



National Applied Research Laboratories

Preliminary reconnaissance report on the Provincial Highway 86 Bridge No.24

v1.0

Bridge Division, NCREE

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Feb. 15. 2016

Year: 1996~2016 (20yrs)

Length: 555m (east bound)

560m (west bound)

Superstructure: single cell box girder

Substructure: 13 piers

Foundation: pile group

WEST

EAST (blocked)

Provincial Highway 86, Bridge No.24

Epicenter distance (23.9km) **NAR Labs**



臺南市 (TAI) 震度：5 級

地震資訊

發震時間：2016/02/06 03:57:27

震央位置：東經120.54度，北緯22.93度

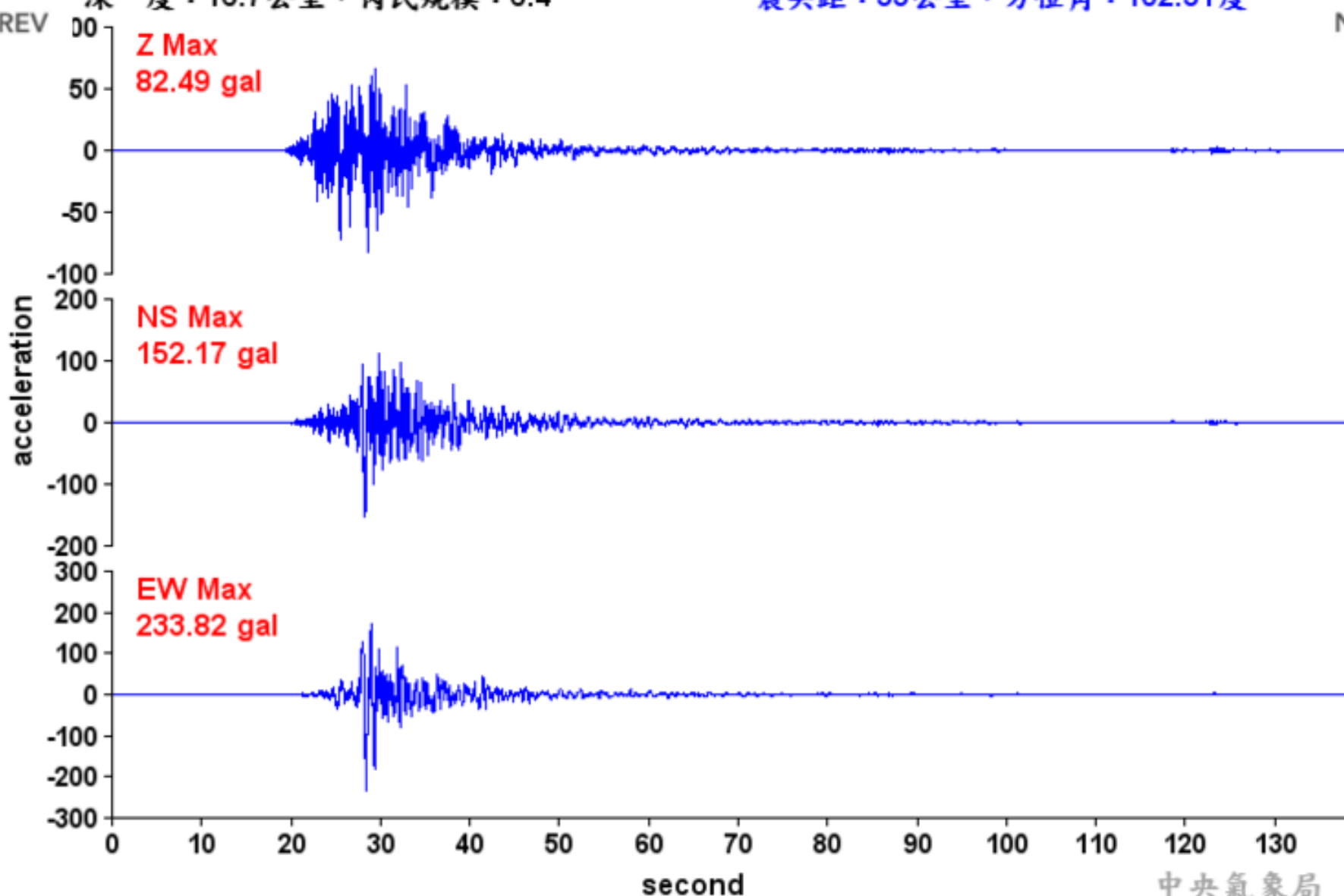
深度：16.7公里，芮氏規模：6.4

測站資訊

波線起始時間：2016/02/06 03:57:15

測站位置：東經120.21度，北緯22.99度

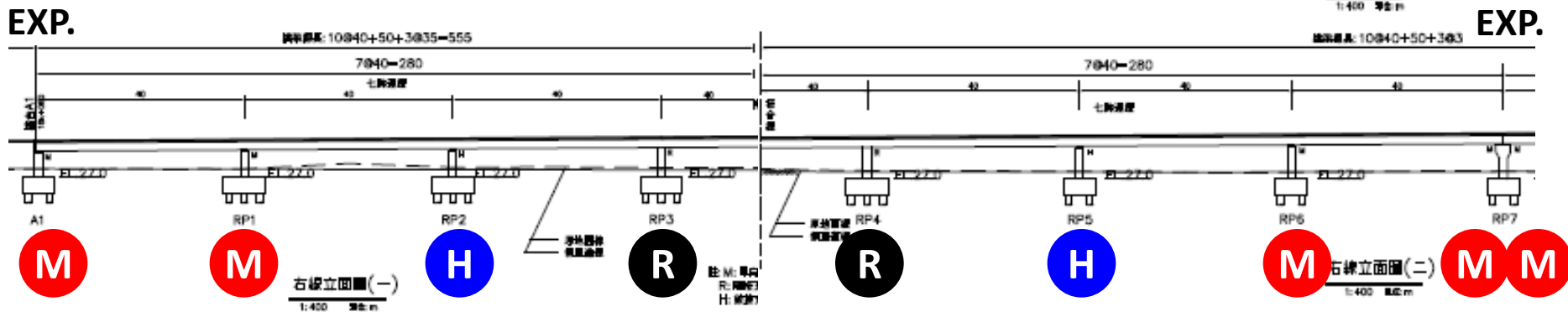
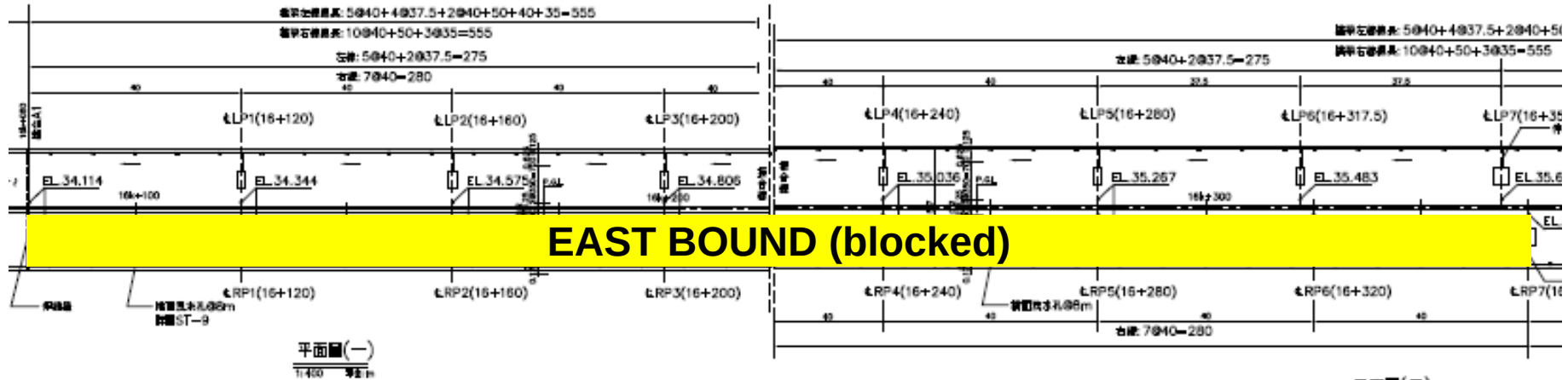
震央距：35公里，方位角：102.31度



Fault distance (11.9km)



Structural system #1 (A1~P7)



