

PUMP STATION CHECK LIST

I. SITE LOCATION

- _____ A. Location of pump station site has to be reviewed and approved by Planning Department and Department of Public Utilities. (II-V-F-1-J-i)
- _____ B. The pump station has to be located in accordance with the sanitary sewer MASTER PLAN. (II-V-F-1-j-ii)
- _____ C. The site plans should show all metes and bounds. The site has to be purchased and plat deeded to the City. (II-V-F-1-j-iii)
- _____ D. Lot size 40' x 55' (typical). (II-V-F-1-j-iii)
- _____ E. Adjacent to City maintained right-of-way. (II-V-F-1-j-iii)

II. TYPE OF PUMP STATION

- _____ A. City standard pump station is a suction lift or wet well/drywell pump station with a brick building, emergency forcemain connector, emergency electrical connection and concrete driveway. (II-V-F-1-b)
- _____ B. A submersible pump station is permitted ONLY IF this station meets all of the criteria for selection of submersible sewerage pump station. See policy on this subject. (II-V-F-2-c)
- _____ C. If pump station discharges into an existing gravity system, then check with the Public Utilities Engineering Division regarding downstream capacities and need for upgrading the system (i.e. gravity line and/or P.S. etc.). Note: This must be approved by Public Utilities prior to submittal. (II-V-F-1-g)
- _____ D. If HRSD forcemain line is accessible, then the pump station will have to be designed to connect to the HRSD forcemain line. The pump station should be designed to HRSD entrance head requirement. (Contact HRSD for specific requirements). (II-V-F-1-e)

III. DESIGN REVIEW OF PUMP STATION

- _____ A. Pump station shall be located to take advantage of topography so as to maximize the reach of the proposed system. (II-V-F-1-j-i)
- _____ B. Each pump station will be designed to serve approximately a 3000' radius. (II-V-F-1-j-i)
- _____ C. A service area map of the pump station must be submitted on Real Estate Tax Map. This service area must be in accordance with the master plan and approved by Public Utilities.(II-V-F-1-j-i)

- _____ D. Design calculations shall be included with the pump station plans. (See Pump Station Design Calculations Check List) (II-V-F-1-i)

Calculations

- _____ 1. Design flow = 3.1 persons/residence x 100 GPD/Capita x 2.5 (peak factor). (II-V-F-1-i-i)
- _____ 2. Average flow=Design/2.5.(V-F-1-i-ii)
- _____ 3. Retention volume = 10 min. retention time x average flow/7.48 gal./ft.³ (II-V-F-1-i-iii)
- _____ 4. Determine wet well volume based on geometric shape. (II-V-F-1-iv)
- _____ 5. Head calculations. (suction piping in station)(II-V-F-1-i-v)
- _____ 6. Head calculations. (discharge piping in station) (II-V-F-1-i-v)
- _____ 7. Forcemain outside of station. (II-V-F-1-i-v)
- _____ 8. T.D.H. @ design flow.(II-V-F-1-i-vi)
- _____ 9. Pump selection. (min. & max. conditions at initial and ultimate development, HRSD Interceptor Policy) Expected operating condition should fall within envelope and ensure conditions fall within operating range. (II-V-F-1-i-vii)
- _____ 10. NPSH (Net Positive Suction Head) A factory certified reprime test is required. Should not be less than .5 feet. (II-V-F-1-i-vii)
- _____ 11. Priming lift. (II-V-F-2-b-iii)
- _____ 12. Minimum submergence. (II-V-C-4-g)
- _____ 13. Minimum velocities per Health Department. (II-V-C-1-i-viii)
- _____ 14. Hydraulic analysis to determine effect on existing City pump stations. (II-V-C-1-e)
- _____ 15. Check siphon head if applicable. (II-V-F-1-i-ix)
- _____ 16. Pumps must alternate and where 3 pumps are provided, two must meet 2.5 of average flow. (II-V-F-1-i-x)

_____ E. Pump Station Building Design

- _____ 1. Aesthetic review. (IIV-F-1-d)
- _____ 2. Electrical service riser adequate. (II-V-F-3-b)
- _____ 3. All electrical items shall be placed inside the pump house except the emergency electrical connection and VEPCO meter. (II-V-F-1-h)
- _____ 4. Interior layout per City Standard.
- _____ 5. Air release valve is to be located at high point of discharge pipe, upstream of check valve. In the wet well the air release lines are run along the wall and extend just below (3") the low water level.

