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**VIEWMONT
AT
MORNINGSIDE P.U.D.**

STORM DRAINAGE FACILITIES AND INFILTRATION GALLERY

**OPERATIONS AND MAINTENANCE
MANUAL**

January 1996

RECEIVED

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1.00 PURPOSE

This plan is intended to provide general operations and maintenance guidelines for the infiltration gallery located in the Viewmont at Morningside P.U.D. plat. Implementation of these guidelines will insure that the infiltration gallery installed will continue to discharge excess stormwater into the adjacent soils satisfactorily.

2.00 INTRODUCTION

The infiltration gallery noted in the PURPOSE section is located at the east end of the plat along Chapman Road and at the south end of the ponds. Water from the ponds passes into the infiltration gallery via two catch basins and pipes located in the most southerly pond. Please refer to the attached drawings. The purpose of the infiltration gallery is nearly the same as a standard Spokane County Drywell however, the discharge elevations are shallow and spread over a much greater area.

Generally, the drainage system is intended to attenuate and treat storm water runoff from those upstream surfaces and properties prior to discharging the flows to the underlying soils. As shown in the details on the attached drawings, the infiltration gallery is divided into two sections. Each section has a catch basin in the most southerly pond which discharges overflow storm water via pipes into another catch basin. This second catch basin serves as a distribution box with two, slightly sloping, perforated drain pipes extending both east and west. Each perforated pipe is capped on the end with a clean out so that the pipes may be cleaned should excessive siltation be observed flowing into the ponds and catch basins. However, based upon the design and overall detention time, it is expected that this will be kept to a minimum. The infiltration pipes are then placed within a gravel infiltration gallery where water will percolate from the pipes and into the gravel gallery and then be transferred via the gallery sidewall interface with the native soils into the adjacent native soils. It is therefore, of the up most importance to provide adequate operations and maintenance activities to insure that the percolation pipes and the gravel gallery remain silt or dirt free, as this silt or dirt loading will affect the ability of the gravel gallery to convey the outflow water to the native soils due to pore clogging. This could then result in the overtopping of the ponds and impact the downstream properties via overland flow. Should this result the only remedy would be to completely reconstruct the infiltration gallery, therefore periodic maintenance is a must.



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3.00 GENERAL

The infiltration gallery for the Viewmont at Morningside plat is generally a very simple, functional and low maintenance facility. Generally, a periodic visual inspection of the facilities along with mowing will identify any required maintenance. Most maintenance will consist of cleaning out of the culverts or catch basins located in the ponds and disposal of any accumulated debris. However, a specific inspection schedule should be followed regarding the catch basins in pond H which are functioning as distribution boxes as well as the percolation pipes leaving each catch basin/distribution box within the gallery itself.

3.01 Detention Ponds

The four ponds (E,F,G & H) within this infiltration gallery have nearly 9000 square feet of bottom area and are capable of holding 4439 cubic feet of water or nearly 0.5432 acre feet of water, prior to discharging into the infiltration gallery. As shown on the attached drawings the elements comprising these ponds are concrete outflow pads where stormwater enters the ponds from discharge pipes, grass lined swales between ponds E and F and between G and H, grass berms additionally a culvert pipe between ponds F and G was installed to allow for vehicle entrance to other portions of the system. All ponds when full of water should allow for approximately 0.5 feet of storage before discharging water downstream to the next pond. Pond H has two catch basins which capture any overflow water and discharge to the catch basin/distribution boxes within the infiltration gallery.

3.02 Overflow Swales

Between ponds E and F as well as between ponds G and H there are overflow swales which convey the water between these ponds as they reach their storage volume capacity or depth of 0.5 feet.

3.03 Corrugated Metal Pipe (CMP)

Between ponds F and G is a 12-inch CMP pipe which conveys overflow water from pond F to pond G. This pipe is used at this location rather than the overflow swale due to the presence of an access road which provides access to other drainage structures within the plat.



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3.04 Outflow Pads

Within several of the ponds are concrete outflow pads. These pads are generally 3-foot square and are intended to reduce erosion of the detention pond bottoms caused by the outflow from the discharge pipes.

3.05 Catch Basins (Pond H)

Within pond H are the two catch basins referred to earlier. These catch basins collect excess stormwater from the overall pond system and convey this water via the outlet pipes to the infiltration gallery.

3.10 Infiltration Gallery

The infiltration gallery is comprised of two catch basins in Pond H which will convey storm water overflow via two CMP pipes to two catch basin/distribution boxes within the gallery itself. These distribution boxes will each discharge to two perforated percolation pipes. These pipes will be installed with clean outs at the ends opposite the catch basin/distribution boxes to facilitate maintenance.

3.11 Discharge Pipes (from Pond H)

Between the catch basins within pond H and the catch basins which function as distribution boxes are two 12-inch CMP pipes which convey the overflow water to the infiltration gallery.

3.12 Catch Basin/Distribution Boxes

At the end of the two 12-inch CMP pipes are two Spokane County catch basins. These two catch basins each serve to distribute the water to two perforated percolation pipes.

3.13 Percolation Pipes

Each catch basin/distribution box has two, 8-inch perforated percolation pipes which slope away from the catch basin so slightly that they should appear flat. These pipes serve to recharge the infiltration gallery with water so that it can be discharged to the native soils downstream. Each percolation pipe from the catch basin has a clean out on the other end to facilitate cleaning.