A1

PR1

PR2

PR3

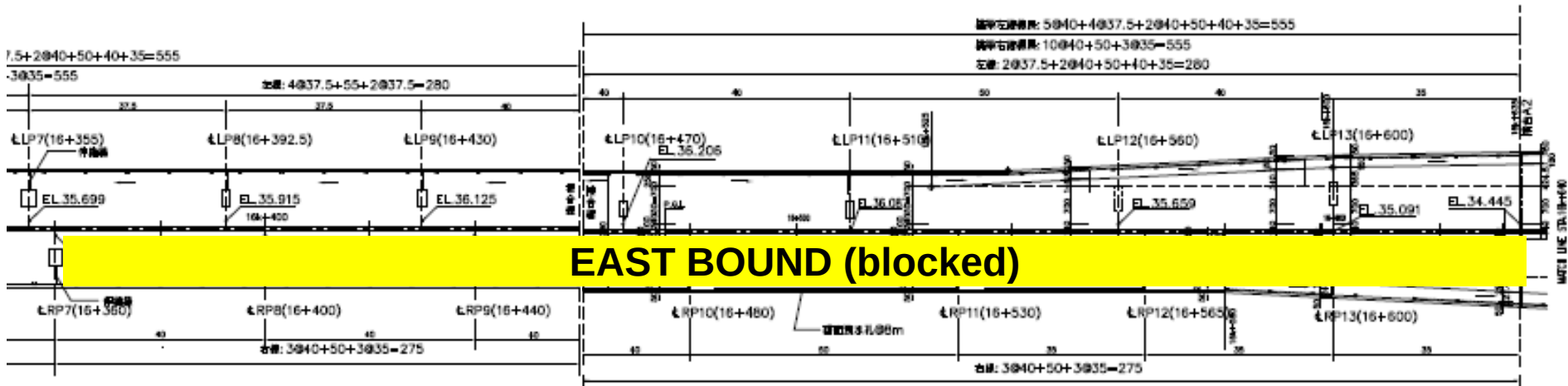
PR4

PR5

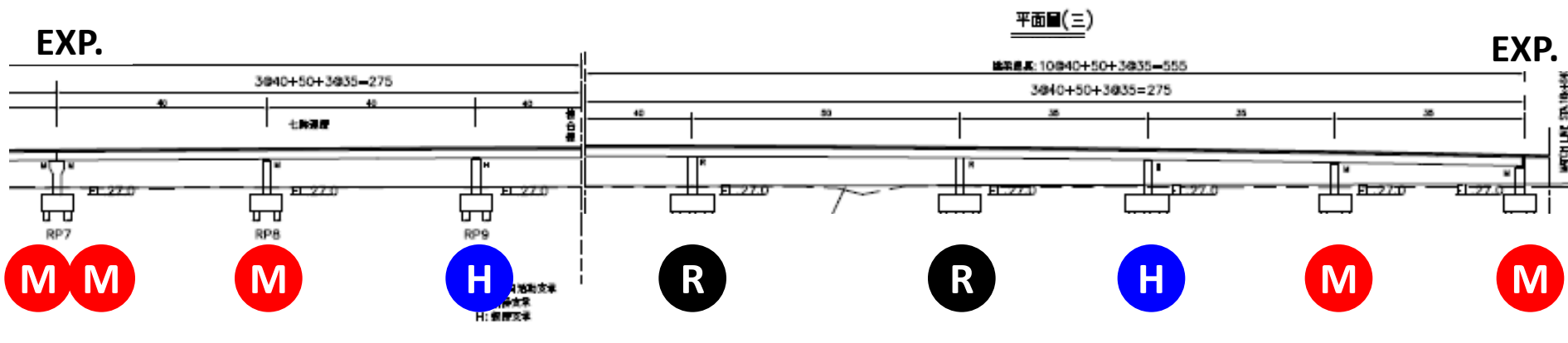
PR6

PR7

Structural system #2 (P7~A2)

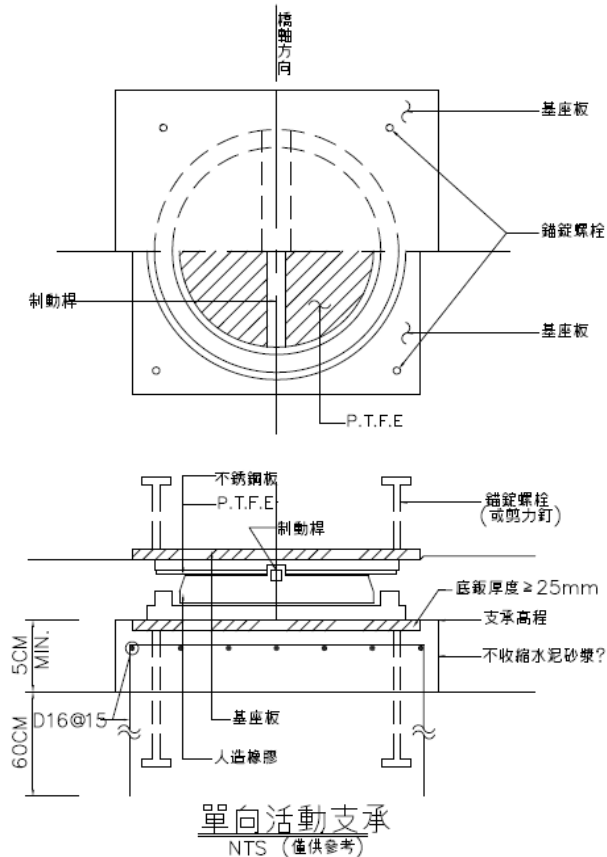


