



## GENERAL REQUIREMENTS

- G A1. Plans shall bear the registration or license number and signature of an architect, contractor, or engineer, registered by the State of California in the appropriate discipline. (94.101.3, 94.103.2.2, Chapter 7, Division 3 of the Business and Professional Code, Article 2, Section 6735.4).
- G A2. Indicate the job address on each page of the plan (94.101.3, 94.103.2.3).
- G A3. Leave a blank space of at least 8½" X11" on the first sheet to allow room for the approval stamps.
- G A4. Provide an approved variance to allow plans at a scale smaller than 1/8 inch per foot (94.101.3, 94.103.2.3).
- G A5. Indicate on the plans the scope of the work to be done (94.101.3, 94.103.2.3).
- G A6. All plumbing fixtures, and devices used in the plumbing system shall be listed by a recognized agency or the Los Angeles Mechanical Testing Laboratory (MTL). All items listed by the MTL shall be installed in accordance with the conditions of approval of the research report (94.301.1.1).
- G A7. Water pipes, plumbing fittings, fixtures, solder, and flux with lead content shall comply with the California Health and Safety Code Section 116875.

## WATER SUPPLY

- G P1. Provide site water piping plans. Site plan shall show the city water main, meter, piping, location of buildings, PRVs, backflow devices, valves, etc. (94.101.3, 94.103.2.3).
- G P2. Indicate on the plans the piping materials for hot and cold domestic water (94.103.2.3, 94.0604.0).
- G P3. Install a control valve in the domestic water supply to each building (94.605.2).
- G P4. Provide a table of fixtures in the building. The table shall indicate the total of each type of fixture, the associated hot and/or cold fixture unit value for each, the total contribution of hot and cold fixture units in the system, and the total number of fixture units in the building (94.103.2.3).
- G P5. Provide riser diagrams for hot & cold water systems (94.101.3, 94.103.2.3).
- G P6. The riser diagram shall show the piping system from the meter to each outlet of the system. The riser shall identify the fixture or device served at each outlet, the fixture unit loads for all branches serving new and existing demands, the pipe sizes, the fixture unit count on each leg of pipe, the pressure regulators, the back flow prevention devices, the pump(s), water heater(s), and the water meter (94.101.3, 94.103.2.3).
- G P7. Specify which fixtures are for private use and which are for public use (94.101.3, 94.103.2.3, Table 6-5, Table A-2).

- G P8. Show all new and all existing devices locate between the city water service and the building plumbing system that cause pressure losses or gains in the system. Devices shall include but not be limited to pumps, water softeners, backflow devices, pressure reducing valves and sub meters (94.101.3, 94.103.2.3, 94.610.2).
- G P9. State the make(s), model(s), size(s), of the above items and indicate if they are new or existing (94.101.3, 94.103.2.3, 94.610.2).
- G P10. Provide manufacturer's specification sheets for such devices indicating the pressure loss through the device(s) from 0 flow to the rated flow (94.101.3, 94.103.2.3, 94.610.2).
- G P11. Indicate on the plans, all fixture unit loads in addition to the loads of the new fixtures including but not limited to, existing fixtures, irrigation load, make up water for cooling towers and boilers, demand for future use, and any other uses (94.101.3, 94.103.2.3, UPC Appendix A Sec. A2).
- G P12. Show the future water demand (UPC Appendix A Sec. A2).
- G P13. Provide hydraulic calculations for sizing the cold and hot water systems for each zone (94.0610, UPC Appendix A, and Information Bulletin P/PC 2002-009).
- G P14. Provide hydraulic calculations showing the pressure losses from the city main to the pressure reducing valve for each zone (94.0610, UPC Appendix A and Information Bulletin P/PC 2002-009).
- G P15. Clearly indicate the high and low static water pressure as given by the Department of Water and Power of the water service serving the building (94.103.2.3).
- G P16. For the purpose of sizing the plumbing system the pressure shall be based on the minimum pressure available (94.610.7).
- G P17. For the purpose of determining the requirement for a pressure reducing valve on the system, the maximum static pressure available shall be used (94.608.2).
- G P18. Clearly identify each hydraulic design zone on the riser diagram. Show any node points on the riser used in the calculations (94.103.2.3).
- G P19. Provide pipe sizing charts for each zone in the building (94.103.2.3).
- G P20. For each down feed zone, provide calculations for the highest and lowest floors in the zone to show that the pipe sizing chart is adequate for every floor in the zone and that no more than 80 psi is delivered to any point in the zone (94.103.2.3, 94.608.2).
- G P21. The maximum velocity of water flowing in copper pipes and piping systems utilizing copper alloy fittings is 8 feet/second for cold water (94.610.12).
- G P22. The maximum velocity of water flowing in copper pipes and piping systems utilizing copper alloy fittings is 5 feet per second for hot water (94.610.12).
- G P23. The minimum residual pressure shall be the highest pressure required by any fixture, but not less than 15 psi (94.608.1).
- G P24. Indicate on the plans the types (flush valve, flush tank) of the water closets, and urinals, used (94.101.3, 94.103.2.3, 94.402.2, 94.402.3).
- G P25. An approved pressure regulating valve (PRV) shall be installed to reduce the water

