Technical Specifications on the Kinet-X System

SECTION LEG DEFLECTION

Worst case horizontal reaction at base of leg is 10 kN with a vertical reaction if 59 kN, base of frame to be built off of concrete floor.
Frictional co-efficient between materials to stop sliding would need to be greater than 10/59 = 0.17
Frictional coefficient of rubber to resist sliding is 0.6 therefore place 5mm rubber bearers under all legs to resist horizontal movement of legs.

HANDRAIL DESIGN

Short sections of steels to be provided at perpendicular's to main run at standard locations.
Handrail to be designed for 1.5 kN/m run with a standard spacing of 1.0m therefore a reaction at the head of a stanchion of 1.5 kN.
Height of handrail is 1.1m therefore base moment is 0.74 kN × 1.1m × 1.6 = 1.30 kNm
Moment capacity of T-connection between beams with 1 M16 bolt with a lever arm of 0.05m
Tensile capacity of M16 bolt = 70.7 kN
Therefore restoring moment capacity of connection = 70.7 kN × 0.05m = 3.53 kNm

STEEL BEAM

Report by CERAM Research Ltd
The following pages show the results of loading a 5m x 5m arrangement to 5kN/m2 plus the weight of ply sheeting loose laid on the system to sandwich the airbag via which load was applied.
It should be noted that whilst the loads are similar, there would be an implicit structural stiffening effect created by the bolted down deck boards when the system is used and these test results can therefore be considered conservative.
Due to limitations of the testing facility.

TREAD JUSTIFICATION

Individual treads to be justified for 5.0 kN/m2
Width of each tread is 0.295m, therefore UDL for tread is 1.48 kN/m and span of tread is 1.1m
Moment; Mtread = 1.48 kN/m × (0.9m)2 / 8 = **149850.00** Nmm
Details of MDF
Internal Bond; IBmdf = 0.65 N/mm2
Modulus of Rupture; MRmdf = 28 N/mm2
Modulus of Elasticity; MEmdf = 3500 N/mm2
Z of tread; Ztread = 0.295m × (0.05m)2 / 6 = **122916.67** mm3
Stress in tread; Stread = Mtread / Ztread = **1.22** N/mm2
Stress exceeds internal bond value, therefore plate needed to make up extra required.
Use Steel plate under MDF, but steel to be structural element
Z of plate required; Zplate = Mtread / 325 N/mm2 = **461.08** mm3
Thickness of plate; Tplate = sqrt(6 × Zplate / 0.12m) = **4.80** mm
Use minimum 5mm plate under MDF treads.