



Seattle Department of
Construction & Inspections

2025 Home Fair Presentation – Prescriptive Plan Set



Earthquake Home Retrofit

Kristen Malec / Dean Greenleaf

Helping people build a safe, livable, and inclusive Seattle.

SDCI VISION, PURPOSE, AND VALUES

Our vision is to set the standard for excellent local government service.

Our purpose is helping people build a safe, livable, and inclusive Seattle.

Our values are equity, respect, quality, integrity, and service.

OBJECTIVES / AGENDA

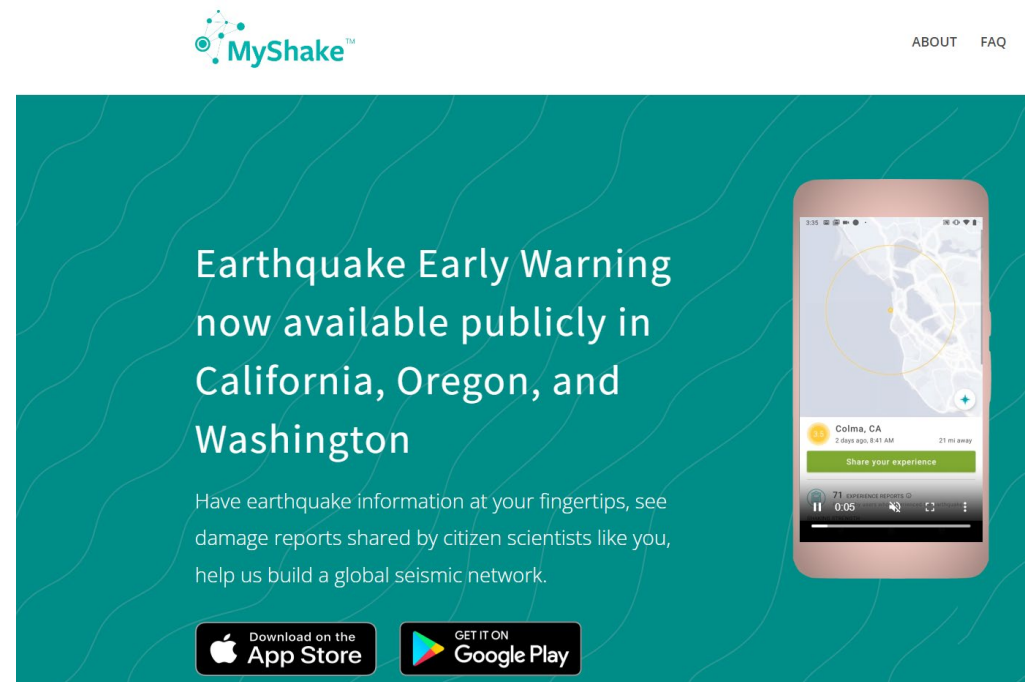
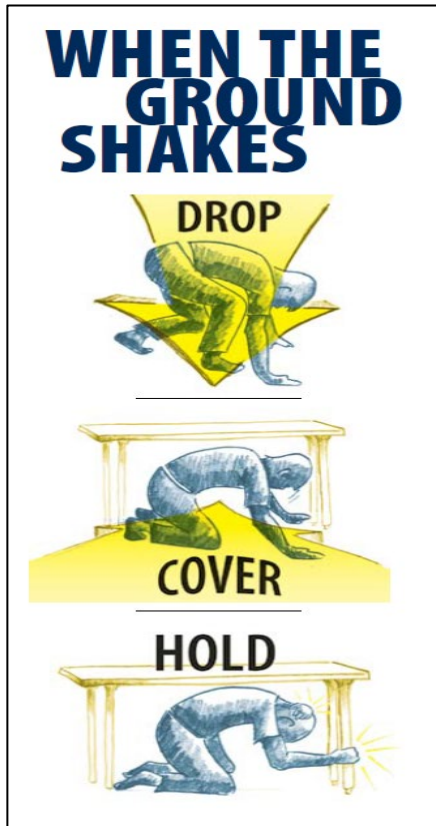
To help you understand more about Prescriptive Earthquake Home Retrofit (EHR) Plan Set

- Earthquake – Building Safety
- Purpose of EHR Program
- History of EHR
- When is EHR needed and what homes qualify for EHR
- Where and what work is done to your home
- Prescriptive EHR Plan Set – Key Pages
- How to apply
- Other retrofit options
- SDCI Resources

PUBLIC SAFETY IN AN EARTHQUAKE

Seattle Office of Emergency Management

<http://www.seattle.gov/sdci/about-us/who-we-are>



PERSONAL PREPAREDNESS FOR EMERGENCY

Supplies / Tools



Communication - have a non-local contact



EHR - PURPOSE

- Promote public safety by making older homes safer and reduce earthquake-induced damage
- Improve earthquake resistance:
 - Anchor home to foundation
 - Brace cripple walls
- Simplify the permit process for “retrofitting” existing homes
- This program is designed to work for a typical 2-story, wood framed residence

This program will not “earthquake proof” your home.

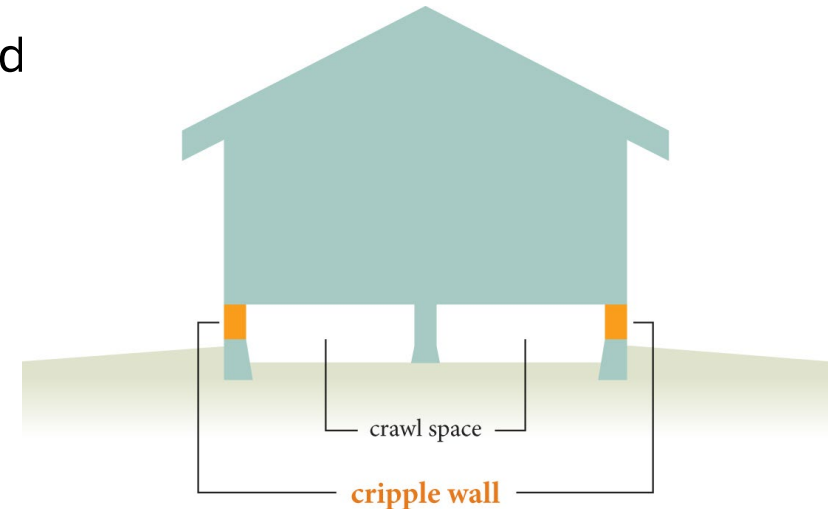


Image courtesy of California Department of Insurance



Photo – 1989 Loma Prieta Earthquake

EHR - PURPOSE

These are examples of the type of damage to a home that this program is designed to reduce.



