



EARTHQUAKE HOME RETROFIT HANDBOOK

HOW TO COMPLETE THE HOME ASSESSMENT CHECKLIST



Disclaimer

The information in the Earthquake Home Retrofit Handbook is based on current earthquake home retrofit practice and standards for the retrofit of existing buildings. Practice and standards may change as new information is learned. No guarantee is made that the use of the information in the series will prevent all losses in all earthquakes. Liability for any losses caused by earthquakes or as a result of applying the information in these publications is specifically disclaimed.

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INTRODUCTION

Guide to Completing the Home Assessment Checklist

This handbook contains detailed information to help you complete the Home Assessment Checklist.

* The information collected by using the Home Assessment Checklist on page 18 will help you, the homeowner or contractor, to determine if the home qualifies to use the standard plan and to briefly assess what retrofit work your home needs. After completion of the checklist, you should have sufficient information to decide whether you want to proceed with the earthquake Home Retrofit project. The completed checklist is a required part of the building permit application. The Home Assessment Checklist should take one to two hours to complete.

The Home Assessment Checklist helps you complete the following tasks:

- Compile general homeowner and project information, such as homeowner name, telephone, and project address
- Determine if the home qualifies to use the voluntary, Standard Earthquake Home Retrofit (SEHR) Plan
- Complete a brief visual survey of the home to identify what earthquake retrofit work may be needed and to determine if critical elements to be used in the retrofit are damaged or missing, and
- Determine if you need the services of an architect or engineer

How do earthquakes damage homes? During an earthquake the shaking of the ground is transferred into the house through its foundation. If the home's construction is strong enough, it suffers little structural damage. However, if it has a structural weakness, as most older homes do, the energy of the shaking will focus on that weakness and begin to damage your home.

Many wood-frame homes, particularly those built in Washington before 1965, may not be adequately bolted to their foundation. Without this anchorage, a foundation can be literally jerked out from under the building above by a large earthquake. Older homes have been damaged or destroyed in this manner by every major earthquake.

Homes lacking the installation of sheathing to strengthen the short wall between the foundation and the first floor framing have sustained severe damage even when bolted to the foundation. Washington homes built after 1975 generally have these short walls or "pony walls" strengthened to resist collapse during earthquake ground shaking. However, some Washington homes built as recently as 1985 lack sufficient strengthening. If the pony wall in your house is not strong, it should be strengthened. If not, the next earthquake may damage the pony wall and knock the home off its foundation, even if you've properly bolted it down.

COMPLETING THE HOME ASSESSMENT CHECKLIST

The checklist beginning on page 18 is divided into two parts: Qualification Requirements (Questions 1-11) and Identify Retrofit Needs for Home (Questions 12-25). The next few pages will help you determine the information needed to complete each question on the checklist. Additional information, to help explain terminology and/or concepts, is included in shaded boxes for easy reference.

PART 1 – QUALIFICATION REQUIREMENTS – QUESTIONS 1-11

The information required in Part 1 helps determine if the home qualifies to use Standard Earthquake Home Retrofit (SEHR) Plan Program. A “No” or “Uncertain” answer to any of the questions in Part 1 indicates that you may need an architect or engineer to prepare alternate or additional construction drawings in order to obtain a building permit. Figure 1 shows a typical Seattle home likely to qualify to use the SEHR Plan.



**Figure 1. Example of a Seattle home that qualifies to use the Standard Earthquake Home Retrofit (SEHR) Plan
(Photo by Gary Milici, RetroFitters)**

Question 1: Is the home of light, wood-frame construction?

The Standard Earthquake Home Retrofit (SEHR) Plan applies only to light, wood-frame residential construction. The larger building forces generated by earthquake shaking for heavier construction materials, such as concrete or brick, would likely exceed the size of the force assumed in SEHR Plan, resulting in the home falling off the foundation. Homes with a brick veneer over a wood-frame qualify to use the SEHR Plan. Earthquake shaking may cause severe damage to the brick veneer.

Question 2: Does the home have four or fewer dwelling units?

Buildings with more than four dwelling units tend to be larger, heavier, and more complex structures. An architect or engineer must design the appropriate earthquake retrofit method for these structures. If the home has been remodeled into separate dwelling units, the structure may also be weakened in ways that the standard plan does not address. You may need an architect or engineer to design a part or all of the retrofit.

Question 3: Is a sill plate present?

If your home lacks a sill plate like those shown in Figure 8 and 14, you may need to hire an engineer or architect to determine how to add a sill plate or to develop an alternate foundation anchoring method. Appendix D in Booklet 3 provides a plan detail that may help to develop an alternate method that uses anchor side plates instead of a vertically installed anchor bolt.

