APPENDIX F
DESIGN WORKSHEET

Owner’s Name: ________________________________________________________________

Address: ____________________________________________________________________

Builder’s Name: ______________________________________________________________

Site Location: __________________________________________________________________

PART 1: SITE CONDITIONS
(Accompanies Chapter 2)

1. Has the Manufacturer’s Worksheet been provided? yes no

Existing Grade Elevation (201-1)

2. Does the site require a survey? yes no
   (Answer yes if: 1) elev. to be altered by grade or fill; 2) site near flood zone; 3) subdivision. Answer no if individually-sited with no alteration of building site.)

3. If yes to above, what is the surveyed existing grade elevation? __________ ft.

Flood Protection Elevation (201-2)

4. Is the building site in a flood zone? yes no
   (If yes to 4, then answer 5, 6, 7 & 8. If no, skip to 9.)

5. What is the Base Flood Elevation or the Flood Protection Elevation (use highest value)? __________ ft.

6. Is the site to be graded, filled, or bermed? yes no
   (If no, skip to 9.)

7. If yes to 6, have all permits been provided? yes no

8. If no to 6, then are the buildings to be built on elevated foundations? yes no
   (If yes, this handbook cannot be used. Refer to FEMA Manual.)
**Frost Penetration Depth (201-3)**

9. What is the maximum frost penetration depth? ___________ in.  
(see Appendix H, page H-4)

10a. Does foundation plan show base of footing extending below frost penetration depth? yes no  
(If yes proceed; if no, applicant should revise plans.)

10b. Does foundation plan show base of footing extending below top-soil layer (min. 12”) to undisturbed soil? yes no

**Ground Water Table Elevation (201-4)**

11. For subdivisions, does a Geotechnical Engineer recommend drainage of subsurface water? yes no  
(If no, skip to 13.)

12. Has groundwater drainage plan been provided? yes no

**Soil Conditions (202, 203)**

13. If any of the following adverse site conditions are discovered, specific recommendations by a Geotechnical Engineer will be required (applies to subdivisions and individually-sited homes.)

   Organic soil (8” topsoil layer) yes no  
   Expansive (shrink-swell) soil yes no  
   Sloping site yes no  
   Subsidence yes no  

   (Applicant may be referred to Geotechnical Engineer if any of the above are yes. If no, to all of above, move to next step.)

14. Is area in a known termite infestation area? yes no

   Region classification? ____________________  
   (See Appendix H, Termite Infestation Map, page H-10) (If no, skip to 16.)

15. Has applicant complied with CABO R-308 or local ordinance for construction procedures and treatment? yes no  
(If yes, continue; if no, refer applicant to CABO requirements.)
PART 2: SITE PREPARATION
(Accompanies Chapter 3)

16. Acceptable surface drainage plan provided? (301) yes no
   (If no, one must be provided for subdivision)

17. Grading plan provided? (302) yes no

18. Fill specifications conforming to those cited in HUD Land Planning Data Sheet (79g)? (303) yes no
   (If fill is used, below the home's foundation, a report by Geotech. Eng. should be submitted to provide fill specifications.)

19. Finish grade elevation? (304) __________ *
   (Check answers to Part 1: #4 & #5. The finish grade elevation must be higher than #5 if in flood zone.)

PART 3: DESIGN LOADS
(Accompanies Chapter 4)

Information from Manufacturer's Worksheet

20. Has all the information been provided on the Manufacturer's Worksheet? (Appendix E) yes no

21. What is the building self weight (W)? __________ lbs.
   (Mfg. Wksht. #8)

22. What is the building length (L)? __________ ft.
   (Mfg. Wksht. #3)

23. What is the distributed weight per foot of unit length? (w=W/L) __________ lbs./ft.
   (402-1.B, C)

24. What is the building type? Single-Section
   Multi-Section
   C, E, or I
   Foundation design concept?
   (C1, C2, C3, C4, E1, E3, E4, E5, E6, E7, E8, I) __________ *
Dead Load (402-1)

25. What is the light dead load value from Table 4-1? 
   (402-1.A.1) __________ * (lbs./ft.)

26. What is the heavy dead load value from Table 4-1? 
   (402-1.A.2) __________ * (lbs./ft.)

27. Does the answer from Question #23 fall within the values in #25 and #26? (402-1.D) yes no
   (If the answer is yes, continue. If no, the foundation is not within the limits of this document and must be redesigned by a structural engineer.)