Photo – Washington Association of Building Officials



Photo – 1994 California Earthquake

EHR - HISTORY



- The Project Impact prescriptive retrofit program started in California after the 1994 Northridge Earthquake.
- FEMA P-1100 was developed in the 2010's which is intended to be applicable nationwide.
- Washington Association of Building Officials (WABO) revised the FEMA drawings to apply to a broad group of existing homes in Washington.

EHR – WHEN IS IT NEEDED?

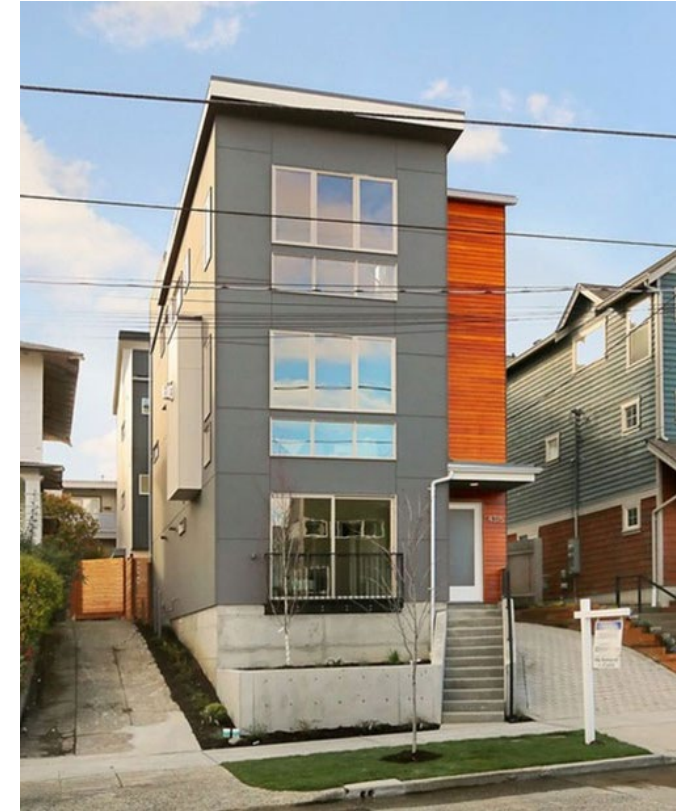
- If the house was built after the early 1980's, it may already have required **anchors, bracing, and framing connections**.
- If your home could be considered “craftsman” or “mid-century modern”, you may need to retrofit.
- Visit us online or consult with a contractor, architect, or engineer.

“INADEQUATE”



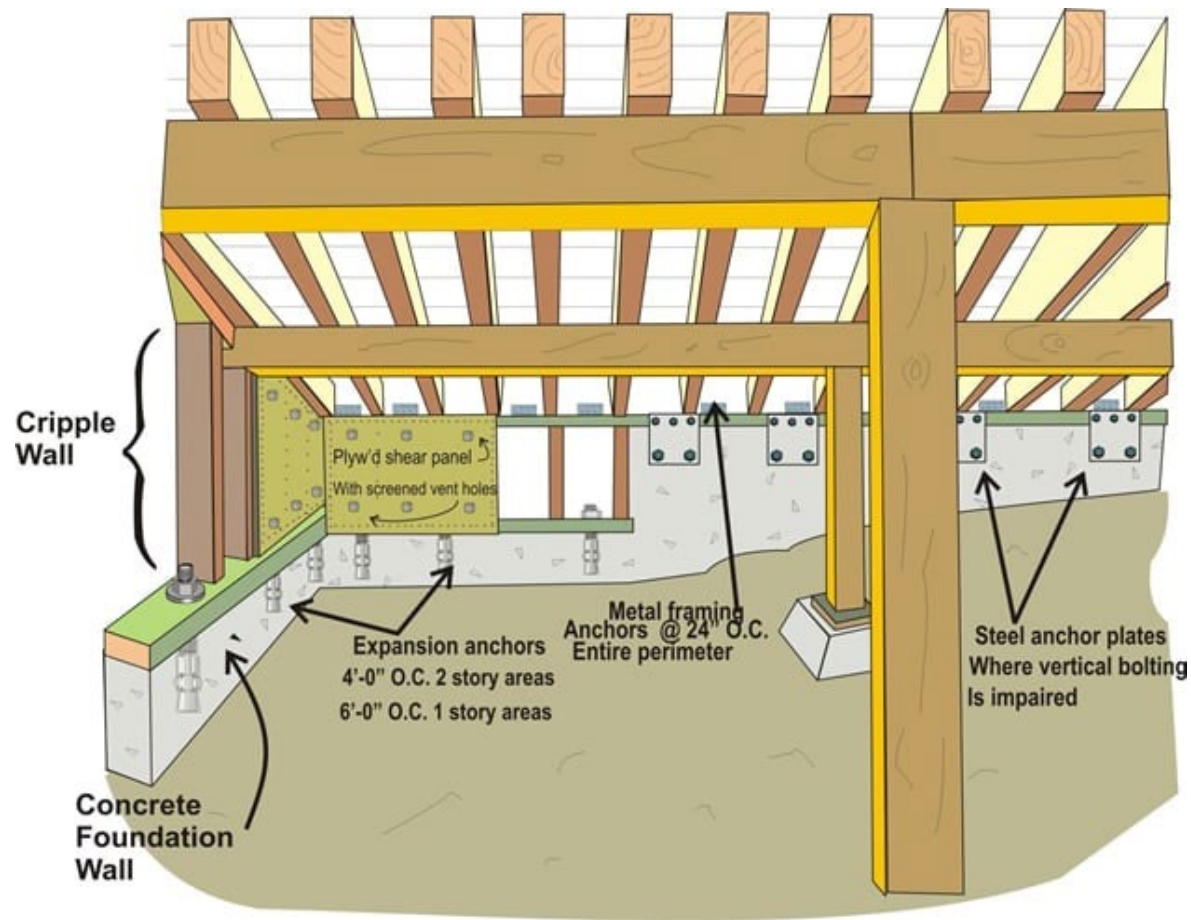
Seattle Times – Hiram Burnett Home built in 1865

“ADEQUATE”