pressure at any fixture to 80 psi or less (94.608.2).

- G P26. The PRV shall be installed in an accessible location at least 12" above ground (94.602.1, 94.602.3, 94.608.2).
- G P27. Show makes, models and sizes of the PRVs on the plans ( 94.103.2.3, 94.0608.2).
- G P28. Provide a copy of the manufacturer's catalog for the PRVs used showing the flow and pressure loss performance curves (94.103.2.3, 94.0608.2).
- G P29. Provide a reduced pressure back flow device (RP) at the meter (94.0603, DWP Rule 16D).
- G P30. Show make, model and size of the RP on the plans (94.103.2.3, 94.0603, 94.610.2).
- G P31. The RP shall be installed at least 12 inches above the finished floor when installed inside the building or 12 inches above the grade when installed outside the building. The RP shall not be installed in a pit where it may become submerged in water (94.603.3.4 & Table 6-2).
- G P32. Provide a copy of the manufacturer's catalog for the RP used showing the flow and pressure loss performance curve (94.103.2.3, 94.610.2).
- G P33. Show size of a water meter on the riser diagram (94.103.2.3, 94.610.2).
- G P34. Showers and combination tub/showers shall be provided with tempering valves (94.418).
- G P35. State make, model, rated pressure, and flow in g.p.m. of domestic water pump(s) (94.103.2.3, 94.610.2).
- G P36. Provide the pump performance curves for the water booster pump(s) / pump assembly being used (94.103.2.3).
- G P37. Individual pumps and packaged pump systems shall be approved by the City of Los Angeles Mechanical Testing Laboratory or other agency recognized by the City of Los Angeles (94.101.3, 94.301.1.1).
- G P38. Provide a copy of the research report for the booster pump or booster pump assembly or prove that it is approved by a City of Los Angeles recognized agency (94.103.2.3, 94.301.1.1).
- G P39. Provide complete details of the booster pump assembly on the plan showing valves, piping, pump(s), tank, controls, PRV, RP, etc. (94.103.2.3).
- G P40. Indicate on the plan the elevations of the following: the water meter, the booster pumps, the PRVs, the backflow device, the highest fixture, the zone(s), etc. (94.103.2.3).
- G P41. Provide written approval from the Department of Water and Power for any cross connection control device at the water service other than that which is required under DWP Rule 16D (94.301.1.1, DWP Rule 16D).
- G P42. Provide water connections and allocations for the fixture units in the hydraulic calculations for the waterless urinals in accordance with the listings of the fixtures and, if at some point in the future, the urinals are replaced with conventional water using types (94.103.2.3, 94.402.3.3 & 94.402.3.4).

## **WATER HEATING**

- G H1. Indicate the type, size and capacity of the water heater(s) and water storage tank(s)

(94.103.2.3).