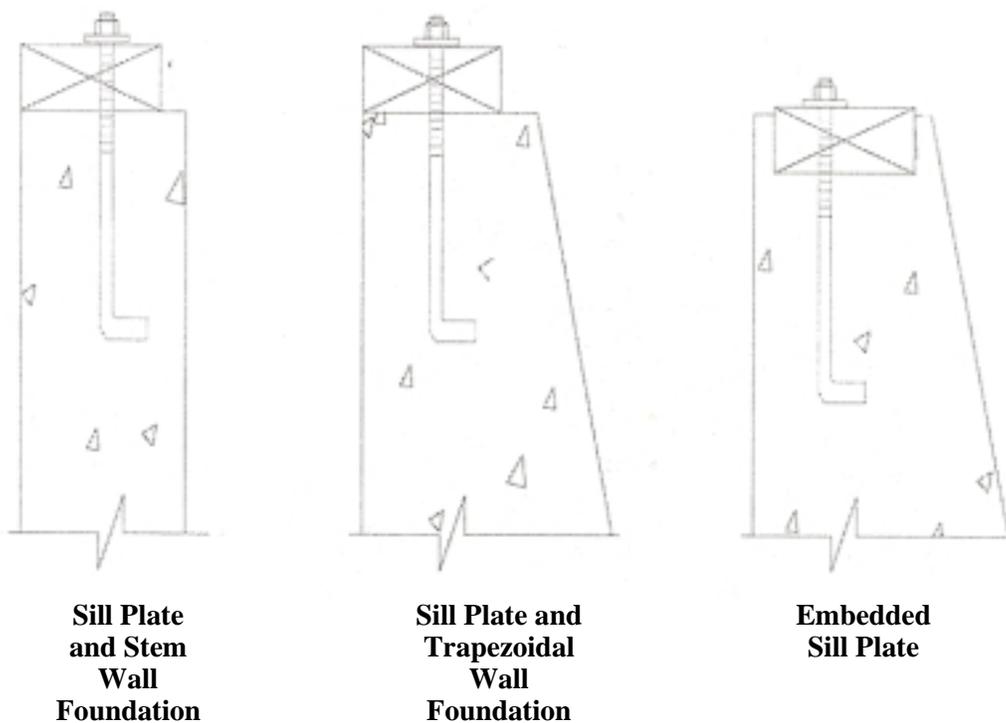


Figure 2. Sill Plate and Foundation Wall Cross Sections. The sill plate is the horizontal piece of wood (two-by-four or two-by-six) that rests on top of the foundation wall (figure provided by City of San Leandro)

Question 4: Is the home built on a flat to moderate slope of less than 30 percent (approximately 18 degrees from horizontal)?

The standard plan applies to homes built on flat to moderate slopes no steeper than the slope formed when the ground increases by one unit the vertical direction for every three units in the horizontal direction (Fig. 2). Vertical changes in slope may be accommodated by “steps” in the foundation wall (Fig. 3). You may measure the vertical height of the foundation step and compare it to the horizontal distance to the next foundation step. In the example shown in Fig. 4, the foundation step is 3 feet and the horizontal distance to the next step is 9 feet, a ratio of 1 vertical to 3 horizontal. If the slope is steeper than allowed by the standard plan, you may need the services of an architect or engineer to address the issues related to building on steep slopes. In some cases, rather than using steps in the foundation wall to accommodate the slope, a steep slope may be excavated or built-up with fill to form a flat building site. While these constructed flat sites qualify to use the standard earthquake retrofit plan, more urgent hazardous conditions may exist that a homeowner should address first. Slopes steeper than 15 degrees are included on the City of Seattle’s Sensitive Areas Map as potentially susceptible to landslides. Check with your local building or land use department to find out if a map of steep slopes has been prepared. In many instances, buildings on slopes greater than three horizontal to 1 vertical will benefit from the retrofit but confirmation from an engineer may be required. In some instances the local jurisdiction may have slopes mapped as part of sensitive area ordinances. Check with the local building or land use department to see if such information is available.

What is a 30 percent slope? A 100 percent slope (1 vertical to 1 horizontal) results when the angle of the slope is 45 degrees from the horizontal. This *maximum angle of repose* forms the steepest slope on which objects may rest without sliding. A 30 percent slope (1 vertical to 3 horizontal) results when the angle of the slope measured from the horizontal is about 18 degrees (**Fig. 2**).

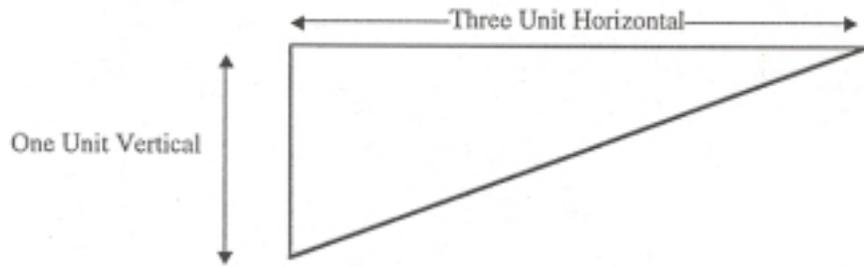


Figure 3 To qualify to use the Standard Earthquake Home Retrofit (SEHR) Plan, no portion of the home should be built on a slope steeper than one vertical to three horizontal (18 degrees).



