



# Supplemental Plan Check Correction Sheet for Structural Design - General (2020 LABC)

Plan Review Date: \_\_\_\_\_

Plan Check #: \_\_\_\_\_ Permit Application Number: \_\_\_\_\_

Job Address: \_\_\_\_\_

Plan Check Engineer: \_\_\_\_\_ Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Your feedback is important, please visit our website to complete a Customer Survey at [www.ladbs.org/LADBSWeb/customer-survey.jsf](http://www.ladbs.org/LADBSWeb/customer-survey.jsf).

If you have any questions or need clarification on any plan check matters, please contact your plan check engineer and/or his or her supervisor.

**For instructions and other information, read the master plan check correction sheet attached.**

Supplemental Correction sheets attached (comply with corrections as marked):

- Curtain walls
- Storage racks
- Wood Construction
- Flexible Diaphragm
- Steel Frame Design including Moment Frame
- Steel Frames
- Light Gauge Steel Construction
- Masonry Shear Walls
- Concrete Shear Wall
- Concrete special moment resisting frame
- Prestress concrete
- Two Way concrete slab
- Concrete Prestress
- Concrete Tilt Up retrofit (Chapter 91)
- URM Retrofit
- Reinforced concrete and frame with masonry infills - Chapter 95

Obtain the following Information Bulletins, Affidavits or forms from our web site: [www.ladbs.org](http://www.ladbs.org)

- P/GI 2020-018 Computer Software Program Solutions
- P/BC 2020-002 Retaining wall (4'-0" high or less)
- P/BC 2020-007 Cutting, Notching and Boring of wood members
- P/BC 2020-010 Lumber species and Grade in wood shear walls
- P/BC 2020-015 Power driven steel studs in concrete
- P/BC 2020-024 Structural Observation
- P/BC 2020-030 Interconnection ties for pile caps and caissons
- P/BC 2020-031 Concrete Proportioning & Admixture Qualification
- P/BC 2020-032 Fabricators of High Strength Structural Steel
- P/BC 2020-034 Registered Deputy Inspector
- P/BC 2020-036 Fabrication tolerances for built-up steel
- P/BC 2020-046 Composite steel concrete construction
- P/BC 2020-048 Strong motion accelerographs requirements
- P/BC 2020-051 Wet mix shotcrete
- P/BC 2020-071 Wall anchors to flexible diaphragms design criteria
- P/BC 2020-083 Retaining wall design
- P/BC 2020-098 Steel Moment Frame connections
- P/BC 2020-100 Use of slab on grade as foundations
- P/BC 2020-116 Footing design for expansive soils

## **A. GENERAL PLANS**

1. A supplemental plan check and permit with the applicable fees are required for deferred items. Allow time for a normal plan check process. The engineer of record shall review the design of the deferred item(s) and verify conformance with the intent of the original design.
  - a. Prefabricated stairs including handrails
  - b. Prefabricated roof and floor trusses
  - c. Curtain Walls
  - d. Storage racks
2. Identify and reference all sections and details as to their location on the plan and elevation views.
3. Cross Reference all calculations for joists, beams, shear walls, etc, to framing/floor plans.
4. Submit structural calculations/design details for \_\_\_\_\_.
5. Provide plans for temporary shoring of excavations that remove the lateral support from a public way or an existing building. Excavations adjacent to a public way require Public Works approval prior to issuance of building permit.
6. A grading bond is required to be posted for projects involving over 250 cubic yards of soil in "Hillside Grading Areas".