EAST BOUND (blocked)

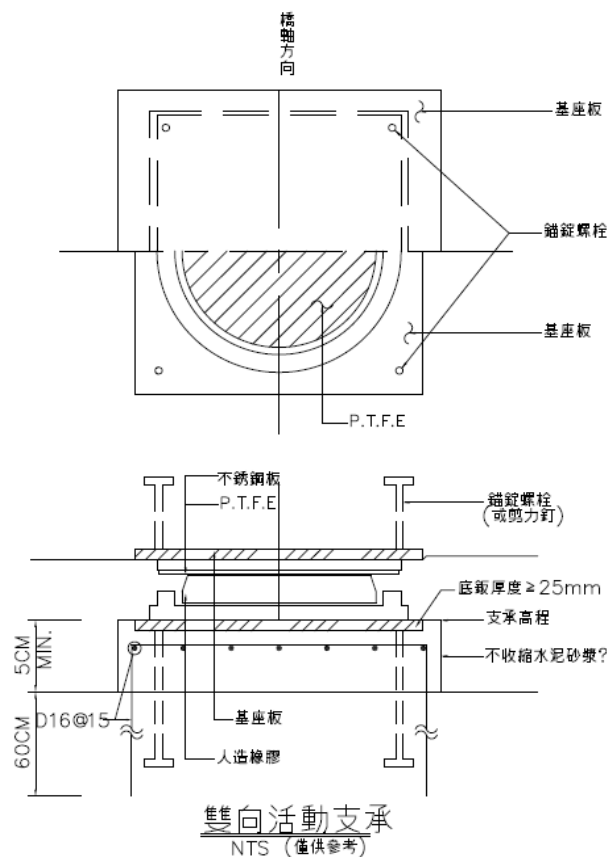


PR7 PR8 PR9 PR10 PR11 PR12 PR13 A2

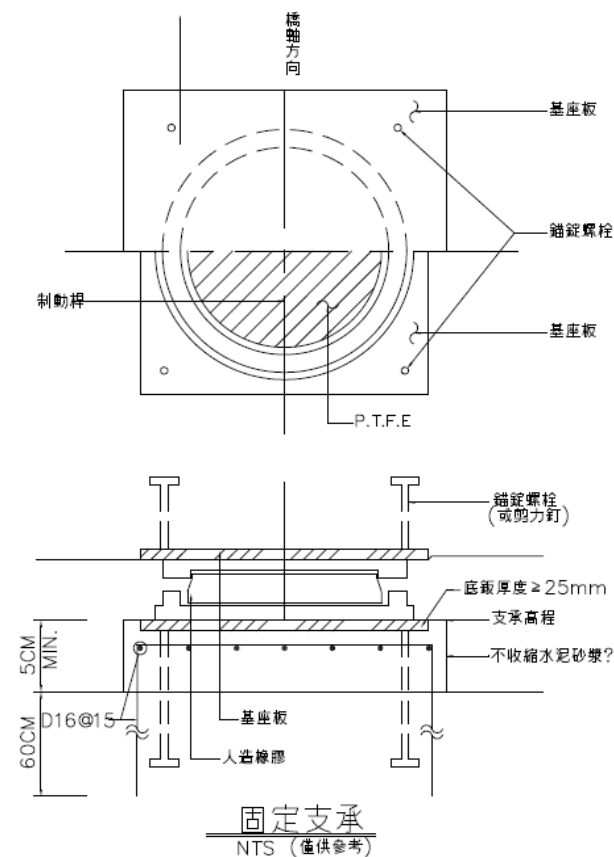
Type of pot bearing



HINGE
(uni-dir.)