Figure 4 The foundation wall “steps” down to accommodate the slope of the land. Three steps are shown above (Photo by Linda Noson, AGRA Earth & Environmental).



Figure 5 Measuring the horizontal and vertical distance to determine if the home qualifies to use the Standard Earthquake Home Retrofit (SEHR) Plan. This home qualifies to use the standard plan. (Photo by Linda Noson, AGRA Earth & Environmental)

Question 5: Is the foundation wall around the perimeter of the home continuous except for allowable exclusions?

The Standard Earthquake Home Retrofit (SEHR) Plan applies to homes with a continuous foundation under the building's exterior walls. Two exceptions to the requirement that the foundation be continuous are (1) a small single-story section that interrupts the perimeter foundation for 10 feet or less and (2) uninhabitable areas built outside of the home's foundation, such as porches or storage rooms. Figure 5 illustrates these exclusions.

If the floor framing in your home sits directly on the earth or on "post and pier" foundations, you will need to have a new concrete or reinforced masonry foundation wall system installed. Installation of a completely new system will significantly increase the cost of the earthquake retrofit. Similarly, damaged or weakened sections of foundation wall must be replaced before doing the retrofit work. The Plan Detail Reference sheet in the Permit Application Packet includes a construction drawing (see detail 1a) for replacing a damaged section of foundation. Some foundation damage may not be discovered until retrofit work has begun.

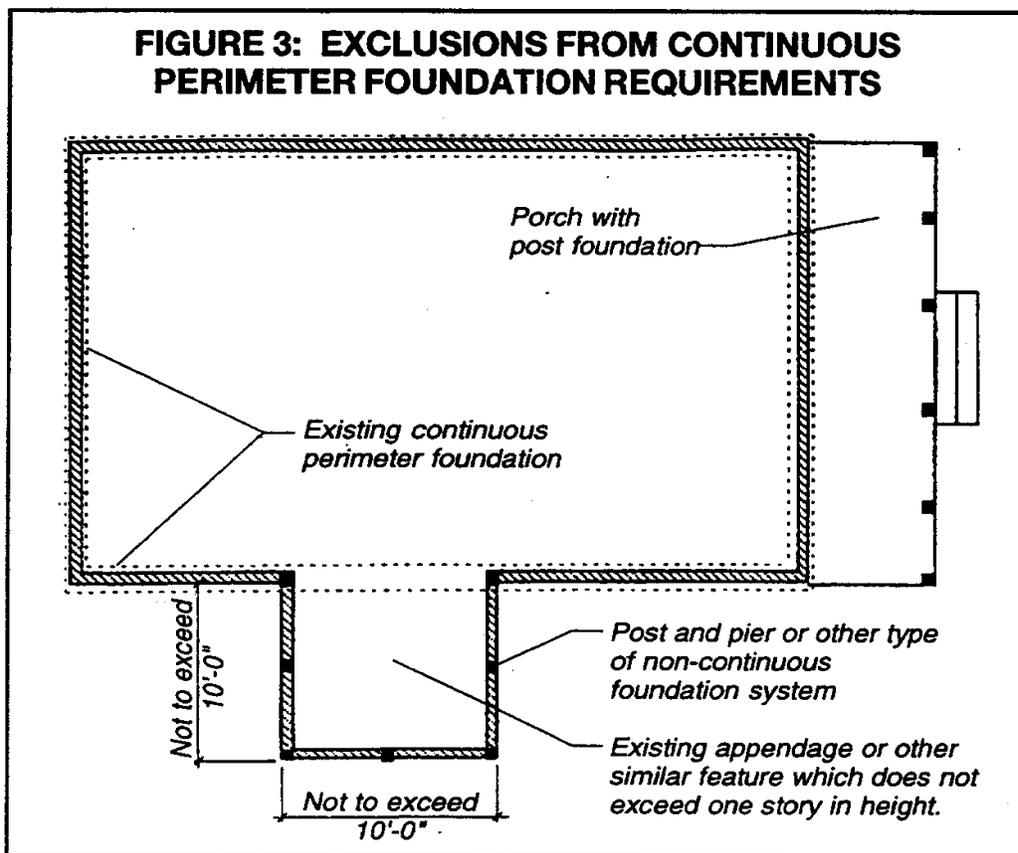


Figure 6 . Exclusions from continuous perimeter foundation requirements (from Client Assistance Memo 302, DCLU, Seattle).

Question 6: Is the foundation of concrete or reinforced masonry that is in good condition?