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

**B. MATERIAL SPECIFICATION & INSPECTIONS**

1. Specify the following items on plans:
  - a. Type of soil and bearing value per Table 1806.2.
  - b. Standard 2500 psi min concrete for Group R or U of light-frame construction, two stories or less in SDC D, E, or F (1808.8.1)
  - c. 4000 psi min for precast non-prestressed driven piles, socketed drilled shafts, and micropiles. 5000 psi min for precast prestressed driven piles.
  - d. 3000 psi min. for concrete foundations in SDC D, E, or F other than listed above.
  - e. Type and  $f_m$  of masonry units. Proportions of mortar and grout mixes.
  - f. Type of Structural Steel, Structural Pipe, Tubing, Reinforcing bars.
  - g. Grade, species, and moisture content of all lumber. Type and grade of plywood sheathing.
  - h. The size, LA research report # and manufacturer of the shot pins. Show on plans, the maximum spacing of the shot pins in bearing/nonbearing walls.
2. For metal deck, specify manufacturer, product name, and LA research report number on plans: Specify on plans and calculations the deck designation of which tables were used to determine the allowable loads. Provide complete welding information on plans.
3. Structural Observation per Section 1704.6 is required for this project. The engineer of record shall prepare an inspection program, including the name(s) of the individuals or firms who will perform the work. The inspection program shall be shown on the first sheet of the structural plans.
4. (Continuous Special Inspection) (Periodic Special Inspection) is required for (\_\_\_\_\_) per Sec 1705 and quality assurance program of AISC 360 and 341 (steel), SDI QA/QC (Cold-formed steel deck), Tables 1705.2.3 (open-web steel joist and joist girders), 1705.3 (concrete), 1705.5.3 (Mass Timber), TMS 402-16 and TMS 602-16 Ch. 3 (masonry), Tables 1705.6 (soils), 1705.7 (driven deep foundations), and 1705.8 (cast-in place deep foundations).
5. Where special inspection or testing is required, the registered design professional in responsible charge shall include a Statement of Special Inspections on the plans which include materials, systems, components and work required to have special inspections or tests, the type and extent of each special inspection and test, and whether it will be continuous or periodic. (1704.2.3, 1704.3)
6. The following structural products shall comply with an approved Los Angeles City Research Report or an ICC or IAPMO report with a LABC or LARC Supplement. Copy the conditions of approval onto the plans and show compliance with those conditions.
 

<input type="checkbox"/> Hold-downs	<input type="checkbox"/> Prefab Shear Wall Panels
<input type="checkbox"/> Expansion/Adhesive anchor bolts	<input type="checkbox"/> Straps
<input type="checkbox"/> Sill Plate Connectors	<input type="checkbox"/> Others such as _____

**Add note on plans:**

1. Contractors responsible for the construction of a wind or seismic force resisting system/component listed in the Statement of Special Inspection shall submit a written statement of responsibility to the LADBS Inspectors and the owner prior to the commencement of work on such system or component. (1704.4)
2. Continuous Special Inspection by a registered deputy inspector is required for field welding, post-installed adhesive anchors installed horizontally or upwardly inclined to resist sustained tension loads, shotcrete placement, concrete strength  $f_c > 2500$  psi, sprayed-on fireproofing, engineered masonry, high-lift grouting, , high load diaphragms and special moment-resisting concrete frames, and helical pile foundations. (1705 & Chapters 19, 21, and 22)
3. Foundation sills shall be naturally durable or preservative-treated wood. (2304.12.1.4)
4. Field Welding to be done by welders certified by the LADBS for (structural steel)(reinforcing steel)(light gauge steel). Continuous inspection by a deputy inspector is required.
5. Shop welds must be performed in a LADBS licensed fabricator's shop.
6. LADBS licensed fabricator is required for (Trusses), (Structural Steel), \_\_\_\_\_.
7. Glued-laminated timbers must be fabricated in a LADBS licensed shop. Identify grade symbol and lamination species per 2018 NDS Supplement Table 5A.
8. Provide lead hole 40% - 70% of threaded shank diameter and full diameter for smooth shank portion.
9. Periodic Special Inspection is required for wood shear walls, shear panels, and diaphragms, including nailing, bolting, anchoring, and other fastening to components of the seismic force resisting system. *Special inspection by a deputy inspector is required where the fastener spacing of the sheathing is 4 inches on center or less.* (1705.12.2)

10. Special activity inspection is required for (buildings over 5 stories or 60' in height) (buildings over 50,000 sq. ft. of ground floor area) (buildings over 200,000 sq. ft. of total floor area) (1705.1.6)
11. A copy of the Los Angeles Research Report and/or conditions of listing shall be made available at the job site.