Sustainable Connections – modern infill housing

EHR - WHERE WORK IS DONE

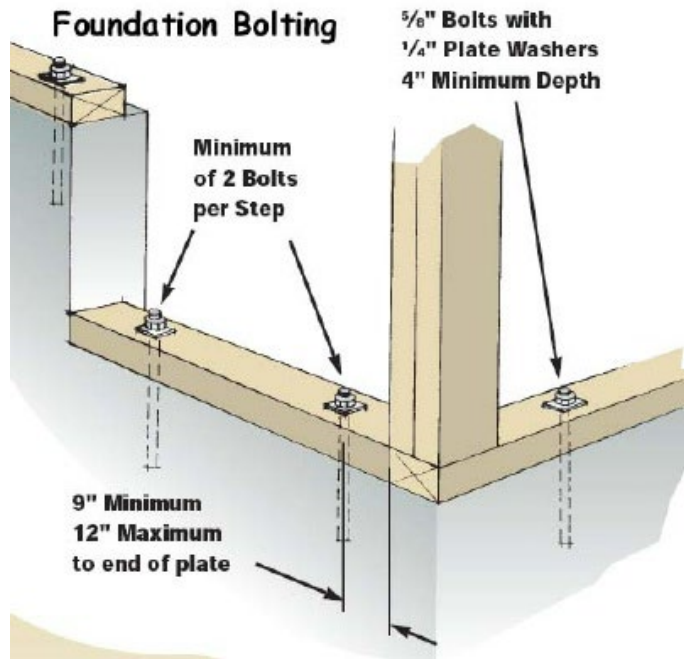


EHR prescriptive retrofit plan set focuses on the basement or crawlspace below the first-floor framing.

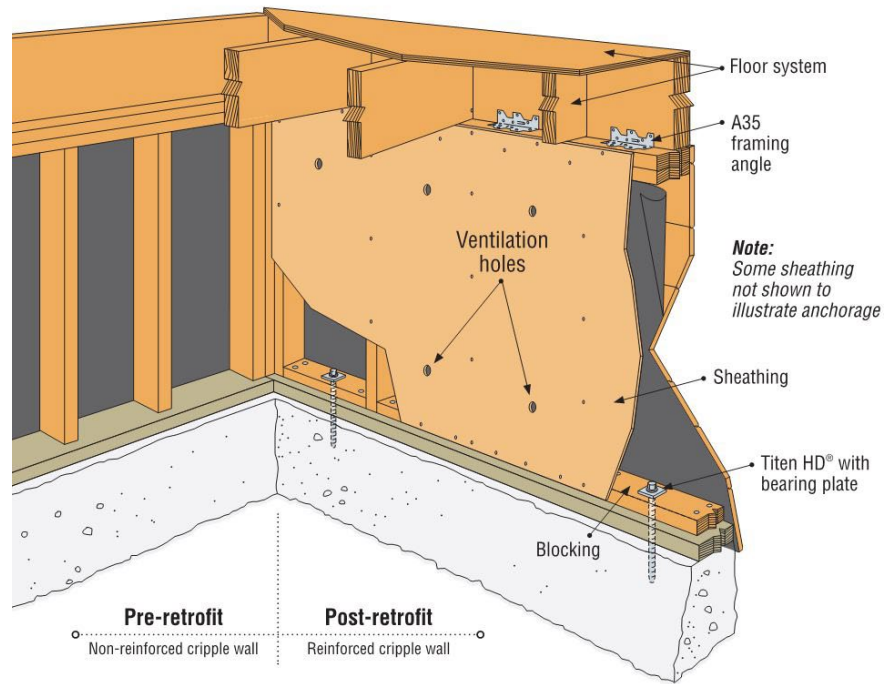
Crawl space illustration from Seismic Safety, Inc.

