M-8/D005A TIMARRON West Unit 3+4

DRAINAGE STUDY FOR THE TIMARRON WEST SUBDIVISION UNITS 3 & 4

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APRIL 6, 2000

PREPARED FOR:

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BUILDING B
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ALBUQUERQUE, NEW MEXICO 87109

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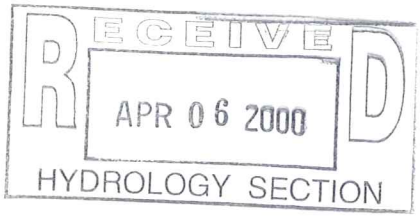
Date



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I. INTRODUCTION

This Drainage Study will address the developed storm runoff and the necessary facilities to adequately convey the flow from the properties legally described as Tracts 1& 2, Lands of Grevey/Liberman. Combined, these tracts contain approximately 36.6 acres are planned to have 179 single-family dwellings.

Timarron West is located west of the Snow Vista Channel and north of DeVargas Road. Units 3 & 4 are bounded to the north by Sunrise Terrace and to the east by Timarron West Unit 2. See vicinity map on the preliminary plat for location.

This study is necessary in order to obtain preliminary plat approval for the Timarron West Subdivision Units 3 & 4. Prior to final plat and building permit approvals of this project, final grading plans and work order construction plans must be approved by the City of Albuquerque (CoA).

II. METHODOLOGY

Existing and proposed site hydrological conditions were analyzed for the 100-year, 6-hour storm in accordance with the revised Section 22.2, Hydrology, of the Development Process Manual (DPM) for the City of Albuquerque, dated January 1993. Street capacities were analyzed using Manning's equation, consistent with the revised DPM Section 22.2. All data and calculations supporting this study are located in **Appendix B.** The new rational method hydrologic procedures identified within the revised DPM Section 22.2 are utilized to determine peak flow rates for design of the storm drainage improvements within the projects. The 100-year, 6-hour storm is used as the design event. The results are included in **Appendix A.**

The storm sewer system internal to the subdivision is analyzed using current DPM methods for gravity flow conditions. Inlet capacity computations, along with all hydraulic computations, are included in **Appendix B**.

III. EXISTING CONDITIONS

A. Topography and Existing Drainage Patterns

Timarron West will be sited on undeveloped land that slopes west to east at approximately 3.5 percent. The site drains to the Snow Vista Channel through an existing detention pond located in Timarron West Unit 1. The detention pond restricts the flow that enters the channel to 1.3 cfs per acre. A storm drain system has been built through Timarron West Units 1 and 2 to convey flow to the pond and channel. This storm drain has been sized and stubbed to serve Units 3 and 4.

B. Offsite Drainage

The existing basin to the west of Unit 4 is called Basin N on the historic basin map exhibit. This basin currently produces 29 cfs. The flow from this basin currently combines with undeveloped flow in Units 3 and 4. There is an existing berm and swale that collects this flow at the western boundary of Timarron West Unit 2 and conveys it to a temporary detention basin. This drainage then passes through Units 4, 3, 2, and 1, through a permanent detention pond, and is released into the Snow Vista Channel. The temporary detention basin will be filled in with the development of Unit 3.

IV. LAND TREATMENTS

The minimum lot dimensions are 45' x 105'. The percent impervious was determined using the following formula from Table A-5 of the DPM, Section 22.2.

percent "D" = $7 * \sqrt{((N*N) + (5*N))}$

where N = units/acre.

V. PROPOSED DEVELOPED CONDITIONS

The proposed development is a single-family, detached-unit residential subdivision with 179 lots on 36.6 acres, producing a density of 4.9 D.U. per acre. Proposed street configurations are shown on the Grading Plans See **Plates 1 & 2**. An AHYMO analysis, shown in **Appendix A,** was performed to determine the flows created by this subdivision and to model the ponds.

