^2+\left(\frac{V}{\Phi V_u}\right)^2}=\sqrt{\left(\frac{281.6}{377}\right)^2+\left(\frac{366}{2464}\right)^2}=0.76<1 \qquad \text{OK}$$

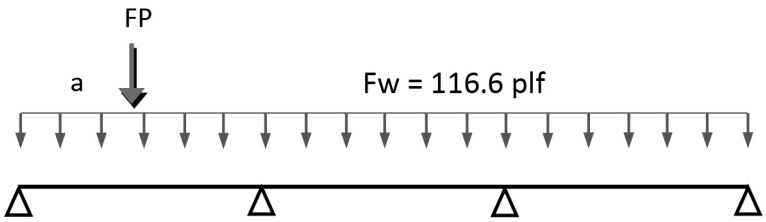
Summary:

The maximum nominal moving concentrated load P_n = 400 lbs using “reasonable” load locations. Table 14.1 developed with iterative computer models indicates P_n = 410 lbs.

This example uses the structural capacity of the concrete topping only. The form deck is simply a stay-in-place form for construction loads and concrete placement. If flute concrete and form deck were included, ϕV_u, ϕM_u and I_g would increase, suggesting P_n would also increase. Example 13 and Table 14.6 considers these options.

Example 13: Moving Load on Form Deck – All Concrete

Example Problem using Table 14.6



Given: Previous problem with the additional contribution of concrete in the flutes and 24 gage steel form deck.
1 x 4 form deck spanning 5-0
3 in normal weight concrete topping, 3 ksi
6x6 – W2.9xW2.9 WWR at $t_c/2$
LL = 40 psf (40 plf / ft width)

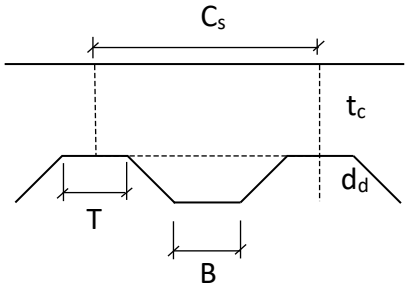
Find: Maximum concentrated live load anywhere along the span. Include deck capacity and concrete in the flutes.

Solution 1: From Table 14.6, P_{max} = 967 lbs (ASD) using a load factor = 1.6.
If load factor = 1.2. P_{max} = 967*(1.6/1.2) = 1289 lbs

Solution 2: Solution 2 locates the load at "reasonable" locations for maximum stress with load distribution. Exact load locations for maximum stress are indeterminate. Solution 2 demonstrates how Table 14.6 was generated.

Loads: Dead load and concrete volume depends on deck geometry which varies between suppliers. If geometry is unknown, assume B = T = d_d and $C_s = 4d_d$.

$$\text{Area/ft} = 12t_c + \frac{12d_d}{C_s}\left[\frac{C_s - T + B}{2}\right]$$



$$\text{Area/ft} = 12(3\text{ in}) + \frac{12(1\text{ in})}{4\text{ in}}\left[\frac{4\text{ in} - 1\text{ in} + 1\text{ in}}{2}\right] = 42\text{ in}^2\text{ / ft width}$$

$$w_{concrete+WWR} = 1.2\left(\frac{42\text{ in}^2\text{ / ft}}{144\text{ in}^2}\right)(145\text{ pcf}) + 1.2(0.2\text{ psf})(1\text{ ft}) = 50.99\text{ plf}$$

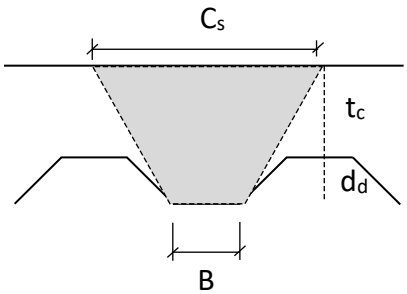
$$w_{deck} = 1.2(1.3\text{ psf})(1\text{ ft}) = 1.56\text{ plf}$$

$$w_{live} = 1.6(40\text{ psf})(1\text{ ft}) = 64\text{ plf}$$

$$\sum w = 116.6\text{ plf}$$

Check Shear:

Concrete shear area is a function of profile and web pitch, and varies between suppliers. If the deck geometry is unknown, assume B = d_d and Cs = 4 d_d. Shear is unlikely to govern.