### **C. FOUNDATION AND GRADING**

1. Add details to show compliance with all corrections on enclosed Grading Pre-inspection Report and see supplemental grading correction sheet for additional comments.
2. All foundations shall be designed for expansive soil conditions unless a soil report is provided and approved by LADBS Grading Division (see Information Bulletin for more information). Provide details on foundation plans to comply with the requirements.
3. Call out minimum thickness of 3-½ inch concrete slab on grade, reinforcement, and 6-mil moisture barrier on foundation plan. (1907.1)
4. Detail (and reference location on foundation plan) typical foundation sections for: perimeter walls, interior bearing walls, depressed slabs, foundation common to dwelling and garage, garage entrance, spread and/or post pads.
5. Concrete grade beams that are part of a Special Moment Frame shall use A706 reinforcing steel. Transverse reinforcement shall be provided over a length equal to twice the member depth measured from the face of the supporting member. The spacing of such reinforcement shall not exceed: (a)  $d/4$ , (b) 6 times the diameter of the smallest primary flexural rebars excluding longitudinal skin rebars, or (c) 6 inches. The first hoop shall be located not more than 2 in. from the face of the column. The remainder of the grade beam shall have stirrups with seismic hooks at both ends spaced not more than  $d/2$ . (ACI 318, 18.13.3.3, 18.6.4)
- 5a. Concrete grade beams shall be constructed with minimum  $f'_c=3000$  psi. (1808.8.1)
6. Foundations with stem walls shall be reinforced with a minimum of two No. 4 bars at the top of the wall and two No. 4 bars at the bottom of the footing. (1905.1.7, IB P/BC 2020-116)
7. Slabs-on-grade with turn-down footings shall be reinforced with a minimum of one No. 4 bar at the top and one No. 4 bar at the bottom. (1905.1.7)
8. Provide details for stepped footings when slope of top and/or bottom of footing exceeds 1:10. Top surface of the stepped footing shall be level. (1809.3)
9. Detail a footing setback of the smaller of  $H/3$  or 40' to the face of slope or as required by the approved soil report. (1808.7.2; Fig 1808.7.1)
10. Provide an ascending slope clearance to building of  $H/2$  or 15' max. (1808.7.1, Fig 1808.7.1)
11. In SDC D, E or F, Site Class E or F, individual spread footings and in SDC D, E or F, individual pile caps and caissons subject to seismic forces shall be interconnected by ties in two directions. Ties shall be capable of resisting, in tension or compression, a force equal to the lesser of the product of the larger footing design gravity load times  $S_{DS}$ , divided by 10 and 25% of smaller footing design gravity load. (1809.13, 1810.3.13)
12. Earthquake Induced Liquefaction/Landslide Area: A geotechnical report is required to evaluate the potential for soil liquefaction and soil strength loss during earthquake. (1803.5.11)
13. Socketed drilled shafts depth shall be sufficient to develop the full load bearing capacity with a min. factor safety of two. Where a structural steel core is used, the corss cross-sectional area of the core shall not exceed 25% of the gross area fo the drilled shaft. (1810.3.9.6)
14. In seismic design category D, E and F, deep foundation reinforcement shall meet the minimum requirements. (1810.3)