EHR - WHAT WORK IS BEING DONE

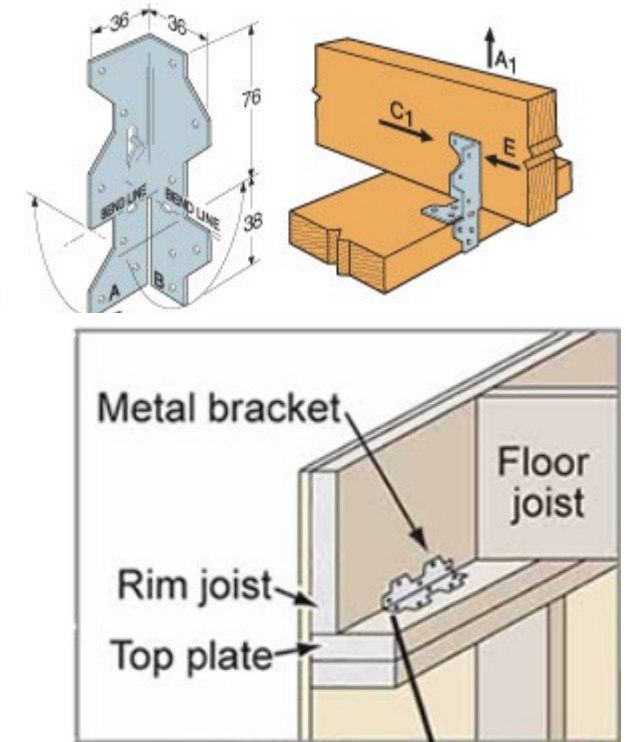
Anchor to Foundation



Brace Walls Below 1st Floor



Connect Framing



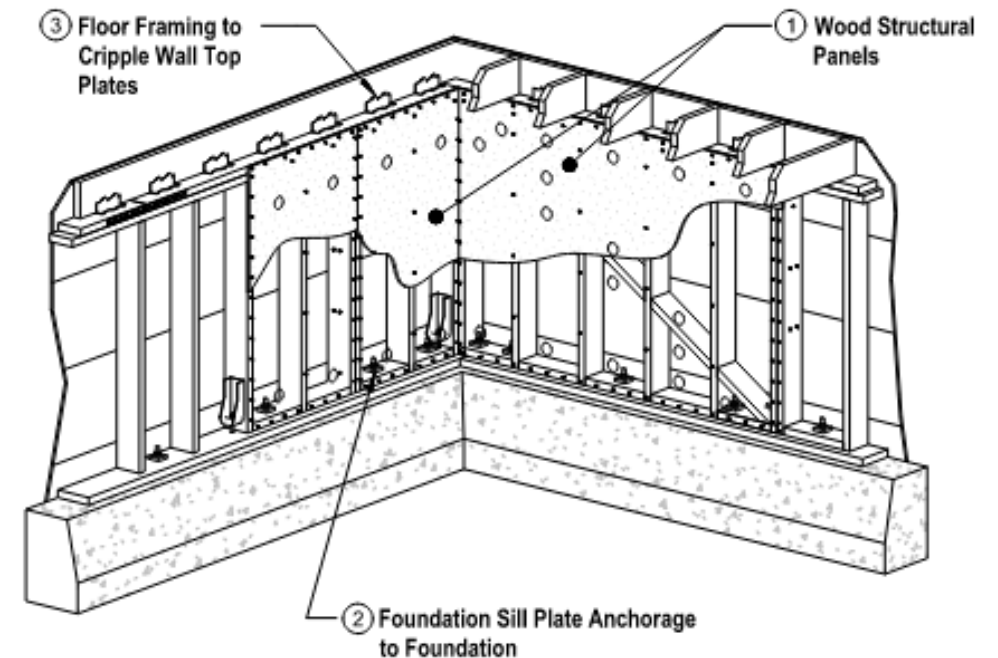
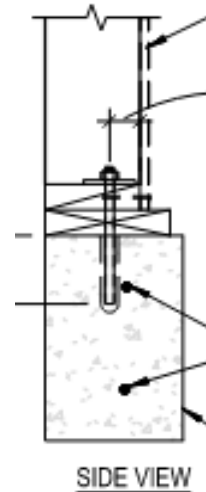
Images courtesy of Walnut creek Construction, Hipspro.com and Simpson Strong tie Catalog.

EHR PLAN SET KEY PAGES

The prescriptive plan set is a complete package, with instructions on how to fill it out, details and descriptions of each connection and examples of the retrofit layouts.

These are the Key Pages in the prescriptive 21-page plan set:

- Coversheet: Sheet S0
- Weight Classification: S3
- Earthquake retrofit schedule: Sheet S3.1
- Foundation and retrofit layout plan: Sheet S4
- Details: Sheet D1 through D6



SHEET S0 - ELIGIBILITY FOR USE

How to determine if a home is eligible for EHR:

- Cover Sheet: S0 – Table 1
- If the answer to any of these questions is NO or “Non-compliant,” the home is not eligible.
- If you are not sure about your answer, **please ask!** We can chat online or through Q&A.

Table 1: ELIGIBILITY FOR USE

To determine if a home qualifies, answer the following:	Compliant	Non-compliant
1. The dwelling is a one- or two-family detached structure or townhouse. The dwelling unit is a townhouse and assessment and retrofit will occur for all attached townhouse dwelling units at the same time.		
2. The dwelling is a wood light-frame dwelling that is two stories or less (basement OK).		
3. The dwelling is a crawlspace/basement and the perimeter (not including porches or other appurtenances) is supported on: a. Cripple walls, or b. Foundation stem walls, or c. Post and pier systems to be retrofitted with cripple walls, or d. Cripple walls or foundation stem walls in combination with a slab on grade foundation.		
4. The dwelling has a continuous perimeter foundation (not including porches or other appurtenances), concrete stem walls, or will be retrofitted to have a continuous perimeter foundation.		
5. Cripple walls, where they occur, do not exceed 7'-0" in clear height.		
6. The maximum slope as measured from the top of foundations along one edge of the home to the other end does not exceed 30%.		
7. Weight of roofing material shall not exceed 12 psf, except for one-story crawlspace dwellings with clay tile roofing as described in footnote 1 below.		
8. Weight of exterior wall finish shall not exceed 10 psf (Stucco OK), except that masonry wainscots supported on concrete or masonry foundations are permitted to extend up to four feet above the top of foundation. Brick veneer ok for one story condition per note on sheet S3		
9. The maximum square footage of the dwelling, excluding areas supported on slabs on grade, do not exceed 3,000 square feet for one story dwellings and 4,000 square feet for two-story dwellings.		
10. No part of the foundations is constructed of unreinforced masonry or stone.		
11. There is no indication that an engineered seismic force-resisting system is present in the dwelling (engineered plans, visible tie-down brackets).		

If you answered "Compliant" to each of these questions, proceed to Sheet S3.

If you answered "Non-compliant" to any of these questions the home is not eligible to apply this plan set, unless a Registered Design Professional addresses the non-compliant issues in accordance with P-1100 FEMA Prestandard, Section 4.5, Differing Conditions.

Footnote:

1. One story crawlspace dwellings with clay tile that weigh up to 20 psf or full height brick veneer (with light roof material) shall be permitted to be strengthened in accordance with the provisions for two-story heavy construction as noted in the applicable Earthquake Retrofit Tables.

IS THIS DWELLING ELIGIBLE?

Answers to Questions 1-11 determine if the dwelling qualifies.

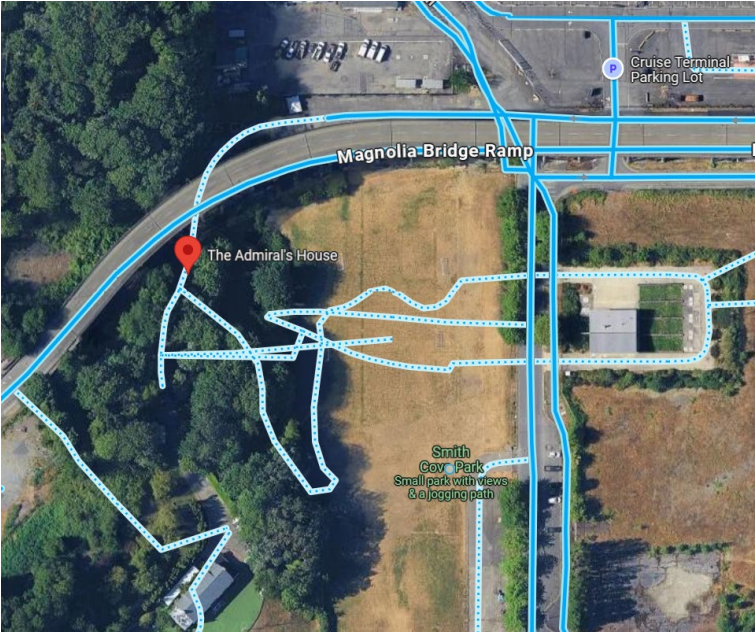
- ✓ 1. One or two family?
- ✗ 2. Two stories and wood light frame construction?
- ✓ 3. Crawlspace or basement?
- ✓ 4. Continuous foundation?
- ✓ 5. Cripple walls, where they occur are under 7' tall?
- ✓ 6. Site is sloped less than 30%?
- ✓ 7. Light weight roof less than 12 psf?
- ✓ 8. Exterior wall less than 10psf?
- ✗ 9. Maximum square footage less than 4,000 sq.ft?
- ✓ 10. No masonry or stone foundation?
- ✓ 11. No indication of an existing engineered seismic force resisting system?