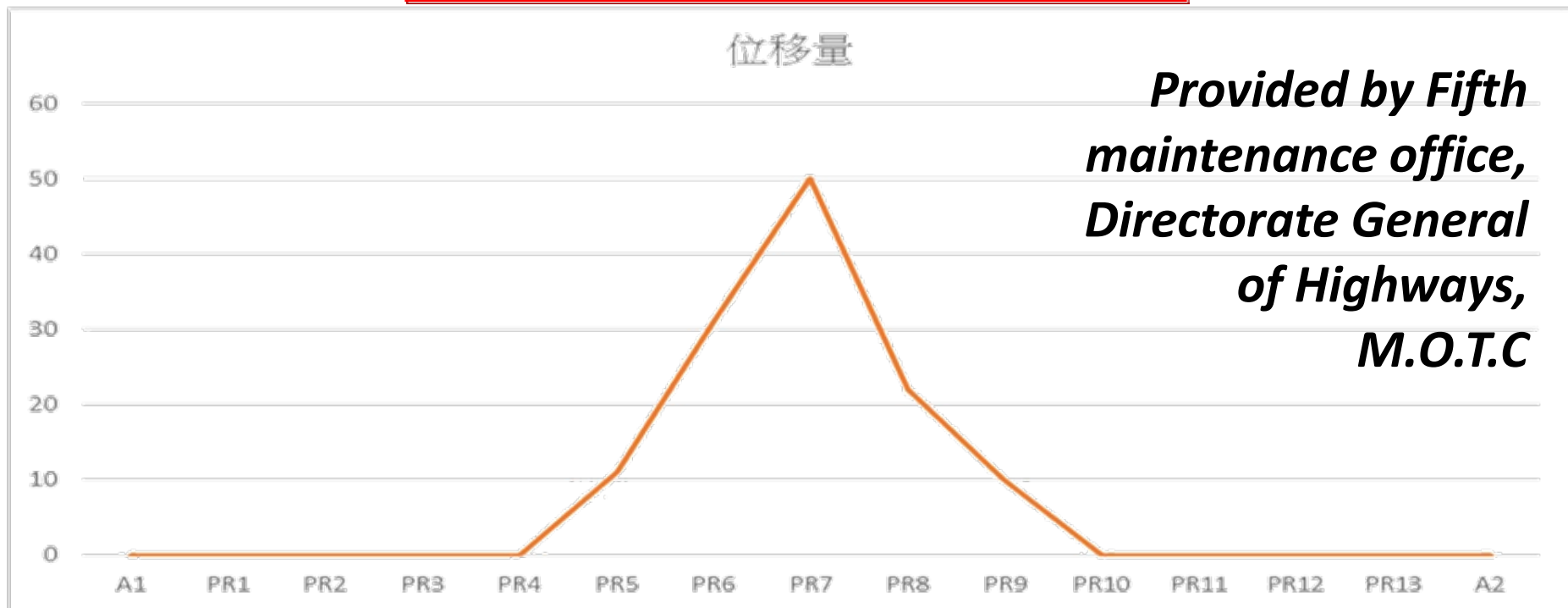
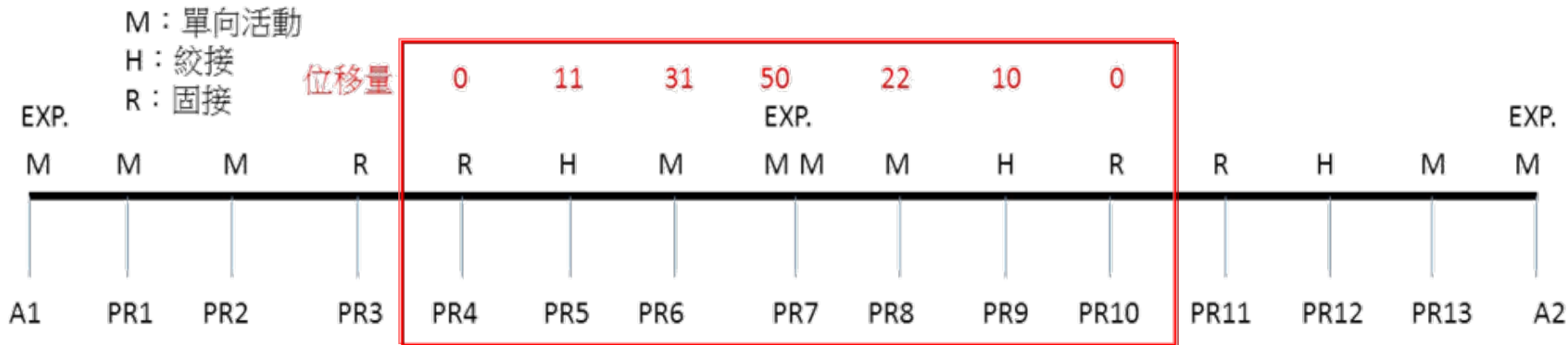


