

SEPTEMBER 10, 2008

SUPPLEMENTAL DRAINAGE INFORMATION

FOR

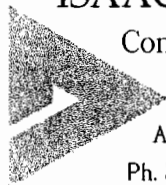
VENTANA RANCH SELF STORAGE PHASE III

BY



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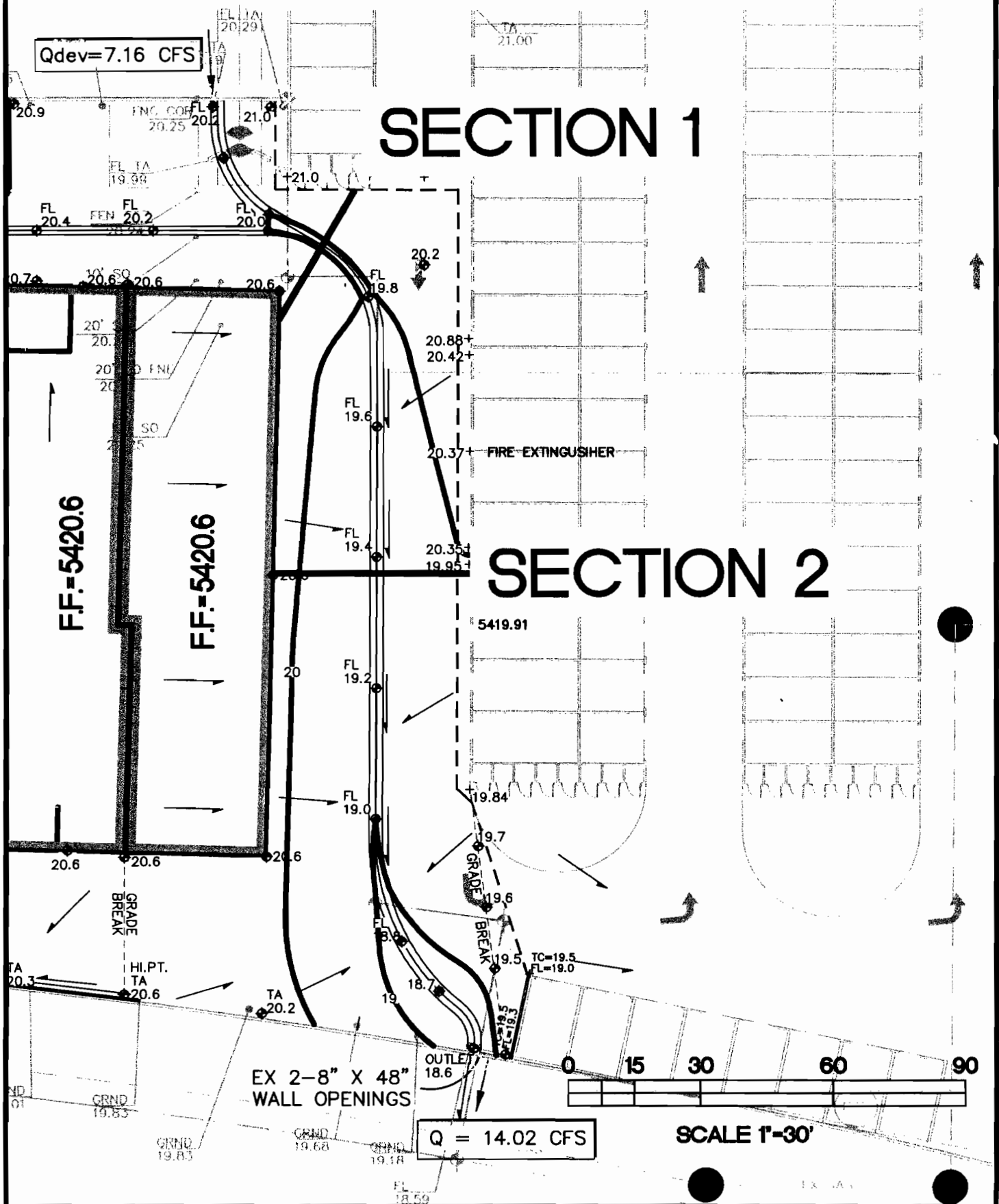
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I&A Project No. 1681

Channel Sections

SECTION 1

SECTION 2



Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc.

