

ENGINEERING • ENVIRONMENTAL • SURVE
DESIGN • BUILD • CONSTRUCTION MANAGEMENT

**TECHNICAL DRAINAGE STUDY
UPDATE**

FOR

**STARBUCKS BONANZA
(APN: 140-30-411-005)
DS1489**

@

N PECOS ROAD AND E BONANZA ROAD

JPL Job No. 22012

Prepared for:

SMITHS FOOD & DRUG CENTERS, INC.

1014 Vine St., 7th Flr.,
Cincinnati, OH 45202

Prepared by:

JPL Engineering, Inc.

6725 South Eastern Ave., Ste. 5

Las Vegas, Nevada 89119

Phone: 702-898-6269

Fax: 877-557-8292

July, 2022

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Starbucks Bonanza Date: 7/26/22

Location of Development: a) Descriptive (Cross Streets) North/South: Pecos Road
East/West: Bonanza Road

b) Section: 30 Township: 22 South Range: 62 East

c) APN : 140-30-411-005

Name of Owner: Smiths Food & Drug Centers, Inc.

Telephone No.: _____ Fax No.: _____ E-Mail Address: _____

Address: 1014 Vine Street, 7th Flr, Cincinnati, OH 45202

Contact Person-Name: James Lopez Telephone No.: (702) 898-6269

* E-Mail Address: james@jplengineeringinc.com Fax No.: _____

Firm: JPL Engineering, Inc.

Address: 6725 S. Eastern Ave, Ste 5, Las Vegas, NV, 89119

Type of Land Development/Land Disturbance Process:

☐ Rezoning	☐ Subdivision Map	☐ Clearing and Grading Only
☐ Parcel Map	☐ Planned Unit Development	☐ Other (Please specify below)
☐ Large Parcel Map	☐ Building Permit	☒ X

1. Total Owned Land Area: At Site: 0.91 AC +/- Being Developed/Disturbed: 0.91 AC +/-

2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ☒ No

3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ Yes** ☒ No

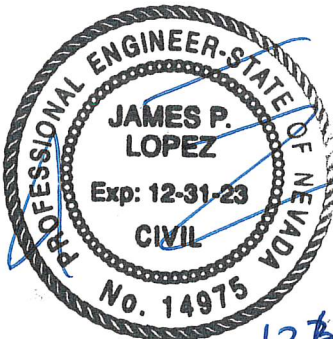
4. Proposed type of development (Residential, Commercial, Etc.): Commercial

5. Approximate upstream land area which drains to the subject site: See Plans

6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: DS1489

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: _____

8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal

Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

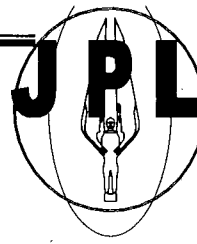
*New Required Field

****Review and concurrence of the Clark County Regional Flood Control District is required.**

Local Entity File No.	Revision	Date

REFERENCE:

STANDARD FORM 1



July 26, 2022

Albert Y. Sung, P.E.
Project Engineer
Public Works Dept./ Flood Control
495 S. Main Street
Las Vegas, Nevada 89101

**RE: UPDATE TO TECHNICAL DRAINAGE STUDY FOR STARBUCKS COFFEE COMPANY
(DS1489)**

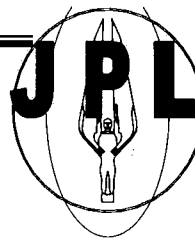
Mr. Sung:

The purpose of this letter is to provide a drainage study letter for the proposed Starbucks located at the northeast corner of Pecos Road and Bonanza Road. The improvements are to a section of the approved drainage study Smiths No. 367 (DS1489). The drainage pattern for the site remains the same. The onsite flow drains east/southeast onto East Bonanza Road. The previously approved study TDS Smith's 367 (DS1489) was reviewed it was determined that the offsite flow is acceptable for the update analysis. The conservative offsite flow on Bonanza Road is 229/607-cfs (Q10/Q100). A FlowMaster analysis was done on Bonanza Road in order to determine the normal flow depth. The normal flow on Bonanza is determined to be 1.38'. The 100-year water surface elevation on Bonanza is 94.93. The proposed building elevation is 94.95. The analysis and the grading plan are attached with the referenced material from the previously approved study.

Please contact JPL Engineering Inc. if you should have any further questions.

