CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

July 29, 2014

Fred C. Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

Richard J. Berry, Mayor

RE: **California Street On-Street Parking Improvements (H18D069)**
Supplemental Drainage Analysis
Engineer's Stamp Date 7-22-2014

Dear Mr. Arfman:

Based upon the information provided in your submittal received 7-23-14, the above
referenced submittal is approved for Work Order.

If you have any questions, you can contact me at 924-3695.
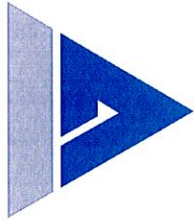
PO Box 1293

Albuquerque

New Mexico 87103

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Planning Dept.
Development Review Services

www.cabq.gov

Orig: Drainage file
c.pdf: via Email: RECIPENT

Albuquerque - Making History 1706-2006

SUPPLEMENTAL DRAINAGE ANALYSIS

COA - PWO Project No.:   **761982**

Project: California St. On-Street Parking Improvements

Zone Atlas Page: H-18

Investigation:

The attached storm water analysis of the contributing drainage basins and their drainage characteristics was requested by COA Hydrology as a condition of plan approval.

Existing Conditions:

- The existing building and those to the east of California all have their roof drainage to the rear (north) onto the public alley. In addition, a portion of the apartments to the northeast also contribute storm water runoff onto the alley.

- The alley storm waters intersect the north end of California St with the deepest flow depth being along the north right-of-way of the alley

- An assumption was made that the flows would split evenly between turning and running straight to the west.

- All contributing areas was analyzed as being 100% Land Treatment "D".

Conclusions:

1. The 100 yr – 6hr flow rate at the entrance to the sidewalk culvert was computed at 2.7 cfs.

2. The sidewalk culvert has the flow carrying capacity of 1.8 cfs.

3. The remaining 0.9 cfs of storm water will flow around the nose of the new island onto Menaul Blvd.

CALCULATIONS: CALIFORNIA STREET :

Based on Drainage Design Criteria for City of Albuquerque Section 22.2, DPM, Vol 2, dated Jan., 1993

ON-SITE

AREA OF SITE:		23811	SF	=	0.5

100-year, 6-hour

ALLOWABLE DISCHARGE:				DEVELOPED FLOWS:				EXCESS PRECIP:	
		Treatment SF	%			Treatment SF	%	Precip. Zone	3
Area A	=	0	0%	Area A	=	0	0%	$E_A = 0.66$	
Area B	=	0	0%	Area B	=	0	0%	$E_B = 0.92$	
Area C	=	0	0%	Area C	=	0	0%	$E_C = 1.29$	
Area D	=	23811	100%	Area D	=	23811	100%	$E_D = 2.36$	
Total Area	=	23811	100%	Total Area	=	23811	100%		

On-Site Weighted Excess Precipitation (100-Year, 6-Hour Storm)

$$\text{Weighted } E = \frac{E_A A_A + E_B A_B + E_C A_C + E_D A_D}{A_A + A_B + A_C + A_D}$$

Allowable E	=	2.36 in.	Developed E	=	2.36 in.

On-Site Volume of Runoff: $V360 = E*A / 12$

Allowable V_{360}	=	4683 CF	Developed V_{360}	=	4683 CF

On-Site Peak Discharge Rate: $Qp = Q_{pA}A_A + Q_{pB}A_B + Q_{pC}A_C + Q_{pD}A_D / 43,560$

For Precipitation Zone   3

Q_{pA}	=	1.87		Q_{pC}	=	3.45
Q_{pB}	=	2.60		Q_{pD}	=	5.02

Allowable Q_p	=	2.7 CFS	Developed Q_p	=	2.7 CFS

[Professional Engineer seal: FRED C. ARFMAN, NEW MEXICO, 7322, PROFESSIONAL ENGINEER, signed, 07.22.14]

ORIFICE EQUATION - 18" WIDE SIDEWALK CULVERT OUTLET TO MENAUL BLVD.

