Dynamic BLS Slab Experiments

Dynamic BLS Slab Experiment Test Matrix

Slabs	HC	RC	HS	RS	DM
1	×		×		×
2	×		×		×
3	×		×		×
4	×			×	×
5	×			×	×
6		×	×		×
7		×	×		×
8		×	×		×
9		×		×	×
10		×		×	×

- **DM – Double Mat Reinforced**
- **RS – Conventional Steel Rebar (Grade 60)**
- **RC – Conventional Concrete (4 ksi)**
- **HS – Vanadium Steel Rebar (83 ksi)**
- **HC – High Strength Concrete (15.5 ksi)**

Dynamic Blast Load Experiment

Slab #3

HC/HS/DM

Pavg = 57.23 psi

Iavg = 1129 psi-msec

DL = 6.0 in

DA = 5.5 in

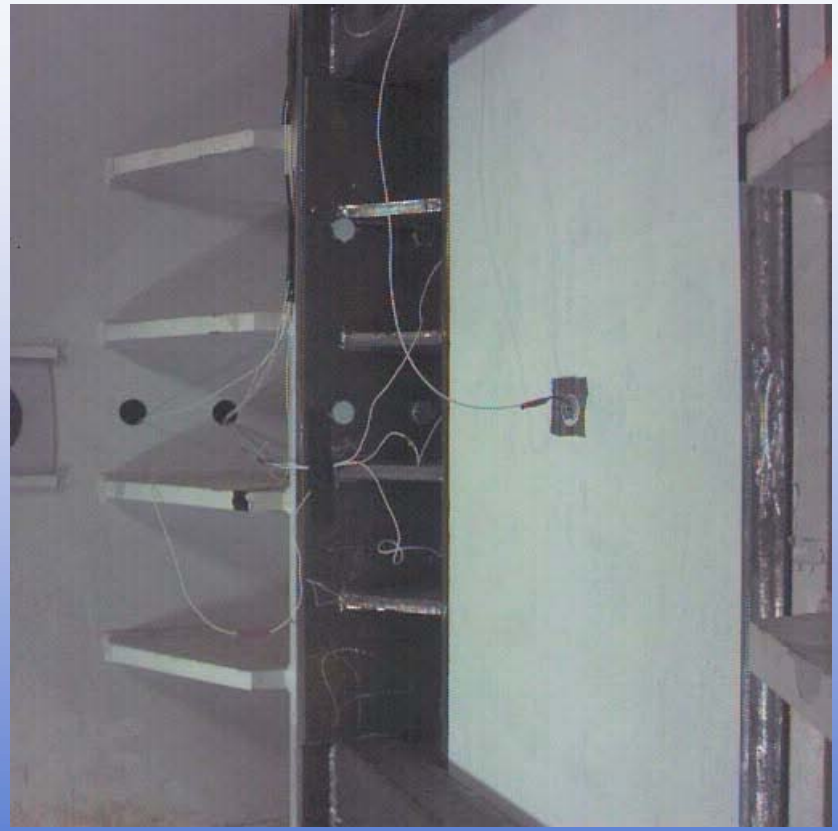
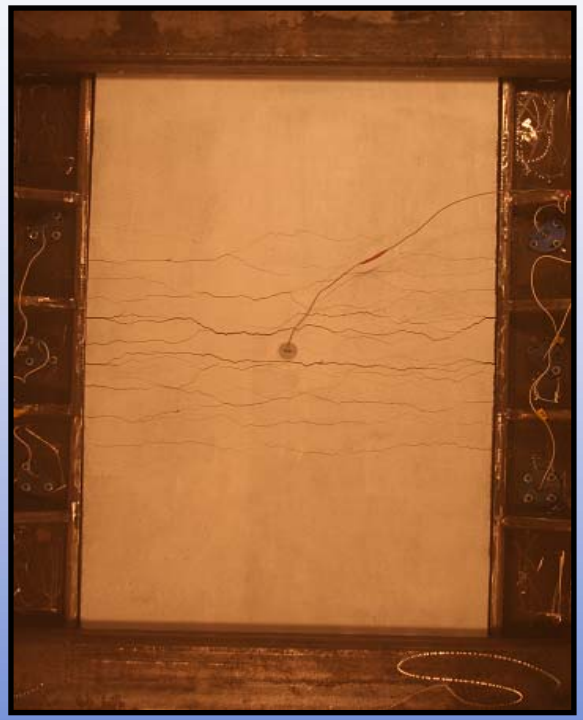