Timarron West Unit 4 intercepts offsite drainage from the west. A temporary berm will be constructed on the west boundary of Unit 4 to divert the flow to a detention and desiltation pond. The existing basin to the west of Unit 4 is called Basin N on the historic basin map exhibit. This basin currently produces 29 cfs. A second detention pond is located to the west of the future Timarron West Unit 5. This pond intercepts 15.6 cfs of offsite flow from the undeveloped Basin WN. This pond drains north to the pond west of Unit 4 through a storm drain. This pond is connected to the storm drain system in Unit 4. These ponds are 2' deep and release 3.4 cfs to Timarron West Unit 4.

The flow from the northern third of Unit 5 will be accommodated in Units 3 and 4. This 23.3 cfs will be conveyed through a storm drain across De Vargas Road. It will pick up the flow from the western portion of De Vargas Road and continue north into Unit 4. This flow will combine with the offsite flow of Unit 4 and Basins A, B1, B2, and C in Unit 4. This flow will be routed through a detention pond within Unit 4. The flow entering this pond is 63.5 cfs and the flow exiting the pond is 2.3 cfs. During the 100-year event, the pond is 3.0 feet deep and holds 2.3 Acre-ft. The flow from the pond is conveyed through a storm drain system to the eastern boundary of Unit 3. This storm drain system also collects the flow from the remaining basins of Unit 3 and 4 resulting in a flow of 91.95 cfs. The storm drain system in Units 1 and 2 was designed to accept 1.3 cfs per acre from Units 3 and 4. Therefore, 92 cfs can be conveyed through the existing storm drain system. The calculations for the storm drain, hydraulic grade line, street capacity, and pond design are in **Appendix B**. Street capacity calculations include offsite drainage.

The offsite detention ponds can be removed when the land to the west of Timarron West is developed. These future developments would be required to divert the water south through storm drains or swales to the Amole Arroyo. The capacity of the storm drain system through Timarron West will be depleted with the development of Timarron West Units 3, 4, and 5.

VI. CONCLUSION

The development of Timarron West Units 3, 4, and 5 will result in an improvement in the drainage conditions for this area. This report includes a detailed study of the existing and proposed runoff, street capacities, and pond volumes. Attached are the preliminary plat, existing conditions basin map, proposed conditions basin map, and grading plans. This drainage plan maintains the overall drainage pattern and allows for safe management of storm runoff in the proposed development.

SCALE: 1" = 386'
(APPROX.)

BASIN N
29.0 cfs

BASIN 4
26.4cfs

BASIN 3
32.9 cfs

BASIN WN
15.6 cfs

BASIN 5N
10.4 cfs

BASIN WS
43.5 cfs

BASIN 5S
32.0 cfs

TIMARRON WEST
HISTORIC CONDITIONS
OFF - SITE BASIN MAP

BASIN B
A=0.005 SQMI
A=3.18 AC
Q=10.1 cfs

BASIN F1
A=0.00136 SQMI
A=0.87 AC
Q=2.8 cfs

BASIN F2
A=0.00168 SQMI
A=1.08 AC
Q=3.4 cfs

BASIN F3
A=0.002 SQMI
A=1.25 AC
Q=4.1 cfs

BASIN F4
A=0.0019 SQMI
A=1.24 AC
Q=3.9 cfs

BASIN K
A=0.0013 SQMI
A=0.81 AC
Q=2.6 cfs

BASIN 114.0
A=1.62 AC
Q=5.79 cfs

10.1 CFS (ROAD)
2.76 CFS (ROAD)
RED ROBIN
9.42 CFS (ROAD)
16.73 CFS (ROAD)
24.0 CFS (ROAD)
13.6 CFS (PIPE)
10.44 CFS (ROAD)
16.33 CFS (ROAD)
RED ROBIN

STREET 'B'
13.7 CFS (PIPE)
3.05 CFS (ROAD)
STREET 'C'