#### **Add note on plans:**

1. If adverse soil conditions are encountered, a soils investigation report may be required. (1803.5.2)

## **D. VERTICAL LOADS**

1. In office buildings and other buildings where partition locations are subject to change, add a 15psf floor live load in addition to other live loads, unless the specified live load is 80psf or greater. (1607.5)
2. Corridors, stairs and exits must be designed for live loads per Table 1607.1.
3. Floors supporting vehicles not exceeding 9 passengers shall be designed for both a live load of 40 psf or a 3,000 lb concentrated load acting on a 4.5 inch by 4.5 inch area, which ever produces the greater load effect per LABC Table 1607.1, footnote a.
4. The uniform (concentrated, special) live loads must be applied in accordance with LABC Table 1607.1.
5. Ceiling joists shall be designed for ( ) live load per LABC Table 1607.1. Uninhabitable attic without storage and less than 42 inches of headroom may be designed for 10 psf live load.
6. Suspended ceilings in exit facilities serving more than 30 occupants shall be designed per 1613.8.1.3 - Provide details.
7. The live loads used in the design of buildings and other structures shall be the maximum loads expected by the intended use or occupancy but shall in no case be less than the minimum uniformly distributed unit loads required by LABC Table 1607.1.
8. Submit structural calculations and plans including truss profiles, member sizes and connection details for all roof and floor trusses prior to issuance of the building permit. Provide LARR # for\_\_\_\_\_.
9. The Engineer or Architect of record, shall review and approve truss design for loads, location, and suitability for intended use.
10. The weight of all landscaping materials shall be considered as dead load and shall be computed on the basis of saturation of the soil as determined in ASTM E2397. The uniform design load for unoccupied landscaped areas on roofs shall be 20psf. The uniform design load for occupied landscaped areas on roofs shall be per Table 1607.1.
11. Roof surfaces covered by photovoltaic panel systems shall be designed for the roof live load  $L_r$  in addition to the panel loading unless the area covered by each solar photovoltaic panel or module has a clear space of maximum 24 inches between the panels and the roof-top, in which case only the panel loading need be considered. (1607.13.5.1)
12. Ballasted photovoltaic panel systems shall be designed and analyzed per LABC 1604.4, 1604.3.6, 1611 for ponding, and 1613.3. (1607.13.5.4, 1613.3)

## **E. LATERAL LOADS**

1. Provide analysis and design for wind loads per LABC 1609. The following information shall be shown on plans per Section 1603.1.4: 1) Basic design wind speed and allowable stress design wind speed; 2) Risk category; 3) Wind exposure; 4) Applicable internal pressure coefficient; 5) Components and cladding design wind pressure in terms of psf.
2. Earthquake design data - The following information related to seismic loads shall be shown on plan per LABC 1603.1.5
  - a. Seismic importance factor,  $I$ , and risk category.
  - b. Mapped spectral response accelerations,  $S_s$  and  $S_1$ .
  - c. Site class.
  - d. Spectral response coefficients,  $S_{DS}$  and  $S_{D1}$ .
  - e. Seismic design category.
  - f. Basic seismic-force-resisting system(s).
  - g. Design base shear. Total weight of building.
  - h. Seismic response coefficient(s),  $C_s$ .
  - i. Response modification factor(s),  $R$ .
  - j. Analysis procedure used.
  - k. Redundancy factor used.
  - l. The design load bearing value of soils (1603.1.6) $\Sigma$
3. Seismic Design Category (SDC) shall be based on LABC Table 1613.2.3(1) and Table 1613.2.3(2). When  $S_1$ , is greater than or equal to 0.75, the building shall be assigned to SDC E for Risk Category I, II, or III and assigned to SDC F for Risk Category IV. (1613.2.5)
4. Provide a ground motion hazard analysis is required in accordance with ASCE 7-16 Section 21.2 as follows:
  - a. Seismically isolated structures and structures with damping systems on sites with  $S_1$  greater than or equal to 0.6.
  - b. Structures on Site Class E sites with  $S_s$  greater than or equal to 1.0 unless the site coefficient  $F_a$  is taken as equal to that of Site Class C.

