

# CITY OF ALBUQUERQUE



May 24, 2011

Scott Eddings, P.E.  
Huitt-Zollars, Inc.  
6501 Americas Parkway NE  
Albuquerque, NM 87110

**Re: BJ Restaurant- Winrock Mall, Grading Plan for Building Permit  
Engineer's Stamp date 5-23-2012 (J19/D058A)**

Dear Mr. Eddings,

Based upon the information provided in your submittal received 5-23-12, the above referenced Grading Plan is approved for Grading Permit and Building Permit.

Per the DPM Chapter 22 Section 9, runoff from the trash enclosure pad is required to drain to the sanitary sewer. Per our telephone discussion, this will be shown on the utility plan for Building Permit, and must be included in your Engineer's Certification for Certificate of Occupancy.

Prior to Certificate of Occupancy release, provide this office with an Engineer's Certification per the DPM checklist, including the as-built trash enclosure drainage.

If you have any questions, you can contact me at 924-3994.

Sincerely,

Gregory R. Olson, P.E.  
Senior Engineer, Planning Dept.  
Development and Building Services

C.Pdf: Addressee  
Orig: File

PO Box 1293

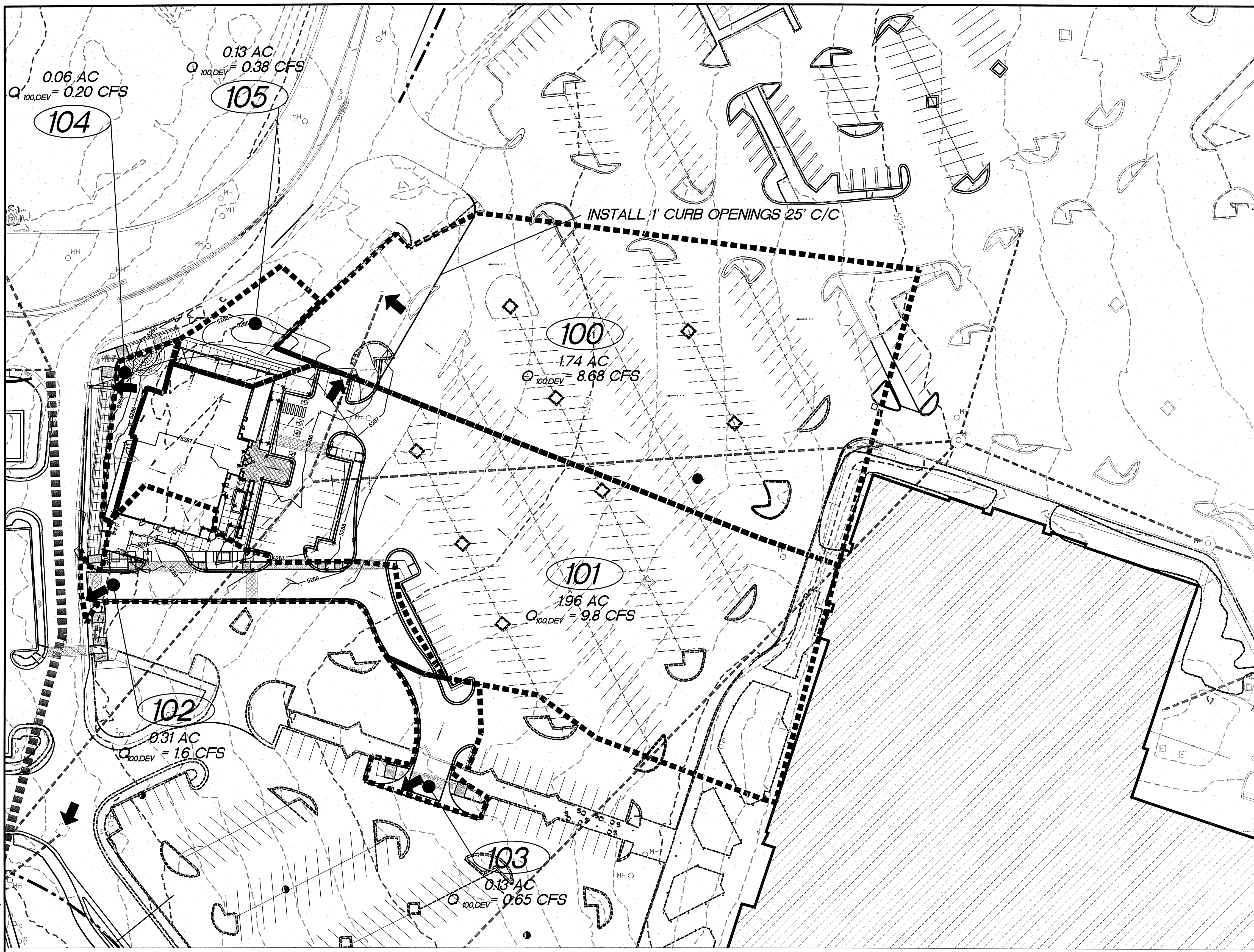
Albuquerque

NM 87103

[www.cabq.gov](http://www.cabq.gov)



May 23, 2012 3:06:43pm - User settings  
C:\PROJ\7003030\BJS BUILDING PERMIT\DWG\ [J:\WC-2012-EXISTING BASE.DWG] [J:\03-2012-BASE.DWG]  
AutoCAD LT 2012



LEGEND

EXISTING BUILDING

BASIN BOUNDARY LINE

EXISTING STORM DRAIN

PROPOSED CURB AND GUTTER

PROPOSED CONTOUR (5' INTERVAL)

FLOW DIRECTION

TYPE 'C' DRAINAGE INLET