Snow Load (402-2) / Minimum Roof Live Load (402-2.C)

28a. What is average annual ground snowfall (Pg)? 
   (See Ground Snow Load map, pages H-11, H-12 and H-13.) __________ * (lbs./sq.ft.)

28b. What is 0.7 multiplied by Pg? 
   __________ psf.

29a. What is the roof slope? (Mfg. Wksht. #7) __________

29b. What is the minimum roof live load for the roof slope?  
   (D-200.2.B) __________ psf.

30. Record the larger magnitude of item 28b or item 29b. Use this magnitude for roof load where required. __________ psf.

Wind Load (402-3)

31a. What is the basic wind speed (V)? 
   (See Wind Speed map, page H-14.) __________ mph.

31b. If V is less than 80 mph, record MPS min. 80 mph for wind design. (402-3.A) __________ mph.

32. Is the site inland or coastal? (402-3.B) Inland Coastal
   (If inland, skip to question #38.)

33. If a coastal area, has the manufacturer provided connection details? (402-3.D) (Mfg. Wksht. #12) yes no
34. If yes to #33, what design wind speed has the manufacturer used in designing connection details? (Mfg. Wksht. #14) ___________ mph. *

35. Are the connection locations shown? (Mfg. Wksht. #16a) yes no

36. Are connection details provided for foundation shear walls? (For an answer of yes, all questions under Mfg. Wksht #16 must be answered satisfactorily.) yes no

37. Is the value for Question 34 equal to or greater than the number given in Question 31? (If yes, proceed. If no, return design to manufacturer for clarification.) yes no

Seismic Load

38a. What are the seismic acceleration values? (See Seismic maps, pages H-15 and H-16) Aa ___________ *

38b. Is A\textsubscript{v} < 0.15? (if no, proceed. If yes, seismic need not be considered, skip questions 39 to 41.) yes no

39. Seismic performance category. (See H-300 for Special Requirements of Foundation Design.) __________

40. What is the applicant's proposed design concept? (Design Wksht. #24) ___________ *

41. Do the Foundation Design Concept Tables approve the foundation system for use in seismic areas of Question #38 above? (See Appendix A) (If yes, proceed. If no, return to applicant for foundation design choice more suited to high seismic areas.) yes no

PART 4-FINAL DESIGN PROCEDURE
(Accompanies Chapter 6)

42. What is the actual building width? (Mfg. Wksht. #4) ___________ ft.
43. The nominal building width to be used in the Foundation Design Tables, (Aftg, Av & Ah) is Wt: \[ \text{ft.} \] (600-2.A and Figure 6-1)

44. Where are the foundation supports located? Check drawings submitted by the owner and Foundation Design Concepts in Appendix A. Circle the support locations shown on the Manufacturer's foundation concept plan.

45. Do these locations match the Foundation Concept shown in Appendix A? Do the locations match Question #24 on the Design Worksheet? \[ \text{yes} \quad \text{no} \]
   (If yes, proceed. If no, return to Owner for clarification.)

46. Is Vertical Anchorage present? \[ \text{yes} \quad \text{no} \]

APPENDIX A

47. What is the basic system type? \[ \text{________} \ast \]
   (From Part 3: #24; Mfg. Wksht. #2)

48. What is the spacing between piers? \[ \text{Exterior: 4' 5' 6' 7' 8'} \]
   \[ \text{Interior: 4' 5' 6' 7' 8'} \]
   \[ \text{Continuous Marriage Wall: 4' 5' 6' 7' 8'} \]
   Largest or Average Marriage Wall Opening: \[ \text{________ ft.} \]
   Tie Down (C1) \[ \text{________ ft.} \]

APPENDIX B

**Required Footing Size**

49. The required Exterior Wall Footing, for the foundation type, is found in the Required Effective Footing Area table in App. B, Part 1. (Use maximum value from item #30.) \[ \text{________} \ast \]

The Required Exterior Square Footing size is:

Type C \[ \text{________ sq.ft.} \]

Type E or I \[ \text{________ ft.} \]
   \[ \text{(width)} \]
50. The Required Interior Footing area is: __________ sq.ft. 
(Also exterior piers for foundation type E)

51a. The Required Continuous Marriage Wall Footing area is: __________ sq.ft.