- G H2. Provide a detail of the water heater assembly showing the water heater(s), the hot and cold water pipe connections, mountings, storage tank(s), pressure and temperature relief valve and discharge location, thermal expansion tank, circulating pump, check valve, and venting (94.103.2.3).
- G H3. For tankless water heaters installed to serve individual dwelling units, provide the manufacturer's installation instructions (94.103.2.3).
- G H4. Show the location on the water heating assembly on the plan (94.103.2.3).
- G H5. Provide a temperature & pressure relief valve on the water heater (94.608.3).
- G H6. The temperature & pressure relief valve shall discharge to an approved location (94.608.5).
- G H7. Pressure relief valves for water heaters installed and discharging inside a building shall discharge to a floor drain or floor sink (94.608.3 & 94.608.5).
- G H8. Provide an approved thermal expansion tank at the water heater. Show it on the riser diagram (94.103.2.3, 94.608.2, & 94.608.3).
- G H9. Thermal expansion tank shall be installed on the cold water line, with no valves between the water heater and the expansion tank as per the manufacturer's instructions (94.608.2 & 94.608.3).
- G H10. State make and model of the thermal expansion tank (94.103.2.3, 94.608.2, & 94.608.3).
- G H11. Provide the manufacturer's printed sizing instructions on the thermal expansion tank (94.103.2.3, 94.608.2, & 94.608.3).
- G H12. For water heaters installed inside the building other than natural draft, tank type, provide a copy of the manufacturer's printed instructions (94.103.2.3).
- G H13. Show combustion air openings (94.507).
- G H14. Combustion air for water heaters installed in closets of bedrooms or bathrooms shall come from the outside (94.505.1).
- G H15. Provide calculations for sizing combustion air openings and ducts (94.507.3, 94.507.4, 94.507.5, 94.507.6, 94.507.7 ).
- G H16. Show room volume where combustion air is supplied by the room (94.103.2.3, 94.507.2 ).
- G H17. Water heaters installed in bedrooms and bathrooms shall be of the direct vent type and shall discharge and draw combustion air from the outside (94.505).
- G H18. Closets in bedrooms or bathrooms where water heaters are installed shall be equipped with a fire rated, self closing door (94.505.1).
- G H19. Provide water heater budget (Title 24 Sect. 151(b)1 & 151(f)8).
- G H20. State the first hour rating (in gallons) of the water heater and the number of bathrooms and bedrooms (94.501.0, TABLE 5-1).

## **WASTE & VENT SYSTEM**

- G W1. Provide site sewer piping plans. Site plan shall show the city sewer main, location and elevation of the closest upstream manhole cover in the city sewer, building drain(s), piping, size, slope, etc. (94.101.3, 94.103.2.3).
- G W2. Indicate on the plans the piping materials for the waste and vent systems ( 94.103.2.3, 94.0701.0, 94.903).
- G W3. Indicate on the plans the piping materials for the sewer system ( 94.103.2.3, 94.0701.0, 94.715 & Table 7-1).
- G W4. Provide a table with calculations for the total number of fixtures in the building. The table shall indicate the total of each type of fixture, the associated waste fixture units for the fixture and the total number of waste fixture units in the building (94.103.2.3).
- G W5. Provide riser diagrams for the waste and vent systems (94.101.3, 94.103.2.3).
- G W6. The riser diagram shall indicate all the fixtures served, the pipe size and the fixture unit count on each leg of pipe (94.103.2.3).
- G W7. Show all pipe sizes on the plan (94.103.2.3).
- G W8. Show the slope of the horizontal drainage piping (94.103.2.3, 94.708).
- G W9. All fixtures that are installed where the grade is sufficient to allow for drainage by gravity, shall drain by gravity to the public sewer (94.709.0).
- G W10. Where a fixture is installed on a floor level that is lower than the next upstream manhole cover of the public or private sewer, serving such drainage piping, it shall be protected from backflow of sewage by installing an approved type backwater valve (94.710.1).
- G W11. Where fixtures are installed on floor levels that are higher than the next upstream manhole cover of the public or private sewer, serving such drainage piping, these fixtures shall not discharge through a backwater valve (94.311.5).
- G W12. Provide suds relief (94.711.0).
- G W13. Clearly indicate on the plan the waste stacks that carry the discharge of suds producing fixtures (bathtubs, clothes washers, dishwashers, kitchen sinks and laundry sinks). Show on the waste floor plan the connections with vertical risers and the distances between connections and the vertical to horizontal changes of direction for the waste stacks discharging suds producing fixtures (94.711.0).
- G W14. The slope of the drainage piping shall be not less than 1/4" per foot except that 4" and larger waste pipes may be sloped at 1/8" per foot when loaded per the requirements of Table 7-5 of the Plumbing Code (94.708).
- G W15. The slope of the building sewer piping shall be not less than 1/4" per foot except that 4", 5" and 6" sewer pipes may be sloped at 1/8" per foot and 8" and larger sewer pipes may be sloped at 1/16" per foot when loaded per the requirements of Table 7-5 and 7-8 of the Plumbing Code (94.718).
- G W16. The aggregate cross sectional area of the vent shall not be less than that of the largest required building sewer. (94.904.1)
- G W17. Provide clearance from the Industrial Waste Division. The Industrial Waste Management Division of the Department of Public Works, Bureau of Sanitation may be contacted at 323-342-6118 and is located at 2714 Media Center Drive, Los Angeles 90065 (94.307.0).