- c. Structures on Site Class D sites with  $S_1$  greater than or equal to 0.2 unless the value of the seismic response coefficient  $C_s$  is determined by Eq. (12.8-2) for values of  $T \leq 1.5T_s$  and taken as equal to 1.5 times  $C_s$  determined by either Eq. (12.8-3) for  $T_L \geq T > 1.5T_s$  or Eq. (12.8-4) for  $T > T_L$ .
  - d. Structures on Site Class E sites with  $S_1$  greater than or equal to 0.2, unless  $T$  is less than or equal to  $T_s$  and the equivalent static force procedure is used for design. (ASCE 7, 11.4.8)
5. For vertical combinations in the same direction, the value of the response modification coefficient,  $R$ , used for design at any story shall not exceed the lowest value of  $R$  that is used at any story above that story. (ASCE 7, 12.2.3.1)
  6. For horizontal combinations in the same direction, the value of  $R$  used for design in that direction shall not be greater than the least value of  $R$  for any of the systems utilized in that direction. (ASCE 7, 12.2.3.3)
  7. Structural elements supporting discontinuous walls or frames of structures having out-of-plan offset horizontal irregularity or in-plane discontinuity in LFRS irregularity shall be designed to resist the seismic load effects including  $\Omega_o$ . (ASCE 7, 12.3.3.3)
  8. Justify the redundancy factor used per ASCE 7 Sec. 12.3.4.
  9. All members of the structure, including those not part of the seismic force-resisting system, shall be designed using the vertical seismic load effect  $E_v = 0.2S_{DS}D$ . (ASCE 7, 12.4.2)
  10. Design shall account for the most critical load effects due to direction of loading. For non-parallel LFRS elements, or where any column or wall that forms part of two or more intersection seismic force-resisting systems and is subjected to axial load due to seismic forces greater than or equal to 20% of the axial design strength of the column or wall, the structure shall be analyzed for 100% of the forces for one direction plus 30% of the forces for the perpendicular direction. (ASCE 7, 12.5)
  11. The effective seismic weight,  $W$ , of a structure shall include the dead load, minimum 25% of the storage area floor live load, partition weight or a minimum of 10psf whichever is greater, permanent mechanical equipment, and weight of saturated and dry landscaping. (ASCE 7, 12.7.2)
  12. Calculate seismic drift based on deflections of each level with  $C_d$  and  $I$  factors using strength level forces in accordance with Section ASCE 7 Sec.12.8.6.
  13. Provide separation from property line per Eq.12.12-1 or provide separation from adjacent structure(s) on the same property per Eq.12.12-2. ASCE 7 Sec.12.12.3. Compare the calculated seismic drift with the allowable story drift per ASCE 7 Sec. 12.12.1.
  14. Cantilever columns used as part of the seismic-force resisting system, shall comply with the following:
    - a. Maximum axial stress of 15% of allowable. (AISC 341-16 Sec.E5, E6)
    - b. Columns designed as OMF and SMF shall use  $R$ ,  $C_d$  and  $\Omega_o$  factors as per Section G of Table 12.2-1 of ASCE 7. All limitations contained in the table shall be complied with except that OMF may be used in SDC D subject to the limitations in footnote  $\ell$ .
    - c. The lowest  $R$  value shall be used in the same direction unless the building is an Risk Category I or II building that does not exceed 2 stories in height and light frame construction or flexible diaphragms are used. (12.2.3.3)
    - d. Columns designed as SMF shall comply with the requirements of Table D1.1 of AISC 341-10.
    - e. Steel tube and pipe columns shall be designed as OMF only.
  15. Foundations designed to support cantilevered columns used as part of the SFRS shall comply with the following:
    - a. Foundations shall have the strength to resist the load combinations with over strength factor of Section 12.4.3.1 of ASCE 7.
    - b. Grade beams shall be designed in accordance with the following requirements of ACI 318-14:
      - i. Section 13.3.2 and 18.3.2 for OMF
      - ii. Section 18.4.2 for IMF
      - iii. Section 18.6, for SMF
  16. Provide justification that the proposed cantilever column/grade beam connection detail is fixed as assumed in the design.
  17. Submit structural calculations and connection details for the structural members that provide support for the seismic forces generated by elevators. The seismic forces must be determined in accordance with ASCE 7 Sec. 13.3. The calculations and details provided must show the complete load path from the rail supports to the building's lateral-force-resisting system. (ASCE 7, 12.10 and LABC 1607.10.1)
  18. Provide seismic anchorage calculations for non-structural components per ASCE 7 Chapter 13.