51b. The Required Footing area under posts at the ends of marriage wall opening(s) is: __________ sq.ft.

**Vertical Anchorage Requirements in the Transverse Direction (602-4)**

Exterior Av __________ *
(lbs./pier spacing; lbs./ft for E type; lbs./tie-down spacing)

52b. Number of vertical tie-down locations for multi-section units: 2 or 4 or 6

52c. For units with additional vertical anchorage at the interior piers, determine the Required Vertical Anchorage. 
Interior Av __________ *
(lbs./int pier spacing)

53. What is the manufacturer-supplied value? 
Exterior __________ *
Interior __________ *

54. Is this value (#53) greater than the value given in #52a? 
yes no
(If yes, continue. If no, return to owner for clarification.)

**Horizontal Anchorage Requirements In The Transverse Direction (602-5)**

<table>
<thead>
<tr>
<th>trial 1</th>
<th>trial 2</th>
<th>trial 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

55a. What number of transverse foundation walls was selected? (602-5.E) (If vertical X-bracing planes are used, complete items #55a, #56 and #57 for 2 transverse walls, and then skip to item #59.)

55b. Are diagonal ties used to complete the top of the transverse short wall for horizontal anchorage? (602-5.G.1)

Yes no

Estimate height (h) for appropriate illustration in Figure 6-10.
56. Using the tables, find the Required Horizontal Anchorage (Ah). (Appendix B; Part 3)

<table>
<thead>
<tr>
<th>trial</th>
<th>trial</th>
<th>trial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>lbs./ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lbs./ft.</td>
</tr>
</tbody>
</table>

57a. What is the manufacturer’s-supplied rated capacity for sliding? (#16c, Mfg. WkSht.)

57b. If answer to item #55b is yes, record manufacturer or product supplier rated strap tension capacity

<table>
<thead>
<tr>
<th>trial</th>
<th>trial</th>
<th>trial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>lbs./strap</td>
</tr>
</tbody>
</table>

58a. Is value #57a greater than item #56? If yes, continue. If no, return to section 602-4.C and to question #55a and select a larger number of transverse foundation walls. If the maximum number selected (6) does not work, return to owner (who may wish to contact the manufacturer for clarification).

<table>
<thead>
<tr>
<th>trial</th>
<th>trial</th>
<th>trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

58b. If answer to #55b is yes, required tension in diagonal (T₁). (Complete procedure in Section 602.5.G.1.)

<table>
<thead>
<tr>
<th>trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>lbs.</td>
</tr>
</tbody>
</table>

58c. Is value #57b greater than #58b? If yes, continue to item #62. If no, return to owner for product with greater capacity.

<table>
<thead>
<tr>
<th>trial</th>
<th>trial</th>
<th>trial</th>
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</thead>
<tbody>
<tr>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

59. If using vertical X-bracing planes in lieu of transverse short walls (and the formulas in section 602-5.G.2), determine anchorage values and sizes for diagonal members. (If shear walls are selected in item #55, skip to item #62.)

<table>
<thead>
<tr>
<th>trial</th>
<th>trial</th>
<th>trial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ft. *</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

a. Vertical X-bracing spacing proposed.

b. Number of vertical X-bracing locations proposed. (Item #13, Mfg. WkSht. for trial 1.)
c. Required horizontal anchorage (C) value, based on formula. (602-5.G.2.c)

<table>
<thead>
<tr>
<th></th>
<th>trial 1</th>
<th>trial 2</th>
<th>trial 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>lbs./x-brace set</td>
</tr>
</tbody>
</table>

d. Estimated height (h) in Figure 6-10.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ft.</td>
</tr>
</tbody>
</table>

e. Tension (T₁) required. (602-5.G.2.d)

<p>| | | | |</p>
<table>
<thead>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>lbs./diag.</td>
</tr>
</tbody>
</table>

60. What is the manufacturer-supplied rated strap tension capacity? (#16, Mfg. WkSht.) (or capacity defined by literature supplied by product supplier)

61a. Is value #57 greater than value #59c?
If yes, continue. If no, return to Section 602-5.G and to question #59 and select a greater number of X-brace locations as a next trial. Repeat until answer is yes, then continue.