- G W18. Show location(s) of the grease interceptor(s) on the plans (94.103.2.3).
- G W19. Provide product literature for the grease interceptor ( 94.103.2.3).
- G W20. Ice machines, drink dispensers, coffee machines, freezers, refrigeration coils, and similar equipment shall be indirectly connected to the drainage system (94.801.2).
- G W21. Food-preparation sinks, steam kettles, potato peelers, dipper wells, and similar equipment shall be indirectly connected to the drainage system by means of an airgap (94.801.2).
- G W22. Pot sinks, scullery sinks, dishwashing sinks, silverware-washing machines, commercial dishwashers, shall be directly connected to the drainage system. A floor drain shall be provided adjacent to the fixture with the fixture connected on the sewer side of the floor drain trap (94.704.3).
- G W23. Show details for the wet venting (94.908.0)
- G W24. All wet vented fixtures shall be within the same story (94.908.0).
- G W25. Show details for the island venting (94.909.0).
- G W26. The island sink drain, upstream of the return vent, shall serve no other fixtures (94.909.0).
- G W27. Show the floor drain in the Fire Pump room (94.2030, 5.12.6.2 NFPA 20).
- G W28. Install a clean out every 100 feet or a manhole every 300 feet in the building sewer (site sewer) in straight runs and for each aggregate horizontal change in direction exceeding 135° (94.719).
- G W29. Provide relief vent stack (94.907).
- G W30. Provide yoke vents. Show yoke vents on the riser diagram (94.907.1).
- G W31. Provide lot subdivision. The building sewer shall not cross lot lines (94.308, 94.721.1).

## **COMBINATION WASTE AND VENT SYSTEMS**

- G W32. Combination waste and vent system is only allowed where structural conditions preclude the installation of a conventional system (94.910.1).
- G W33. Show the combination waste and vent system on a floor plan (94.103.2.3).
- G W34. Provide a riser or isometric diagram of the combination waste and vent system (94.103.2.3).
- G W35. Identify each fixture served by the combination waste and vent system (94.103.2.3).
- G W36. Combination waste and vent systems shall not be utilized where solids or grease waste is anticipated (94.306.1, 94.910.7, 94.910.2, UPC Appendix B Sect. B1).
- G W37. No toilets or urinals are allowed in a combination waste and vent system (94.0910.7).
- G W38. No vertical waste pipes are allowed in a combination waste and vent system (94.0910.5).
- G W39. Provide a vent immediately downstream of the uppermost fixture (94.910.3).