Concrete or reinforced masonry foundations must be in good condition. The foundation should be substantially plumb (upright) and level. The concrete or reinforced masonry should be fully cured and hardened. There should be no excessive cracking or spalling (Fig. 6 and Fig. 7). Foundation problems may not be apparent until after retrofit work begins. See detail F on planset, to replace damaged sections of the foundation wall. An architect or engineer will need to design a repair for more extensive problems.

Stone, clay tile, or unreinforced masonry foundation materials typical of pre-1940's homes are too weak to resist earthquake shaking and need to be strengthened or replaced. An architect or engineer must evaluate a foundation wall system constructed of these materials. Replacement or repair of the foundation may be carried out according to the recommendations in the evaluation report upon approval by the building official.

What is the foundation? Your home's foundation is a key structural element that transmits the weight of the building and its contents to the ground and secures the building against the side-to-side movements caused by high winds or earthquake forces. The performance of the home during earthquake shaking will be undermined if the foundation is in poor condition or absent. The checklist helps identify potential foundation problems. Some foundation problems may not become apparent until after construction begins.

What is a slab-on grade foundation? The standard plan does not apply to buildings constructed on a concrete slab, sometimes called a slab-on-grade, where the grade is the surface of the site. Light, wood-frame buildings constructed on a concrete slab have generally performed well in past earthquakes. Retrofitting a building constructed on a concrete slab requires removing external finishings and installing connections between the floor framing system and the slab. These tasks are expensive and difficult to accomplish. Retrofitting this type of construction is generally not cost effective.



Figure 7 The foundation should be in good conditions. This ½ inch crack may need to be repaired before completing the earthquake retrofit. (Photo by Linda Noson, AGRA Earth & Environmental)



Figure 8. This foundation wall shows signs of deterioration and cracking. Problems with the foundation may not be identified until installation of the retrofit anchor bolts. (Photo by Gary Milici, RetroFitters).

Question 7: Are the pony walls 4 feet or less in height?

The Standard Earthquake Home Retrofit (SEHR) Plan does not apply to buildings with a pony wall more than 4 feet tall. Pony walls over 4 feet in height need additional engineering. An architect or engineer may be needed to determine additional requirements, such as the use of special anchors, such as “hold downs” or other methods.

What is a Pony Wall?

Pony walls, also called knee walls or cripple walls, are the short walls that connect the foundation to the first floor of the house. They may enclose the “crawl space” or the basement area underneath the home’s first floor (Fig. 8, 9, and 13). A pony wall improves access under the house for repairs and installation of elements like plumbing.