The Admiral's House – Formerly Fort Lawton, Magnolia. 2001 W. Garfield Street. Photo courtesy of Cooper Jacobs Real Estate.

HOW DO WE VERIFY ELIGIBILITY?

Maps / Street View and King County Parcel Viewer



BUILDING

Building Number	1
Year Built	1945
Year Renovated	0
Stories	2.5
Living Units	1
Grade	10 Very Good
Grade Variant	0
Condition	Good
Basement Grade	
1st Floor	3,100
1/2 Floor	960
2nd Floor	2,240
Upper Floor	0
Finished Basement	0
Total Finished Area	6,300
Total Basement	2,240
Basement Garage	0
Unfinished 1/2	0
Unfinished Full	0
AGLA	6,300
Attached Garage	0
Bedrooms	8
Full Baths	2
3/4 Baths	5
1/2 Baths	1
Heat Source	Gas
Heat System	Forced Air
Deck Area SqFt	0
Open Porch SqFt	0
Enclosed Porch SqFt	0
Brick/Stone	0
Fireplace Single Story	0
Fireplace Multi Story	1
Fireplace Free Standing	0
Fireplace Additional	0
AddnlCost	0
Obsolescence	0
Net Condition	0
Percentage Complete	0
Daylight Basement	
View Utilization	

Click the camera to see more pictures.

Picture of Building 1

Floor plan of Building 1

LEGEND

PARCEL # 232563-0106

APPRAISER FLP

DRAW DATE 3/1/2006

REV DATE

FIREPLACE

BSMT 2240 sf

1ST FL 3100 sf

1/2 FL 960 sf

2ND FL 2240 sf

3RD

UNFIN 1/2

UNFIN FULL

BSMT GAR

ATT GAR

CARPORT

OP

ENC P

DECK

SHEET S3 - WEIGHT CLASSIFICATION

Weight Classification

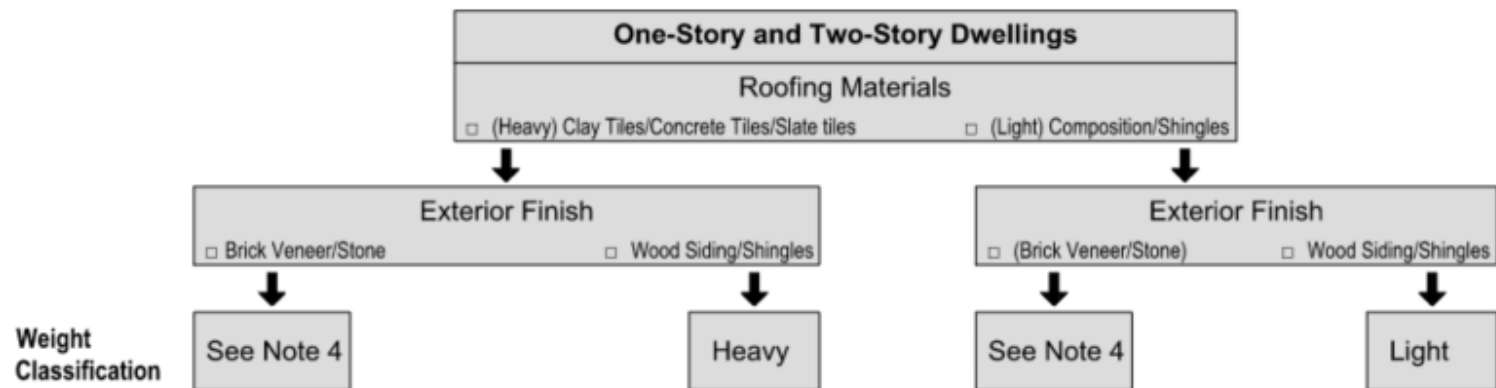
The next factor used to establish the appropriate amount of earthquake strengthening is the dwelling weight. For the purposes of this Plan Set, two weight classifications (Heavy and Light) have been established as described below. Using the flowchart presented:

1. Start with the roofing material then to the exterior finishes.
2. Note the weight classification result for use in the Earthquake Retrofit Schedule, Sheet S3.1.

Specific notes for exterior, interior and roof coverings:

1. The "wood siding or shingles" exterior finish category also includes finishes of similar weight, including but not limited to fiber-cement and aluminum siding.
2. The "comp or shingles" roofing material category also includes roofing materials of similar weight, including but not limited to roll roofing, built-up felt roofing, single-ply membrane roofing, and metal roofing.
3. The exterior finish, roofing material, and interior finish categories are intended to be identified based on the predominant materials used in construction. Where interior or exterior finishes vary, a heavier type finish shall be assumed where 25% or more of the heavier finish type exists within the dwelling.
4. • Structures with both brick veneer/stone veneer and heavy roof assembly should consult with a registered design professional and are outside the scope of this document.
• Structures with both brick veneer/stone veneer and light roof assembly are limited to one story above concrete foundation and shall proceed using the two-story tables for determining wall panel length and anchorage/fastener spacing.

HEAVY OR LIGHT?



SHEET S3.1 – BRACED WALL LENGTH

This Table is for One-story

- 1) Weight Category
- 2) Total Area
- 3) Mark the row
- 4) Cripple Wall Height
- 5) Total Wall Section length is twice the length shown here.
- 6) Number and type of Sill Anchors
- 7) Number and type of Clips / Ties to first floor framing

