2014 South Napa Earthquake: UMB Performance
SEAOC 2014 Convention

Bill Tremayne, S.E. (CA), CPEng (NZ)
SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
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NORTH-SOUTH (360°)
SRSS OF RECORDS

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
TAGGED BUILDINGS + RETROFITTED UMB

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
OVERVIEW OF RECONNAISSANCE

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
MARE ISLAND – MASONRY INFILL STEEL FRAMES

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MARE ISLAND – NON-DUCTILE CONCRETE
SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE

MARE ISLAND – NON-DUCTILE CONCRETE
SOUTHWEST NAPA EARTHQUAKE – UMB PERFORMANCE

NAPA – POST OFFICE – STEEL FRAME w/ URM INFILL

Courtesy of Bret Lizundia
NAPA – POST OFFICE – STEEL FRAME w/ URM INFILL

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
NAPA – POST OFFICE – STEEL FRAME w/ URM INFILL

Courtesy of Marko Schotanus

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
NAPA – POST OFFICE – STEEL FRAME w/ URM INFILL

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
975 1st Street - Semorille Building – Braced Frame Retrofit

South Napa Earthquake – UMB Performance
975 1ST STREET - SEMORILLE BUILDING – BRACED FRAME RETROFIT

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
975 1ST STREET - SEMORILLE BUILDING – BRACED FRAME RETROFIT

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
RETROFITTED URM + BUSINESS CONTINUITY!

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
RETROFITTED URM + BUSINESS CONTINUITY!

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE

Courtesy of Bret Lizundia
RETROFITTED URM + BUSINESS CONTINUITY!
(2 weeks later)

Courtesy of Bret Lizundia

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
RETROFITTED URM + BUSINESS CONTINUITY!
(2 weeks later)

Courtesy of Bret Lizundia
SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE

1040 MAIN STREET

Photo courtesy Google Street View
1040 MAIN STREET - RETROFITTED URM

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE

Courtesy of Bret Lizundia
1040 MAIN STREET - RETROFITTED URM

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
1122 MAIN ST – RETROFITTED URM (except parapet)

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE

Courtesy of Bret Lizundia
1122 MAIN ST – RETROFITTED URM

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE

1122 MAIN ST – RETROFITTED URM

Courtesy of Bret Lizundia
GOODMAN LIBRARY - RETROFITTED

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
GOODMAN LIBRARY - RETROFITTED

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
GOODMAN LIBRARY - RETROFITTED

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE

Courtesy of Bret Lizundia
GOODMAN LIBRARY - RETROFITTED

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE

Courtesy of Bret Lizundia
GOODMAN LIBRARY - RETROFITTED

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE

Courtesy of Bret Lizundia
902 MAIN STREET - JOE’S DOWNTOWN BREWERY

Retrofitted in 2010

Very little if any damage – open for business on Sunday after the earthquake

Photo courtesy Google Street View

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
813 MAIN STREET – STEEL MRF RETROFIT

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
901 MAIN ST - RETROFITTED URM

SOUTH NAPA EARTHQUAKE – UMB PERFORMANCE
CONCLUDING REMARKS

- Many URM’s with comprehensive interventions performed well (LS~CP)
- Falling hazards vs. time of day
- OOP effects & interaction with in-plane @ corners
- Placarding inconsistencies
- Follow-up evaluations are critical for URM’s
- Data collection:
  - Talk to people!
  - Mine resources: Clearinghouse
- Need more detail: Quantitatively understand issues
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- EERI

- ATC & FEMA
QUESTIONS?