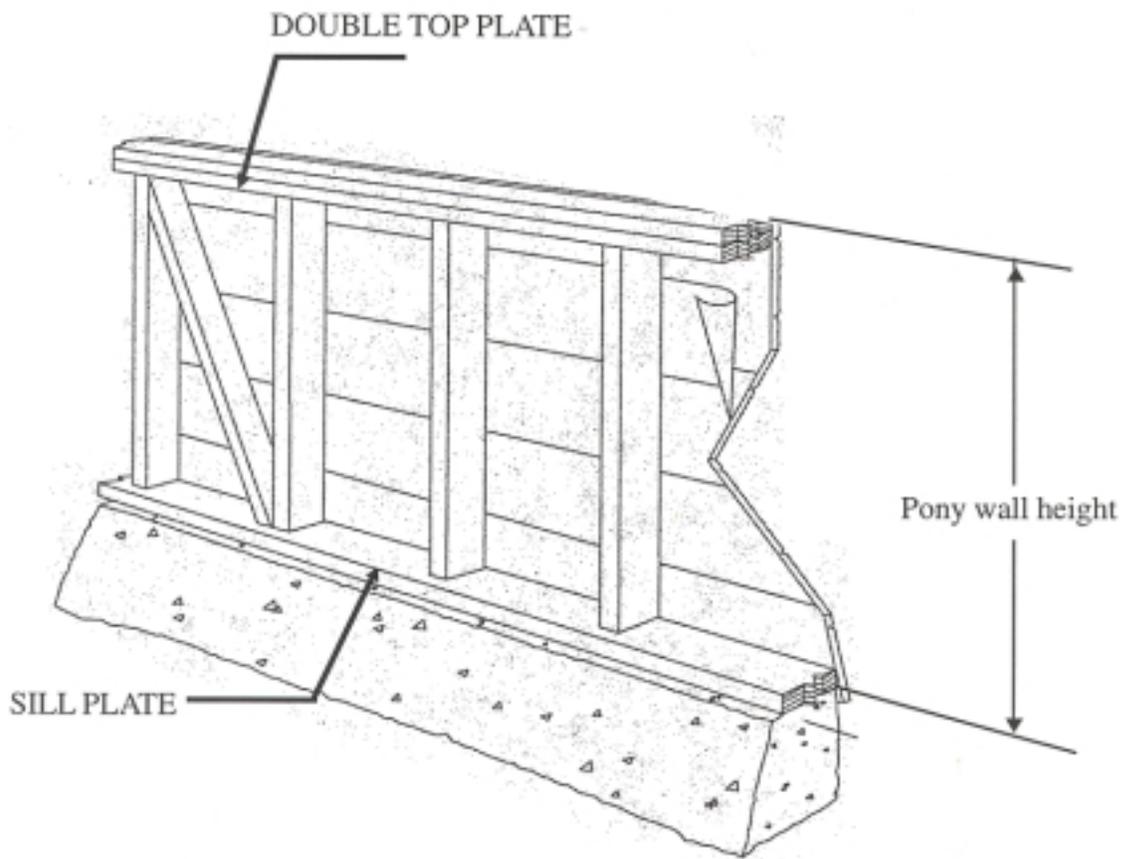


Figure 9. Pony Wall Height Measurement. Measure the height of the pony wall from the bottom of the sill plate or joist blocking to the top of the double plate that rests on the pony wall studs (modified from City of San Leandro)



Figure 10 The height of the pony wall is measured from the bottom of the sill plate to the top of the double plate. A home with a pony wall over 4 feet like this one, which is about 5 feet, does not qualify to use the Standard Earthquake Home Retrofit (SEHR) Plan. (Photo by Linda Noson, AGRA Earth & Environmental)

Question 8: Is your home three-stories or less, counting pony walls over 18 ½ inches as one story?

The SEHR plan applies to a home with one to three stories built over a raised foundation or a basement. If the pony wall studs are more than 14 inches tall, the pony wall area must be counted as a story. A pony wall with 14-inch wall studs is typically 18 ½ inches high, including the sill plate and double top plate (Fig. 9). Therefore, a one-story home with a pony wall taller than 18 ½ inches must be retrofit as though it had two-stories and a two-story as though it had three stories. A three-story with a pony wall taller than 18 ½ inches does not qualify to use the SEHR plan. Figure 10 shows a typical one-story home. Note the second-story windows; it may be that there is limited useable second-floor area, but the building official would consider this a single-story structure. Figure 11 shows a one story home remodeled to include dormers in the roof. The homeowner should retrofit this as a two-story to provide additional protection due to the additional weight in the second floor area. Figure 12 shows two-stories above the pony wall. Because the pony wall in this home is over 18 ½ inches, this home must be retrofit using the prescriptive requirements for a three story home. This issue sometimes requires judgment and will require the assistance of the building department to clarify.

Question 9 & 10: What is the Overall Height of the Pony Wall? How Many Floors are Above the Pony Wall (or above the foundation)?

Both of these questions require a numerical answer, not a “yes” or “no” otherwise common to the Checklist. Questions 9 & 10 have been added because of confusion of many homeowners about the number of stories in the building. This information helps decide the specific condition for the subject building.



Figure 11 Retrofit using the prescriptive requirements for a two-story home (attic remodeled for occupancy) provided pony wall less than 18 ½ inches. (Photo by Linda Noson, AGRA Earth & Environmental)



Figure 12 Retrofit using the prescriptive requirements for a remodeled two-story home (attic remodeled, dormers and occupied floor added) provided pony wall less than 18 ½ inches. (Photo by Linda Noson, AGRA Earth & Environmental)



Figure 13 Retrofit using the prescriptive requirements for a three-story home (two-stories plus pony wall over 18 ½ inches). (Photo by Linda Noson, AGRA Earth & Environmental)

If a basement pony wall is finished on the inside with wall board, paneling, etc., you will need to remove these materials in order to complete the survey and the retrofit. Removing some finishes may be difficult. The additional work and replacement of any damaged finishes will increase the cost of the retrofit project and should be noted on the checklist in the space provided for comments.



Figure 14 These wall finishings must be removed in order to determine if the home has previously not only been retrofit, but correctly and sufficiently. (Photo by Linda Noson, AGRA Earth & Environmental)

Question 11: Is the roof made of standard lightweight roofing materials, such as wood or composition shingle?

Heavy roofing materials have more significant requirements for retrofit. See Table 1 on the planset for more details.

PART TWO – IDENTIFY RETROFIT NEEDS FOR HOME – QUESTIONS 12-25

“Yes” answers to Questions 12-25 indicate that the structural element does not require either earthquake retrofit or repair work. “No” or “Uncertain” answers to Questions 12-25 indicate that retrofit work, repairs, or both may be needed.

Plan details showing how to complete the identified retrofit work according to the requirements of the Standard Earthquake Home Retrofit (SEHR) Plan are included on the planset details reference sheet. Chapter 3, Guide to Completing Your Earthquake Home Retrofit Plan, explains how to select the plan details to use in your plan. Additional plan details for common conditions not addressed in the standard plan are provided in Appendix D of Chapter 3.

Your Standard Earthquake Home Retrofit (SEHR) Plan must be approved by your local building department. In some cases, the services of an engineer or architect may be needed to develop new plan details if the retrofit method or materials to be used are not in the standard plan or if the home does not qualify to use the standard plan.