EARTHQUAKE RETROFIT SCHEDULE ($S_{DS}=1.0$ Seismic) ONE-STORY																	
① Weight Category	② Total Area in Square Feet	③ Mark row that applies ☒	⑤ Length Each of Two Braced Wall Sections Required Along Each Perimeter Wall Line								Number of Foundation Connectors or Anchors at Each Perimeter Wall Line Assume Distributed Along Length						
			Wood Structural Panels								⑥ Foundation Sill Anchors			⑦ Floor to Cripple Wall or Floor to Foundation Sill			
			④ Cripple Wall Height								Panel Edge Nailing	Type "A/B"	1/2"Ø Bolt	5/8"Ø Bolt	Type "D"	Type "E" or "F"	Type "G"
			up to 1'	1'-1" to 2'	2'-1" to 4'-0"	4'-1" to 6'-0"	6'-1" to 7'-0"	Without Tie-downs	With Tie-downs	Without Tie-downs							
1-Story Light Construction	up to 800		5.3'	5.3'	8.0'	5.3'	9.3'	5.3'	9.3'	6.7'	4"	4	7	5	11	10	14
	801 to 1000		6.7'	6.7'	8.0'	6.7'	10.7'	6.7'	10.7'	8.0'	4"	5	8	6	13	12	16
	1001 to 1200		6.7'	6.7'	9.3'	6.7'	10.7'	8.0'	12.0'	8.0'	4"	6	10	7	15	14	19
	1201 to 1500		8.0'	8.0'	10.7'	8.0'	13.3'	9.3'	13.3'	9.3'	4"	7	12	8	18	17	22
	1501 to 2000		9.3'	10.7'	13.3'	10.7'	14.7'	10.7'	16.0'	12.0'	4"	9	15	10	23	22	29
	2001 to 2500		12.0'	12.0'	14.7'	12.0'	17.3'	12.0'	18.7'	13.3'	4"	10	18	12	27	26	35
	2501 to 3000		14.7'	14.7'	16.0'	14.7'	18.7'	14.7'	20.0'	16.0'	4"	12	21	14	32	31	40
1-Story Heavy Construction	up to 800		5.3'	6.7'	8.0'	5.3'	10.7'	6.7'	10.7'	8.0'	2"	6	10	7	15	14	18
	801 to 1000		6.7'	8.0'	9.3'	6.7'	12.0'	8.0'	12.0'	9.3'	2"	7	11	8	17	17	22
	1001 to 1200		6.7'	8.0'	10.7'	8.0'	12.0'	9.3'	13.3'	10.7'	2"	8	13	9	20	19	25
	1201 to 1500		8.0'	9.3'	12.0'	9.3'	14.7'	10.7'	14.7'	12.0'	2"	9	15	11	24	23	30
	1501 to 2000		9.3'	10.7'	14.7'	10.7'	16.0'	12.0'	17.3'	13.3'	2"	11	19	13	30	29	38
	2001 to 2500		10.7'	13.3'	16.0'	12.0'	18.7'	14.7'	20.0'	16.0'	2"	13	23	16	36	34	45
	2501 to 3000		12.0'	14.7'	17.3'	13.3'	20.0'	16.0'	21.3'	17.3'	2"	16	27	18	41	40	53

BRACED WALL PANELS

Strengthening the Cripple Wall Using Braced Wall Panels - Sheet S3.1

- Creating a “braced wall panel” beneath the first-floor framing at basement wall or cripple wall
- Cripple Wall Maximum height is 7 feet and minimum length is 2 feet
- All exterior wall lines are required to have a minimum total length of braced wall panels