Sincerely,

Apolonio Roblero, E.I.T
Project Engineer



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Flowmaster Calculation

Bonanza Q100

Worksheet for Irregular Channel

Project Description	
Worksheet	Bonanza Q100_
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	0.8600 %
Discharge	607.00 cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Mannings Coefficient	0.015
Water Surface Elevation	1.38 ft
Elevation Range	0.00 to 1.03
Flow Area	80.1 ft ²
Wetted Perimeter	102.67 ft
Top Width	100.00 ft
Actual Depth	1.38 ft
Critical Elevation	1.62 ft
Critical Slope	0.3554 %
Velocity	7.58 ft/s
Velocity Head	0.89 ft
Specific Energy	2.27 ft
Froude Number	1.49
Flow Type	Supercritical

Calculation Messages:
Water elevation exceeds lowest end station by 0.7790612 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+07.00	0.013
0+07.00	0+93.00	0.016
0+93.00	1+00.00	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.50
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+50.00	1.03
0+93.00	0.17

Bonanza Q100
Worksheet for Irregular Channel

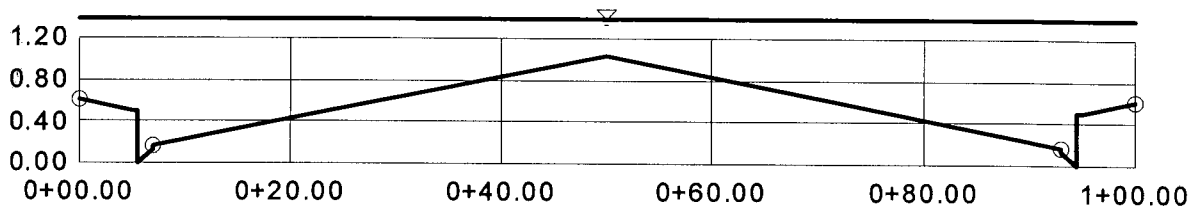
Natural Channel Points	
Station (ft)	Elevation (ft)
0+93.00	0.13
0+94.50	0.00
0+94.50	0.50
0+95.00	0.50
1+00.00	0.60

Bonanza Q100 Cross Section

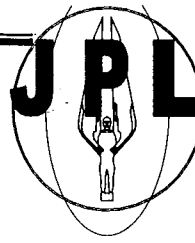
Cross Section for Irregular Channel

Project Description	
Worksheet	Bonanza Q100_
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	0.8600 %
Water Surface Elevation	1.38 ft
Elevation Range	0.00 to 1.03
Discharge	607.00 cfs



V:10.0
H:1
NTS



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Previously Approved DS1489 Smith's No. 367

1489
N-30

[Handwritten signature]

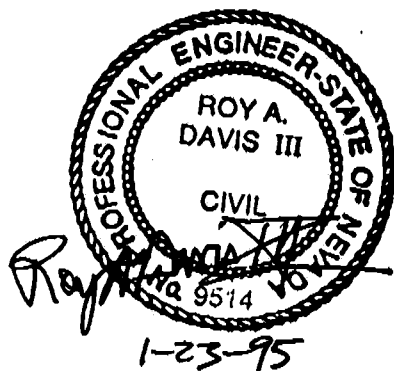
Addendum #1

RESPONSE TO COMMENTS

SMITH'S NO. 367

398.004

JANUARY 1995



CITY OF LAS VEGAS

DATE:

INTER-OFFICE MEMORANDUM

February 14, 1995

TO:

Joel Harris
Land Development Services
Department of Public Works

FROM:

Randy Fultz, P.E. *RF*
Project Manager
Dept. of Public Works

SUBJECT:

Drainage Study for "Smith's No. 367"
(Price-Rite pad only)

COPIES TO:

G.C. Wallace
Attn: Roy Davis

John McNellis, P.E.

File No. DS1489C
Date of Engineer's Stamp: 02/13/95
Date Received by City: 02/14/95

HISTORY:

Review Fees:

1st Submittal	N/C	01/13/95 - Not Acceptable
2nd Submittal	N/C	02/06/95 - Not Acceptable
3rd Submittal	N/C	02/14/95 - (See Comments Below)
	\$0	

REMARKS:

The drainage study for the subject project has been reviewed and

 X is acceptable in concept subject to conformance to all City standards.
 must be resubmitted or supplemented including the following:

NOTE:

Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a drainage study addendum and accepted by CLV Flood Control. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year from date of issuance. If the proposed construction has not been completed in that time period the City of Las Vegas reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction.

1. This drainage study is for the Price Rite building only. A drainage study update is required for the future shops and pads to set the finished floor elevations.