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4.00 MAINTENANCE

Below is a maintenance description for each of the detention ponds and infiltration gallery elements. The maintenance described is expected to be provided by the Homeowners association on the schedule noted within each element.

4.00.01 General

Due to the potential negative impacts on nearby properties if the drainage facilities are not properly maintained, a representative of the homeowner's association shall be assigned to be responsible for visually inspecting the following storm drainage facilities after a rainfall or significant snowmelt event.

1. Inspect all pipe inlets, catch basins and overflow swales making sure that they are clear of debris and obstructions.
2. Inspect the pond berms making sure there are no breaches or breaks in the berm.

These visual inspections listed under 4.00.01 General are in addition to the maintenance schedules noted for each item.

4.01 Detention Ponds

The four detention ponds consist of a bermed depression constructed from the native soils, this depression should be sodded and/or hydroseeded and watered periodically with an irrigation system. Periodic maintenance and inspections of these ponds will include mowing and removal of any accumulated debris, such as leaves, weeds and trash. During the mowing operations any obstructions which would not allow water to flow freely from the ponds via either overflow swales, pipes or catch basins should be removed or repaired. Additionally, the berms of the ponds should be inspected to insure that they are in good repair and structurally competent and that no outflow has occurred other than along either the overflow swales, pipes or catch basins.

4.02 Overflow Swales

Along the south berm of ponds E and G the overflow swales should be mowed at the same time as the detention ponds. These swales should be grass lined to insure that no



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erosion between the upper and lower ponds takes place. Should during periodic maintenance bare spots be observed, a sod patch or overseeding is recommended to minimize the erosion and siltation possibilities and subsequent impact to the infiltration gallery.

4.03 Corrugated Metal Pipe (CMP)

The pipe between ponds F and G should be checked periodically for obstructions at each end and twice a year the pipe should be visually inspected to insure that there is not mid-pipe blockage. Should a mid-pipe blockage be observed it should be removed immediately. In the event that the pipe were to fail by being crushed it must be replaced with the same type and size pipe as soon as the failure is discovered.

4.04 Outflow Pads

Periodic maintenance of the pads should be done during the mowing operations to insure that the pad is still well seated and that no scouring between the pipe and the pad has occurred. Should scouring or gouging of the dirt around the pad be in evidence then it should be repaired and resodded or overseeded to insure proper regrowth. It is important to resod and/or reseed as soon as the scouring or gouging has occurred to minimize any possible silting up impacts to the infiltration gallery.

4.05 Catch Basins (Pond H)

The two catch basins and pipe outlets in pond H should have the lids removed at least twice a year, once in the spring (April) and once in the fall (October) to insure that the catch basins are free from dirt and silt. Additionally, a check should be made to insure that the pipe outlets are free from any weeds or obstructions. Should excessive silt or dirt be discovered within these two catch basins, they must be cleaned out. The only acceptable way to clean these two catch basins is to remove the dirt via a physical means. In no instance shall the dirt/silt found within these catch basins be hydraulically (hosed) out and allowed to run down the outlet pipes into the infiltration gallery. Excessive silt/dirt entering the infiltration gallery could result in a failure and ultimately the premature replacement of the infiltration gallery.

4.10 Infiltration Gallery

The infiltration gallery generally should be checked twice a year, once in the spring



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(April) and once in the fall (October). The required maintenance is described for each element below.

4.11 Discharge Pipes (from Pond H)

As discussed in 4.05 above, these pipes should be checked to insure that they are free from obstructions and that both the inlet and outlets are not subject to silt or dirt entering the pipes.

4.12 Catch Basin/Distribution Boxes

As with the catch basins described in 4.05 above, these catch basin/distribution boxes should be checked twice a year once in the spring (April) and once in the fall (October). This should be done by removing the lids for a proper visual inspections. Should any silt/dirt be found within these catch basins it must be removed mechanically, using the utmost care to not introduce any silt/dirt into the perforated pipes. Hydraulic removal (hosing) of the silt/dirt from these catch basin/distribution boxes is not allowed as it will lead to a premature failure of the infiltration gallery.

4.13 Percolation Pipes

After the catch basins noted in 4.12 above have been cleared of any dirt/silt, a hose should be inserted into one perforated pipe run and allowed to run for approximately 5 to 10 minutes. Please note that the other pipe run from the catch basin/distribution box should be plugged with a small piece of plywood or other means, however the plug must be larger than the pipe diameter to minimize an accidental plugging incident. During that time, the water should be observed to see if it backs up into the catch basin/distribution box. If it does then the hose should be inserted into the perforated pipe until it reaches the cleanout. This will insure that no pipe blockages have occurred, once this has been done the water should be allowed to run for approximately 5-minutes more to insure that the water level does not continue to rise in the catch basin/distribution box. Once this has been accomplished for the first perforated pipe run it should be repeated for each perforated pipe section for each catch basin/distribution box in the gallery.

In the event that one of the pipe runs does not drain and the water from the hose runs back into the catch basin a contractor with a vacuum truck should be contacted to try to hydraulically unplug the pipe openings within the pipe and insure that water can flow into the gravel portion of the infiltration gallery. In the event that the pipe cannot be



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unplugged it will need to be replaced along with the gravel surrounding the pipe. During this replacement, care should be used to insure that additional areas of the infiltration gallery are not disturbed and contaminated with dirt/silt laden material.



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