Note in the comment space provided on the Home Assessment Checklist the type of retrofit work you identified, such as installing anchor bolts, framing clips, or pony wall structural panels. Note existing conditions that must be repaired before the retrofit work can be completed.

The retrofit assessment questions in Part 2 focus on three retrofit actions commonly needed to strengthen older homes: anchoring the sill plate, connecting the floor framing, and strengthening the pony walls (if you have them).

Anchoring the Sill Plate

Question 12: Are sill plates in good condition?

Check the sill plates for apparent dry rot (fungal infection usually due to moisture, or insect infestation). Dry rot can often be detected by probing the wood. However, it may not be discovered until you drill to install a new anchor bolt. If the drill suddenly moves through the wood easily, it is probably due to a pocket of dry rot or insect damage. Please note the need to repair or replace the sill plate or to fumigate to control infection in the space provided on the Home Assessment Checklist. These repairs need to be considered to the extent feasible when completing the checklist. Completion of the Home Assessment Checklist does not substitute for a home inspection to identify dry rot or insect infestation.

What if my home has dry rot? If you discover dry rot, it is important to stop the source of moisture (frequently a leak at the building corner or a pipe) and replace the damaged sill plate with pressure-treated wood. A temporary support for the framing will be needed when replacing the sill plate.

What if my home has insect damage? Insect damage can be stopped by fumigation. After fumigation, a new section of pressure-treated sill plate can be added on top of the old one. Removing and replacing the sill plate is not necessary.

Question 13: Are sill plates anchored (bolted) to the foundation?

Do you see anchor bolts in the sill plate like those shown in Figure 14? Yes? Go to Question 14.

Question 14: Are sill plate anchor bolts spaced 4 to 6 feet apart, placed near the center of the concrete foundation wall (about 2 ½ inches from the side of a 6-inch foundation wall), and in good condition?

Bolts that have been incorrectly placed or are severely rusted or damaged will need to be replaced. Some sill plates may project over the edge or be recessed from the edge. In this situation, be sure to that anchor bolts are in the middle of the foundation wall, not in the middle of the sill plate. In a 6-inch foundation wall, measure 2 ½ inches from the edge of the concrete foundation wall. The anchor bolt should be about 2 ½ bolt diameters from the side of the 6-inch foundation wall to prevent the wooden sill plate from splitting. ***Each bolt should also have a square washer, if not, the washers must be replaced.

Question 15: Are sill plate anchor bolts at least ½ inch in diameter for one to two story buildings and 5/8 inch for a three-story building?

See Table 1 on the planset for more detail. Anchor bolts in a three-story building may be ½ inch if placed 2 feet 8 inches apart rather than 4 feet apart as noted in Question 16.

Question 16: Are sill plate anchor bolts located not more than 12 inches from the ends of each piece of sill plate that is more than 30 inches in length?

Connecting the Floor Framing

Question 17: Do floor joists have either continuous rim joists or joist blocking present at bearing points?

The floor joists and either continuous rim joists or joist blocking (Fig. 7) are elements of the first floor framing system. These joists normally rest on the sill plate or on the top plates of pony walls. If the continuous rim joist does not rest on top of the pony wall, a new rim joist or joist blocking will need to be installed to provide a place to attach retrofit anchors, structural panels, and framing clips.

A continuous rim joist or solid blocking between joists provides a place to install connections, called framing clips, to attach the floor framing system to the underlying pony wall or sill plate. This attachment is part of the anchoring system to prevent the home from falling off the foundation during earthquake shaking.

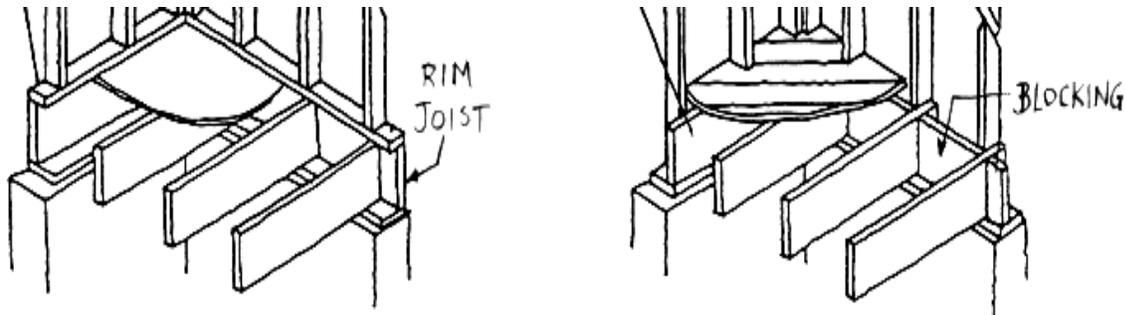


Figure 15 A continuous rim joist on the left or joist blocking on the right is needed to provide a place to attach the framing clips (from City of San Leandro)

Questions 18 & 19: Is the floor framing system connected to the underlying sill plate with metal framing clips or are 8d nails placed 6 inches on center? Is the floor framing system connected to the underlying pony wall top plate with metal framing clips or are 8d nails placed 6 inches on center?

