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RENO DRAINAGE STUDY

ANALYSIS OF THE HARDING AND GULLING DRAINAGE DEFICIENCY AREA

Area 3 of 21

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Prepared for:

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PRELIMINARY

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A. INTRODUCTION

The Harding Way and Gulling Road deficiency area is a small drainage system consisting of approximately 40 acres (refer to Figure 1). The drainage basin includes the street flows from Bryan Street, Gulling Road and a major part of Harding Way up to and excluding McCarran Blvd., which is the northern boundary of this drainage area.

The present land use consists of approximately 82% vacant and 18% residential. However, this area is planned for significant change of the future land map which calls for 100% residential.

This change can significantly affect runoff and care should be taken at this time in planning future development with an emphasis on reducing any increase in storm runoff.

B. FIELD ANALYSIS

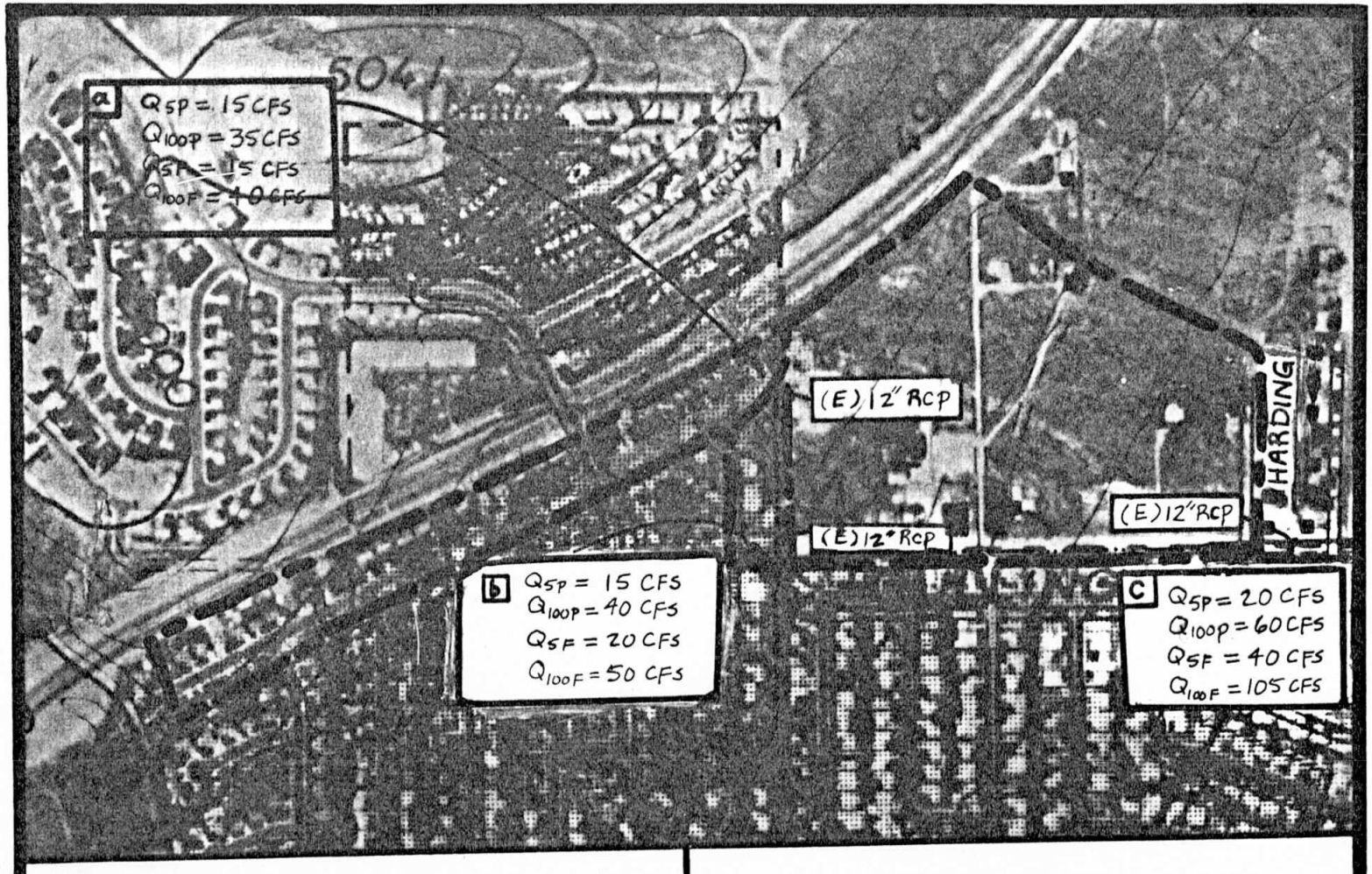
The Harding Way and Gulling Road drainage area consists of some unimproved grassy hillsides with sparse sagebrush and other vegetation in the northern upper reaches. Most of the existing development consists of residential areas by Bryan Street and Rayburn Drive in the western boundary and minor residential development in the northeast.

There are very few drainage facilities for this drainage area considering that the area is planned for full development as a residential site in the future.