## **F. HORIZONTAL DIAPHRAGM**

1. Provide a diaphragm analysis to show diaphragm adequacy per ASCE 7 Sec.12.10.

2. Provide calculations and details to show that collector elements, splices, and connections to resisting elements have the strength to resist the combined loads resulting from the load combinations with overstrength factor per ASCE 7 Sec.12.10.2.1 and 12.14.7.3 except in buildings or portions thereof braced entirely by wood light-frame shearwalls.
3. Provide calculations and details on the plans for the sub-diaphragm and continuous cross-tie system required for all wood diaphragms providing lateral support to masonry or concrete walls. The spacing of continuous ties shall not exceed 40 ft per LABC1613.5.3.
4. Provide details, properly referenced, of the anchorage system between the wood roof and floor diaphragms and the concrete or masonry walls. See LABC1613.5.3 and ASCE 7 Sec.12.11.

## **G. CONCRETE AND MASONRY**

1. Provide a vertical and longitudinal section through each glass block wall showing how it is supported at each edge and reinforced in each direction. Submit lateral calculations. *(ACI 530, Sec. 13.3)*
  - a. The maximum area of each individual glass-block standard unit panels in exterior walls shall be based on the design wind pressure, in accordance with Figure 7.2-1. The maximum panel dimension between supports shall be 25-ft horizontally and 20-ft vertically. *(ACI 530, Sec. 13.2.1)*
  - b. Every glass-block panel shall be provided with a min. 3/8-inch expansion joints at the side and top. Expansion joints shall be entirely free of mortar or other debris and shall be filled with resilient material. Provide a detail on the plans. *(ACI 530, Sec. 7.4)*
  - c. Lateral support shall be provided by panel anchors along the top and sides spaced not more than 16" o.c. or by channel-type restraints. *(ACI 530, Sec. 13.3.3.1)*
2. Structural calculations and details are required for anchored masonry or stone veneer that extends more than 5 ft. above the first floor.
3. The masonry or concrete walls below grade may be designed to span simply supported between slabs. NOTE ON THE PLANS: "The perimeter walls are not to be backfilled until the floor slabs are poured and cured."
4. For concrete cast-in-place beams and columns that are not part of the lateral-force-resisting system, provide transverse reinforcement in accordance with ACI 318 Sec. 18.14.3.2 and 18.14.3.3.
5. Consequences of failure of structural and nonstructural members that are not a part of the seismic-force-resisting system shall be considered. ACI 318 Sec. 18.2.2.2.

## **H. WOOD DESIGN**

1. Structural framing not using Conventional Light-Frame Construction Provisions of LABC Sec. 2308 requires the plans and calculations to be signed and sealed by an architect or civil/structural engineer licensed in the State of California.
2. Cross reference all calculations for joists, beams, shear walls, etc, to framing / floor plans.
3. Show the size, spacing and direction for the (rafters), (ceiling joists) (floor joists) on plans.
4. The size of ridge board, valley or hip members shall not be less than the cut end depth of the rafter.
5. Provide designed ridge beams (4 x min.) for open beam vaulted ceilings when ceiling joists or rafter ties are not provided.
6. Ridge / hip / valley members shall be designed as beams when roof slope is less than 3 :12. Provide calculations.
7. Show blocking at ends of rafters and trusses at exterior walls, and at supports of floor joists.
8. The \_\_\_\_\_ x \_\_\_\_\_ floor girder / beam under \_\_\_\_\_ exceeds the allowable stress for grade. *(T-4A, 2018 NDS Supplement)*
9. Specify the header size at door, window and other openings over 4 ft. wide in bearing walls.
10. Detail is required for header support at the corner windows (see marked plans).
11. Use full height studs (balloon frame) on exterior walls of rooms with vaulted ceiling. Specify size, spacing and maximum allowable span of the full height stud.