Wednesday, Sep 10 2008

MAIN VALLEY GUTTER - SECTION 1

User-defined

Invert Elev (ft) = 19.90
Slope (%) = 0.67
N-Value = 0.015

Calculations

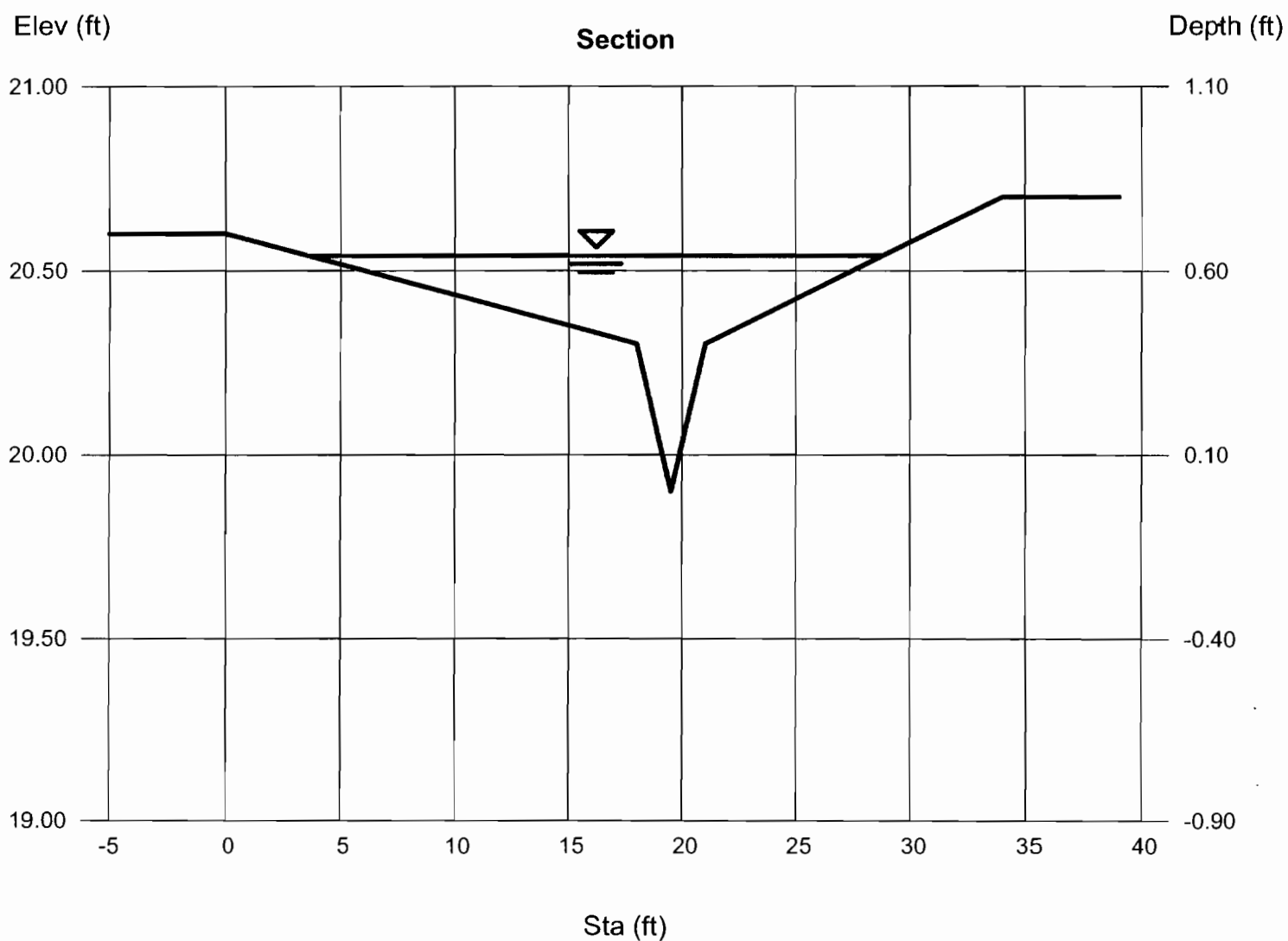
Compute by: Known Q
Known Q (cfs) = 9.00

Highlighted

Depth (ft) = 0.64
Q (cfs) = 9.000
Area (sqft) = 3.98
Velocity (ft/s) = 2.26
Wetted Perim (ft) = 25.31
Crit Depth, Yc (ft) = 0.65
Top Width (ft) = 25.20
EGL (ft) = 0.72

(Sta, El, n)-(Sta, El, n)...