<table>
<thead>
<tr>
<th></th>
<th>yes</th>
<th>yes</th>
<th>yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

61b. Is value #60 greater than value #59e?
If yes, continue. If no, return to section 602-5.G and to question #59 and select a greater number of X-bracing locations. If the maximum number selected does not work, return to owner (who may wish to contact the manufacturer for clarification or product supplier for clarification).

<table>
<thead>
<tr>
<th></th>
<th>yes</th>
<th>yes</th>
<th>yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

Horizontal Anchorage Requirements In The Longitudinal Direction (602-6)

62a. Using the tables, find the required horizontal anchorage (Ah) in the longitudinal direction. (Appendix B, Part 4) (602.6.E) Exterior Wall Ah __________ lbs./ft.

<table>
<thead>
<tr>
<th></th>
<th>trial 1</th>
<th>trial 2</th>
<th>trial 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 or 4</td>
<td>2 or 4</td>
<td>2 or 4</td>
</tr>
</tbody>
</table>

62b. If using vertical X-bracing planes (and the formulas in section 602-6.F) determine anchorage value for X-bracing planes. (If using exterior long walls, skip to item #63.)

1. Number of chassis beam lines used for vertical X-bracing planes.
Number of X-bracing planes proposed under each chassis beam along the length of the unit.

2. Horizontal anchorage (B) required force, based on formula.

3. Assumed height (h-b) based on Figure 6-11.

4. Tension (T_L) based on formula. (602-6.F.(3)).

63. What is the manufacturer-supplied value for horizontal anchorage? (#16d, Mfg. WkSht.)

64a. For shear walls: is value #63 greater than #62a?  
   If yes, skip to item #67. If no, contact owner for clarification.

64b. For X-bracing: is value #63 greater than value #62b.2?  
   If yes, return to item #62b.3. If no, increase number of vertical X-bracing planes and repeat items 62b.1 and 62b.2 until answer is yes. For multi-section units consider 4 lines of vertical X-bracing under all chassis beams.

65. What is the manufacturer-supplied rated strap tension?  
   (#16e, Mfg. WkSht. or product supplier)

66. Is value #65 greater than #62b.4?  
   If yes, continue. If no, contact owner to obtain straps with greater capacity, or return to item #62b.1 and increase the number of vertical X-bracing planes until answer is yes.

**APPENDIX C**

**Withdrawal Resistance Verification (603-2.B)**

67. Using Appendix C, Table C-1 or C-2, verify that the foundation system will resist withdrawal. Answer question #67a for type E. Answer question #67b for types C, I, or type E with interior pier anchorage.
a. **Withdrawal Resistance for long foundation wall.** (Type E)

Circle the type of material that is to be used.

- Reinforced Concrete
- Masonry-Fully Grouted
- Masonry-Grouted @ 48” o.c.
- All-Weather Wood / Footing

1) Using Table C-1, which capacity is greater than required Av? (603-2.B.(1)) (#52a)

\[ \text{___________ lbs./ft.} \]

2) Using Table C-1, what is the height of the wall + footing for required withdrawal resistance? (hw + 6”)

\[ \text{___________ in.} \]

3) What is the height of the wall + footing for frost protection? (frost depth (#9) + 12”)

\[ \text{___________ in.} \]

4) What is the greatest height #67a.2 or #67a.3?

Circle the height which controls.

Withdrawal

Frost Depth

5) Record the bottom of footing depth from grade. (Item #67a.4 - 12”)

\[ \text{___________ in.} \]

6) Using Table C-1, what is the required width of the wall footing for withdrawal?

\[ \text{___________ in.} \]

7) Is item #67a.6 greater than or equal to item #49? yes no

If yes, continue. If no, change footing width to item #49.