- G W40. Provide a separate vent for each waste branch line exceeding 15' in length (94.910.3).
- G W41. Relief vents shall be provided every 100' along the mains, each sized at least one-half ( $\frac{1}{2}$ ) of the cross sectional area of the I.D. of the pipe served (UPC Appendix B Sect. B3).
- G W42. The minimum area of any vent installed in a combination waste and vent system shall be at least  $\frac{1}{2}$  the cross sectional area of the drain pipe served (94.910.3).
- G W43. The size of waste piping in the combination waste and vent piping system shall be sized for the maximum waste load of the branch or the main and the entire length of the main or the branch shall be the same size to insure adequate flow of waste and movement of air (ie. No telescoping of waste lines) (94.910.3).
- G W44. Each trap and waste pipe serving a fixture discharged by a combination waste and vent system, shall be 2 pipe sizes larger than the size of the drainage connection of the fixture (94.910.4).
- G W45. Show a typical detail of the fixture tail piece, trap and waste pipe for fixtures discharging into a combination waste and vent system (94.103.2.3).
- G W46. Fixtures discharging into the combination waste and vent system shall be sized in accordance with anticipated discharge rate and the requirements of Chapter 7 of the Plumbing Code (94.702, 94.703).
- G W47. Connections to a combination waste and vent system shall be made with appropriate fittings at the side of the piping (94.0910.5, 94.0910.7).
- G W48. Show a detail of the point of connection from the combination waste and vent system to the horizontal conventional waste system (94.103.2.3).

## **SEWAGE EJECTOR SYSTEM**

- G W49. All fixtures that are installed such that the grade is sufficient to allow for drainage by gravity, shall drain by gravity to the public sewer or private disposal system (94.709.0).
- G W50. Show on the waste riser diagram all fixtures that discharge into the sewage ejector (94.101.3, 94.103.2.3).
- G W51. Show make, model and horsepower of pump(s) on the plan (94.103.2.3).
- G W52. Provide pump performance curves (94.103.2.3).
- G W53. Provide calculations for the system curve. Take into consideration all the fittings, gate valve and backwater valve (94.103.2.3).
- G W54. Draw the system curve on the pump curve to determine the point of intersection, which will determine the volume flow coming out of the pump.
- G W55. For the purpose of sizing the sewage ejector pump, the minimum pump flow rate GPM required shall be determined by dividing the number of waste fixture units by two (94.702.3).
- G W56. The minimum size of the sewage ejector pump receiving the discharge from one or more water closets shall not less than 20 gpm (94.710.3.1).
- G W57. For the purpose of sizing the gravity waste of the drainage pipe receiving the discharge from the sewage ejector, the number of waste fixture units shall be determined by

multiplying the flow rate in GPM of the system curve where it intersects the pump curve by two (2) (94.702.3).

- G W58. Provide a riser diagram showing the sewage ejector pumps, pump inlet & outlet, backwater valves, static lift in feet, and the gravity line. State length of pipe & elevation difference between the pump inlet and the gravity line. Show pump discharge at gravity line (94.101.3, 94.103.2.3).
- G W59. The method of connecting the discharge piping from the sewage ejector pump to a horizontal gravity waste pipe it shall be from the top through a 'Wye" branch fitting (94.710.4).
- G W60. Sewage ejector sump pit shall be made of concrete, metal or other approved materials. Fiberglass sumps shall be approved by the Los Angeles City Mechanical Testing Laboratory (94.710.8).
- G W61. Please specify the type of material on the plan or specify make, model and research report number of the prefabricated sump pit (94.101.3, 94.103.2.3).
- G W62. Provide air tight cover for the sump (94.710.8).
- G W63. Show high water level. It shall be at least 2 inches below the lowest inlet (94.710.9).
- G W64. Sump(s) shall be provided with a vent pipe which shall extend through the roof (94.710.10)
- G W65. The vent pipe from the sewage ejector pit shall be sized at not less than the number of fixture units discharging into the sewage ejector pit and shall be taken from Table 7-5 of the LAPC (94.710.10).
- G W66. The minimum size of the vent pipe size shall be not less than 1 ½ inches (94.710.10).
- G W67. Provide dual pumps each capable of handling the load independently (94.710.9).
- G W68. Sumps receiving waste from water closets shall have a minimum 2 inch discharge for a sewage ejector serving a single dwelling unit. 3 inch discharge is required for sewage ejectors serving multiple dwelling units or commercial installations (94.710.3).
- G W69. The discharge line from each ejector pump shall be provided with an accessible backwater or check valve and a gate valve or ball valve. The gate valve or ball valve shall be located on the discharge side of the check valve (94.710.4).
- G W70. Gate valve or ball valve and backwater or check valve shall be located outside the pit (94.710.4).
- G W71. Show size, length and type of material of the pump discharge line (94.103.2.3).