END OF REMARKS

dbm

S/T/R: 30/20/62

N-30

COMMENT: "1. The Engineer must provide the depth of flow calculations for Pecos Road."

RESPONSE: The original submittal included a very conservative analysis of the Bonanza Road flows because the project will be addressed off Bonanza Road. However, it is reasonable to expect some flows in Pecos Road. Examination of Figure 5 indicates some portion of the Offsite Area OFF6 will probably reach Pecos Road and flow south. It was determined that the Freedom Park area, labeled OFF6A will reach Pecos Road and flow south. The area labeled OFF6 (County Juvenile Court site) will reach Bonanza Road. The offsite HEC-1 model was revised to reflect the above changes.

The model indicates about 82 cfs will reach Pecos Road during a 100-year event. Approximately 607 cfs reaches Point 4 during the 100-year storm when the Pecos Road flows are added to the Bonanza Road flows. A functioning Regional Facility storm sewer leaves approximately 457 cfs in Bonanza Road.

The Pecos Road flow depth is 0.84 feet which results in a 100-year water surface elevation of 94.48 feet when analyzed at the south lip design grade of the western driveway entrance on Pecos Road. The revised Figure 5, revised HEC-1 offsite model, and the Pecos Road flow depth calculations are included.

 FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985
 U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616

THIS HEC-1 VERSION CONTAINS ALL OPTIONS EXCEPT ECONOMICS, AND THE NUMBER OF PLANS ARE REDUCED TO 3

HEC-1 INPUT

PAGE 1

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

*DIAGRAM

1	ID	*****									
2	ID	SMITH'S #367									
3	ID	*****									
4	ID	6-HOUR RAINFALL, 5MIN TIME INCRMNT 01/18/95									
5	ID	* RAINFALL DISTRIBUTION = SDN3 *									
6	ID	*****									
7	ID	OFFSITE FLOWS TO SMITH'S #367 REVISED TO REFLECT FLOWS IN PECOS ROAD									
8	ID	*****									
9	ID	* SCS UNIT HYDROGRAPH METHOD *									
10	ID	* FILE = SKREV.H1									
11	ID	* 10-YR. DEPTH = 1.58"									
12	ID	* 100-YR. DEPTH = 2.77"									
13	IT	5	0	0	300						
14	IO	5	0								
15	IN	5	0	0							
16	JR	PREC	0.58	1.00							
17	KK	OFF1									
18	KM	OFF-SITE AREA OFF1 AT POINT 1									
19	BA	.0067									
20	PB	2.77									
21	PC	0	.02	.057	.07	.087	.108	.124	.13	.13	
22	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172	
23	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241	
24	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352	
25	PC	.499	.59	.71	.744	.781	.812	.819	.835	.851	
26	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97	
27	PC	.982	.985	.987	.989	.99	.993	.993	.994	.995	
28	PC	.998	.999	1.00							
29	LS	0	80								
30	UD	0.085									
31	KK	OFF2									
32	KM	OFF-SITE AREA OFF2 AT POINT 1									
33	BA	.056									
34	LS	0	80								
35	UD	0.167									
36	KK	1									
37	KM	COMBINE OFF1 & OFF2 AT POINT 1									

38	HC	2						
39	KK	2						
40	KM	ROUTE COMBINED OFF1 & OFF2 TO POINT 2						
41	RK	750	.027	.017	0	TRAP	100	2
42	RK	1900	.012	.017	0	TRAP	100	2
43	KK	OFF3						
44	KM	OFFSITE AREA OFF3 AT POINT 2						
45	BA	.099						
46	LS	0	80					
47	UD	0.322						

HEC-1 INPUT

PAGE 2

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

48	KK	OFF4						
49	KM	OFFSITE AREA OFF4 AT POINT 2						
50	BA	0.202						
51	LS	0	86					
52	UD	0.478						
53	KK	2						
54	KM	COMBINE OFF3 & OFF4 WITH OFF1 & OFF2 AT POINT 2						
55	HC	3						
56	KK	3						
57	KM	ROUTE HYDROGRAPHS TO POINT 3						
58	RK	3000	0.012	.017	0	TRAP	100	2
59	KK	OFF5						
60	KM	OFFSITE AREA OFF5 AT POINT 3						
61	PB	2.74						
62	BA	.273						
63	LS	0	88					
64	UD	0.524						
65	KK	3						
66	KM	COMBINE HYDROGRAPHS AT POINT 3						
67	HC	2						
68	KK	4						
69	KM	ROUTE COMBINED HYDROGRAPHS TO POINT 4 NEAR SITE						
70	KM	AT INTERSECTION OF BONANZA AND PECOS						
71	RK	2200	.0074	0.017	0	TRAP	100	2
72	KK	OFF6						
73	KM	OFFSITE AREA OFF6 (COMMERCIAL-COUNTY COURT ONLY)						
74	PB	2.76						
75	BA	0.111						
76	LS	0	94					
77	UD	0.309						
78	KK	4						
79	KM	COMBINE OFF6 RUNOFF WITH OTHER HYDROGRAPHS REACHING POINT 4						
80	HC	2						
81	KK	OFF6A						
82	KM	FREEDOM PARK AREA EXPECTED TO REACH PECOS						

