



DCI implemented two levels of structural condition assessments for the SDC project. Level 1 was a screening process intended to provide general information to the team on a wide variety of structures over the entire campus. Level 2 was a detailed assessment process for a smaller group of structures requiring additional evaluation.

Phase 1, Level 1 - Rapid Assessment Screening Methodology

DCI Engineers utilized Federal Emergency Management Agency P-154 "Rapid Visual Screening of Buildings for Potential Seismic Hazards" (FEMA P-154) forms to evaluate basic life safety considerations on approximately 170 existing SDC structures. The intent of FEMA P-154 is to document overall building information, identify the primary structural system and construction material, recognize known building deficiencies and irregularities, and determine a numerical score for anticipated seismic resiliency. The estimated duration of visual inspection and completion of screening form is five to ten minutes per structure. The full team building condition report incorporates DCI's visual screening results and physical condition observations with information from other design disciplines to provide a comprehensive summary of the existing building stock on the SDC campus. In some instances, modifications to the Rapid Assessment screening results were necessary based on additional information gathered during the Level 2 detailed assessment process.

Phase 1, Level 2 - Detailed Assessment Methodology

The overall project team developed a "shortlist" of structures that required additional evaluation. DCI Engineers utilized American Society of Civil Engineers 41-13 "Seismic Evaluation and Retrofit of Existing Structures" (ASCE 41-13) Tier 1 checklists and analysis for each structure identified on the "shortlist". The intent of an ASCE 41-13 Tier 1 assessment is to provide a nationwide baseline for existing building seismic evaluation. This type of assessment requires reviewing existing construction documents, observing physical conditions throughout the structure, comparing building data with known structural deficiencies, and incorporating target performance level objectives. The approximate duration of a Tier 1 assessment on the SDC project was 8-16 hours per structure.

Phase 1 Assessment Reports for Shortlisted Structures

Individual assessment reports summarize implemented ASCE 41-13 methodology, information reviewed, and conclusions for each building identified on the "shortlist". The intent of these reports is to document the building data obtained and the assessment process followed to provide justification for recommended levels of strengthening recommended for each shortlisted structure. After reviewing all of the individual assessment, three strengthening recommendation categories were developed:

- **Minimal Strengthening** = Recommended strengthening is comparatively less than requirements for a building with a similar structural system built in the same geographic area during the same era. In some cases, no strengthening is required to maintain current occupancy.
- **Standard Strengthening** = Recommended strengthening is typical for a building with a similar structural system built in the same geographic area during the same era.
- **Major Strengthening** = Recommended strengthening is comparatively greater than requirements for a building with a similar structural system built in the same geographic area during the same era. In some cases, the structure may not be economically feasible to restore and occupy.



Date: 2/28/2018

| Building Name | ASCE 41 Building Type ¹ | Square Footage (ft ²) | Needs Immediate Action | Reusability Rank ² | Potential Improved Rank ³ | Comments |
|--|------------------------------------|-----------------------------------|------------------------|-------------------------------|--------------------------------------|---|
| Acacia Court 1 | W1a | 5,924 | --- | 3 | 2 | |
| Acacia Court 2 | W1a | 6,600 | Yes | 4 | --- | Poor Condition - Immediate roof and heating system repair |
| Acacia Court Garages | W2 | 1,881 | --- | 2 | --- | Ranked 2 instead of 3 based on access to structural system |
| Activity Center (Blue Rose Café) | URM | 6,600 | Yes | 3 | --- | Good condition - Immediate action for roof replacement recommended |
| Stoneman, Poppe, Cromwell, Lux, Judah, Bemis, Corcoran, Malone, Cohen, Smith, Brent, Roadruck, and Bentley | C2a, W1a, & RM1 | 19,624 | --- | 1 | --- | Not all buildings were observed. Rating based on a representative sample. |
| Butler (Redwoods, Sequoia, James, and Cedars) | C2 | 39,652 | --- | 2 | --- | Very low reuse cost considering building square footage. |
| Carpenter Shop | | 1,540 | | | | |
| Carpenter Storage | W2 | | --- | 5 | --- | |
| Chamberlain | C2 and C2a | | --- | 3 | --- | |
| Finnerty | C2a | | Yes | 3 | --- | Good condition - Immediate to repair the room with significant water damage and mold. |
| Fire House | W2 | | --- | 2 | 1 | |
| Frederickson Receiving | C2 | | --- | 3 | 2 | |
| Glass & Sign Shop | W2 & C2 | | --- | 4 | --- | |
| Goddard & Goddard Workshop | C2 & C2a | | --- | 3 | 2 | |