## **NATURAL GAS SYSTEMS**

- G G1. Provide riser diagrams for the gas systems (94.101.3, 94.103.2.3).
- G G2. Indicate on the plans the piping materials for the gas system (94.1209.5).
- G G3. Indicate on the plans the total developed length of the system from the meter or regulator to the most remote gas outlet. (94.1217.4)
- G G4. If sizing the gas system taking into consideration the length of each individual branch line, identify node points on the riser diagram and in the calculations and specify the length, and



gas flow rate of each pipe in the system (94.103.2.3).

- G G5. Provide a separate gas shutoff valve for each system (94.1211.11).
- G G6. Indicate on the plans the hourly volume (CFH) of gas required at each outlet. (94.1216.2)
- G G7. Provide an approved type seismic gas shutoff valve (94.1219.2).
- G G8. Show on plan size, make and model of seismic gas shut off valve (94.1219.2).
- G G9. The seismic shut off shall be installed shall be mounted rigidly to the exterior of the building or structure containing the fuel gas piping (94.1219.3.2).
- G G10. Gas pipe installed under the building shall be encased in an approved conduit (94.1211.1.6).
- G G11. Provide a letter from the gas company stating that they will deliver the required pressure and volume of gas. Note that a "will Serve" letter is not sufficient. The letter from the gas company must specify the flow rate of gas at the required pressure. The flow rate of gas indicated in the letter must be equal to or greater than the total demand of gas shown on the plan (94.1217.4).
- G G12. Show on plans size, make, model, orifice size, spring number, pressure at the inlet of the pressure regulator, and setting of pressure regulator (94.103.2.3, 94.1209.7).
- G G13. Provide the manufacturer's cut-sheet for the pressure regulators showing outlet pressure and flow capacity at the selected settings (94.103.2.3).
- G G14. The pressure regulator orifice plate shall be sized to provide the required gas flow assuming a gas inlet pressure equal to the delivery pressure minus the pressure loss in the piping as reported in Tables 12-7 through 12-11 of the Plumbing Code (94.1209.4.4).
- G G15. An approved gas valve shall be installed immediately preceding each regulator (94.1211.11.1).
- G G16. Pressure regulator shall be vented to the outside of the building (94.1209.7.5).
- G G17. Provide the manufacturer's sizing and installation instructions for the corrugated stainless steel gas tubing (CSST) (94.103.2.3).
- G G18. Copper is not an approved material for gas systems in the City of Los Angeles (94.1209.5.2.3, 94.1209.5.3.2).
- G G19. The maximum pressure of gas in piping running inside the building is 5 psi (94.1211.5).
- G G20. Provide engineering calculations used in sizing the gas piping system (94.1217.3).

## **RAINWATER SYSTEMS**

- G R1. Provide a site plan that shows the rainwater drainage piping systems from the points of connection with the rainwater drains to the point(s) of discharge at the street curb or storm drain (94.101.3, 94.103.2.3).
- G R2. Site plan shall show the piping, elevations, pipe slopes, catch basins, drains, filters, and other components associated with the discharge of stormwater (roof drainage, emergency drainage, area drainage and subsurface drainage) (94.101.3, 94.103.2.3).