STORM DRAIN MANHOLE

DISCHARGE LOCATION

EXISTING CONTOURS

**EXISTING DRAINAGE CONDITIONS**

THIS PORTION OF THE WINROCK PARKING SLOPE FROM SOUTHEAST TO NORTHWEST. OVERLAND STORMWATER IS DIRECT TO STORM DRAIN INLET NUMBER 1. ADDITIONAL PAVEMENT PARKING AREAS SLOPE TO PARKING LOTS EXTERIOR CURB AND GUTTER. CONCENTRATED FLOWS ARE DIRECTED TO CONCRETE RUNDOWN NUMBER 1 DISCHARGING INTO A SMALL LANDSCAPE AREA. THE LANDSCAPE AREA IS GRADED TO SOUTH WHERE STORMWATER IS DISCHARGED ONTO THE RING ROAD AND ENTERS THE 84" STORM DRAIN.

**PROPOSED DRAINAGE CONDITIONS**

BASIN 100 IS EXISTING PARKING AREA. THIS BASIN IS NOT CHANGED BY THE PROJECT.

BASIN 101 CURRENTLY DISCHARGES THROUGH A CONCRETE RUNDOWN INTO STREET A WHICH DISCHARGES INTO STREET A AND ULTIMATELY INTO THE EXISTING 84" STORM DRAIN.

BASIN 101 INCORPORATES THE NEW RESTAURANT AND ASSOCIATED PARKING. BASIN 101 DISCHARGES INTO PROPOSED INLET BATTERY #1.

BASIN 102 CURRENTLY DISCHARGES THROUGH A CONCRETE RUNDOWN INTO STREET A WHICH DISCHARGES INTO STREET A AND ULTIMATELY INTO THE EXISTING 84" STORM DRAIN.

BASIN 102 IS THE NEW DRIVE AISLE AND DISCHARGES INTO STREET A THROUGH A NEW DRIVE PAD.

BASIN 103 CURRENTLY IS A PART OF A LARGER BASIN WHICH DISCHARGES INTO THE EXISTING RING ROAD AND ULTIMATELY INTO THE EXISTING 84" STORM DRAIN.

BASIN 103 WILL DISCHARGE TO THE SOUTH INTO AN EXISTING PARKING FIELD WHICH ALSO DISCHARGES INTO THE EXISTING 84" STORM DRAIN.

BASIN 104 IS NEW LANDSCAPING AND EXCESS STORMWATER SHALL DISCHARGE INTO STREET.

