Application Guide
Slab on Metal Deck

Basic Requirements

Composite metal decks are generally designed as single-span one-way reinforced concrete slabs with the steel deck as the tension reinforcement at the bottom and the concrete in compression. The reinforcement specified in the concrete provides tensile capacity to resist cracking due to drying shrinkage and differential temperature.

Design Basis and Class & Approval Method

Class A (Shrinkage and Temperature): In non-load bearing direction or when original reinforcement ratio is less than 0.002, Uniform-ES ER-0279 Section 4.2.

ICC -ES 3949 | UES ER 279

734-322-2114  www.helixsteel.com
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Helix Conversion

The following table contains dosage rates of Helix that have been calculated to provide the same or larger moment capacity than the original rebar or mesh configurations using Uniform-ES ER-0279 and elastic design methods.

<table>
<thead>
<tr>
<th>Total slab depth (in)</th>
<th>Steel deck thickness (in)</th>
<th>Concrete thickness above deck flutes (in)</th>
<th>Welded wire mesh</th>
<th>Helix 5-25 dosage (lb/cu yd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.50</td>
<td>1.50</td>
<td>2.00</td>
<td>6X6-W1.4XW1.4</td>
<td>8</td>
</tr>
<tr>
<td>4.00</td>
<td>1.50</td>
<td>2.50</td>
<td>6X6-W1.4XW1.4</td>
<td>6.7</td>
</tr>
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<tr>
<td>5.00</td>
<td>1.50</td>
<td>3.50</td>
<td>6X6-W2.0XXW2.0</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Notes:
1. Table is based on concrete with a minimum specified compressive strength of 3,000 psi.
2. Table values are calculated placing the welded wire mesh at the mid-depth of the concrete thickness.
3. Welded wire mesh specified yield strength of 65,000 psi.

Conversion Instructions

- Select the dosage in the table above based on the original concrete thickness and reinforcement detail.
- Review Uniform ES ER 0279 to assure compliance with restrictions.
- To activate the performance guarantee submit your design to sales@helixsteel.com.
- Note the drawing with the Helix alternative “use the mesh as shown on the drawing or XX lb /yd3 Helix 5 25 designed in accordance with Uniform ES ER 0279”.
- Instruct the contractor to contact Helix for pricing, delivery and installation instructions at 734 322 2114 or sales@helixsteel.com.
- This table shows only a sampling of common configurations. Any slab on metal deck configuration meeting the basic requirements above may be designed with Helix in accordance with Uniform ES ER 0279 using Class A Design, Section 4.2 and using the methods described in section 4.6.

Example

- Slab on metal deck 4.5” total thickness (1.5” metal deck + 3” concrete).
- Reinforcement is 6X6 W1.4XW1.4 WWM located mid depth of the concrete thickness.
- Concrete compressive strength 3000 psi.

Slab on metal deck Thickness and WWM Configurations

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Steps

- Calculate the ratio of area of steel reinforcement to the gross area of concrete: \((0.014\times12/6)/ (3” \times 12’’)) = 0.0008 < 0.002. Therefore, use the table.
- Find the row in the table for the Slab on metal deck thickness and the welded wire mesh (yellow).
- Select the dosage rate, 6.7 lb /yd3 (green).
- Add note to drawing with the Helix alternative: “Use the mesh as shown on the drawing or 6.7 lb /yd3 Helix 5 25 designed in accordance with Uniform ES ER 0279.”
- If required, a calculation can be provided for the result shown in the table. Contact your local Helix representative.