8) Record design exterior wall footing width.

\[ \text{___________ in.} \]

b. **Withdrawal Resistance for Piers.** (Types C, C1 (concrete dead-man), I or type E with interior pier anchorage - multi-section units.)

Circle pier type:

- Reinforced Concrete
- Reinforced Masonry - fully grouted
- Reinforced Concrete Dead-man
1) Using Table C-2, which capacity is greater than required Av? (#52a and #52c) (603-2.B.(2))

<table>
<thead>
<tr>
<th>Exterior</th>
<th>Interior</th>
<th>(when used)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>lbs./pier *</td>
</tr>
</tbody>
</table>

2) Using Table C-2, what is the height of the pier + footing for required withdrawal resistance? (hp + 8”)

<table>
<thead>
<tr>
<th>Exterior</th>
<th>Interior</th>
<th>(when used)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>in. *</td>
</tr>
</tbody>
</table>

3) What is the required height of pier + footing for frost protection? (frost depth (#9) + 12”)

<table>
<thead>
<tr>
<th>Exterior</th>
<th>Interior</th>
<th>(when used)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>in.</td>
</tr>
</tbody>
</table>

4) What is the greatest height #67b.2 or #67b.3?

Circle the height which controls.

<table>
<thead>
<tr>
<th>Withdrawal</th>
<th>Frost Depth</th>
<th>Withdrawal</th>
<th>Frost Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

5) Record the bottom of footing depth from grade. (Item #67b.4 - 12”)

<table>
<thead>
<tr>
<th>Exterior</th>
<th>Interior</th>
<th>(when used)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>in.</td>
</tr>
</tbody>
</table>

6) Using Table C-2, what is the required width of the square footing if withdrawal resistance controls or if frost depth controls?

<table>
<thead>
<tr>
<th>Exterior</th>
<th>Interior</th>
<th>(when used)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>in. *</td>
</tr>
</tbody>
</table>

c. **Frost depth for marriage walls.** What is the required depth of footing below grade for frost protection? (frost depth (#9)) (no withdrawal resistance)

<table>
<thead>
<tr>
<th>Exterior</th>
<th>Interior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Vertical Anchorage and Reinforcement for Longitudinal Foundation Walls and Piers (603-2.D)

68. Using Appendix C, Table C-3, C-4A or C-4B, verify that the foundation anchors will resist uplift. Answer question #68a for type E. Answer question #68b for types C, I, or type E with interior pier anchorage.

#### a. **Vertical Anchor Capacity for longitudinal foundation wall** (type E) (603-2.D.2)

1) Using Table C-4A (concrete & masonry), which capacity is greater than the required Av? (#52a, Design Wksht.) If treated wood wall, skip to item #68a.3.

<table>
<thead>
<tr>
<th>Exterior</th>
<th>Interior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lbs./lineal ft. of wall</td>
</tr>
</tbody>
</table>
Circle correct washer choice for the capacity selected

Standard Washer
Oversized Washer

2) Using Table C-4A (masonry and concrete):
   a) Required anchor bolt diameter
      __________ in.
   b) Required anchor bolt spacing
      __________ in.
   c) Using Table C-3A:
      (1) Rebar size
          __________ *
      (2) Lap splice
          __________ in.
      (3) Rebar hook length
          __________ in.

3) Using Table C-4B (wood), which capacity is greater than
   the required Av? (#52a, Design Wksht.)
   __________ lbs./lineal ft. of wall
   If using concrete or masonry wall, skip to item #68b.

4) Using Table C-4B (wood):
   a) Required nailing
      __________ *
   b) Minimum plywood thickness
      __________ in.
   c) Required anchor bolt diameter
      __________ in.
   d) Required anchor bolt spacing
      __________ in.

b. **Vertical Anchor Capacity for Piers**
   (Types C, I, or type E with interior pier anchorage)
   (603-2.D.1)

<table>
<thead>
<tr>
<th>Exterior</th>
<th>Interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>(when used for anchorage in multi-section units)</td>
<td></td>
</tr>
</tbody>
</table>

   1) Using Table C-3, which capacity in the table is greater than the required Av?
   (From #52a, Design Wksht.)
   __________   __________ lbs./pier
2) Using Table C-3:
   a) Number of anchor bolts  1 or 2  1 or 2
   b) Anchor diameter  1/2" or 5/8"  1/2" or 5/8"

3) Using Table C-3A:
   a) Rebar size  #4 or #5  #4 or #5
   b) Lap splice  __________  __________ in.
   c) Rebar hook length  __________  __________ in.