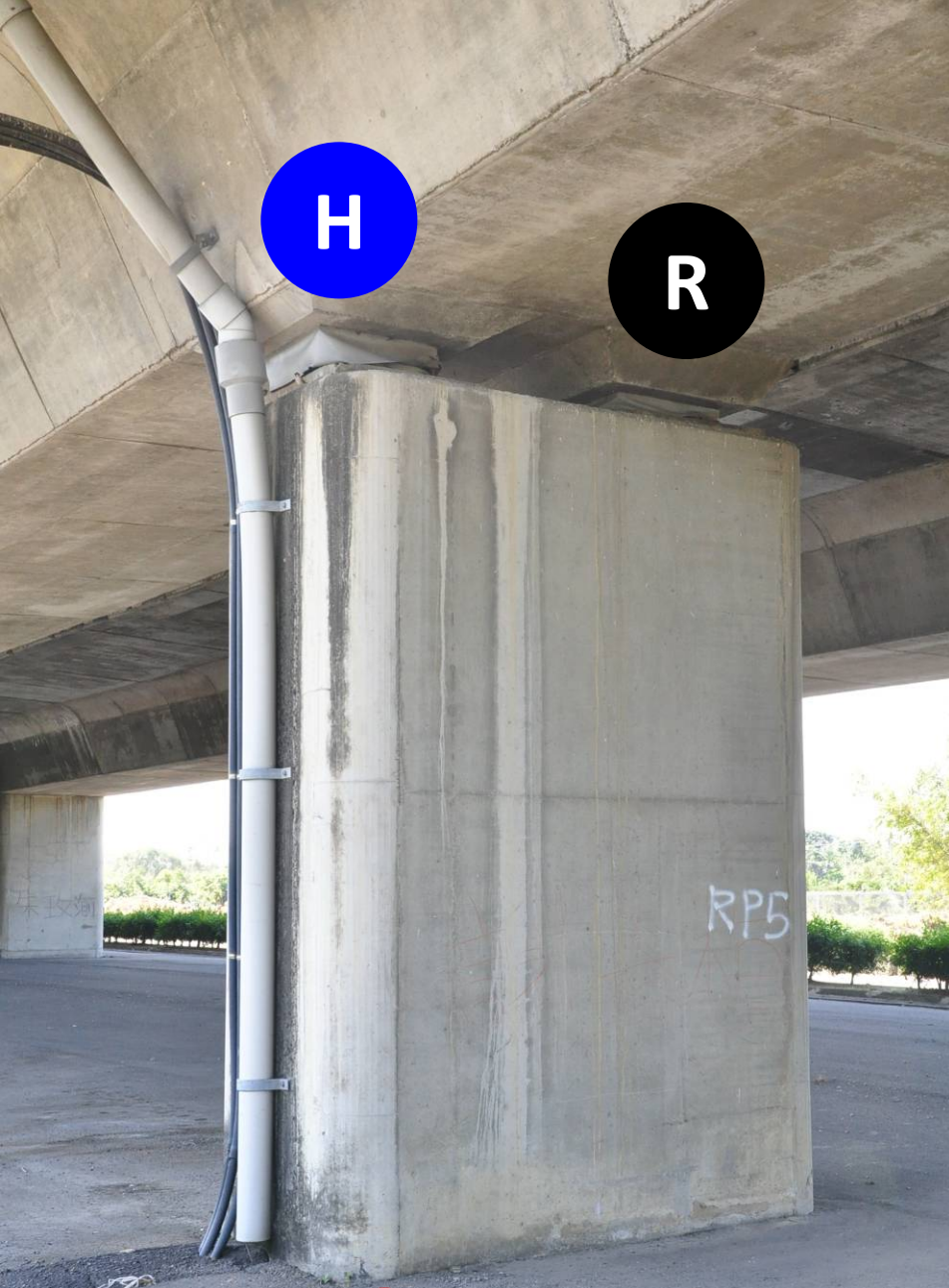
MOVEABLE
(two-dirs.)



