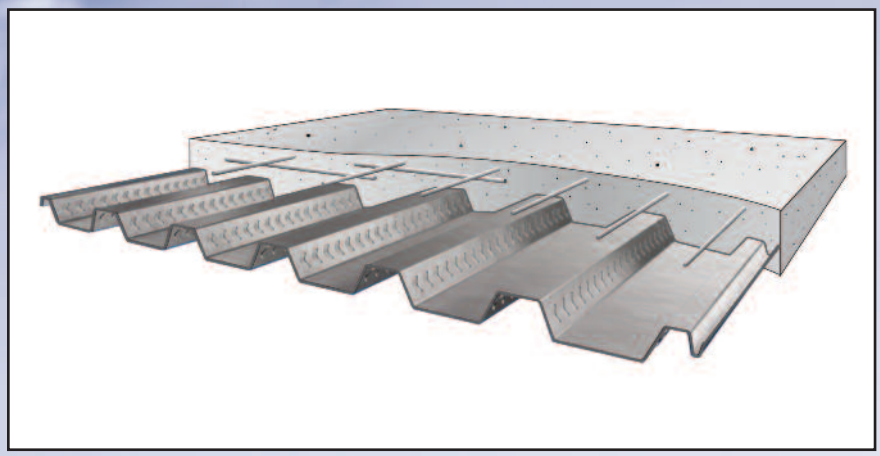
Designer Notes - Composite Slabs



Material Properties

1. The ***AGWAY*** composite steel deck is the RD 36 roof deck with embossments rolled into the web elements to achieve the composite interlocking capacity between the steel deck and concrete.
2. Steel deck section properties were calculated in accordance with CSA S136-07.
3. Steel conforms to ASTM A653 SS Grade 33 with G90 or A25 surface coatings.
4. Concrete is based on normal density of 145 pcf and having a minimum compressive strength of 3 ksi.

Load Tables

1. Loads are maximum specified uniformly distributed loads resulting from human occupancy and should not be used for concentrated loads.
   Maximum specified load from load table must be ≥ ***[LL + 0.833DL]***;
   Where LL = specified live load;
   DL = specified dead load;
   0.833 = 1.25/1.5
2. Loads greater than ***200 psf*** are commonly the result of large concentrated moving loads. In such cases, contact ***AGWAY*** for additional design information.
3. The steel deck provides the positive reinforcement for the simply supported composite slab and no additional reinforcing steel is required.
   To control shrinkage and temperature cracking, a minimum steel wire mesh of 6 x 6 - 10/10 is recommended as per CSSBI S3-03.
4. Shoring requirements shown in shaded areas of the load tables were established in accordance with CSSBI 12M-06.
5. To establish the shear-bond capacity of the ***AGWAY*** composite slab systems, laboratory tests were carried out at the Structural Testing and Research laboratory, Cambridge, Ontario in accordance with CSSBI S2-02.
6. All technical information and load tables were prepared by Dr. R.M. Schuster, Professor Emeritus of Structural Engineering, University of Waterloo, Ontario.

EXAMPLE Inverted Deck G90

Determine the specified uniformly distributed live load that can be placed on the ***AGWAY*** composite floor slab, given the following information:

Given:

- Steel deck thickness = 0.030 in.
- Yield strength = 33 ksi
- Normal density concrete = 145 lb/ft^3
- Overall slab depth = 4.0 in.
- Double span, each = 7′–6″
- Specified superimposed dead load, DL = 36 psf

Solution:

The maximum specified load in **(psf)** from load table must be ≥ [LL + (1.25/1.5)DL], where
LL = specified live load
DL = specified superimposed dead load

From load table under 7′–6″ span, the maximum specified load is ***212 psf***, therefore,
212 ≥ [LL + (1.25/1.5)36] and solving for LL,