The floor joists in the first floor framing system and the underlying sill plate (or the underlying pony wall double plate) need to be checked to be sure that proper connections have been installed and are placed appropriately. The connection between the floor sheathing and the floor joist does not have to be verified as verification of the existence and quality of this connection would be more difficult and expensive.

Question 20: Are pony wall double top plates present and in good condition?

Most homes have two top plates, called a double plate, on top of the pony wall studs. A single top plate requires a top plate splice to strengthen the contact where two top plate sections meet (see planset details or Chapter 3, Appendix D).

Strengthening the Pony Wall

Question 21: Do structural panels (also called sheathing) cover the stud walls on either the inside or the outside of the pony wall?

Generally homes built before 1975 have inadequately strengthened pony wall. Some homes built as recently as 1985 may lack sufficient strengthening. In a few cases, pony walls on houses built before the early 1950s may have horizontal siding installed directly on the studs, and others may have “let-in” diagonal braces (usually 1 x 4) in addition to the siding. Neither of these is adequate structurally and is no longer considered acceptable strengthening by the building code.

However, diagonal wood sheathing (1-inch individual boards laid diagonally across the face of the studs) is adequate strengthening, if the boards are nailed to each stud they cross and to the top and bottom plates.

Figure 16 shows an inadequate attempt to strengthen a pony wall with two by four braces nailed to the pony wall studs instead of nailing structural panels to the wall studs. Newer homes may have a plywood panel that acts both as siding as well as strengthening for the pony wall. This is acceptable, but the owner should check to make sure that the panels were fully nailed to the sill plate and the rest of the panel perimeter. Screws should not be substituted for nails.



Figure 16. Shows an inadequate pony wall bracing that does not meet the requirements in the standard plan (Photo by Gary Milici, RetroFitters Inc.)

Question 22: Does existing pony wall sheathing in a crawl space have sufficient stud cavity ventilation to prevent the growth of fungus within the wall?

When structural paneling is installed on the interior face of the studs, each covered stud space needs to be ventilated to prevent the growth of fungus. This is accomplished by drilling 2 inch to 3 inch round holes near the top and bottom of the structural panel, at least 1 inch below the top plate and 1 inch above the sill plate. These holes should be centered on the panel, unless there is a sill bolt in the stud space, in which case the holes should align with the bolt. If joist blocking prevents the passage of air up the wall cavity, it should be realigned or additional holes in the plywood need to be drilled above and below the blocks. If the pony wall studs are less than 18 inches high, only one hole is required. If the pony wall is part of an insulated basement wall, then stud ventilation is not required.

Question 23: Are the nails around the perimeter of the structural paneling spaced 3 to 6 inches apart?

Unless nails are installed at the proper distance around the structural paneling, the panels may pull off during ground shaking and allow the pony wall to collapse. Screws may not be substituted for nails. The strength and flexibility of nails are important to properly secure the home to its foundation. Screws are brittle and may fail catastrophically, rather than yield like nails.

Question 24: Are the nails along the studs in panel fields (non panel edge conditions) spaced 6 to 14 inches apart?

Yes, nails are an important part of properly strengthening the pony wall. If nails are not adequately spaced, the wall may be too weak and collapse in an earthquake.

Question 25: Are there screened crawl space ventilation openings through structural panels? (1sf of openings per 150sf of crawl space floor area)

The screens prevent small rodents from taking up residence in the stud wall cavity. If the pony wall forms an unheated crawl space, thorough ventilation of the crawl space is required to discourage fungal infection of the framing members. If the installation of structural panels block some of the existing vents, new ones must be added. If the existing ventilation is inadequate, this is a good time to add vents, near the corners and on opposite walls if possible.

It is important to protect wall studs, sill plates, and double plates from getting wet at ventilation openings. The easiest way to accomplish this is to nail sheet metal flashing on the exposed wood after the panel has been installed. The flashing should extend through the thickness of the pony wall and bend out over the exposed surface of the panel, in the crawl space, where it is nailed to the panel.

At this point you should have:

- 1. Entered all information needed for your permit application,**
- 2. Determined if the home qualifies to use Standard Earthquake Home Retrofit (SEHR) Plan; and,**
- 3. Identified the elements of the standard plan needed to complete your home retrofit, repair work that may be needed, and retrofit work not included in the plan.**

THE HOME ASSESSMENT CHECKLIST

Complete the checklist below (or the one in the planset) before applying for a permit, to determine the existing conditions in your home.

Detailed instructions for completed in this checklist are included in Chapter 2 of the Home Retrofit Handbook. Space is provided at the end of the checklist for you to enter comments related to questions answered “no” or “uncertain”.