(0.00, 20.60)-(18.00, 20.30, 0.015)-(19.50, 19.90, 0.011)-(21.00, 20.30, 0.011)-(34.00, 20.70, 0.015)



Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc.

Wednesday, Sep 10 2008

MAIN VALLEY GUTTER - SECTION 2

User-defined

Invert Elev (ft) = 19.43
Slope (%) = 0.67
N-Value = 0.015

Calculations

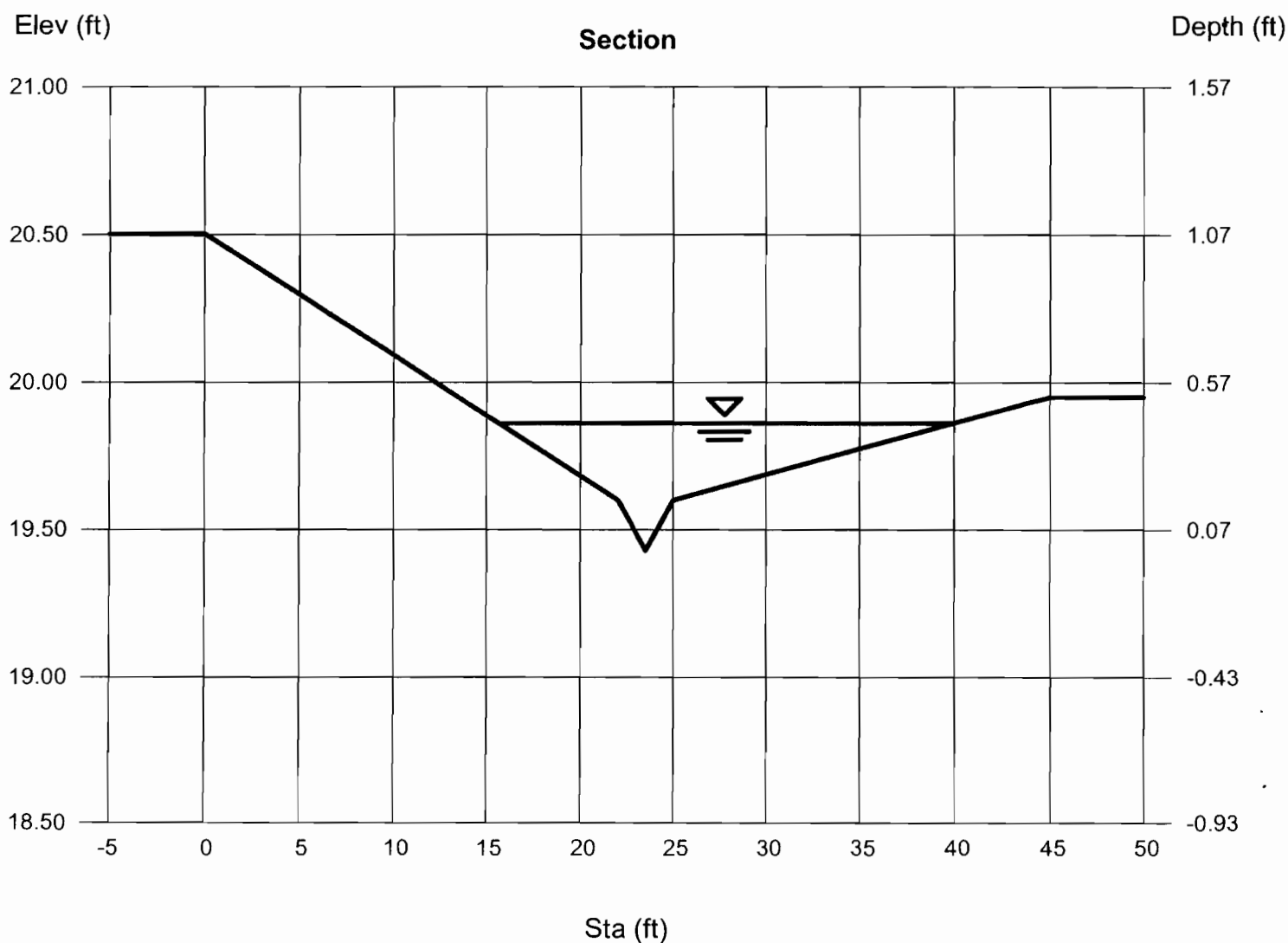
Compute by: Known Q
Known Q (cfs) = 9.00

Highlighted

Depth (ft) = 0.43
Q (cfs) = 9.000
Area (sqft) = 3.79
Velocity (ft/s) = 2.37
Wetted Perim (ft) = 24.24
Crit Depth, Yc (ft) = 0.44
Top Width (ft) = 24.21
EGL (ft) = 0.52

(Sta, El, n)-(Sta, El, n)...