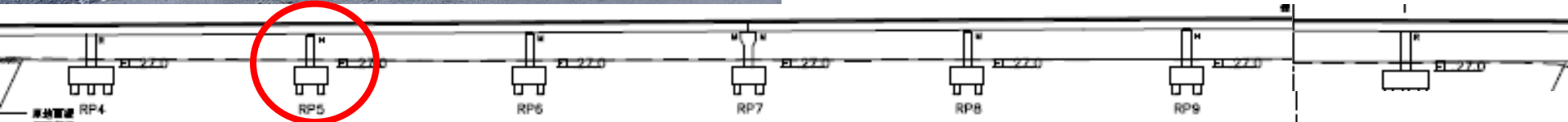
RIGID

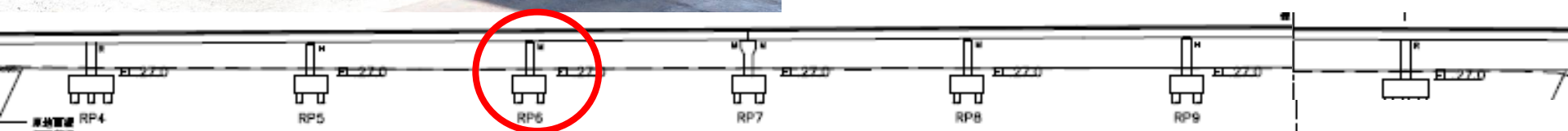
Residual lateral displacement

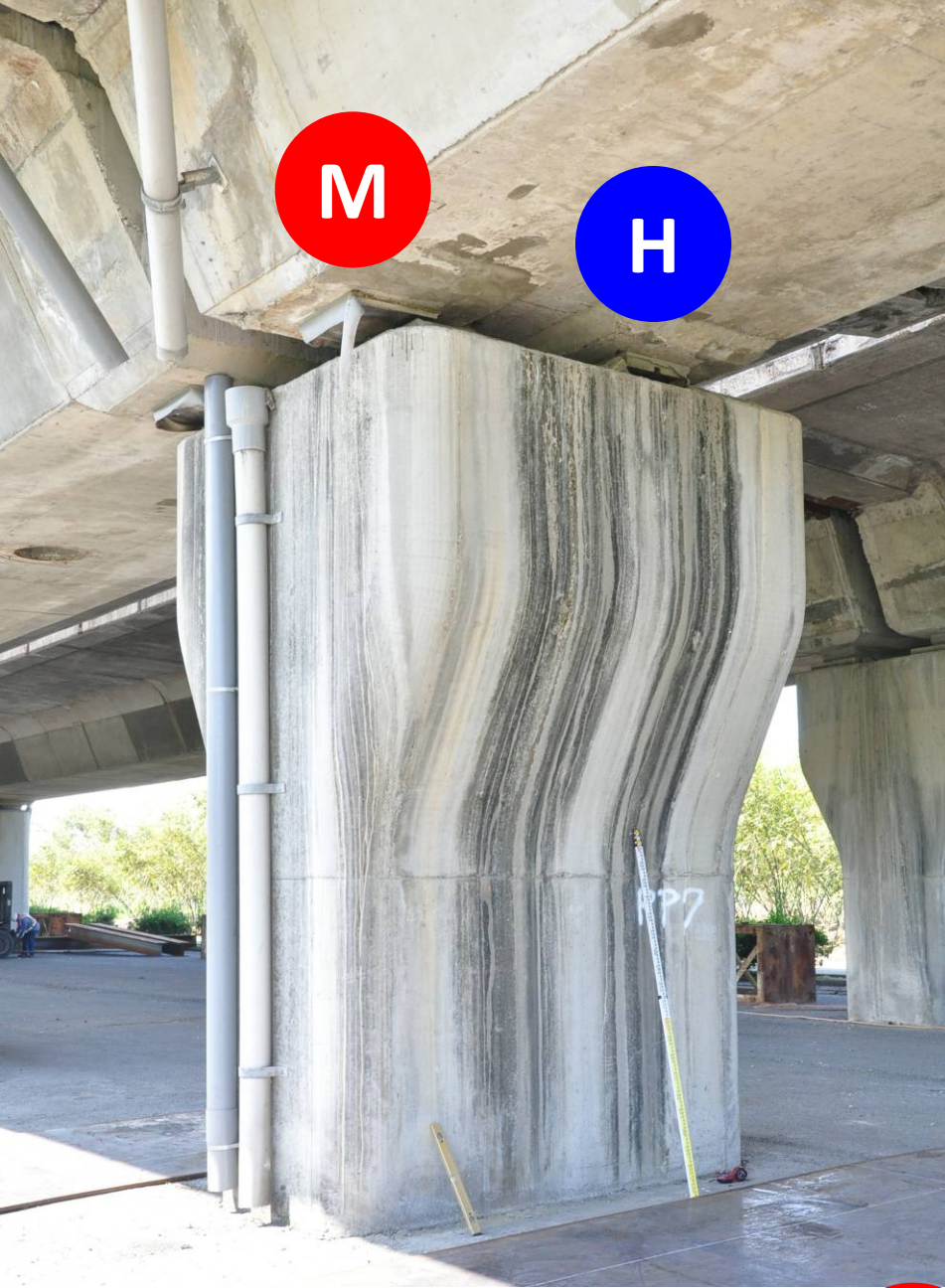