The flows begin in the residential area in the west, mainly consisting of street flows from Bryan. The flows proceed east and divide into two parts at the intersection of Bryan Street and Rayburn Drive. The majority of the flows continue flowing to the east entering the 12-inch RCP crossing Bryan Street through a drop inlet located on Bryan Street. This pipe is badly silted in. These flows then proceed south through a low capacity "V" shape concrete ditch, 24 inches in width and 6 inches in depth, and cross Gulling Road via a 12-inch RCP.

The remaining flows turn south on Rayburn Drive and east on Gulling Road entering the 12-inch RCP crossing Gulling Road.

Once flows cross Gulling Road, they proceed south via the existing "V" shape ditch along the east side of Rayburn Drive crossing Kings Row via a 24-inch RCP and then enter a 24-inch RCP system before finally discharging to Peavine Creek.



LEGEND

Drainage Boundary

Sub-Drainage Boundary

Drainage Node [a]

STORM DRAIN DEFICIEINCY MAP

FIGURE 1

AREA 3 OF 21 7/85 1"= 500'

The flows on the east side of this drainage system proceed as overland flows and finally as street flows (once they arrive at Gulling Road or Harding Way) running towards the southeast, entering a pipe network via a drop inlet at the intersection of Harding Way and Gulling Road. The street flows on Gulling Road flow east in a ditch on the north side of the road, while the street flows on Harding Way proceed south as overland flows. These flows also enter the drop inlet at the Harding-Gulling intersection, which is the beginning of a 12-inch storm drain system running southeast on Severn Drive.

C. ESTIMATED STORM RUNOFF

Estimated storm runoff is calculated for both the 5-year and the 100-year storm at selected nodes. These nodes are shown on Figure 1, the project boundary map. Table 1 summarizes these nodes, giving location, description of node, capacity of node and estimated storm runoff at the node. The existing capacity assumes inlet control. Generally, a range is given. the lower value assumes no head at the inlet while the higher value is at maximum head on the culvert.

It should be noted that the storm runoffs area based on summer storms which give more conservative values than the winter storms (refer to the dry and wet isoopleth maps, in the Reno Drainage Study Preliminary Report: Analysis of Drainage Deficiency Areas Within the City Limits, December 1984).

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D. CONCLUSIONS

It is obvious from Table 1 that the existing drainage structures, particularly in the southeast boundary of the drainage (i.e., node c) are undersized for the estimated 5-year storm flows.

Presently a significant portion of the drainage in the southeast is undeveloped. Care should be taken at this time to plan for storm drainage before additional developments occur. Planning should include upsizing some of the existing storm drainage systems to handle present 5-year storm flows and requiring that all future growth maintain increased runoff on site.

There is significant flooding along the "V" shape ditch running north-south between Bryan Street and Gulling Road, which has an approximately 3 CFS existing capacity. this ditch and the pipes crossing Bryan Street and Gulling Road are severely

TABLE 1. Harding Way and Gulling Road Existing Drainage Facilities Summary

Node and Location	Existing Storm Drainage System	Existing Capacity (cfs)	Estimated Flows Present Land Use		Estimated Flows Future Land Use	
			Q_5 (cfs)	Q_{100} (cfs)	Q_5 (cfs)	Q_{100} (cfs)
a - DI on Bryan Street just east of Rayburn Drive	12" RCP	3-6	15	35	15	40
b - Pipe crossing Gulling Road just east of Rayburn Drive	12" RCP	3-5	15	40	20	50
c - DI located at intersection of Gulling Road and Harding Way	12" RCP	3-6	20	60	40	105

undersized for 5-year storms. Of course, part of this excessive flooding is caused by siltation built up at the 12-inch RCP and drop inlet upstream of this ditch located on Bryan Street.

There is presently a problem with the storm flows generated to the east of the drainage ditch mentioned above. These flows enter a 12-inch pipe system at Harding-Gulling intersection which is undersized for present land use, 5-year storm flows and is significantly undersized for the future land use flows if the additional runoff is not contained on site. Since the existing 12-inch RCP crossing Bryan Street is not adequate, any flooding that occurs will bypass the drop inlet for the 12-inch RCP, and will proceed down Alamo Street (the dirt road on the east side of the drop inlet) to Gulling Road. These flows will proceed east on Gulling Road and eventually arrive at the undersized piping system on Harding Way and Gulling Road. The times of concentrations for the flows from the west down Bryan Street and the flows to the east of the drop inlet on Bryan Street, are short and relatively similar. Thus, the added flows bypassing the D.I. on Bryan Street will compound the flooding problem occurring at Harding Way and Gulling Road.

Upsizing the drainage structures at nodes a and b, the 12-inch RCP's crossing Bryan Street and Gulling Road, and the "V" shaped ditch in between, as well as proper maintenance to reduce siltation, is recommended to assure proper containment of drainage flows at these nodes so as not to create a higher runoff at node c. In addition, since significant upsizing of the long storm drainage system beginning at node c would be expensive, use of storage basins for the future development drainage, and also reducing the present flows at node c, is advised. Of course, the cost of land and its future use must be taken into account.