Horizontal Anchorage and Reinforcement for Transverse Foundation Walls (603-3)

69. Using Appendix C, Table C-5A or C-5B, verify that the foundation anchorage will resist sliding at the transverse end foundation walls. Use for types C, E, or I.

   a. For continuous foundations.

   Using Table C-5A (concrete & masonry) or C-5B (wood), which capacity is greater than the required (Ah) (603-3) (item #56)?
   __________  __________ lbs./ft.

1) Using Table C-5A, find:
   a) Required anchor bolt diameter  __________  __________ in.
   b) Required anchor bolt spacing  __________  __________ in.
   c) Using Table C-3A:
      (1) Rebar size  __________  __________ *
      (2) Lap splice  __________  __________ in.
      (3) Rebar hook length  __________  __________ in.

2) Using Table C-5B, find:
   a) Required nailing  __________  __________ *

(Appendix G - Example 2)
b. *For transverse short foundation walls completed with diagonal braces.*
(603-5)

Using Appendix C, Table C-5A, verify the diagonal anchorage capacity to the short foundation wall.

<table>
<thead>
<tr>
<th></th>
<th>End Wall</th>
<th>Interior Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) Minimum plywood thickness</td>
<td>________</td>
<td>________ in.</td>
</tr>
<tr>
<td>c) Required anchor bolt diameter</td>
<td>________</td>
<td>________ in.</td>
</tr>
<tr>
<td>d) Required anchor bolt spacing</td>
<td>________</td>
<td>________ in.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th>End</th>
<th>Interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Record the required horizontal force (Ah \times Wt) from 602-5.G.1.a and item #56.</td>
<td>________</td>
<td>________ lbs.</td>
</tr>
<tr>
<td>2) Table C-5A capacity for one 1/2” diameter bolt at 12” o.c.</td>
<td>1800</td>
<td>1800 lbs.</td>
</tr>
<tr>
<td>3) Number of bolts (Ah \times Wt \div 1800; one minimum) at concrete or masonry top of short wall.</td>
<td>________</td>
<td>________ *</td>
</tr>
<tr>
<td>4) Size of anchor bolts</td>
<td>________</td>
<td>________ in.</td>
</tr>
<tr>
<td>5) Using Table C-3A:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Rebar size</td>
<td>________</td>
<td>________ *</td>
</tr>
<tr>
<td>b) Lap splice</td>
<td>________</td>
<td>________ in.</td>
</tr>
<tr>
<td>c) Rebar hook length</td>
<td>________</td>
<td>________ in.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th>End</th>
<th>Interior</th>
</tr>
</thead>
</table>
| c. *For vertical X-bracing planes in the transverse direction.*
(603-6)

Using Appendix C, Table C-5A, verify the diagonal anchorage to the pier footings and the tension capacity of the diagonals.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Record the required horizontal force (C) from item #59c.</td>
<td>________ lbs.</td>
<td></td>
</tr>
<tr>
<td>2) Table C-5A capacity for one 1/2” diameter bolt at 12” o.c.</td>
<td>1800 lbs.</td>
<td></td>
</tr>
</tbody>
</table>
3) Number of bolts (C ÷ 1800; one minimum) at top of a footing.  

4) Record the required tension force (T_t) from item #59e.  

5) Select tension strap capacity greater than or equal to T_t from owner’s product supplier or manufacturer’s supplied capacity (item #60).  