$$A_{c(Shear/ft)} = (t_c + d_d)\left[\frac{C_s + B}{2}\right]\left[\frac{12}{C_s}\right]$$

$$A_{c(Shear/ft)} = (3\text{ in} + 1\text{ in})\left[\frac{4\text{ in} + 1\text{ in}}{2}\right]\left[\frac{12}{4\text{ in}}\right] = 30\text{ in}^2/\text{ft width}$$

$$\Phi V_{u(Concrete)} = \Phi 2 A_c \sqrt{f'_c} = 0.75(2)(30\text{ in}^2/\text{ft})\sqrt{3000\text{ psi}} = 2465\text{ plf}$$

$$A_{s(DeckWebs)} \approx 1.3\frac{\text{in}}{\text{web}}\left(\frac{2\text{ webs}}{\text{flute}}\right)\left(\frac{12}{C_s}\right)(0.0239\text{ in}) = 0.186\text{ in}^2/\text{ft width}$$

$$\Phi V_{u(Deck)} = 3900\text{ plf}$$ Ref: AISI S100 – 16 G2.1

$$\sum \Phi V_u = \Phi V_{u(Concrete)} + \Phi V_{u(Deck)} < 2\Phi V_{u(Concrete)} = 4930\text{ plf}$$

Locate FP at a = 4.9 ft for maximum shear. b_{ev} = 1.59 ft

$$\Phi V_u = 4930\text{ plf} = 0.6wL + \frac{FP_n}{b_e} = 0.6(116.6\text{ plf})(5\text{ ft}) + \frac{1.6P_n}{1.59\text{ ft}} \qquad P_n = 4551\text{ lbs}$$

Commentary: The equations for concrete shear area assume symmetric profiles. Deeper decks and composite sections require a more detailed analysis. Reference AISI S100-16 for detailed analysis of web shear.

Check Flexure (Positive Bending):

$$\Phi M_{u(Concrete)} = 377\text{ ft lbs/ft width}$$ (Reference Example 12)

$$\Phi M_{u(Deck)} = \Phi S_p F_y = 0.9(0.098\text{ in}^3/\text{ft})(60\text{ ksi})\frac{1000}{12} = 441\text{ ft lbs/ft width}$$

$$\sum \Phi M_u = 377 + 441 = 818\text{ ft lbs/ft width}$$

Load location, a, for maximum flexure is indeterminate and varies with concurrent uniform load and distribution width, b_e. Using a ≈ 0.4L and M ≈ $0.21FP_nL/b_e$ simplifies this analysis. b_e = 2.7 ft.

$$818 \text{ ft-lbs/ft width} = 0.08wL^2 + \frac{0.21PL}{b_e}$$

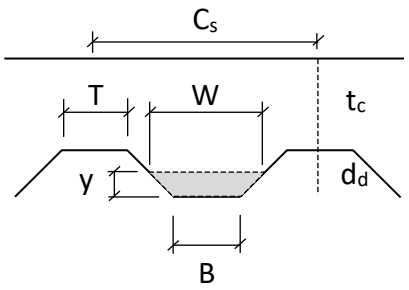
$$818 \text{ ft-lbs/ ft width} = 0.08(116.6 \text{ plf})(5 \text{ ft})^2 + \frac{0.21(1.6)P_n(5 \text{ ft})}{2.7 \text{ ft}} \qquad P_n = 939 \text{ lbs}$$

Commentary: Example 12 calculated a maximum flexural concentrated load of 400 lbs from concrete topping only. Using the form deck for service loads increases capacity, but requires the form to be protected from rust or deterioration. Galvanized sections are recommended.

Check Flexure (Negative Bending):

The user intuitively knows that $-M_u > +M_u$ with WWR at d/2; therefore, P_n for negative bending is never the controlling limit state. The methodology illustated below is a template when $d \neq t_c/2$ or draped fabric is desired. The generic expressions for the height y and width W of the trapezoidal compression zone are illustrated below. If the deck geometry is unknown, assume $B = T = d_d$ and $Cs = 4\ d_d$.