| | | | | | | |
|---|--------------|--|-----|--------------------|-------------------|--|
| Hatch | C2a | | --- | 4 | 3 | |
| King | C2a | | --- | 3 | 2 | |
| Laundry/Property | S3 & C2 | | --- | 2 | --- | |
| Main Kitchen - Eldridge Store in Dining Room | | | --- | | | |
| Main Store Room | URM & PC1 | | --- | PC1 = 2 URM = 3 | --- | |
| Maintenance Shop | URM | | --- | 4 | --- | |
| McDougall | C2a | | --- | 2 | --- | |
| Nelson Treatment Center | C2 | | --- | 3 | 2 | Relatively low reuse cost considering building square footage. |
| Oak Lodge | C2a | | --- | 3 | 2 | |
| Oak Valley School | C2 and C2a | | --- | C2 = 2 C2a = 3 | C2 = 1 C2a = 2 | |
| Ordahl/Johnson and Regamey/Emparan | C2 | | --- | 4 | --- | |
| Hill and Osborne | C2a | | --- | 3 | 2 | |
| Paint Shop | URM | | --- | 4 | --- | |
| Palm Court | C2a | | --- | 3 | 2 | |
| Parmelee & Powers | PC1a | | --- | 1 | --- | |
| Paxton | C2a | | --- | 3 | 2 | |
| Pines | W1a | | Yes | 4 | --- | Immediate attention to stop water infiltration and mold. |
| Plumbers/Motorpool Storage | URMa & W2 | | --- | 3 | --- | |
| Porter Administration/Post Office | | | --- | | | |
| Professional Education Center (P.E.C.) | URM | | Yes | 5 | --- | Immediate attention to stop water infiltration and mold. Stablize collapsing areas of structure. Provide pedestrian barrier around structure. |

| | | | | | | |
|--|------------|-----|-----|---|-----|---|
| All Single Family Residences and Related Garages | W1 and W2a | N/A | --- | 3 | --- | Immediate attend: #141 to repair fire damage. #146 to stop water infiltration and mold. |
| Residence 140 "Sonoma House" and Ancillary Structures | W1 | N/A | Yes | 3 | --- | Immediate attention to Servants Quarters if those are intended for reuse. |
| Storage Barn #1 & #2 (Dairy Area Building No. 11 & 12) | W2 | | --- | 2 | --- | |
| Thompson/Bane - Units 366 & 378 NF Suspense | | | --- | | | |
| Transportation Garage | W2 | | Yes | 3 | --- | Recommend temporary X-bracing on lower level to mitigate soft story danger. |
| Upholstery & Machine Shop | C2 | | --- | 2 | 1 | |
| Wagner, Wright, & Dunbar | Unkown | | --- | 4 | --- | |
| Walnut | W1a | | Yes | 5 | --- | Immediate attention to stop water infiltration and mold. Stabilize collapsing areas of structure. |

Notes:

1) ASCE 41-13 Structure System Building Types:

W1: Single Family Wood Light Frame

W1a: Multi-Story, Multi Unit Wood Light Frame

W2: Wood Frame, Commercial and Industrial

S3: Steel Light Frame (Pre-engineers Steel Building)