- G R3. Site plan shall clearly identify each area of rainwater collection and each associated drain (94.101.3, 94.103.2.3).
- G R4. Provide a riser diagram for the stormwater drainage system (94.101.3.3, 94.103.2.3).
- G R5. Indicate on the plans the piping materials for the roof drainage, emergency drainage, area drainage, and subsurface drainage (94.1101.3).
- G R6. Indicate on riser diagram the area (ft<sup>2</sup>) served by each roof drain, and each area drain (94.101.3.3, 94.103.2.3, 94.1101.11.1).
- G R7. Primary roof drains shall be sized based on a rainwater rate of 2 inches per hour (94.1101.11.1).
- G R8. Provide secondary (overflow) roof drain. Otherwise, indicate the justifications for not having them (94.1101.11.2).
- G R9. The size of secondary (overflow) roof drains shall be sized based on a rainwater rate of 2 inches per hour (94.1101.11.2.2, 94.1101.11.1).
- G R10. Secondary (overflow) roof drains shall discharge above grade in a location observable by the building occupants or maintenance personnel (94.1101.11.2.2.1).
- G R11. Rainwater and area drainage piping shall discharge to a location outside of the building (94.306.2, 94.1101.0).
- G R12. Roof drainage, emergency drainage, area drainage and subsurface drainage drainage piping systems shall discharge through the curb to the street, or to another approved location, or to a stormdrain with Public Works approval (94.1101).
- G R13. Stormwater drainage shall not discharge to the public sewer (94.1101.2).
- G R14. Stormwater drainage systems shall drain by gravity (94.1106.2).
- G R15. Indicate on the plan the slope of horizontal piping (94.103.2.3, UPC Table 11-2).
- G R16. Provide stormwater drains for the courtyard when the courtyard is also a roof of a basement (94.306.2, 94.1101.1).
- G R17. Provide separate overflow drains for the courtyard when the courtyard is also a roof of a basement (94.306.2, 94.1101.1).
- G R18. Roof drains and overflow drains shall be piped independently to the outside of the building (94.1101.11.2.2.1). (Note that 94.1101.11.2.2.2 is not adopted by the City of Los Angeles).
- G R19. Backwater valves shall be installed to prevent flooding of the garage from outside water (94.1101.5.5).

## **SUMP PUMP SYSTEMS**

- G R20. Sump pumps shall only be provided for systems that can not be drained by gravity (94.1105.1.3, 94.709, 94.1106.2).
- G R21. Provide a plan that shows the piping systems from all points of collection to the discharge at the sump (94.101.3, 94.103.2.3).
- G R22. Plan shall show elevations, slopes, catch basins, drains, filters, and other components

associated with the discharge of water to the sump (94.101.3, 94.103.2.3).

- G R23. Site plan shall clearly identify each area of collection for the drains connected to the sump (94.101.3, 94.103.2.3).
- G R24. Indicate on the plans the piping materials for the inlet and discharge piping served by the sump pump (94.1101.3).
- G R25. Show load discharging into the sump (94.103.2.3).
- G R26. Show make, model and horsepower of the pump(s) on plan (94.101.3, 94.103.2.3).
- G R27. Provide pump performance curves (94.101.3, 94.103.2.3).
- G R28. Provide calculations for the system curve. Take into consideration all the fittings, gate valve and backwater valve (94.101.3, 94.103.2.3).
- G R29. Draw the system curve on the pump curve to determine the point of intersection, which is the volume rate discharging from the pump. (94.101.3, 94.103.2.3)
- G R30. Provide a riser diagram showing the sump, sump inlet & outlet piping, backwater valves, static lift in feet, and the gravity line. State length of pipe & elevation difference between the bottom of the sump and the gravity line. Show pump discharge at gravity line. Show gravity line point of discharge at the curb or storm drain (94.101.3, 94.103.2.3).
- G R31. Sump(s) shall be made of concrete, metal or other approved materials. Fiberglass sumps shall be approved by the Los Angeles city Mechanical Testing Laboratory (94.710.8).
- G R32. Please specify the type of material on the plan or specify make, model and research report number of the prefabricated sump (94.101.3, 94.103.2.3).
- G R33. The sump pit shall be at least 15 inches in diameter and 18 inches in depth (94.1101.5.3).
- G R34. Provided an air tight cover (94.710.8, 94.1101.5.3).
- G R35. The lowest inlet to the sump shall have a minimum clearance of 2 inches above the high water level (94.0710.9).
- G R36. Sump shall be provided with a vent pipe (94.710.10, 94.906.0).
- G R37. Provide dual sump pumps (94.1101.13).
- G R38. Minimum size of pump shall be 15 gpm (94.1101.5.3).
- G R39. The discharge line from each pump shall be provided with an accessible backwater or check valve and a gate valve or ball valve (94.710.4).
- G R40. The gate valve or ball valve shall be located on the discharge side of the check valve (94.710.4).
- G R41. Gate valve or ball valve and backwater or check valve shall be located outside the pit (94.710.6).
- G R42. Show size, and length of the pump discharge line (94.103.2.3).
- G R43. The discharge line from the sump shall be at least 1 ½ inch diameter (94.1101.5.3).