$$y^2\left[\frac{C_s - T - B}{2d_d}\right] + y\left[\frac{B}{2}\right] - \frac{A_sF_yC_s}{12\beta f'_c} = 0$$



$$W = B + \left[\frac{y(C_s - T - B)}{d_d}\right]$$

$$y^2\left[\frac{4 \text{ in} - 1 \text{ in} - 1 \text{ in}}{2(1 \text{ in})}\right] + y\left[\frac{1 \text{ in}}{2}\right] - \frac{(0.058 \text{ in}^2/\text{ft width})(60 \text{ ksi})(4 \text{ in})}{12(0.85)(3 \text{ ksi})} = 0 \quad y = 0.469 \text{ in}$$

$$W = 1 \text{ in} + \left[\frac{0.469 \text{ in}(4 \text{ in} - 1 \text{ in} - 1 \text{ in})}{1 \text{ in}}\right] = 1.938 \text{ in} \quad \text{and} \quad Y\ bar_{Trapezoid} = 0.259 \text{ in}$$

$$-\Phi M_u = \Phi A_s F_y \left(\frac{t_c}{2} + d_d - Y\ bar_{Trapezoid} \right)$$

$$-\Phi M_u = 0.9\left(0.058 \frac{in^2}{ft} \right)(60\ ksi)\left[\frac{3\ in}{2} + 1\ in - 0.259\ in \right]\frac{1000}{12}$$

= 584.9 ft lbs/ft width

$$-\Phi M_{u(Deck)} = \Phi S_n F_y = 0.9(0.098\ in^3 / ft)(60\ ksi)\frac{1000}{12} = 441\ \text{ft lbs/ft width}$$

$$\sum \Phi M_u = 584.9 + 441 = 1026\ \text{ft lbs/ft width}$$

Load location for maximum negative bending is indeterminate, but unlikely to control when the WWR is located at tc/2. Using a = 0.63L and –M ≈ 0.105 FP_nL / b_e is reasonable. Again, minimum distribution width is prudent.

$$-\Phi M_u = 1026\ \text{ft lbs/ft width} = 0.10wL^2 + \frac{0.105FP_nL}{b_e}$$

$$-\Phi M_u = 0.10(116.6\ psf)(5\ ft)^2 + \frac{0.105(1.6)P_n(5\ ft)}{2.67\ ft} \qquad P_n = 2335\ lbs$$

Check Flexure (Transverse Bending):

Reference Example 12

$P_n = 2917\ lbs$

Check Deflection: Form deck I_p is relatively small compared to I_e of the concrete topping, deflection is unlikely to limit concentrated load capacity and the section is not composite; therefore, concrete only should be used in deflection calculations.

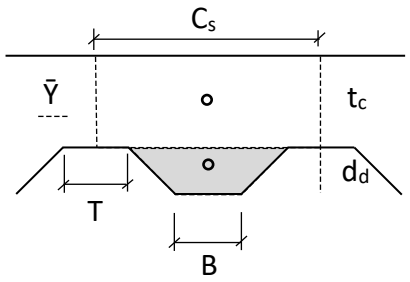
Approximate estimates of I_e may simplify analysis. One option assumes simple span design with $I_e = 0.25I_g$ when $t_c + d_d < L/24$.

$0.25I_g = 0.25(46.39) = 11.60\ in^4/ft\ width$ (see I_g derivation below)

$$\frac{L}{360} = 0.167\ in = \frac{P_n L^3}{48EIb_e} = \frac{P_n(60\ in)^3}{48(3156000\ psi)(11.60\ in^4/ft)(2.75\ ft)} \quad P_n = 3730\ lbs$$

Commentary: If more detailed deflection analysis is required or long-term deflection checks desired, I_{avg} should be calculated based on cracked and un-cracked properties, $1.0P_n$ and appropriate uniform loads.

Uncracked Section: The generic equations for I_g, I_c and I_e are illustrated below. If unknown, assume $T = B = d_d$ and $C_s = 4\ d_d$.



$$A_{c(Flute)} = d_d\left[\frac{C_s - T + B}{2}\right]\left[\frac{12}{C_s}\right]$$

$$Ybar_{(Flute)} = t_c + d_d - \frac{d_d(2(C_s - T) + B)}{3(C_s - T + B)}$$

$$I_{g(Flute)} = {d_d}^3\frac{(C_s - T)^2 + 4B(C_s - T) + B^2}{36(C_s - T + B)}\left[\frac{12}{C_s}\right]$$

$$I_{g(Section)} = \frac{12{t_c}^3}{12} + 12t_c(\Delta y)^2 + I_{g(Flute)} + A_{c(Flute)}(\Delta y)^2$$

$$A_{c(Flute)} = 1\ in\left[\frac{4\ in - 1\ in + 1\ in}{2}\right]\left[\frac{12}{4\ in}\right] = 6\ in^2/ft\ width$$

$$Ybar_{(Flute)} = 3\ in + 1\ in - \frac{1\ in(2(4\ in - 1\ in) + 1\ in)}{3(4\ in - 1\ in + 1\ in)} = 3.417\ in$$

$$I_{g(Flute)} = 1\ in^3\frac{(4\ in - 1\ in)^2 + 4(1\ in)(4\ in - 1\ in) + 1\ in^2}{36(4\ in - 1\ in + 1\ in)}\left[\frac{12}{4\ in}\right]$$