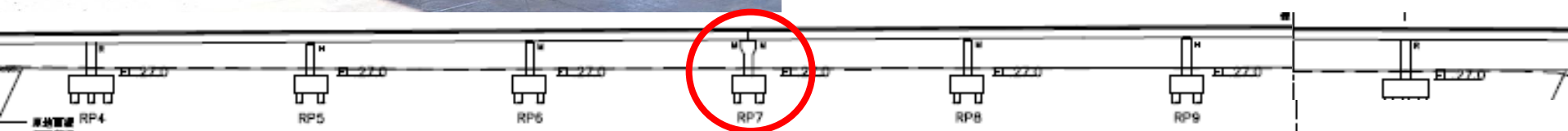
RP5





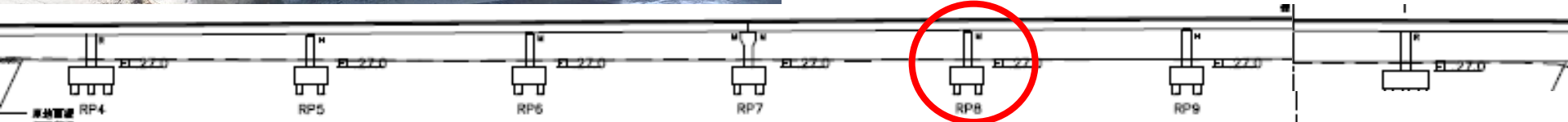


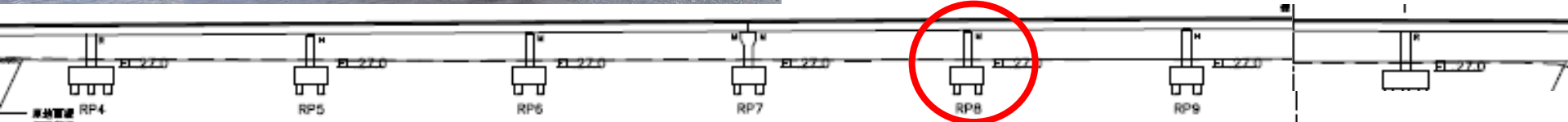
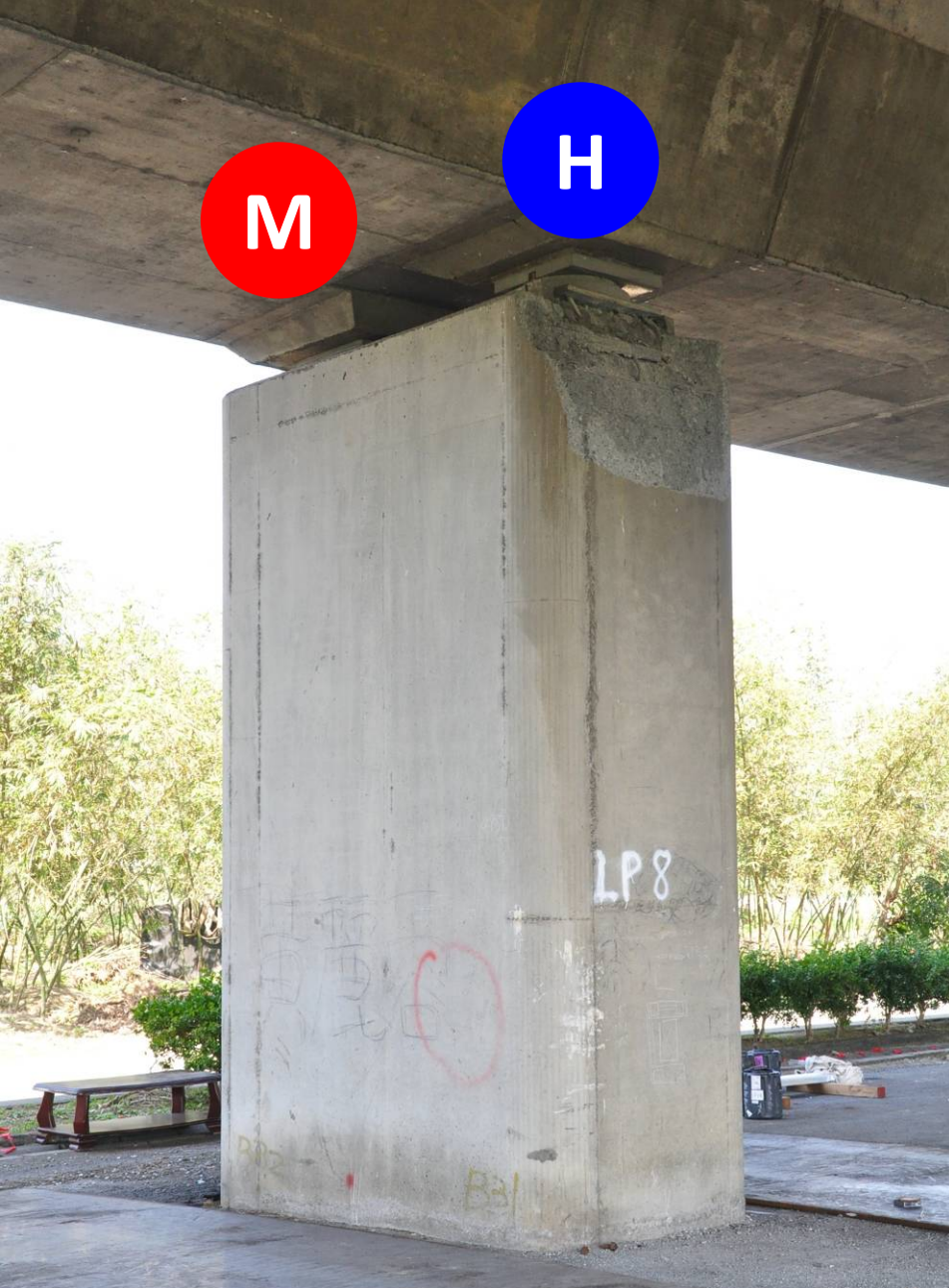
RP7