12. For plywood roofs and floors, specify panel index no. \_\_\_\_\_, plywood thickness, grades, nailing schedule, panel layout pattern, and zones.
13. Three- and four-story wood structures require 3x4 or 2x6 studs at 16" o.c. max. in bearing partitions below the top two stories. Submit calculations showing that allowable stress in compression perpendicular to grain is not exceeded in the sill plates at the proposed stud spacing. (T-4A, NDS Supplement)
14. Provide a diaphragm analysis to show diaphragm adequacy. Diaphragm aspect ratios to be limited to those in Table 4.2.4 of SDPWS. (Sect. 4.2 of SDPWS)
15. Lumber and structural wood panel diaphragms shall not be considered as transmitting lateral forces by rotation except one story, attached or detached residential garages or similar non habitable wood structures provided the diaphragm is not constructed of straight sheathing. (Sect. 4.2.5 of SDPWS)
16. For connections exposed to weather multiply other allowable fasteners loads per T 11.3.3, NDS:
  - a. Bolts x .70
  - b. Lateral nails loads x .70
  - c. Screw withdrawal loads x .70
17. Fasteners in preservative treated wood or fire retardant treated wood shall be of hot dipped zinc coated galvanized steel or stainless steel. (2304.10.5.1)
18. For wood to wood connections, where there are over 2 bolts in a row, reduce the allowable bolt loads per T 11.3.6, NDS.
19. If required by structural calculations, show size, location and embedment length of all anchor bolts (including HD bolt anchors) on foundation plan.
20. When bolting to an existing footing, provide a copy of the LA Research Report approval for the type of bolt, allowable design loads and required edge distances. Deputy inspection is generally required.
21. Specify the size, LARR number and manufacturer of the shot pins. The max. spacing of shot pin in bearing or nonbearing wall is \_\_\_\_\_ respectively. Indicate on plans.
22. Decks shall be attached to the structure without the use of toenails or nails in withdrawal. (1604.8.3)

## **I. SHEAR WALLS**

1. Provide a shear wall schedule on the plans and specify the maximum design shear load for each shear wall type. Limit the design shear wall loads to those allowed by Code. Clearly indicate on the plans all plywood and drywall shear walls.
2. The \_\_\_\_\_ is inadequate to resist lateral/uplift forces. Show roof/floor diaphragm nailing, wall bracing, shear connections, tie down hardware and hold-down anchors. Submit lateral design.
3. Provide shear connection details, properly referenced, at the top and bottom of all shear walls.
4. The horizontal distribution of seismic shear to wood structural panel shear walls shall be in accordance to ASCE 7 Sec. 12.3.1.1 and 12.8.4.1. Wood diaphragms shall not be designed as rigid. If it is demonstrated that the wood diaphragm is semi-rigid, seismic loads shall be distributed using an envelope of flexible and rigid diaphragm analysis.
5. Provide LARR number for screws used in steel sheets or cold-formed steel framed walls sheathed with wood structural panels. Shear values for steel sheets or cold-formed steel framed walls sheathed with wood structural panels shall conform with the requirements in AISI-Lateral C2.2.1 and C2.2, respectively. Allowable values shall be in conformance with Table C2.1-3, taking in to account the corresponding reductions per C2.1 (AISI-Lateral)
6. Wood structural panel shear walls shall meet the story drift limitation of ASCE 7 Sec. 12.12.1. Conformance shall be determined by testing or calculations. Calculated deflection shall be determined according to EQ. 4.3-1 of SDPWS. (2305.3)
7. Use of gypsum board, gypsum lath, and cement plaster shear walls shall use Response Modification Coefficient, R=2 for bearing wall systems and R=2.5 for building frame systems. (ASCE 7 Table 12.2-1)
8. Stucco shear walls shall utilize furring, galvanized nails (having a minimum 11 ga., 1-1/2" long, 7/16" diameter head, and furred out a min. of 1/4") to attach the lath to the studs. Staples shall not be used. (2306.3)
9. The maximum nominal unit shear capacity for three-ply plywood resisting seismic loads is 400 plf. (2306.3)