BASIN 105 IS A DEPRESSED LANDSCAPE AREA AND WILL RETAIN THE DESIGN EVENT. A FLOOD EVENT WILL INUNDATE THE LANDSCAPING AND EXCESS WATER WILL BE RELEASED INTO THE PARKING LOT BEFORE THE BUILDING FLOOR IS FLOODED.

100% SUBMITTAL

Designed By:  
**HUITT-ZOLLARS**  
Huitt-Zollars, Inc.  
333 Rio Rancho Drive NE, Suite 101  
Rio Rancho, New Mexico 87124  
Phone (505) 892-5141 Fax (505) 892-3259

**BJS BUILDING PERMIT DRAINAGE PLAN**

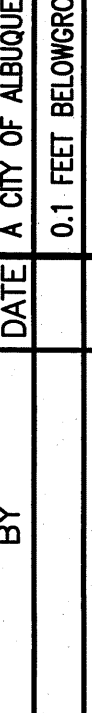
Design	Review	Committee	City Engineer	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.

Zone Map No.  
J-18-Z

Sheet  
C100

Of

ENGINEER'S SEAL			SURVEY INFORMATION		BENCH MARKS		AS BUILT INFORMATION	
<div><p>12856 DAVID S. SMITH REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO 6/25/12</p></div>			FIELD NOTES		FOUND MONUMENT "1.119A"		CONTRACTOR	
			NO.	DATE	A CITY OF ALBUQUERQUE BRASS DISK SET IN A CONCRETE POST		WORK	
				BY	0.1 FEET BELOWGROUND LEVEL AND IS STAMPED "1-119A, 1969".		STAGED BY	
					X = 1548358.44		DATE	
					Y = 1483076.47		DATE	
					ELEVATION IS 5326.611 (NAD 1986)		DATE	
							DATE	
							DATE	
							DATE	
							DATE	
REVISIONS			DESIGN		DESIGNED BY:		DATE:	
DRAWN BY:			DATE:		DWC NAME:		DATE:	
CHECKED BY:			DATE:		PROJ #:		17-0833-01	
					RECORDED BY:		DATE:	
					NO.			



BASIN 100 – HYDRAULICS

DRAINAGE AREA 100 AREA = 1.74 ac.

DRAINAGE ZONE 3  
PRECIPITATION: 360 = 2.60 in.  
1140 = 3.10 in.  
10day = 4.90 in.

EXCESS PRECIPITATION:		PEAK DISCHARGE:	
TREATMENT A	0.66 in.	1.87	cfs/ac.
TREATMENT B	0.92 in.	2.60	cfs/ac.
TREATMENT C	1.29 in.	3.45	cfs/ac.
TREATMENT D	2.36 in.	5.02	cfs/ac.

EXISTING CONDITIONS:		PROPOSED CONDITIONS:	
AREA	AREA	AREA	AREA
TREATMENT A	0.00 ac.	0.00 ac.	
TREATMENT B	0.00 ac.	0.00 ac.	
TREATMENT C	0.03 ac.	0.03 ac.	
TREATMENT D	1.71 ac.	1.71 ac.	

EXISTING EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.03 )+( 2.36)x( 1.71 )/ 1.74 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 1.74 )/ 12 = 0.339097 ac-ft = 14771 cf

EXISTING PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.03 )+( 5.02)x( 1.71 )= 8.68 cfs

PROPOSED EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.03 )+( 2.36)x( 1.71 )/ 1.74 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 1.74 )/ 12.0 = 0.339097 ac-ft = 14771 cf

V100-1440 = ( 0.34 )+( 1.71)x( 3.10 - 2.60 )/ 12 = 0.410147 ac-ft = 17866 cf

V100-10day = ( 0.34 )+( 1.71)x( 4.90 - 2.60 )/ 12 = 0.665927 ac-ft = 29008 cf

PROPOSED PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.03 )+( 5.02)x( 1.71 )= 8.68 cfs

BASIN 103 – HYDRAULICS

DRAINAGE AREA 103 AREA = 0.13 ac.