The Orifice Equation is used to calculate the Flow at the opening of a Channel

$Q = C*A * (2*g*h) ^ 0.5$

Where	Q	=	1.81	cfs	
	C	=	0.6		(indicating that the opening will function at 60% capacity)
	A	=	0.75	sq.ft.	
	g	=	32.2	ft/sec^2	
	h	=	0.25	ft	depth of flow at opening from the center of culvert

At a head of 6' (center of 12" pipe = 5088.5, high water elevation = 5094.5), a 6.5" dia. opening into the propose 12" RCP will be required to maintian a maximum discharge rate of 2.7 cfs.

50%

50%

EXISTING BUILDING
1 Story- Block Construction

BAS
(23,811

$Q_{100} = 1.8 CFS$
INTO
SIDEWALK

CALIFORNIA ST

$Q_{100} = 0.9 CFS$
AROUND NOSE OF
FORM OUT, D = 0.3'

MENAUL BLVD

18" WIDE SIDEWALK
CULVERT

ADA RAMP DETAIL
SCALE: 1"=5'

TC= 69.19
FL= 68.69

TC= 69.43
FL= 68.93

FL= 68.93

ROW

TC= 69.18
FL= 68.93

69.20   68.86   FL= 68.86

5.6%   FL= 68.83

2.0'   RAMP 7.30'   2.5'

69.19   68.75

FL= 68.72
FL= 68.70

FL= 68.62

TC= 69.25
FL= 68.58

TC= 69.15
FL= 68.48=
SDWK CULV INV

TC= 69.18
FL= 68.51

4.5'

10:1

3' A.D.A. PATH @
2% MAX. CROSS SLOPE

A

CURB RTN
CURB RTN

A

NOTE:
QUARTER POINT GRADES ARE REFERENCED AS 1, 2 & 3
ALONG THE FACE OF CURB IN A CLOCKWISE DIRECTION.

3'-0"
A.D.A.
PATH
2% MAX.

VALLEY GUTTER

SECTION A-A

QUARTER POINT & ADA PATH DETAIL
NTS

FACE OF BLDG. = ROW±

EXISTING PCC SIDEWALK
REMOVE AND REPLACE

EXISTING CURB & GUTTER TO
BE REMOVED AND DISPOSED

NEW MEDIAN
CURB & GUTTER

2' MIN.

EXISTING
ASPHALT

2% MAX.

EXISTING ASPHALT TO BE
REMOVED AND REPLACED

MATCH NEW ASPHALT TO NEW
WITH SMOOTH RIDING TRANSITION

SECTION A-A
NTS

16' ALLEY   EX 12" SAS

MATCH EXIST
TC & FL ELEV

S89°50'35"W   60.00'

STA=11+99.22, 33.82' LT
NE PROPERTY CORNER

FC4

	TC	FL
1	71.02	70.52
2	70.91	70.41
3	70.80	70.30

STA=11+85.25, 27.00' LT
TC=70.25
FL=69.75

STA=11+75.00, 27.00' LT
TC=70.17
FL=69.67

STA=11+50.00, 27.00' LT
TC=69.94
FL=69.44

EXISTING BUILDING

STA=11+25.00, 27.00' LT
TC=69.72
FL=69.22

A

LOT 5
BLOCK 2
VISTA ENCANTADA
Filed September 21, 1948 in Volume C, Folio 108
0.2048 Ac.

STA=11+00.00, 27.00' LT
TC=69.49
FL=68.99

STA=10+75.00, 27.00' LT
TC=69.28
FL=68.78

PRIVATE PCC SIDEWALK NOT
PART OF THIS PROJECT

STA=10+59.25, 27.00' LT
TC=69.19
FL=68.69

STA=10+50.28, 33.82' LT
SE PROPERTY CORNER

N1,495,198.18
E1,543,050.87

FC1

	TC	FL
1	–	68.83
2	–	68.72
3	–	68.62

N1,495,198.25
E1,543,075.92

EX. FH TO REMAIN
IN PLACE

S89°36'25"E   60.00'

STA=10+42.24, 41.73' LT
MATCH EXST TC&FL ELEV

TC= 69.15
FL= 68.48
SDWK CULV INV

STA=10+42.25, 25.99' LT
TC=69.18
FL=68.51

EX. 6" GI W

MENAUL

STA