Development of Structural Testing Systems in CISMID

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Building Group G3
Structural Behavior of low ductility Concrete Wall

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This walls are widely used on Middle rise buildings

Low ductility wall: main differences

1. Thickness
   - 100mm thick
   - (RC walls: min 150mm)

2. Reinforcement
   - Electrowelded wire mesh
   - (RC walls: only deformed steel bars)
   - Deformed steel bars at edges
   - Dowells tied to basement
Low ductility wall: main differences

3 construction

(FC: walls, then slabs)

One day, one story: walls and slabs placed at once

Massive, continuous placement: joint at base of wall, hole air bags (cangrejeras)

Fluid concrete with fibers
Reduces total time of construction
Why to study this walls

• During 1998 to 2003 non regulation was applied in the construction of this kind of wall due to were not consider shear walls. The application was on 5 story buildings, however many constructors start to build structures of 12, 14 and 16 stories, just like that, without confinement columns.

• On 2003 the NTE-060 Peruvian Concrete Standard include recommendations for construction of this kind of walls.

• Stiffness contribution of the perpendicular wall is need in order to know the inelastic behavior under lateral load with and without perpendicular wall.

• Check the new equipment received by UNI from SATREPS project.

• Compare stresses levels with test results performed at Yokohama University

DRAWINGS OF SPECIMENS

I Wall: Wall-01 & Wall-02
DRAWINGS OF SPECIMENS

T - Wall: Wall-03

Malla tipo: Q-108 (5.50x12 @.10) (A=1.08 cm²)

Ver detalle de acero

Dimensions and details are shown in the diagram.
SPECIMENS: I and H types

Simple : I walls (2 specimens)

SPECIMENS: I (simple) and H

With orthogonal walls : H wall (1 specimen)
Construction of Specimen

SIMPLE WALL

H type WALL

Construction of Specimen

REINFORCEMENT AND FORMS
Test of I-walls

<table>
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<th>CH-01</th>
<th>CH-02</th>
<th>CH-03</th>
<th>CH-04</th>
<th>CH-05</th>
<th>CH-06</th>
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ADQUISITION SENSORS FOR MEASURING

Test: hysteresis wall-01
Cyclic Test: cracks on wall-01

AGRIETAMIENTO MURO 1
Cara Sur
Drift: 1/280

AGRIETAMIENTO MURO 1
Cara Sur
Drift: 1/200

Cyclic Test: cracks on wall-01

AGRIETAMIENTO MURO 1
Cara Sur
Drift: 1/200

AGRIETAMIENTO MURO 1
Cara Sur
Drift: 1/154
Wall-01- Final State

(Images of wall with markings and text)

Wall-01- Final State

(Images of wall with markings and text)
Cyclic Load Test Wall-01

Test: hysteresis wall-02
Cyclic Test: cracks on wall-02

AGRIETAMIENTO MURO 2
Cara Sur
Drift: 1/2015

AGRIETAMIENTO MURO 2
Cara Sur
Drift: 1/1503

Cyclic Test: cracks on wall-02

AGRIETAMIENTO MURO 2
Cara Sur
Drift: 1/1075

AGRIETAMIENTO MURO 2
Cara Sur
Drift: 1/549
Cyclic Test: cracks on wall-02

AGRIETAMIENTO MURO 2
Cara Sur
Drift: 1/280

AGRIETAMIENTO MURO 2
Cara Sur
Drift: 1/200

Cyclic Test: cracks on wall-02

AGRIETAMIENTO MURO 2
Cara Sur
Drift: 1/200

AGRIETAMIENTO MURO 2
Cara Sur
Drift: 1/154
Cyclic Load Test Wall-02

Building Group G3
On line real time Vibration Monitoring System in Peru

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Capture Signal at Structural Lab
CISMID-FIC-UNI

CISMID-FIC-UNI ITK-06 IP-Sensor
13/07/2011 -05:07 hrs

CISMID-FIC-UNI ITK-06 IP-Sensor
16/09/2011 -16:50 hrs

ITK Sensor Monitoring Network

ITK-P01
ITK-P02
ITK-P03
ITK-06

Proposal Location
Sensor Working
CONCLUSIONS

• New equipment was implemented in the structural Lab of CISMID.

• A program for test Two I walls and One H wall has been initiated.

• Results of the first the walls provide information to continue the study of the behavior of low ductility wall.

• Next step is the research of the influence of perpendicular wall on low ductility specimens.

• The results will complement our Japanese counterparts research and we can discuss in order to learn about the influence of the flange to web wall.