City of Albany
Alameda County, California

GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF PRIVATE STORMWATER PUMPING SYSTEMS

GENERAL

These guidelines are for privately owned and maintained stormwater pumping systems installed in the City of Albany (City). Pumping applications vary from site to site and may require special design. When required, the owner shall furnish a pumping system design prepared by a California registered professional engineer. The City and its Engineer accept no responsibility for the design, construction, operation, or maintenance of privately owned and operated stormwater pumping systems.

All design and installation shall be done in conformance with the general requirements of the Cal OSHA, current applicable electrical and building codes, and City requirements. All equipment and accessories shall be standard manufactured items, and shall be specifically manufactured for stormwater use by a company regularly engaged in the manufacturing and assembly of similar units for a minimum of five (5) years. The manufacturer's specifications for pump systems, including electrical controllers, sumps, etc., shall be submitted to the City Engineer for review and approval prior to the start of any work.

For uses other than residential, installations require dual pumps (duplex system), designed to function independently in case of over load or mechanical failure.

All pumping system submittals shall meet the minimum requirements set forth in these guidelines, unless otherwise approved by the City Engineer.

SIZING STORMWATER PUMPS

Stormwater pumps shall be capable of handling the runoff produced by the 100-year rainfall event for a 5-minute duration. Based upon City of Albany rain gage information this is 0.43 inch per 5 minute or 0.086 inch per minute. Area calculations shall be based upon all surfaces which drain to the pump sump. Alternate pump sizing criteria will only be approved upon submittal by a California Registered Professional Engineer and of a hydrology study and hydraulic calculations which demonstrate the adequacy of the proposed system.

PUMPS

Unless otherwise approved, the pump shall be one of the three types described below:

1. Centrifugal, non-clog, vertical column with enclosed shaft.
2. Submersible, centrifugal, non-clog.
3. Submersible, centrifugal, grinder pump.

If pump types 1) or 2) are used, the pumps shall have a minimum capacity of 45 GPM when pumping against the required head at LWL without surcharge unless otherwise approved by the City Engineer. The impeller shall be a non-clog type and shall be capable of passing a 2-inch sphere. The minimum pump discharge shall be 2 inches in diameter. If a submersible grinder

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pump is used, the pump shall have a minimum capacity of 16 gpm when pumping against the required head at LWL without surcharge for a pump discharge of 1 ¼ inches in diameter. The grinder shall be constructed of long-lasting, low-maintenance material that is capable of reducing all components in normal domestic sewage (including a reasonable amount of "foreign objects," such as paper, wood, plastic, glass, rubber, etc.) to finely divided particles which will pass freely through the passages of the pump.

The submittal must demonstrate that the velocities and pump cycling times meet the minimum requirements of the manufacturer. The applicant is responsible for submitting pump system curves, data and calculations showing that the pumps will perform as intended.

PUMP SUMP

The sump shall be cylindrical in configuration with a minimum diameter of 30 inches unless otherwise approved by the City Engineer. The sump shall be designed to prevent excessive pump cycling (switching on and off). Pumps should run a minimum of 30 seconds. There shall be a minimum distance of 16 inches between the HWL and LWL and a maximum distance of 24 inches between the HWL and LWL. The pump sump inlet invert shall be 6 inches above the HWL. Special approval is required for dimensions which are not within the specified range.

The pump sump shall be made of one of the following materials:

1. Asphalt-coated steel (prefabricated 3/16-inch steel plate).
2. Fiberglass. All fiberglass tanks shall be filament wound, minimum ¼ -inch wall thickness with tank interior surface protected with a minimum 0.10-inch thick, resin-rich, corrosion barrier and shall have anti-flotation flanges if the tank is 200 gallons or larger in capacity.

The pump sump shall have a 3-inch minimum inlet connected to a precast drop inlet (Christy or approved equal). The outlet shall be the size of the pump discharge. The inlet and discharge pipes and electrical connections shall be installed underground. Except as noted below, the sump shall be a watertight structure and penetrations for these connections shall be standard with the sump manufacturer. Pipes and conduits shall be fitted with manufactured hubs to prevent water from infiltrating or leaking from the sump. Sumps with open (free drawing) bottoms will only be considered when they are located a minimum of 10 feet from any building foundation or property line.