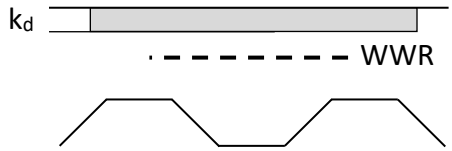
$$= 0.458\ in^4/ft\ width$$

$$Y_{(Section)} = \frac{(12\ in)(3\ in)(1.5\ in) + 6\ in^2(3.417\ in)}{(12\ in)(3\ in) + 6\ in^2} = 1.77\ in$$

$$I_{g(Section)} = \frac{(12\text{ in})(3\text{ in})^3}{12} + (12\text{ in})(3\text{ in})(1.77\text{ in} - 1.5\text{ in})^2 + \frac{0.458\text{ in}^4}{\text{ft}}$$
$$+ \frac{6\text{ in}^2}{\text{ft}}(3.417\text{ in} - 1.77\text{ in})^2 = 46.39\text{ in}^4/\text{ft width}$$

Positive Cracked Section:

$$12\left(\frac{k_d^2}{2}\right) = nA_s(d - k_d) \qquad k_d = 0.326\text{in}$$

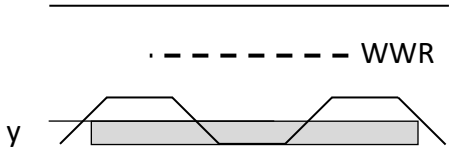


$$+I_{cr} = \frac{12(k_d)^3}{3} + nA_s(d - k_d)^2$$

$$+I_{cr} = \frac{12\text{ in}(0.326\text{ in})^3}{3} + 9.35(0.058\frac{\text{in}^2}{\text{ft}})(1.5\text{ in} - 0.326\text{ in})^2$$
$$= 0.886\text{ in}^4/\text{ft width}$$

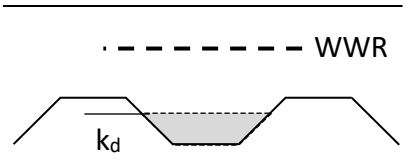
Negative Cracked Section: The direct solution for k_d of the trapezoidal compression zone is a cubic polynomial with multiple solutions. To simplify the calculations, solve for an effective area (12y) and transform to a trapezoidal area. The initial iteration assumes $k_d < d_d$.

$$12\left(\frac{y^2}{2}\right) = nA_s(t_c + d_d - d - y)$$



y = 0.432 in and $A_c = 5.184\text{ in}^2/\text{ft width}$

The generic expression for k_d is illustrated below. If deck geometry is unknown, use T = B = d_d and C_s = 4 d_d.



$$k_d{}^2\left(\frac{C_s - T - B}{2d_d}\right) + k_dB - A_c\left(\frac{C_s}{12}\right) = 0$$

$$k_d^2\left(\frac{4\text{ in}-1\text{ in}-1\text{ in}}{2\text{ in}}\right)+k_d(1\text{ in})-5.184\frac{\text{in}^2}{\text{ft}}\left(\frac{4\text{ in}}{12}\right)=0 \qquad k_d=0.906\text{ in}$$

$$W=B+\frac{k_d(C_s-T-B)}{d_d}=1\text{ in}+\frac{0.906\text{ in}(4\text{ in}-1\text{ in}-1\text{ in})}{1\text{ in}}=2.812\text{ in}$$

$$A_c=k_d\frac{B+W}{2}\left(\frac{12}{C_s}\right)=\left(0.906\text{ in}\right)\frac{1\text{ in}+2.812\text{ in}}{2}\left(\frac{12}{4\text{ in}}\right)=5.181\text{ in}^2\text{ / ft width}$$

$$Ybar=\frac{k_d(2W+B)}{3(W+B)}=\frac{0.906\left(2\left[2.812\text{ in}\right]+1\text{ in}\right)}{3\left(2.812\text{ in}+1\text{ in}\right)}=0.525\text{ in}$$

$$I=\frac{k_d^3(W^2+4WB+B^2)}{36(W+B)}\left(\frac{12}{C_s}\right)=0.328\text{ in}^2\text{ / ft width}$$

$$c\text{–}I_{cr}=I+A_c(k_d-Ybar)^2+nA_s(t_c+d_d-k_d-d)^2=2.458\text{ in}^4\text{ / ft width}$$

Commentary: If $k_d > d_d$, the cracked section is located within t_c and the equations above are not valid. k_d and I_{cr} should be recalculated using traditional engineering mechanics.

