DESARCH
SCAFFOLDING

FLOOR FALSEWORK DESIGN CALCULATION

SYSTEM: CUP LOCK SYSTEM

PROJECT:
PROPOSED MOSQUE (G+1) & SERVICE BLOCK AT WADI AL SAFA 5,DUBAI,U.A.E.

CLIENT:
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CONSULTANT:
CITY SPACE ENGINEERING CONSULTANCY.

MAIN CONTRACTOR:
ARIFCO BUILDING CONTRACTING L.L.C.

REFERENCE DWG.NO.:
DBC/H/2020/6501 (ROOF SLAB)

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DATE: 29/03/2020

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SLAB DEPTH 300mm

A. Slab Falsework

Cuplock Support System- (Grid 1.800x1.30)

Slab Falsework

Self weight of Concrete		=	25.0 kN/m³
Self weight of Formwork		=	0.50 kN/M²
Live load		=	1.50 kN/M²
Concrete	.30x25.0 kN/m2	=	7.50 kN/M²
Construction live load		=	1.50 kN/M²
	q	=	**9.00 kN/M²**

B. Plywood Sheathing

Plywood thickness	=	18 mm
Normal Size	=	1220 x 2440 mm
Concrete Pressure	=	9.00 kN/M²

See Deflection Diagram for 18 mm Plywood

Max. Allowable Spacing of Spacing of Support	=	**575 mm (allow.)**
Actual / Assembly Spacing of Support	=	**400 mm < allowable OK**

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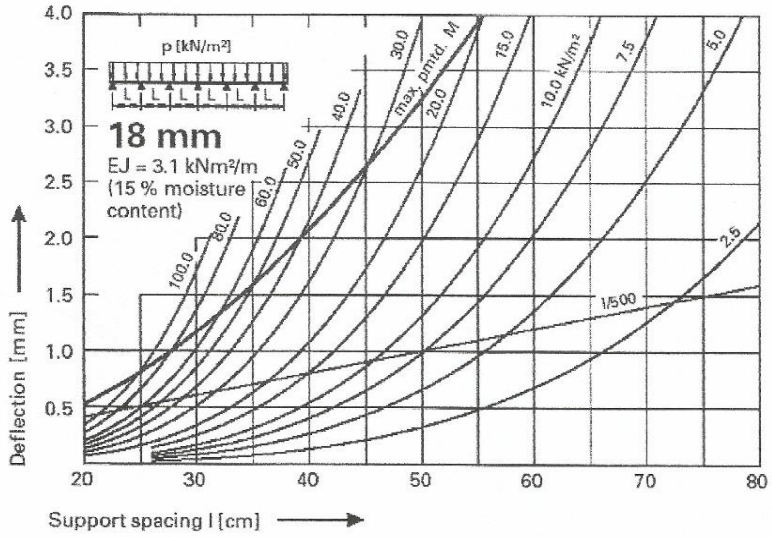
Diagram for 18mm Plywood according to DIN 18 218

For the concrete pressure of	**14.0 kN/m²**
Maximum allowable support spacing	**520 mm**
Maximum allowable deflection	**2.0 mm**

Deflection diagram Finnish birch plywood



Since the actual spacing is 450 mm which is below to allowable 520mm. Therefore, the plywood is safe.

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C. Check Secondary beam

Technical Information { see reference page-)
Infill beam length Actual= **1.20 m** Length Normal = **1.30 m** ` Safe Distributed load= **7.50 kN/ M²**

Imposed load = 9.00 kN/m³

Secondary beam (infill Beam) Spacing = 400 mm

Loading Calculation

w=iposed load x secondary beam spacing
w = 9.00 kN/ M² x 0.400 =3.60 kN/ m

Since the actual load is 3.60 kN/ m x 1.20 =4.32 kN < 7.50 kN so it's OK.
Therefore, Secondary beam is safe.

D. Check Primary beam

Technical Information { see reference page-)
Decking beam length Actual= **1.65m** Length Normal = **1.80 m** Safe Distributed load= **40.00 kN/ M²**

Loading Calculation

w=iposed load x primary beam spacing
w = 9.00 kN/ M²x 1.80x1.30 =21.06 kN/ m

Since the actual load is 21.60 kNwhich is below the allowable load **40kN**
Therefore, Primary beam is safe.

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E. Support System

(Combination of Standard, ledgers, Drop head, Base Jack, Universal Jack & Bracings)

Technical Information
According to Cuplock Technical Data Information
allowable load per Standard with lift of ledger 1.5m
and providing bracing every after 2 bays at both directions is 35 kN

Loading Calculation

Area of Slab per standard	=	1.80x1.30= 2.34 M²
Self weight of Decking	=	0.50 kN/M²
Load on per Standard	=	9.00+0.50 *2.34=22.23 kN

Therefore Support is safe. OK

Ledger Spacing

According to BS 1139-1:1990, see table B.2 reference
Maximum permissible axial load for unbraced used tubes with
effective length of 1500mm is 35.0 kN is greater than allawable.

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F. Diagonal Bracing

(Diagonal bracing with scaffold tube 48.30 mm Dia. & swivel coupler)

The design of bracing to horizontal resistance force required to be transmitted is specifies in BS5975:1996 Code of practice for falsework

The BS code specifies minimum lateral stability criteria aqualine to the greater of either 2.50% of the vertical load in the standards acting horizontal forces from wind erection tolerances, non vertical and concrete pressure of other forces acting as described in the code.

1. Horizontal force equavalent to 2.50% of vertical loa (Hv) = 32.50kN x 2.50% = 0.73 kN/m

1. Horizontal force resulting from erection tolerances 1.0% of applied vertical load H, is 1& of 29.16kN = 32.50kN x1.0% = 0.33 kN/m

Total horizontal force= 0.73+0.33 = 1.06N

Safe load of diagonal as strut. = 1.06 / cos35 deg. = 1.26kN

Use least of A) coupler capacity of 6.30kN

B) Safe load of diagonal as strut.

6.30/1.26=50 say 4 standards, sobracing shall be provided every fourth standard at both direction.

.E.