Technical Summary of Proposed Engineering Standards

Building Classification & Description	Approx. # of Buildings	Upgrade Level
URM Class 1 Critical Buildings (Risk category IV buildings, power stations serving critical facilities, water facilities, other public utilities)	6	Buildings are to be evaluated and retrofitted to an **Immediate Occupancy Performance level** meaning that the building will be immediately occupiable and operational following a Design Earthquake (BSE-1N) AND to a **Life Safety Performance Level** meaning that significant damage to structure may have occurred which may or may not be repairable following a maximum expected earthquake (BSE -2N) but building occupants are expected to exit safely. The performance objective is equivalent to that of new building standards. Some typical upgrades that may be required include: a. brace URM parapets, cornices and chimneys; b. anchor URM walls to floors and roofs for out of plane loading; c. attach diaphragm to vertical elements to transfer in plane shear. d. New roof and floor sheathing as required for diaphragm functions e. bracing of walls to with vertical steel elements to prevent buckling of exterior walls f. Additional bracing elements such as concrete shear walls or braced steel frames g. foundation upgrades etc.
Class 2 A. All school buildings B. Risk category III buildings (public assembly spaces)	92, including 45 schools. 38 churches and a few other non-profit buildings are proposed to be treated as class 3.	Buildings are to be evaluated and retrofitted to a **Damage Control Performance Level** meaning the building may not be immediately occupiable but could be repaired and occupied in a relatively short time frame following a Design Earthquake(BSE-1N) AND to a **Collapse Prevention Performance Level** meaning the building may suffer damage that may or may not be repairable but building occupants are expected to exit safely) following a maximum expected earthquake (BSE- 2N). Under this standard the retrofitted building is expected to perform equivalent to new buildings assigned to Risk category III buildings. Some typical upgrades that may be required may include a. brace URM parapets, cornices and chimneys; b. anchor URM walls to floors and roofs for out of plane loading; c. attach diaphragm to vertical elements to transfer in plane shear. d. New roof and floor sheathing as required for diaphragm functions e. bracing of walls to with vertical steel elements to prevent buckling of exterior walls f. Additional bracing elements such as concrete shear walls or braced steel frames g. foundation upgrades etc.

Class 3 All URM buildings not categorized as URM Class 1,2 or 4	1,332 Plus churches and other non-profit buildings (but not schools) may elect to use this standard.	Only the following elements are required to be upgraded per ASCE 41 standard: a. brace URM parapets, cornices and chimneys; b. anchor URM walls to floors and roofs for out of plane loading; c. attach diaphragm to vertical elements to transfer in plane shear. d. New roof sheathing as required for diaphragm functions. The performance objective provides reduced or limited safety objective in that it helps **Reduce Risk of Collapse**. In addition, churches and non-profit buildings that are classified as URM Class 2 but elect to use the standards for URM Class 3 are required to post placards.
Class 4 1 and 2-story buildings with 0-10 occupants.	201	Only the following elements are required to be upgraded per ASCE 41 a. brace URM parapets, cornices and chimneys; b. anchor URM walls to roofs for out of plane loading.

ABBREVIATIONS AND REFERENCES FROM THE TABLE:

RISK CATEGORY is defined in *Oregon Structural Specialty Code*, 2014, Table 1604.5.
ASCE 41 refers to latest edition of American Society of Civil Engineers standard ASCE 41. As of this writing, the reference standard is ASCE 41-13.
BASIC SAFETY EARTHQUAKE 1N (BSE-1N) is taken as two-thirds of the BSE-2N in accordance with ASCE 41.
BASIC SAFETY EARTHQUAKE 2N (BSE-2N) is taken as a seismic hazard with a 2% probability of exceedance in 50 years in accordance with ASCE 41
IMMEDIATE OCCUPANCY PERFORMANCE LEVEL means the post-earthquake damage state in which only very limited structural damage has occurred and the building should be occupiable and operational following an event. Although the building may suffer some structural damage requiring minor structural repairs, these repairs are not required to before re-occupancy. The risk of life-threatening injury as a result of structural damage is very low.
LIFE SAFETY PERFORMANCE LEVEL means the post-earthquake damage state in which significant damage to structure has occurred which may or may not be repairable but building occupants are expected to exit safely. This damage has not resulted in large falling debris hazard. The structure is not an imminent risk of collapse, and injuries might occur during an earthquake but the overall risk to life -threatening injury as a result of structural damage is expected to be low.
DAMAGE CONTROL PERFORMANCE LEVEL means a post-earthquake damage state between Life Safety and Immediate Occupancy performance levels. It is intended to provide greater reliability of resisting collapse and being less damaged than a typical structure but not to the extent required of a structure designed to meet the Immediate Occupancy Performance level. It would potentially permit return to function more quickly than the Life Safety Performance Level, but not as quickly as Immediate Occupancy Performance Level.
COLLAPSE PREVENTION PERFORMANCE LEVEL means the post-earthquake damage state in which the building is on the verge of partial or total collapse. Significant damage has occurred and there exists significant risk of injury caused by falling hazards. The structure may not be repairable and is not safe for reoccupancy because aftershock activity could induce collapse.