83	BA	0.116	
84	LS	0	79
85	UD	0.254	
86	KK	4	
87	KN	COMBINE OFF6A(FREEDOM PARK) WITH OTHER FLOWS REACHING POINT 4	
88	EC	2	
89	ZZ		

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT
 --- LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
 NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

17	OFF1		
	.		
31	.	OFF2	
	.	.	
	.	.	
36	1.....		
	V		
	V		
39	2		
	.		
43	.	OFF3	
	.	.	
48	.	.	OFF4
	.	.	.
	.	.	.
53	2.....		
	V		
	V		
56	3		
	.		
59	.	OFF5	
	.	.	
	.	.	
65	3.....		
	V		
	V		
68	4		
	.		
72	.	OFF6	
	.	.	
	.	.	
78	4.....		
	.		
81	.	OFF6A	
	.	.	
	.	.	
86	4.....		

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985
 U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616

SMITH'S #367

6-HOUR RAINFALL, 5MIN TIME INCRMNT 01/18/95

* RAINFALL DISTRIBUTION = SDN3 *

OFFSITE FLOWS TO SMITH'S #367 REVISED TO REFLECT FLOWS IN PECOS ROAD

* SCS UNIT HYDROGRAPH METHOD *

* FILE = SNREV.H1

* 10-YR. DEPTH = 1.58"

* 100-YR. DEPTH = 2.77"

14 IO

OUTPUT CONTROL VARIABLES

IPRNT 5 PRINT CONTROL

IPLOT 0 PLOT CONTROL

QSCAL 0. HYDROGRAPH PLOT SCALE

IT

HYDROGRAPH TIME DATA

NMIN 5 MINUTES IN COMPUTATION INTERVAL

IDATE 1 0 STARTING DATE

ITIME 0000 STARTING TIME

NQ 300 NUMBER OF HYDROGRAPH ORDINATES

MDDATE 2 0 ENDING DATE

NDTIME 0055 ENDING TIME

COMPUTATION INTERVAL .08 HOURS

TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

JP

MULTI-PLAN OPTION

NPLAN 1 NUMBER OF PLANS

JR

MULTI-RATIO OPTION

RATIOS OF PRECIPITATION

.58 1.00

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

.. WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
 TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1	RATIO 2