6) Record diagonal strap data  

**Horizontal Anchorage for Longitudinal Foundation Walls (603-4)**

70. Using Appendix C, Table C-5A or C-5B, verify that the foundation horizontal anchorage will resist sliding at the long foundation walls. Use for types C, E and I.

   a. **For continuous exterior foundation walls.**

      Using Table C-5A (concrete and masonry) or Table C-5B (wood), which capacity is greater than the required exterior Ah? (602-6.E) (item #62a)  

      1) Using Table C-5A, find:

         a) Required anchor bolt diameter  

         b) Required anchor bolt spacing  

         c) Using Table C-3A:

            (1) Rebar size  

            (2) Lap splice  

            (3) Rebar hook length  

      2) Using Table C-5B, find:

         a) Required nailing  

         b) Minimum plywood thickness  

         c) Required anchor bolt diameter  

         d) Required anchor bolt spacing
b. **For vertical X-bracing planes.**

(603-6.A.(2))

Using Appendix C, Table C-5A, verify the diagonal anchorage to the pier footings and the tension capacity of the diagonals.

1) Record the required horizontal force \( B \) from item #62b.2. 

\[ \text{___________ lbs.} \]

2) Table C-5A capacity for one 1/2” diameter bolt at 12” o.c. 

\[ 1800 \text{ lbs.} \]

3) Number of bolts \( B \div 1800; \text{one minimum} \)

\[ \text{___________ } \ast \]

4) Record the required tension force \( T_L \) from item #62b.4. 

\[ \text{___________ lbs./diag.} \]

5) Select tension strap capacity greater than or equal to \( T_L \) from owner’s product supplier or manufacturer’s supplied capacity (item #60). 

\[ \text{___________ lbs./diag.} \]

6) Record diagonal strap data 

\[ \text{___________} \]

**SUMMARY SHEET**

(Accompanies Chapter 7)

71. Compare values from preceding questions. Select the largest value.

a. **Bearing area and vertical anchorage**

1. **Pier footings: types C, E & I.**

<table>
<thead>
<tr>
<th>Piers</th>
<th>Marriage Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exterior</td>
</tr>
<tr>
<td></td>
<td>Interior</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
</tr>
<tr>
<td></td>
<td>At Post</td>
</tr>
</tbody>
</table>

Required Effective Footing Area from questions #49, #50, & #51. 

\[ \text{_______ sq.ft.} \]

Required footing area to resist withdrawal due to uplift from Question #67. (for single-section or 2 tie-down system, only the exterior piers resist uplift, for 4 tie-down only the interior piers and exterior walls resist uplift) 

\[ \text{_______ sq.ft.} \]
## Piers

<table>
<thead>
<tr>
<th></th>
<th>Marriage Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exterior</td>
</tr>
<tr>
<td></td>
<td>Interior</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
</tr>
<tr>
<td></td>
<td>At Post</td>
</tr>
<tr>
<td><strong>Pier Footing Sizes</strong> (largest of above)</td>
<td>_______ _______ _______ _______ sq.ft.</td>
</tr>
<tr>
<td><strong>“Dead-man” footing size.</strong></td>
<td>_______ sq.ft.</td>
</tr>
</tbody>
</table>

### Reinforcing for pier footings:
Bring forward answers from previous questions. (#68b)
(Types C, I, or E with interior pier anchorage.)

<table>
<thead>
<tr>
<th></th>
<th>Exterior</th>
<th>Interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of anchor bolts</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Anchor bolt diameter</td>
<td>_______</td>
<td>_______  in.</td>
</tr>
<tr>
<td>Rebar size</td>
<td>_______</td>
<td>_______</td>
</tr>
<tr>
<td>Lap splice</td>
<td>_______</td>
<td>_______  in.</td>
</tr>
<tr>
<td>Rebar hook length</td>
<td>_______</td>
<td>_______  in.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Exterior</th>
<th>Interior</th>
<th>Marriage Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Footing depth: grade to bottom of footing</strong></td>
<td>_______</td>
<td>_______</td>
<td>_______ in.</td>
</tr>
<tr>
<td><strong>Pier footing and “dead-man” footing reinforcing bars:</strong></td>
<td>#4 at 10&quot; o.c.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>“Dead-man” footing depth: grade to bottom of footing</strong></td>
<td>_______ in.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. *Long Foundation wall footing: type E or I:*

   **Required Effective Footing Width**
   
   **Required Footing Width for soil bearing (#49)** | _______ ft. |
   
   **Required Footing Width to resist uplift withdrawal (#67a.6)** | _______ ft. |
   
   **Wall Footing Size (largest of above)** | _______ ft. |
   
   **Footing Depth: Grade to bottom of footing (#67a.5)** | _______ in. |
Footing reinforcing bars.  

Reinforcing for longitudinal foundation walls: Record answers from item #68a and record sizes and spacings.