Figure 3. HC/HS/DM Slab#3 DBLS test video

Dynamic Blast Load Experiment

Slab #10

RC/RS/DM



P_{avg} = 44.81 psi

I_{avg} = 825.38 psi-msec

D_L = 4.0 in

D_A = 4.1 in

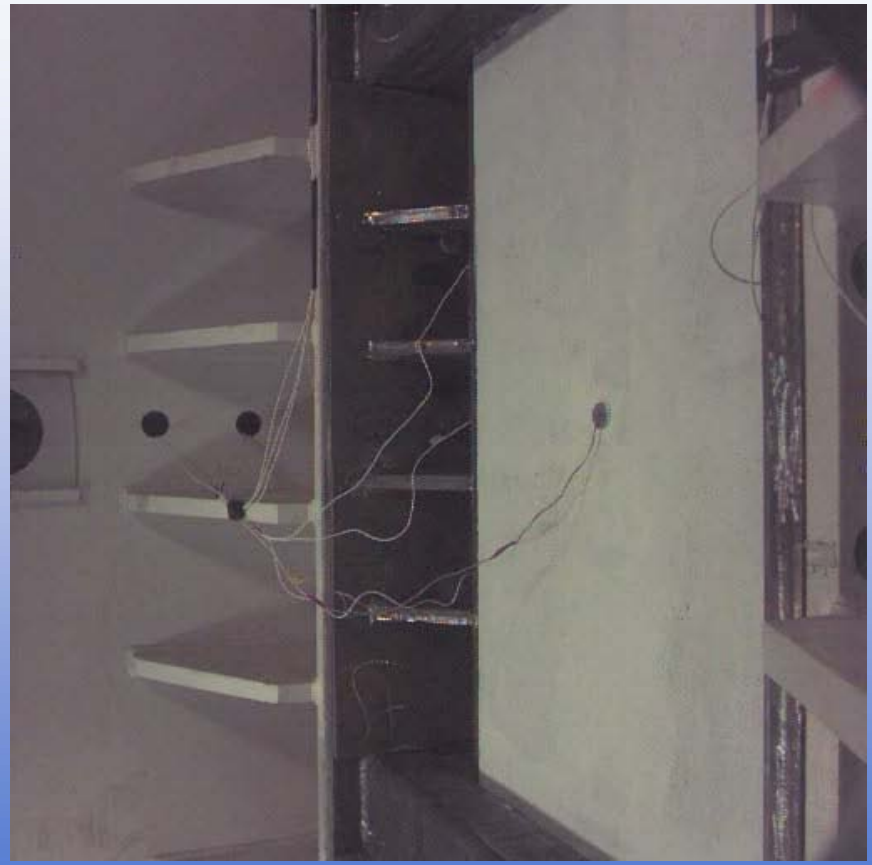


Figure 10. RC/RS/DM Slab#10 DBLS test video

Dynamic Blast Load Experiment

- **The slabs reinforced with vanadium micro-alloyed rebar and high strength concrete resulted in *20%* less deflection and *25%* less rotation than slabs reinforced with Grade 60 rebar and high strength when loaded with similar pressures and impulses.**
- **A reduction of *45%* less deflection and *84%* less support rotation was observed in the vanadium micro-alloyed rebar and conventional concrete reinforced slabs, in comparison to the Grade 60 rebar and conventional concrete reinforced slabs.**
- **The increased protection provided by using vanadium micro-alloyed rebar was witnessed in the dynamic blast load tests. The type of concrete used in construction will determine the level of protection provided. High strength concrete with vanadium micro-alloyed rebar provided the best results in terms of the least amount of damage and survival of the greatest loading in this test series.**