C2: Concrete Shear Walls with Stiff Diaphragm

C2a: Concrete Shear Walls with Flexible Diaphragm

PC1: Precast or Tilt-up Concrete Shear Walls with Flexible Diaphragms

PC1a: Precast or Tilt-up Concrete Shear Walls with Stiff Diaphragms

RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms

RM1a: Reinforced Masonry Bearing Walls with Stiff Diaphragms

URM: Unreinforced Masonry Bearing Walls with Flexible Diaphragms

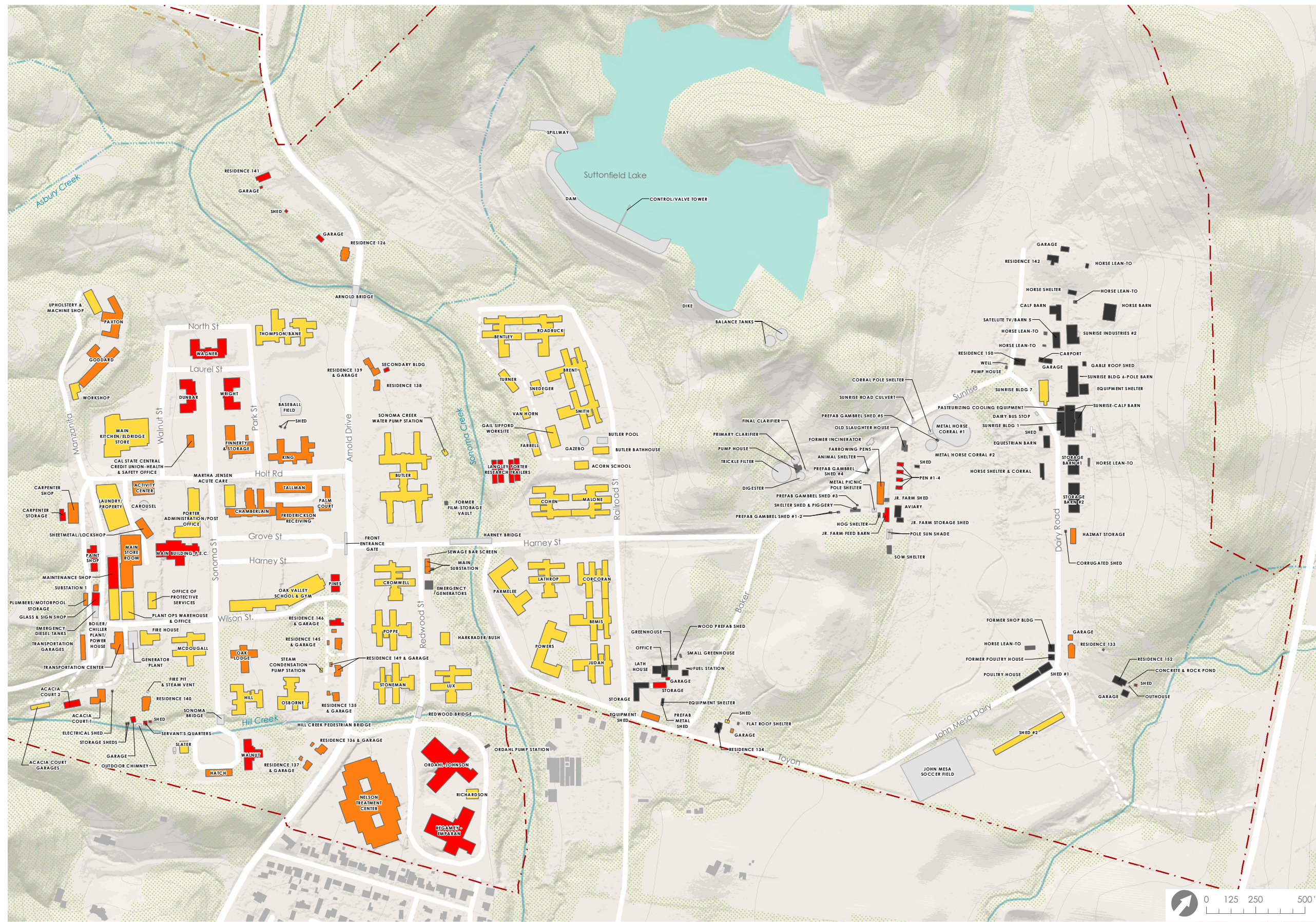
URMa: Unreinforced Masonry Bearing Walls with Stiff Diaphragms

2) Rank System Definitions:

- 1 No or negligible strengthening required
- 2 **Minimal strengthening required** based on building age and type.
- 3 **Standard strengthening required** based on building age and type.
- 4 **Major strengthening required** based on building age and type.
- 5 Very difficult to reuse. Consider Demolition.

3) High potential of improving the building reusability rank with additional investigation, material testing, and/or a detailed structural analysis.

Figure X.X
RAPID ASSESSMENT: EXISTING CONDITIONS - STRUCTURAL



LEGEND

- Minimal Strengthening Required
- Standard Strengthening Required
- Major Strengthening Required
- Structure Not Evaluated
- Building Not Evaluated
- Building/Structure Destroyed by Fires
- SDC Property

Sources:
Page & Turnbull, JRP Historical Consulting,
USGS, GreenInfo Network, Sonoma Ecology
Center, WRT