(0.00, 20.50)-(22.00, 19.60, 0.015)-(23.50, 19.43, 0.011)-(25.00, 19.60, 0.011)-(45.00, 19.95, 0.015)



The main reasons for the difference in LVDF No. 1 developed flows from the PMDMP are:

- The Las Ventanas drainage scheme maximizes the drainage area into the pond by diversions of "500" and "600" basins. This has increased the contributing basin area to over 2 square miles from the PMDMP's 1.3 square miles. This correspondingly has reduced the flows going to the Calabacillas and the Middle Branch Piedras Marcadas.
- The Las Ventanas development scenario is different from that assumed by the PMDMP.

The differences in the contributing drainage areas are pictured in Figure 5, Contributing Basins for Las Ventanas Drainage Facility No. 1.

The two city ponds in Basin 503W and Basin 315B are summarized in Table 3. Following Table 3 are brief descriptions of flow scenarios for the ponds.

Table 3

City Ponds

Name	Drainage Area (sq mi)	Flowrate (cfs)		Storage (ac-ft)	Total Depth (ft)
		In	Out		
503W Pond	.034	73	13	1.7	3.5
315B Pond	.047	107	0	4.5	7

3/4 acre

The city pond in Basin 503W intercepts flows from Basin 502 entering Las Ventanas just south of the northwest corner of the subdivision. This pond reduces flows from 73 cfs to 13 cfs.

LVDF

The city pond proposed for Basin 315B is a temporary retention pond because there is no existing storm drain into which these flows can be discharged. As long as it is a temporary retention pond, maintenance will be the responsibility of the property owner. The pond may be reconstructed into detention or eliminated when downstream improvements or capacity become available. As a detention pond, flows are reduced from 107 cfs to 39 cfs, which approximates the existing condition flowrates.

6.5 Synopsis of Developed Flow

The following is a synopsis of the flow patterns for Las Ventanas:

- West Branch Calabacillas Diversion System: Basins 502, 503W, 503M, 504E, and 316NW are routed to LVDF No. 1 via the West Branch Calabacillas Diversion Channel, 316NE is added to these flows, and the sum is discharged into LVDF No. 1 from the northwest.
- North Branch Piedras Marcadas System: Basins 501, 504W, 319A, 319B, 318A, 318B, 317A, and 316SW are routed via Tributary A, Tributary B, and the North Branch Piedras Marcadas Channel. Basins 601, 602, and 317A are routed as street flows to the North Branch Piedras Marcadas Channel and summed. The combined flows are summed with 316SE and discharged from the channel into LVDF No. 1 from the west.
- Basin 320 discharges to LVDF No. 2 in the east of Basin 320. Facility No. 2's discharges are added to the same pipe that outfalls from LVDF No. 1. Basin 505 is also added to this pipe as it exits Las Ventanas at the northeast corner of the property. The sum of the flows are conveyed to the West Branch of the Calabacillas.

- Basins 503E, 314BS, and 315B discharge in directions away from the routes to Facilities No. 1 and 2. 503E and 314BS exit Las Ventanas without attenuation although the total discharge from these two basins is less than the existing, undeveloped discharge from these areas. 315B in the southeast corner of Las Ventanas is proposed to have a temporary retention pond until downstream facilities are constructed east of Las Ventanas.

7.0 RECOMMENDATIONS AND PHASING OF PROPOSED DRAINAGE PLAN

7.1 Introduction

This Drainage Master Plan updates an upstream portion of the PMDMP that was requested by AMAFCA in 1993 and implements many of the conceptual improvements proposed in the PMDMP. It provides a plan for accommodating the off-site and on-site drainage flows in a series of channels, storm drains, and detention ponds.

By implementing components of the PMDMP and diverting additional basins to LVDF No. 1, drainage is effectively concentrated within Las Ventanas. The proposed drainage system lessens the peak flows that would impact the Calabacillas Arroyo and the Middle Branch of the Piedras Marcadas Arroyo.

A large portion of land will be required to provide locations for drainage structures that will accommodate increased flows due to full development. It is anticipated that the largest detention and outfall facilities will be located on the east edge of Las Ventanas. This area is approximately 80 acres and borders almost the entire length of the east boundary of the project.