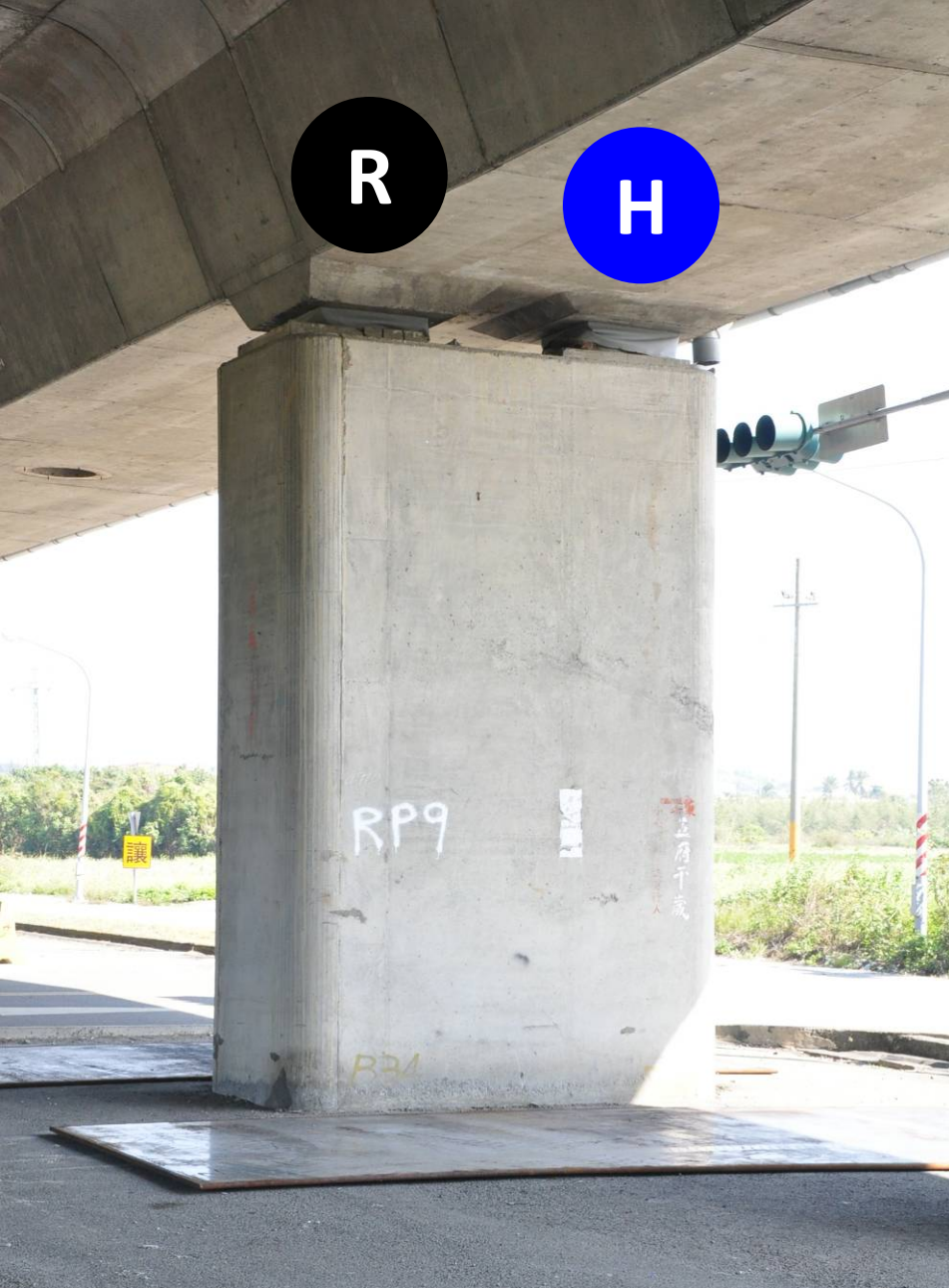




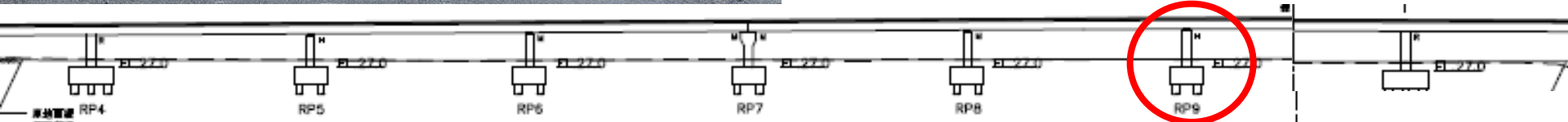
RP8







RP9





Gap between two bounds @ Exp. Joint

Gap @exp. Jt. 59cm

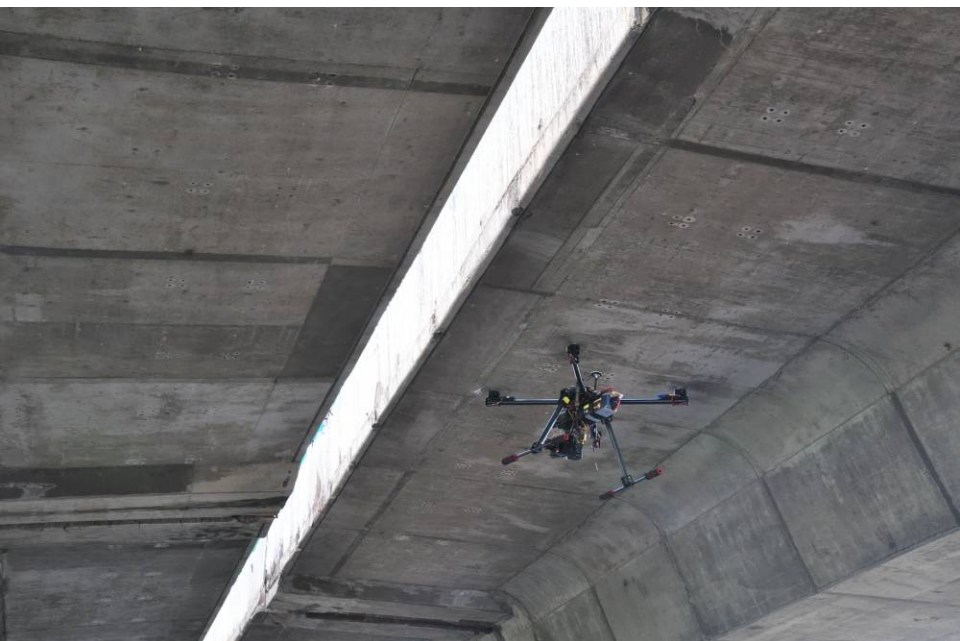




GROUND LIDA



HANDHELD LIDA



UAV



TAPE MEASURE

- The damage patterns of bridge No.24 are related to arrangement of **bearing system** within the vibration unit, and the seismic **wave propagation** roughly perpendicular to the longitudinal axis of the bridge.

- Failure of bearings provides a **sliding mechanism** to protect the piers without hinge mechanism; however, the allowance of **permanent displacement** as well as the **pounding effect** should be identified by nonlinear time history analysis in design stage.

Suggestions

- 落實橋梁設計審查、施工計畫審查與施工監造及查核。
- 全面加裝橋梁防落裝置。
- 儘速進行橋梁耐震能力評估與補強。

**Thanks for your
attention!**