Inverted check valve required for wet well/dry well application.

(II-V-F-4-d)
- _____ 6. Heater and exhaust vent with calculations to ensure 12 complete air changes per hour if continuous and 30 air changes per hour if not continuous. (II-V-F-5-b)
- _____ 7. Ensure wet well ventilation duct is extended to platform and relief duct terminates just below slab. Ducts shall be PVC in wet well and vent pipe above slab shall be D.I. (II-V-F-5-i)
- _____ 8. Pressure and vacuum gauges are provided. (II-V-F-5-e)
- _____ 9. Check valves and gate valves provided with a gate valve between EPC and wall. (II-V-F-4-b)
- _____ 10. Back flow preventer provided. (II-V-F-4-h)
- _____ 11. Bubbler pipe and high water alarm placed along wall and located as close to ladder/platform as possible. (II-V-F-5-a&j)
- _____ 12. Check that all minimum separations are provided and that pump removal is facilitated. (PS-1)
 - _____ (a) 2' between pumps and between pumps and walls.
 - _____ (b) 18" joint of pipe behind pump.

- _____ (c) 2' minimum between outside wall and first joint of pipe for both effluent and influent.
- _____ (d) Dimensions of door frame (varies with size of pumps).
- _____ (e) Hooks and chains for pump removal.
- _____ 13. Ensure design is in conformance with OSHA standards. Consult with ECR Management for any information. (II-V-F-1)
 - _____ (a) 7' shaft guarding. (2 pit only)
 - _____ (b) 42" railing height.
 - _____ (c) 4" toe guards.
 - _____ (d) 16" stair rungs.
- _____ 14. 100-Yr. and 25-Yr. flood identified and protection provided in accordance with Section 22.01.01 of the Sewerage Regulations. (I-I-A-26)
- _____ 15. Bar screen (removable). (II-V-F-5-k)
- _____ 16. Permanent emergency suction pipe. (optional)
- _____ 17. All miscellaneous metal in wet well to be stainless steel or aluminum. (II-V-F-5-f)
- _____ 18. Alarm control points are correct on the power riser diagram.(II-V-F-3-b)
- _____ 19. Soil borings provided foundation design adequate.(I-I-A-8)
- _____ 20. Review specifications for conformance with City Specifications. (II-V-C-1)
- _____ 21. Eight copies of Shop Drawings on all systems needed. (See Shop Drawings Checklist) (I-I-A-18)

_____ F. Site Plan Review

- _____ 1. Driveway to be 7" Class A3 concrete with 6" x 6" wire mesh. (II-V-F-1-c)
- _____ 2. Landscaping required. See typical layout or consult City Arborist.

- _____ 3. Lot grading provided. (.5% min.) (II-I-Q-5)
- _____ G. Request to Public Utilities for HRSD Certificate must be submitted to Utility Engineer, Department of Public Utilities with copy to Department of Public Works. (II-V-H-8)
- _____ H. Portable equipment data required. Minimum overflow time is atleast 95 minutes depending on pump station location. (II-V-F-1-h)

IV. APPROVAL

Dedication required for all off-site pump station sites prior to approval.

- _____ A. Notification of portable pump and telemetry depository requirements in approval letter.
- _____ B. Copies of design calculations and service area map to the Utility Engineer, Public Utilities with approval letter.
- _____ C. Has State Health Department/Water Control Board approval been granted.