The pump sump cover shall not be less than ½ -inch epoxy coated steel plate or heavy cast iron made to accommodate the pump (if a column type) with an opening for the electrical conduits, vent, and an inspection plate. The cover shall be designed to resist the maximum dead and live loads, including impact. Sump covers in driveways or parking areas shall be traffic rated. (H-20)

The sump cover shall be securely anchored to the pump sump by stainless steel bolts, and all joints between the component parts shall be sealed with gasketed covers that are gas tight.
The pump sump shall be anchored with concrete or by other suitable means to prevent against flotation When required by the City Engineer the applicant shall submit buoyancy (anti flotation) calculations prepared by a California registered professional engineer. Pump sump covers shall be installed at an elevation and location sufficiently high so that the cover will not become inundated during wet weather.

MOTOR

Motors for column-type pumps shall be a drip-proof vertical type, shall be totally enclosed weather protected. The motor shall conform to the standards of NEMA as to the enclosure, type of mounting, and basic electric design.

LEVEL CONTROLS

The pump's level controls shall be the ball and rod mechanical float or solid core mercury switches seated within polypropylene shell(s) with neoprene covered cable, or an approved equal. High water set point shall not be less than six (6) inches below invert of inlet pipe into the pump tank, and a high water alarm shall be set above the high water set point.

The level control for the low water set point shall be positioned so that the motor is fully submerged at all times. Each pump level control shall be wired directly and independently to terminals within the control panel.

ALARM SYSTEM

All private pumping systems shall be furnished with an alarm system. The alarm system shall be mounted near the pump and shall provide a visible pilot light, and an audible alarm with silencer to alert the occupant. The alarm system shall be on a separate circuit from the pump motor, and shall signal for a high water condition or a low water condition. The alarm system shall remain latched should the high water or low water condition occur until cleared by the occupant.

CONTROL PANEL

The pump manufacturer shall supply a completely self-contained motor control panel with short circuit and overload protection for the pump.

The panel shall be mounted external to the pump tank. The panel shall have a NEMA I classification when mounted inside the building served or a NEMA 4X enclosure when mounted outside. The control panel shall include a thermal magnetic circuit breaker and disconnect as required by the National Electrical Code (NEC), a magnetic starter for the pump motor, a control transformer to supply 115 volts for the control circuit, fuse, terminal strip with box lugs and wiring color coded to NEC requirements.

ELECTRICAL WORK

All electrical work shall conform to the requirements of the NEC as adopted by the City. Power requirements shall be as recommended and approved by Pacific Gas and Electric Company. Exterior pump and float cables shall be installed in rigid conduits and shall be connected directly to the panel. Extensions of the factory furnished cable to the panel shall be made only of a water tight junction box.

HIGH WATER OVERFLOW PIPE

When required by the City Engineer, the sump shall have a high water overflow pipe the same diameter as the discharge line. The overflow pipe shall extend to an area where the stormwater runoff can be dispersed in a manner that will re-create the flow prior to the project and that will not concentrate flow onto adjacent property during a pump failure. The overflow dispersal system shall be shown on the plans.

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DISCHARGE LINE

The pressure portion of the discharge line, including the gate valve, check valve, cleanout and mechanical couplings, shall be equal in size to the pump discharge. The discharge line connecting the check valve, gate valve, cleanout and mechanical couplings shall be hard drawn copper tubing type DWV or PVC Schedule 80. The remaining discharge line to the curb or storm drain system be schedule 80 PVC pipe with long radius bends. The sidewalk crossing and curb penetration shall conform to standard City details. Trenching and backfill, including depth and bedding requirements shall conform to City Standard Specifications for side sewers.

SUBMITTALS FOR PRIVATE STORMWATER PUMPING SYSTEMS

The applicant shall submit, as a minimum, the information required on the attached forms entitled "Private Stormwater Pumping System" consisting of three (3) pages. The application for a private pumping system shall include a plot plan showing the relative locations of the sump, the control panel, adjacent structures and connection to the gravity sewer. Additional information shall be submitted when required by the City Engineer.

ATTACHMENT: Application Form (3 pages)

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