The plans examiner will determine if your proposal meets the requirement to use the Standard Earthquake Home Retrofit (SEHR) Plan, based on your answers.

THIS SECTION TO BE FILLED IN BY THE HOMEOWNER			
Owner Name:		Telephone Number:	
Mailing Address:	City	State	Zip Code
Property Address (If different from above)	City	State	Zip Code
<input type="checkbox"/> Owner Occupied <input type="checkbox"/> Non owner occupied			
PART 1 – Qualification Requirements (Existing Conditions)			
All “Yes” or “NA” (not applicable) answers mean your home is qualified to use the Standard Earthquake Home Retrofit (SEHR) Plan. You may need to hire an engineer or architect to develop the appropriate retrofit method if “No” or “Uncertain “ is checked.			
Home Characteristics	Yes or NA	No	Uncertain
1. Is the home of light, wood-frame residential construction?			
2. Does the home have four or fewer dwelling units?			
3. Is a sill plate present?			
4. Is the home built on a flat or moderate slope of less than 30 percent (approximately 18 degrees from horizontal)?			
5. Is the foundation wall around the perimeter of the home continuous except for allowable exclusions?			
6. Is the foundation of concrete or reinforced masonry that is in good condition?			
7. Are the pony walls 4 feet or less in height?			
8. Is the home three stories or less, counting pony walls over 18 ½ inches as one story?			
Additional Home Information	Yes	No	Uncertain
9. What is the overall height of the pony wall? (Specify dimension.)			
10. How many floors are above the pony wall (or above the foundation)? (Specify # of floors.)			
11. Is the roof made of standard lightweight roofing materials, such as wood or composition shingle?			

PART 2 – Identify Retrofit Needs for Homes

All “Yes” answers indicate no retrofit work is needed. “No” or “Uncertain” answers indicate retrofit and/or repair work is needed to improve the resistance of the home to earthquake shaking.

Anchoring the Sill Plate	Yes	No	Uncertain
12. Are sill plates in good condition?			
13. Are sill plates anchored (bolted) to the foundation?			
14. Are sill plate anchor bolts spaced 4 to 6 feet apart, placed near the center of the concrete foundation wall (about 2 ½ inches from the side of a 6 inch foundation wall), and in good conditions?			
15. Are sill plate anchor bolts at least ½ inch in diameter for one to two story buildings and 5/8 inch for a three-story building?			
16. Are sill plate anchor bolts located not more than 12 inches from the ends of each piece of sill plate that is more than 30 inches in length?			
Connecting the Floor Framing	Yes	No	Uncertain
17. Do floor joists have either continuous rim joists or joist blocking present at bearing points?			
18. Is the floor framing system connected to the underlying sill plate with metal framing clips or are 8d nails placed 6 inches on center?			
19. Is the floor framing system connected to the underlying pony wall top plate with metal framing clips or are 8d nails placed 6 inches on center?			
Strengthening the Pony Wall (Answer NA if no pony walls)	Yes or NA	No	Uncertain
20. Are pony wall double top plates present and in good condition?			
21. Do structural panels (also called sheathing) cover the stud walls on either the inside or the outside of the pony wall?			
22. Does existing pony wall sheathing in a crawl space have sufficient stud cavity ventilation to prevent the growth of fungus within the wall?			
23. Are the nails around the perimeter of the structural paneling spaced 3 to 6 inches apart?			
24. Are the nails along the studs in panel fields (non panel edge conditions) spaced 6 to 14 inches apart?			
25. Are there screened crawl space ventilation openings through structural panels? (1sf of openings per 150sf of crawl space floor area)			

COMMENTS:

If you answered “No” or “Uncertain” answers (use this space to explain)

Name of person who completed the Home Assessment Checklist (PLEASE PRINT)					
Signature of person who completed the Home Assessment Checklist:					
Date assessment completed:					
Relationship of person completing the Home Assessment Checklist to the home retrofit project: (CIRCLE ONE)					
Owner		Lessee		Contractor	
Licensed Architect		Licensed Engineer		Owner's Agent	
If a contractor completed the Home Assessment Checklist, please supply the following information. (The original license or a notarized copy will need to be provided when you apply for a building permit.)					
Name	Address		Telephone	License #	Exp.Date
Company Name:			Work Number:		
Consultant Name:			Home Number:		
Has the contractor completed an approved Home Retrofit Training Class? _____ Yes _____ No					
If yes, enter workshop date and location: _____					

RESULTS of the Home Assessment Checklist (FOR OFFICE USE ONLY):
<input type="checkbox"/> Home qualifies to use the Standard Earthquake Home Retrofit (SEHR) Plan
<input type="checkbox"/> Home does not qualify to use the Standard Earthquake Home Retrofit (SEHR) Plan
<input type="checkbox"/> Earthquake Home Retrofit not needed
<input type="checkbox"/> Damaged or missing structural elements must be repaired or installed before completing the retrofit