From 68a.2: masonry and concrete:

Required anchor bolt diameter

Required washer size  | Standard | Oversized

Required anchor bolt spacing

Rebar size

Lap splice

Rebar hook length

From 68a.4: wood: Record answers from item #68a.4 and record sizes and spacings.

Required nailing

Minimum plywood thickness.

Required anchor bolt diameter

Required anchor bolt spacing

b. **Horizontal anchorage in the transverse direction - foundation walls**

1. **Continuous foundation walls (#69a)**

   Number of transverse foundation walls (#55a)  
   2  4  6

   Required Footing Width (minimum)
   12 in.

   From #69a.1: concrete / masonry:

<table>
<thead>
<tr>
<th>End Wall</th>
<th>Interior Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor bolt diameter</td>
<td></td>
</tr>
</tbody>
</table>

   |  |  |
   |  |  |

   F - 19  
   (Appendix G - Example 2)
| Anchor bolt spacing | _______ | _______ | in. |
| Rebar size | _______ | _______ |
| Lap splice | _______ | _______ | in. |
| Rebar hook length | _______ | _______ | in. |
| From #69a.2: wood: | | |
| Required nailing | _______ | _______ |
| Minimum plywood nailer | _______ | _______ |
| Anchor bolt diameter | _______ | _______ |
| Anchor bolt spacing | _______ | _______ | in. |

2. *For transverse short foundation walls completed with diagonal braces* (#69b)

| Number of pairs of diagonals (1 for single-section units, 2 for multi-section units) times number of short walls (end or interior) (#55a) | _______ | _______ |
| Diagonal spacing (same as number of short walls) | _______ | _______ |

| From #69b: concrete / masonry: | | |
| Anchor bolt diameter | _______ | _______ | in. |
| Number of bolts | _______ | _______ |
| Rebar size | _______ | _______ |
| Lap splice | _______ | _______ | in. |
| Rebar hook length | _______ | _______ | in. |

3. *For vertical X-bracing planes in lieu of short walls.* (#69c)

| Number of X-brace locations (#59) | _______ |
Spacing of vertical X-brace planes (#59) __________ ft.

Items from #69c.3 and #69c.5

Required anchor bolt diameter __________ in.

Number of bolts at top of footing to connect diagonal __________

Diagonal strap size __________

Connection to top flange of chassis beam (describe) ______________

c. Horizontal anchorage in the longitudinal direction - exterior foundation walls

1. Continuous foundation walls

   Reinforcing for longitudinal foundation walls: record only if larger sizes or closer spacing than recorded for vertical anchorage (#71a.2).

   From #70a.1: concrete / masonry:

   Anchor bolt diameter __________ in.

   Anchor bolt spacing __________ in.

   Rebar size __________

   Lap splice __________ in.

   Rebar hook length __________ in.

   From #70a.2: wood: record only if larger sizes or closer spacings than recorded for vertical anchorage (#71a.2)

   Required nailing __________

   Minimum plywood nailer __________

   Anchor bolt diameter __________

   Anchor bolt spacing __________ in.
2. *Vertical X-bracing planes under chassis beam lines* (#70b.)

Number of X-brace locations along one chassis beam line. _________

Spacing of X-brace locations along one chassis beam line. _________ ft.

Required anchor bolt diameter. _________ in.

Number of bolts at top of footing at connection to the diagonal. _________

Diagonal strap size. _________

Connection to bottom flange of chassis beam (describe). ___________________________

72. Do foundation dimensions and details comply with Foundation Capacities Table, based on Foundation Design Table Values? yes no

73. If #72 yes, approve. If no, return to applicant.  APPROVE  DISAPPROVE