LL = *182 psf*

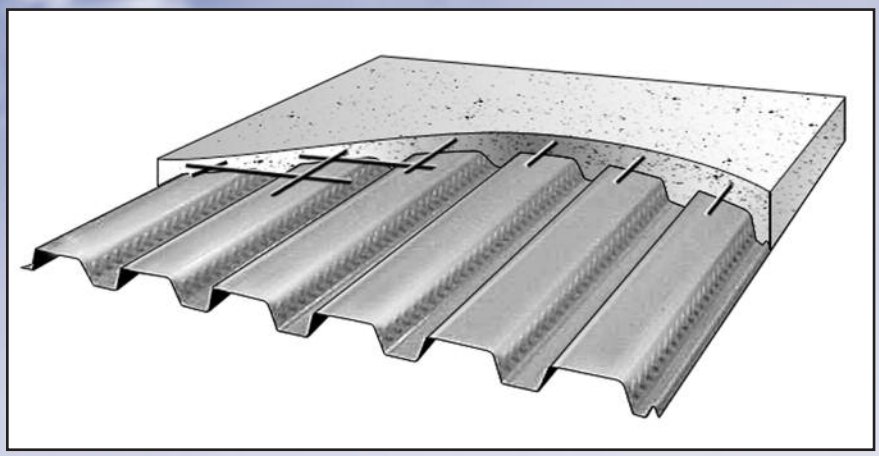
Since this is in the shaded area, one shore support is required at mid-span in each span.

Note:

The self-weight of the steel deck and concrete slab have already been accounted for in the maximum specified uniformly distributed load given in the composite slab load table.

METRIC

Designer Notes - Composite Slabs



Material Properties

1. The ***AGWAY*** composite steel deck is the RD 36 roof deck with embossments rolled into the web elements to achieve the composite interlocking capacity between the steel deck and concrete.
2. Steel deck section properties were calculated in accordance with CSA S136-07.
3. Steel conforms to ASTM A653M SS Grade 230 with Z275 or ZF75 surface coatings.
4. Concrete is based on normal density of 2300 kg/m^3 with a minimum compressive strength of 20 MPa.

Load Tables

1. Loads are maximum specified uniformly distributed loads resulting from human occupancy and should not be used for concentrated loads.
   Maximum specified load from load table must be ≥ ***[LL + 0.833DL]***;
   Where LL = specified live load;
   DL = specified dead load;
   0.833 = 1.25/1.5.
2. Loads greater than ***10 kPa*** are commonly the result of large concentrated moving loads. In such cases, contact ***AGWAY*** for additional design information.
3. The steel deck provides the positive reinforcement for the simply supported composite slab and no additional reinforcing steel is required.
   To control shrinkage and temperature cracking, a minimum steel wire mesh of 152 x 152 - MW9.1/MW9.1 is recommended as per CSSBI S3-03.
4. Shoring requirements shown in shaded areas of the load tables were established in accordance with CSSBI 12M-06.
5. To establish the shear-bond capacity of the ***AGWAY*** composite slab systems, laboratory tests were carried out at the Structural Testing and Research laboratory, Cambridge, Ontario in accordance with CSSBI S2-02.
6. All technical information and load tables were prepared by Dr. R.M. Schuster, Professor Emeritus of Structural Engineering, University of Waterloo, Ontario.

EXAMPLE Composite Deck ZF75

Determine the specified uniformly distributed live load that can be placed on the ***AGWAY*** composite floor slab, given the following information:

Given:

- Steel deck thickness = 0.762 mm
- Yield strength = 230 MPa
- Normal density concrete = 2300 kg/m^3
- Overall slab depth = 120 mm
- Double span, each = 2.2 m
- Specified superimposed dead load, DL = 1.20 kPa

Solution:

The maximum specified load in **(kPa)** from load table must be ≥ [LL + (1.25/1.5)DL],
Where
LL = specified live load
DL = specified superimposed dead load

From load table under 2.2 m span, the maximum specified load is ***17.3 kPa***, therefore,
17.3 ≥ [LL + (1.25/1.5)1.20] and solving for LL,

LL = *16.3 kPa*

Since this is in the shaded area, one shore support is required at mid-span in each span.

Note:

The self-weight of the steel deck and concrete slab have already been accounted for in the maximum specified uniformly distributed load given in the composite slab load table.