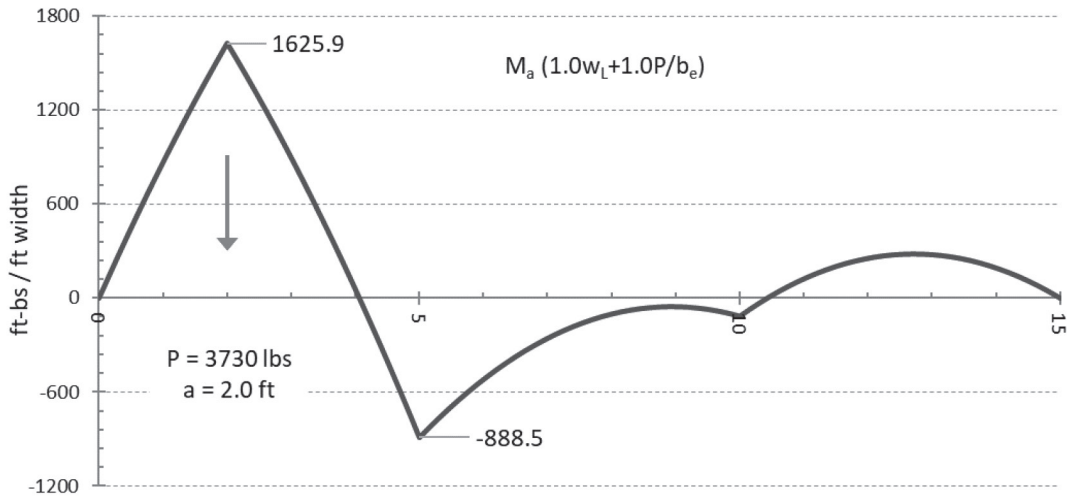
Effective Section:

$$f_r=7.5\lambda\sqrt{f'_c}=7.5(1.0)\sqrt{3000\text{ psi}}=411\text{ psi}$$

$$+M_{cr}=\frac{f_rI_g}{+y_t}=\frac{411\text{ psi}(46.39\text{ in}^4)}{3\text{ in}+1\text{ in}-1.77\text{ in}}=8550\text{ in}-\text{lbs}$$

$$-M_{cr}=\frac{f_rI_g}{-y_t}=\frac{411\text{ psi}(46.39\text{ in}^4)}{1.77\text{ in}}=10772\text{ in}-\text{lbs}$$

Prior deflection estimates using $I_e = 0.25I_g$ suggested P_n = 3730 lbs for L/360. Locating P_n = 3730 lbs at a = 0.4L results in the bending envelope shown below. Load factors for P_n and w = 1.0 and b_e = 2.7 ft.



$$+I_e = \left(\frac{M_{cr}}{+M_a}\right)^3 I_g + \left(1 - \left(\frac{M_{cr}}{+M_a}\right)^3\right) + I_{cr}$$

$$+I_e = \left(\frac{8550}{19510}\right)^3 46.39 + \left(1 - \left(\frac{8550}{19510}\right)^3\right) 0.886 = 4.82 \text{ in}^4 / \text{ft width}$$