BASIN D1
A=0.0016 SQMI
A=1.04 AC
Q=3.25 cfs

BASIN G1
A=0.0016 SQMI
A=1.02 AC
Q=3.25 cfs

BASIN I1
A=0.0017 SQMI
A=1.06 AC
Q=3.45 cfs

BASIN L1
A=0.0016 SQMI
A=1.03 AC
Q=3.25 cfs

BASIN B2
A=0.0015 SQMI
A=0.99 AC
Q=3.05 cfs

BASIN A
A=0.0021 SQMI
A=1.34 AC
Q=5.79 cfs

BASIN POND

QIN= 54.4 cfs
Qout=2.3 cfs
d=2.9'
VOL=2.1 AC-FT

STILL TO BE PRIVATELY MAINTAINED

BASIN D2
A=0.0031 SQMI
A=1.96 AC
Q=6.3 cfs

BASIN G2
A=0.0031 SQMI
A=1.96 AC
Q=6.3 cfs

BASIN I2
A=0.0034 SQMI
A=2.17 AC
Q=6.9 cfs

BASIN L2
A=0.00433 SQMI
A=2.77 AC
Q=8.77 cfs

OPEN SPACE
A=0.8 AC

STREET 'A'
STREET 'F'
STREET 'G'
STREET 'H'
STREET 'J'

5.79 CFS (ROAD)
3.3 CFS (PIPE)
6.28 CFS (ROAD)
6.28 CFS (ROAD)
6.88 CFS (ROAD)
3.45 CFS (ROAD)
3.25 CFS (ROAD)
20.93 CFS (PIPE)
90.8 CFS (PIPE)
60.84 cfs (PIPE)
51.24 cfs (PIPE)
8.6 CFS (PIPE)

TEMPORARY DESILTING & DETENTION POND
Qin=29.0
Qout=3.34 cfs
VOL=1.16 AC-FT
d=2.0

Qin=15.6 cfs
Qout=4 cfs
d=2.0'
VOL=0.25 AC-FT

FUTURE DESILTING & DETENTION POND

42.5 CFS (PIPE)
1.35 CFS (ROAD)
2.32 CFS (PIPE)
STREET 'D'
SIZED FOR WHAT?
9.55 CFS (ROAD)
11.54 CFS (PIPE)
14.11 CFS (ROAD)
6.15 CFS (PIPE)
9.11 CFS (ROAD)
24.3 CFS (ROAD)
3.3 CFS (ROAD)
27.15 CFS (PIPE)
STREET 'D'
16.67 CFS (ROAD)
31.71 CFS (ROAD)
25.44 CFS (ROAD)

BASIN C
A=0.0044 SQMI
A=2.83 AC
Q=6.9 cfs
4.0

BASIN E
A=.0032 SQMI
A=2.07 AC
Q=6.5 cfs

BASIN H
A=0.0020 SQMI
A=1.29 AC
Q=8.9 cfs

BASIN J
A=0.0015 SQMI
A=0.97 AC
Q=6.5 cfs

30.0 CFS (PIPE)
STREET 'E'
25.5

A=0.0019 SQMI
A=1.23 AC
Q=5.24 cfs
BASIN DV1

5.24 CFS (ROAD)

UNIT 5 CONTRIBUTION
Q=25.7 cfs
AHYMO SAYS 23.3

A=0.0048 SQMI
A=3.06 AC
Q=13.22 cfs
BASIN DV2

DE VARGAS ROAD

13.66 CFS (ROAD)
3.6 CFS (ROAD)
8.6 CFS (PIPE)

N

50 25 0 50
1" = 50'

TIMARRON WEST UNITS 3-5
ON-SITE BASIN MAP
PLATE 3

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ENGINEERS PLANNERS PHOTOGRAMMETRISTS SURVEYORS SOFTWARE DEVELOPERS

P:\99470\COP\DESIGN\DRN_EXHIBITS\34BASIN.DWG