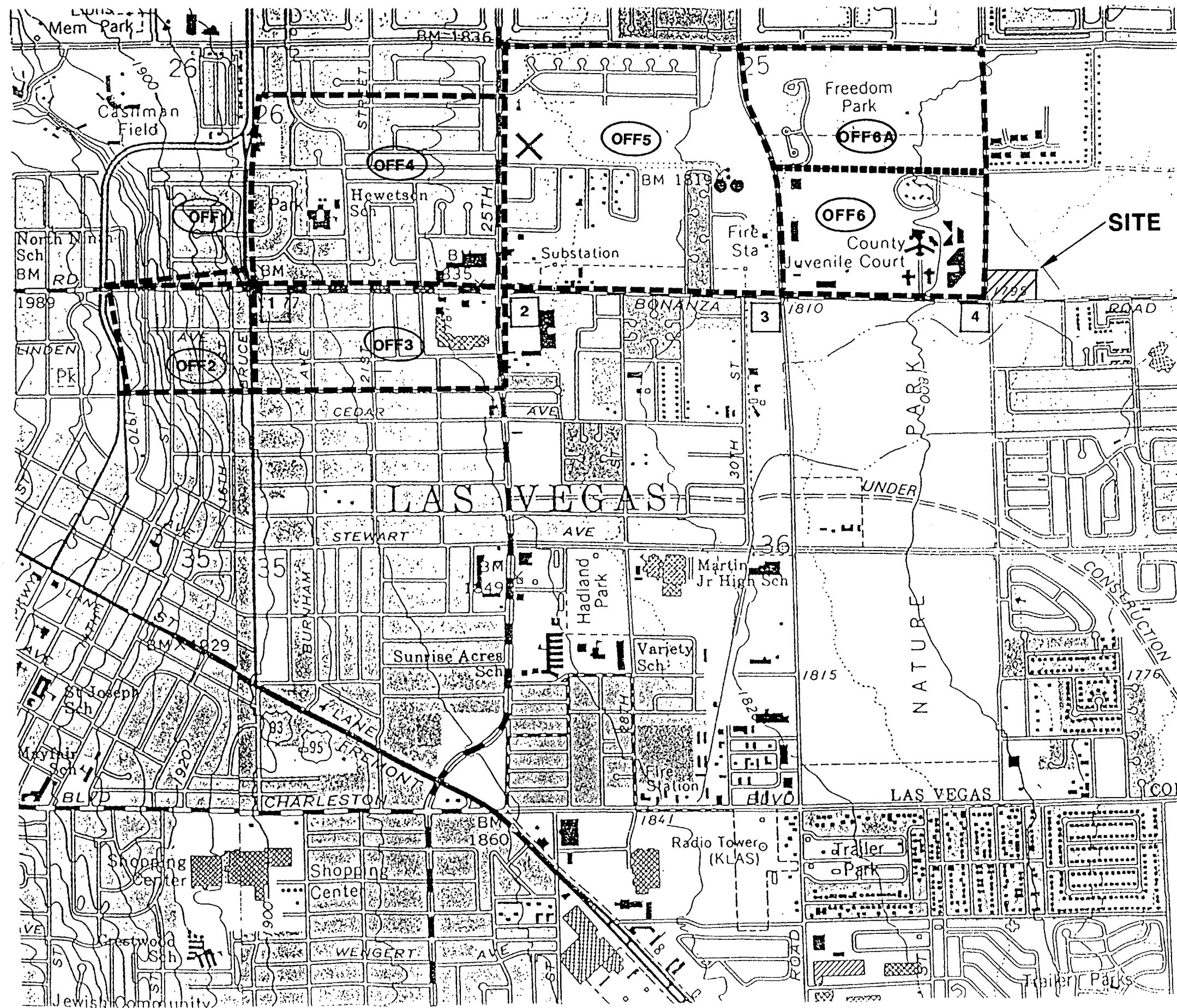
					.58	1.00
HYDROGRAPH AT						
+	OFF1	.01	1	FLOW	2.	7.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	OFF2	.06	1	FLOW	15.	50.
				TIME	3.58	3.58
2 COMBINED AT						
+	1	.06	1	FLOW	17.	57.
				TIME	3.58	3.58
ROUTED TO						
	2	.06	1	FLOW	16.	52.
				TIME	3.75	3.75
HYDROGRAPH AT						
	OFF3	.10	1	FLOW	20.	67.
				TIME	3.83	3.75
HYDROGRAPH AT						
	OFF4	.20	1	FLOW	58.	150.
				TIME	3.92	3.92
3 COMBINED AT						
+	2	.36	1	FLOW	88.	255.
				TIME	3.83	3.83
ROUTED TO						
+	3	.36	1	FLOW	88.	251.
				TIME	4.00	3.92
HYDROGRAPH AT						
+	OFF5	.27	1	FLOW	85.	206.
				TIME	4.00	4.00
2 COMBINED AT						
+	3	.64	1	FLOW	174.	456.
				TIME	4.00	3.92
ROUTED TO						
+	4	.64	1	FLOW	171.	455.
				TIME	4.08	4.00
HYDROGRAPH AT						
+	OFF6	.11	1	FLOW	71.	140.
				TIME	3.75	3.75
2 COMBINED AT						
+	4	.75	1	FLOW	213.	548.
				TIME	4.00	3.92
HYDROGRAPH AT						
+	OFF6A	.12	1	FLOW	23.	82.
				TIME	3.75	3.67
2 COMBINED AT						
+	4	.86	1	FLOW	229.	607.

TIME

4.00

3.92

*** NORMAL END OF HEC-1 ***



SCALE: 1"=1,000'

LEGEND

- OFF5 SUBAREA DESIGNATION
- 4 FLOW CONCENTRATION POINT
- DRAINAGE BOUNDARY

REVISED

SMITH'S NO. 367

FIGURE 5
OFFSITE DRAINAGE MAP

 **G.C. WALLACE, INC.**
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. LAS VEGAS, NEVADA 89102