- G R44. The sump discharge line shall drain into a gravity pipe. Where the pump discharge line connects to a horizontal gravity pipe, it shall be from the top through a 'Wye" branch fitting (94.0710.4).
- G R45. Provide a modification from Grading Division to allow a pump to be used in lieu of gravity to drain the site (91.7013.10).
- G R46. For the purpose of sizing gravity drainage piping downstream of the sump pump system, each g.p.m. of flow shall be equivalent to 24 square feet of roof area and the piping shall be used using a rainfall rate of 4 inches per hour (94.1107).
- G R47. Show the gravity line all the way to the point of discharge. (94.101.3.1, 94.103.2.3).
- G R48. When discharging to the public street the pressure line shall connect to a gravity pipe within the property (Department of Public Works requirement).

## **SUSMP**

- G R49. Clearly identify the method with which the requirements for rainwater filtration will be accomplished to meet the requirements of the Watershed Protection Division (94.101.3, 94.103.2.3).
- G R50. Provide the Standard Urban Stormwater Mitigation Plan (SUSMP) stamped and approved by the Watershed Protection Division of the Department of Public Works (94.103.2.3).
- G R51. Stormwater shall be discharged in an approved location such as the street curb or the storm drain Stormwater may discharge on site provided it does not flow across the public way or create a nuisance (94.1101.1).
- G R52. Provide a plan approved by the Grading Division that grants authority to discharge the rainwater drainage in an area where the water will percolate into the ground. Clearly indicate of the plan the location of the points of discharge, any subsurface drainage piping, buildings, footings and the public way (94.103.2.3).
- G R53. Provide approval from Grading Division to discharge the roof drainage to the site. The Grading plan shall clearly identify the location of the points of discharge and collection. For flows across a planter or biofilter or into the ground, show the rate of flow, the size, slope and the design of the planter, biofilter, infiltration pit, etc. (94.103.2.3).
- G R54. The piping configuration shown on the SUSMP plan shall be in accordance with the Los Angeles Plumbing Code and shall match the configuration shown on the plumbing plan (94.103.2.3).
- G R55. Identify the make, model, size and research report number of the stormwater filter(s) on the plan (94.103.2.3).
- G R56. Stormwater filter(s) and any other components associated with the stormwater drainage system shall be approved by the Los Angeles Mechanical Testing Laboratory (94.103.2.3, 94.301.1.1).
- G R57. Provide a copy of the research report issued by the Los Angeles Mechanical Testing Laboratory for the stormwater filter(s) and any other components associated with the stormwater drainage system and shown on the plans (94.103.2.3, 94.301.1.1).
- G R58. Provide a copy of the manufacturer's printed specifications for the stormwater filter(s) and any other components associated with the stormwater drainage system and shown on the plans identifying the maximum bypass flow of the filter(s) (94.103.2.3).

- G R59. No stormwater filters shall be installed on drains or piping serving the secondary (overflow) roof drainage system (94.311.5).

## **SUBSURFACE DRAINS**

- G S1. Show subsurface drainage on the floor plans (94.101.3).
- G S2. State piping material for the subsurface drainage system (94.103.2.3, 94.1102.5).
- G S3. Non perforated piping shall be made of an approved metallic material as in sanitary drainage systems (94.1102.1).
- G S7. Backwater valves shall be installed to prevent flooding of the garage from subsurface water (94.1101.5.5).
- G S4. Provide a statement from a civil engineer showing the required discharge rate (94.101.3).
- G S5. The subsurface drainage shall be piped to a storm drain system or an approved water course, to the front street curb or gutter or to an alley (94.1101.5.2).
- G S6. Where groundwater is encountered, such as from a high water table, or a continuously flowing spring, subsurface drainage piping shall only be discharged to a storm drain system or an approved water course (94.1101.5.2).
- G S7. Provide clearance from the Upper Los Angeles River Area Watermaster (ULARA) for removal of groundwater in areas of the San Fernando Valley, such as from a high water table, a continuously flowing spring or other source. The ULARA Watermaster office is located at 111 N. Hope Street, Room 1450, Los Angeles, CA 90012 and the Watermaster may be contacted at 213-367-1020 or 213-342-0896.