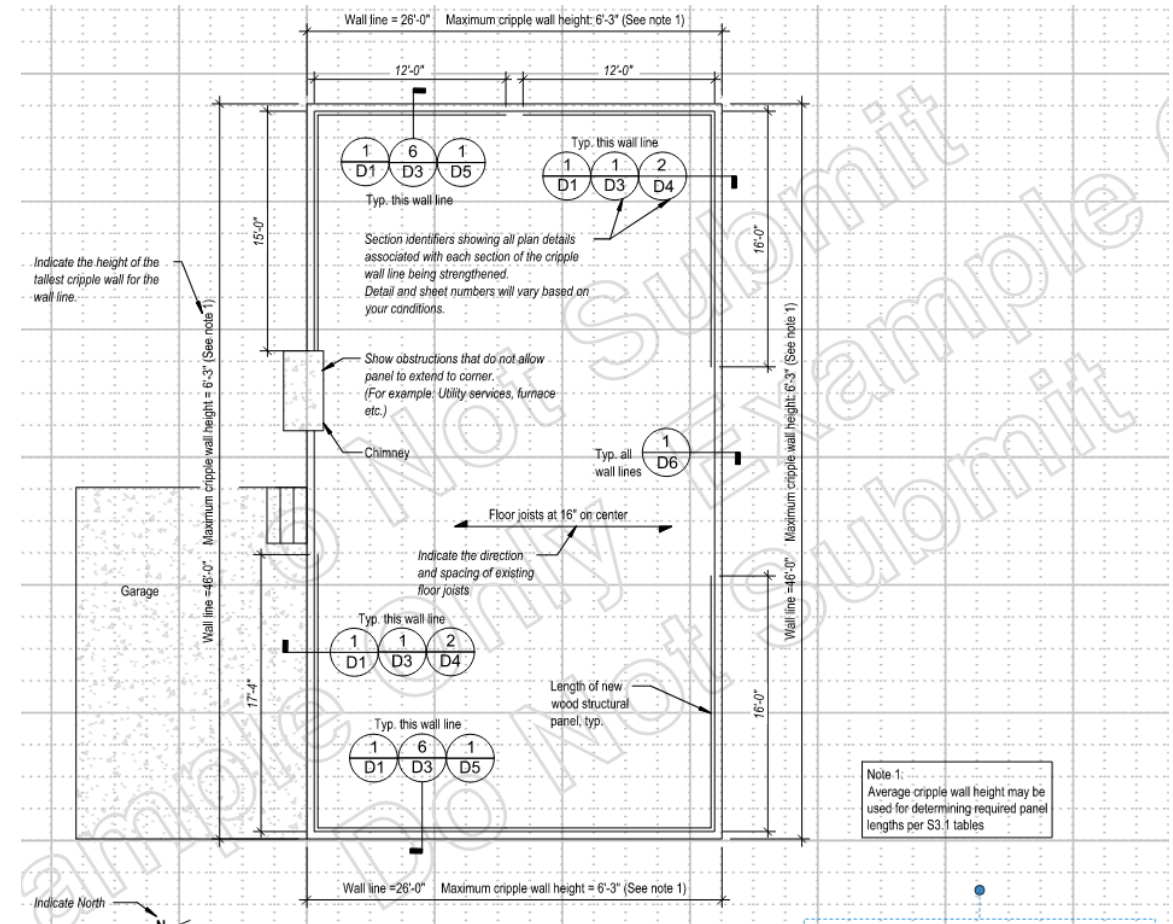


OSB braced wall panel (with hole) and URFP courtesy of Simpson Strong Tie

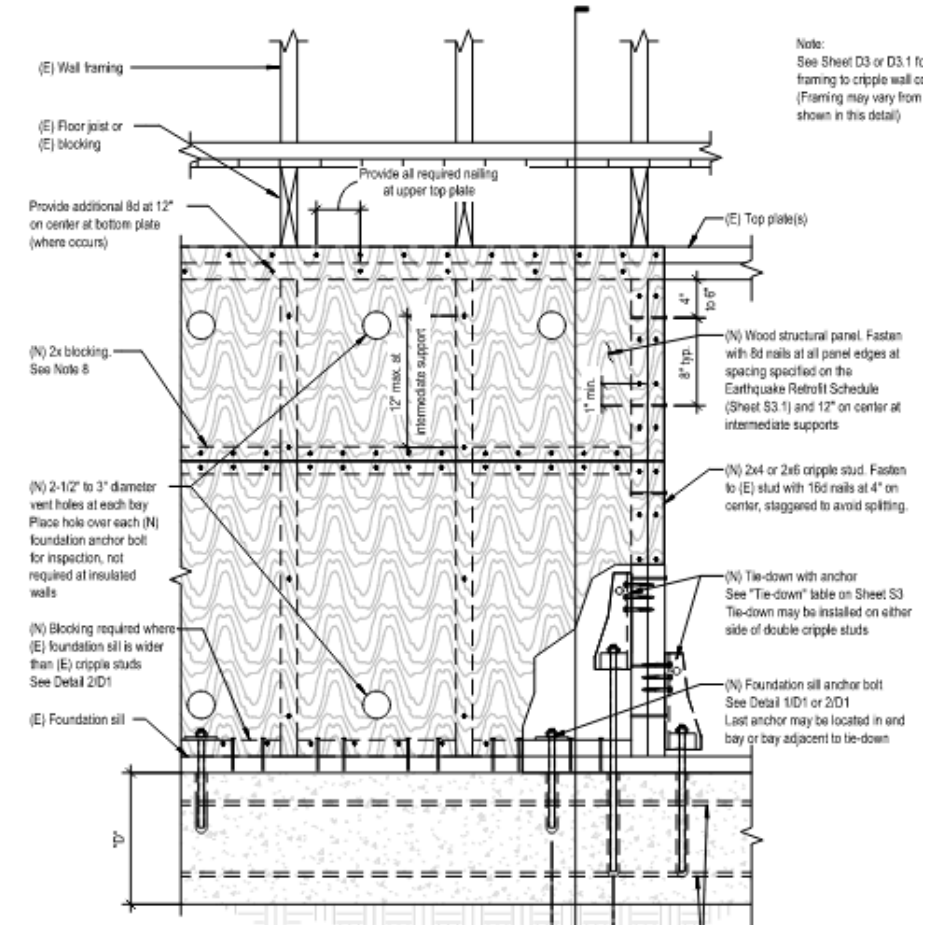
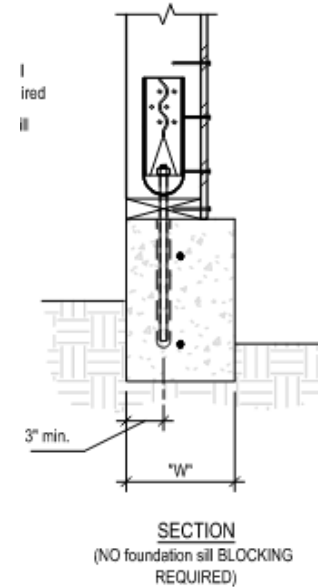
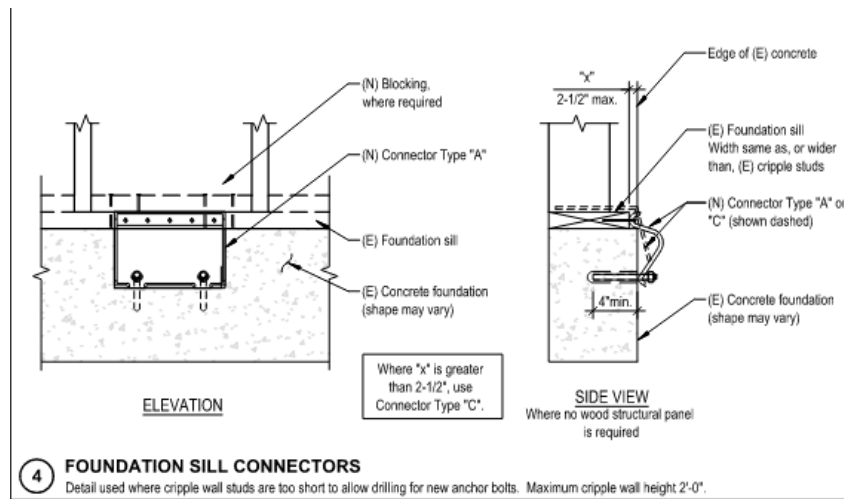
SHEET S4 - FLOOR PLAN

Draw Floor Plan - Sheet S4

- Measure and mark existing conditions.
- Show which of the details provided will be used.
- Mark and note wall bracing for each exterior wall line and show length of braced wall panels.
- Refer to example floor plans (Sheets 17-21).



SHEETS D1 THROUGH D6 - DETAILS



- D1 Foundation Sill to Concrete Foundation Connection Details
- D2 Floor Framing to Foundation Sill Connection Details
- D3 Floor Framing to Cripple Wall Connection Details
- D3.1 Floor Framing to Cripple Wall Connection / Foundation Replacement Details
- D3.2 Floor Framing to Cripple Wall Connection Details
- D4 Wood Structural Panel Installation without Tie-Downs
- D5 Wood Structural Panel Installation with Tie-Downs
- D6 Vent Openings and Top Plate Details