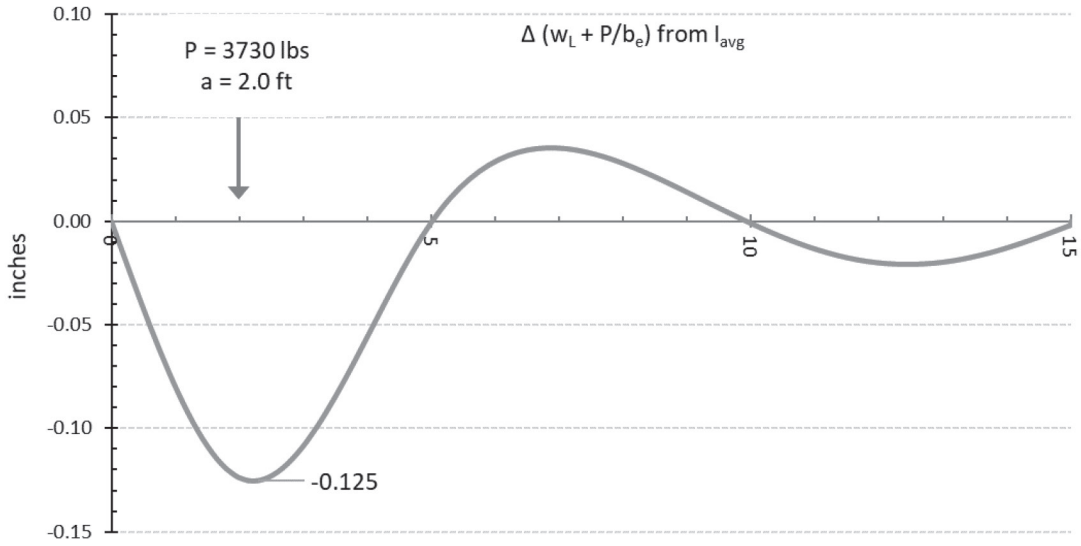
$$-I_e = \left(\frac{M_{cr}}{-M_a}\right)^3 I_g + \left(1 - \left(\frac{M_{cr}}{-M_a}\right)^3\right) - I_{cr}$$

$$-I_e = \left(\frac{10772}{10662}\right)^3 46.39 + \left(1 - \left(\frac{10772}{10662}\right)^3\right) 2.458 = 47.76 \qquad \text{use } -I_e$$

$$= 46.39 \text{ in}^4 / \text{ft width}$$

$$I_{avg} = \frac{4.82 + 46.39}{2} = 25.6 \text{ in}^4 / \text{ft width}$$

Locating P_n = 3730 lbs at a = 2.0 ft results in a total deflection of 0.125 in or L/480 demonstrating that $I_e = 0.25I_g$ and simple span deflection checks are valid approximations.



Creep:

If long-term creep (5 years and ξ = 2.0) deflection checks are desired for P_n = 967 lbs, $M_a < M_{cr}$ and $I_{avg} = I_g$ = 46.39 in^4/ft. Uniform load deflection = 0.008 in, instantaneous P_n deflection = 0.03 in, and time dependent deflection = 0.03 in. Total deflection = 0.068 in or L/882.

Summary:

This example demonstrates the potential additional capacity available when the concrete in the flutes and the form deck are considered structural; P_n = 967 lbs vs P_n = 410 lbs.

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US Customary to SI Unit Conversion Table

	TO CHANGE	MULTIPLY BY
LENGTH	in to mm	25.4 (exact)
	ft to mm	304.8 (exact)
	ft to m	0.3048 (exact)
AREA	in^2 to mm^2	645.16 (exact)
	ft^2 to m^2	0.092903
MASS	lb to kg	0.453592
	2000 lb to 1000 kg	0.907185
	lb/ft to kg/m	1.48816
	lb/ft^3 to kg/m^3	16.0185
	lb/yd^3 to kg/m^3	0.593276
FORCE	lb to N	4.44822
	kip to kN	4.44822
	lb/in to N/m	175.127
	lb/ft to N/m	14.5939
	kip/ft to kN/m	14.5939
	psf to kN/m^2	47.880
PRESSURE	lb/in^2 to kPa	6.89476
	lb/ft^2 to kPa	0.04788
	kip/in^2 to MPa	6.89476
SECTION MODULUS	in^3 to mm^3	16387.1
	in^3/ft to mm^3/m	53763.5
MOMENT OF INERTIA	in^4 to mm^4	416231
	in^4/ft to mm^4/m	1365587

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FLOOR DECK DESIGN MANUAL

SECOND EDITION

JUNE 2020

FIRST PRINTING

Supplement #1

November 7, 2022

Question:

“If reinforcing steel in deck-slabs is removed or replaced with fibers, are concentrated load distribution methodologies and FDDM load tables still valid?”

Answer:

No.

The current SDI methodology is based on relative stiffness of the deck-slab/transverse beam and cracked sections. When no reinforcing steel is present in the transverse beam, φMw is limited by the un-cracked section and modulus of rupture *fr*. If the transverse beam is uncracked, the deck-slab must also remain uncracked and φMn is invalid.

Limited test data is available for deck-slabs with steel fibers in lieu of temperature and shrinkage steel; however, the results suggest equivalent stiffness. More testing is required before SDI could validate load distribution methodology for fiber reinforced deck-slabs.