Assessment of Drainage Conditions in the Vicinity of the 4th Street Culvert on Eagle Valley Road in Yoncalla, OR.

8/1/2008

At the July Yoncalla City Council meeting it was brought to the attention of the Council that there appeared to be an inordinate amount of standing water in the west side ditch along the Eagle Valley Rd between 4th and 5th streets. This led to a discussion about previous concerns regarding this area.

Since there appeared to be some uncertainty as to the exact nature of the problem, I agreed to provide my assessment of the situation. The following photos help identify the problem and possible contributing factors.

> **Photo 1 shows the ditches in question looking south from 4th Street toward 5th Street. Water depths of 20 inches were observed.**
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> **Photo 2 was taken from 5th Street looking north.**
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> **Photo 3 is a close up view of the 4th St. culvert which appears to be 36" dia. Note that there is no apparent flow and that the backwater is restricting the opening of the culvert to about 1/3 of its design capacity.**
>
> **Photo 4 shows the corresponding backwater associated with the other end of the culvert on the east side of the railroad tracks. This water also appears to be stagnant and appears to be connected hydraulically with the mill pond.**
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> **Photos 5-7 shows water levels that occurred in January 2005. Note that the water is flowing across Eagle valley Road into the east-side ditch. In Photo 8 Mr. Maccabee is showing the water level reached in November 1996.**
>
> **Photo 9 shows the estimated drainage area (76 acres) based on contours from a 10m DEM.**

According to Mr. Maccabee, a local resident, during the flooding episodes the water starts to pond on the high school grounds and then moves north crossing 5th Street and continues to rise until it crosses Eagle Valley Road. He also stated that he has seen the water level fluctuate as much as 10 inches during the past month (no precipitation).

Tentative Conclusions:

1. **It is possible that pond outfall control has become partially plugged, resulting in an increase in the surface elevation of the pond. The fluctuation of the water level during the drought period suggests that beaver or other animal activity may involved.**

2. **The increase in pond level does not cause any flooding directly but the increased backwater in the 4th Street culvert could seriously affect the performance of the culvert as it tries to drain the water from coming the indicated drainage area (Photo 9).**

3. **A possible solution to this situation is to adjust the outlet control of the pond so that the effective pond level is about 12 inches lower. This would vastly improve the drainage capacity of the 4th street culvert and should eliminate most of the backwater flooding.**

4. **It would be helpful if the outlet control of the pond was wide enough to accommodate winter flows without raising the level of the pond appreciatively.**

Please note: This assessment is a preliminary investigation and did not involve extensive field study or research. It was intended only as a first step to aid in the definition and identification of the problem. I would welcome and encourage the opinions of others who are more experienced in the assessment and design of road drainage systems.

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Continuation of previous report dated 8/1/2008
Current Condition: (9/30/08)

By September 30 the mill pond level had receded and, as shown in Photo 10, the culvert is not, at this time, being affected by backwater from the pond. However, Photo 11 shows that the west inlet end is significantly below the drainage grade. In this photo, only 22 inches of the 34 inch vertical opening is not submerged. It appears that the culvert inlet is more than 12 inches below the effective drainage grade. As a result, during full flow conditions the culvert will function in a reduced capacity.

The lower pond level also provided an opportunity to easily inspect the outlet end of the culvert on the east side of Eagle Valley Road as well as the inlet side of the railroad box culvert. Photo 12 shows the outlet side of the culvert that is approximately 90% plugged with sediment and debris. Photo 13 shows the cleared condition of the railroad culvert that measures approximately 40 by 50 inches.

Suggested Actions:

This subdrainage has a history of flooding that results in property damage and safety hazards on Eagle Valley Road within the City of Yoncalla. It is suggested that the only outlet drain for this drainage area be managed to minimize the flood risk. Toward that end the following actions are presented for consideration:

1. If possible, attempt to keep the mill pond level below the critical level that backfills into the culvert. This action would be particularly useful during winter rain season.

2. Assure that the pipe culvert outlet and connecting ditch to the railroad culvert is clear of all obstructions to assure maximum flow for the existing configuration.

3. Check the culvert size requirements for this drainage and, if it is larger than the current effective capacity (with 12 inches below grade) then consider options to increase the effective rate of drainage for this area.

4. The ditches in the vicinity of the inlet appear to be below grade and, as a result, retain perennial standing water. This condition is a hazard from both a health and safety standpoint. Filling these ditches to grade level might alleviate this condition.

The City feels that this situation is serious and is anxious to work with the appropriate parties to improve the situation in the 4th Street / Eagle Valley Road area. Please contact Yoncalla City Hall at 849-2152 with comments or questions.

Kent Smith
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Yoncalla City Councilman

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

Photo 12

Photo 13