10. Limit the height-width ratio of the plywood (wood structural panels) shear walls, perforated shear wall segments, perforated shear walls and shear wall piers to 2:1. Otherwise, provide calculation for the Aspect Ratio Factor per SDPWS 4.3.4. Provide complete calculations (including deflection) and details for shear wall with openings. (T 4.3.4 SDPWS)
11. The following applies to all shear walls with a shear values using allowable stress design (ASD) exceed 350 plf or load and resistance factor design (LRFD) exceed 500 plf. These walls shall be clearly identified on the plans and provide with the following: (2306.3)
  - a. All framing members receiving edge nailing from abutting panels shall not be less than a single 3x stud or two 2x studs nailed together in accordance with NDS 15.3.
  - b. Nails shall be placed not less than 1/2" edge distance from the panel edges and 3/8" from the edge of the connecting members.
  - c. All wood structural panel joint and sill plate nailing shall be staggered at all panel edges.
12. Provide calculations and details for drag strut connections to shear walls. See checked plans.
13. Provide the design for the shear transfer from the roof diaphragm or upper shear wall to the shear wall below the floor or roof. Detail nails, bolts, shear plates, sill plates, and blocking as required by design. Use reduced values for nails with reduced embedment.
14. Provide referenced calculations showing the overturning moments in the shear wall segments.
15. Structural calculations and details are required for anchored masonry or stone veneer that extends above the basement for Seismic design category E & F. For Seismic Design Category D Structural calculations and details are required for anchored masonry or stone veneer that extends above the first floor.
16. The anchor or group of anchors shall be designed for the maximum tension that can be transmitted to the anchor or group of anchors based on the development of a ductile yield mechanism in the attachment in flexure, shear, or bearing, or a combination of those conditions, and considering both material overstrength and strain hardening effects for the attachment. (ACI 318, 17.2.3.4.3)
17. Justify the capacity of tie down bolt in concrete footing/wall/deck per ACI 318 Chapter 17 with factored design loads. Apply  $\Omega_o$  for discontinuous conditions per ASCE 7 Sec. 12.3.3.3. Provide reinforcing details and calculations to show how the forces are transferred and resisted by the diaphragm.
18. Provide LARR number for hold-down connectors. The capacity of hold-down connectors that do not consider cyclic loading of the product shall be reduced to 75% of the allowable earthquake load values. (2305.5)
19. Hold-down straps - Include the following in design and detailing between floors:
  - a. Design and detail straps installation when used as hold-downs across floor joists. Account for reduced number of nails across joist.
  - b. Determine the allowable load based on the number of nails through the strap into the posts above and below the void space between floors. Specify the number of nails required.
  - c. Design and detail straps so that the minimum nail spacing will be provided when the strap nailing is combined with the shear wall edge nailing (i.e. provide 4x member wherever a strap and shear wall edge nailing occurs or detail strap nailed over and through un-nailed plywood and show nailing pattern on plan).

**Add note on plans:**

1. Hold-down connector bolts into wood framing require approved plate washers. Hold-downs shall be finger tight and 1/2 wrench turn just prior to covering the wall framing. Connector bolts into wood framing require steel plate washers on the post on the opposite side of the anchorage device. Plate size shall be a minimum of 0.299 inch by 3 inches by 3 inches. (2305.5)
2. Roof diaphragm nailing shall be inspected before covering. Face grain of plywood shall be perpendicular to supports. Floor shall have tongue and groove or blocked panel edges. Plywood spans shall conform with Table 2304.8(1).
3. All diaphragm and shear wall nailing shall utilize common nails or galvanized box.
4. All bolt holes shall be drilled 1/32" to 1/16" oversized. (NDS 12.1.3.2)
5. Hold-down hardware must be secured in place prior to foundation inspection.



<b>ADDITIONAL CORRECTIONS</b>	<b>Code Sec. No.</b>