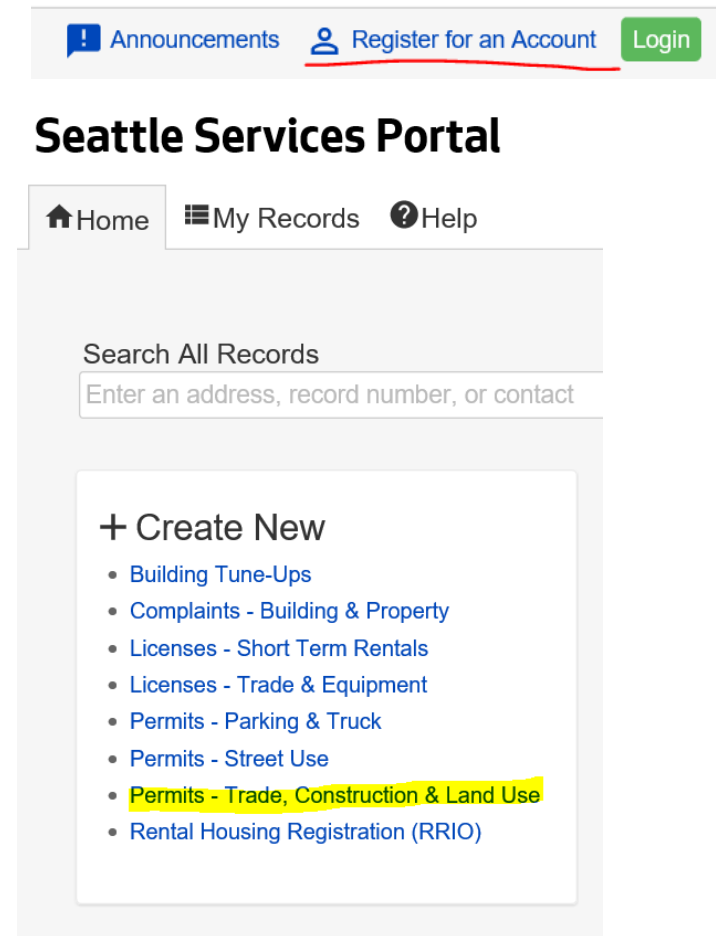
EHR - APPLICATION PROCESS

All Construction Projects, including the EHR Prescriptive start the same way

- Apply on the Seattle Services Portal
- Project review – respond to corrections
- Inspections

EHR PLAN SET– Application Benefits

- No need for an intake appointment
- Plan review is expedited
- EHR Plan review fees are typically cheaper than other permits



OTHER RETROFIT OPTIONS

Items not addressed by the EHR plan set:

- Chimneys
 - DR 7-2025
- Framing above the first floor
- Interior crawl space walls or columns



OTHER RETROFIT OPTIONS

- Homes that don't qualify for the EHR plan set
 - Submit a voluntary seismic retrofit stamped and designed by an engineer
 - Voluntary retrofits can be submitted as an **STFI** (subject to field inspection) permit
- Are you doing other major alterations to your home?
 - Plan review may be required
 - Your permit might be a substantial alteration per the 2021 Seattle Residential Code section **R107.5.1** and may need URM chimney upgrades per **R107.5.3**
 - Seismic upgrades are a requirement for substantial alterations per section **R107.5.1.2**.
 - Options for seismic upgrades are:
 1. Engineered Design
 2. EHR plan set

R107.5.1.2 Seismic regulations. Buildings or structures to which substantial *alterations* or repairs are made shall comply with Sections R301.1.3 or Sections R403.1.6, R602.10 and R602.11. In addition, the *building official* may require testing of existing materials, at applicant or property owner's expense, if there is insufficient evidence of structural strength or integrity of the building or structure.

Exception: In lieu of compliance with the seismic provisions of Sections R403.1.6, R602.10 and R602.11, if *approved* by the *building official*, the applicant may evaluate and strengthen portions of the building lateral support structure, such as foundations and cripple walls.

Note: Where applicable, the submittal of City of Seattle Earthquake Home Retrofit Plans may be used to demonstrate compliance with the exception to Section R107.5.1.2. See [www.seattle.gov/sdci/permits/permits-we-issue-\(a-z\)/earthquake-home-retrofit-permit#2.startpermitapplication](http://www.seattle.gov/sdci/permits/permits-we-issue-(a-z)/earthquake-home-retrofit-permit#2.startpermitapplication) for more information.

SUMMARY - RECAP

EHR Plan Set offers a prescriptive approach for improvements to existing homes.

- Working to build a more disaster resilient community - Be Prepared.
 - Focus is on Building Safety. This program will not “earthquake proof” your home.
- What Types of Homes Can Use This Plan Set?
 - Existing, wood framed homes that are on concrete foundations and are two stories or less in height may qualify.
- What work is being done and where?
 - **Anchor** to the foundation, **Brace** the walls below the first floor and **Connect** these walls to the first-floor framing.
- Key Pages of EHR Plan set and how to apply.
- Other retrofit options

SDCI – PERMIT RESOURCES

SDCI Website / EHR Permit:

[http://www.seattle.gov/sdci/permits/permits-we-issue-\(a-z\)/earthquake-home-retrofit-permit](http://www.seattle.gov/sdci/permits/permits-we-issue-(a-z)/earthquake-home-retrofit-permit)

STFI application:

[https://www.seattle.gov/sdci/permits/permits-we-issue-\(a-z\)/construction-permit---subject-to-field-inspection](https://www.seattle.gov/sdci/permits/permits-we-issue-(a-z)/construction-permit---subject-to-field-inspection)

SDCI – Ask us a question Online:

www.seattle.gov/sdci/resources/send-us-a-question

- Chat with us online!



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Mayor Jenny A. Durkan

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Seattle Department of Construction & Inspections
Nathan Torgelson, Director

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Earthquake Home Retrofit Permit

What Is It?

We want to help you to protect your home against earthquake damage by speeding up the application process for Earthquake Home Retrofit Permits (also known as Project Impact). We also provide you with suggestions, called prescriptive plan sets, on how to retrofit your home. These plan sets help you obtain the Earthquake Home Retrofit Permit quickly and easily. They also eliminate the need to hire a design professional to develop drawings. If your project does not meet the requirements of our prescriptive plan set, you can also submit a voluntary seismic retrofit designed by an engineer.

Our home retrofit plans address two common kinds of earthquake damage: the wall between the foundation and first floor collapsing or the home moving off its foundation.

How Much Does It Cost?

Our fees are based on your estimated value of work, labor, and materials. Earthquake Home Retrofit projects that use our prescriptive plan set qualify for reduced permit fees.

[Fee Subtitle](#)

How Long Does It Take?

We usually do our initial review of Earthquake Home Retrofit Permits in two weeks. If your retrofit is designed by an engineer, your project will qualify for a [subject-to-field-inspection permit](#). Subject-to-field-inspection permits are issued over the counter on the day you apply if you apply in person, or within a few days if you apply electronically.

Steps to Get Your Permit

Expand all

1. Research

+

2. Start Permit Application

+

3. Submit Plans

+

4. Get Permit

+

Questions?

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