DRAINAGE ZONE 3  
PRECIPITATION: 360 = 2.60 in.  
1140 = 3.10 in.  
10day = 4.90 in.

EXCESS PRECIPITATION:		PEAK DISCHARGE:	
TREATMENT A	0.66 in.	1.87	cfs/ac.
TREATMENT B	0.92 in.	2.60	cfs/ac.
TREATMENT C	1.29 in.	3.45	cfs/ac.
TREATMENT D	2.36 in.	5.02	cfs/ac.

EXISTING CONDITIONS:		PROPOSED CONDITIONS:	
AREA	AREA	AREA	AREA
TREATMENT A	0.00 ac.	0.00 ac.	
TREATMENT B	0.00 ac.	0.00 ac.	
TREATMENT C	0.00 ac.	0.00 ac.	
TREATMENT D	0.13 ac.	0.13 ac.	

EXISTING EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.00 )+( 2.36)x( 0.13 )/ 0.13 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 0.13 )/ 12 = 0.025335 ac-ft = 1104 cf

EXISTING PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.00 )+( 5.02)x( 0.13 )= 0.65 cfs

PROPOSED EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.00 )+( 2.36)x( 0.13 )/ 0.13 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 0.13 )/ 12.0 = 0.025335 ac-ft = 1104 cf

V100-1440 = ( 0.03 )+( 0.13)x( 3.10 - 2.60 )/ 12 = 0.030643 ac-ft = 1335 cf

V100-10day = ( 0.03 )+( 0.13)x( 4.90 - 2.60 )/ 12 = 0.049753 ac-ft = 2167 cf

PROPOSED PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.00 )+( 5.02)x( 0.13 )= 0.65 cfs

BASIN 101 – HYDRAULICS

DRAINAGE AREA 101 AREA = 1.96 ac.

DRAINAGE ZONE 3  
PRECIPITATION: 360 = 2.60 in.  
1140 = 3.10 in.  
10day = 4.90 in.

EXCESS PRECIPITATION:		PEAK DISCHARGE:	
TREATMENT A	0.66 in.	1.87	cfs/ac.
TREATMENT B	0.92 in.	2.60	cfs/ac.
TREATMENT C	1.29 in.	3.45	cfs/ac.
TREATMENT D	2.36 in.	5.02	cfs/ac.

EXISTING CONDITIONS:		PROPOSED CONDITIONS:	
AREA	AREA	AREA	AREA
TREATMENT A	0.00 ac.	0.00 ac.	
TREATMENT B	0.00 ac.	0.00 ac.	
TREATMENT C	0.04 ac.	0.04 ac.	
TREATMENT D	1.92 ac.	1.92 ac.	

EXISTING EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.04 )+( 2.36)x( 1.92 )/ 1.96 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 1.96 )/ 12 = 0.381971 ac-ft = 16639 cf

EXISTING PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.04 )+( 5.02)x( 1.92 )= 9.78 cfs

PROPOSED EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.04 )+( 2.36)x( 1.92 )/ 1.96 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 1.96 )/ 12.0 = 0.381971 ac-ft = 16639 cf

V100-1440 = ( 0.38 )+( 1.92)x( 3.10 - 2.60 )/ 12 = 0.462005 ac-ft = 20125 cf

V100-10day = ( 0.38 )+( 1.92)x( 4.90 - 2.60 )/ 12 = 0.750125 ac-ft = 32675 cf

PROPOSED PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.04 )+( 5.02)x( 1.92 )= 9.78 cfs

BASIN 104 – HYDRAULICS

DRAINAGE AREA 104 AREA = 0.06 ac.

DRAINAGE ZONE 3  
PRECIPITATION: 360 = 2.60 in.  
1140 = 3.10 in.  
10day = 4.90 in.

EXCESS PRECIPITATION:		PEAK DISCHARGE:	
TREATMENT A	0.66 in.	1.87	cfs/ac.
TREATMENT B	0.92 in.	2.60	cfs/ac.
TREATMENT C	1.29 in.	3.45	cfs/ac.
TREATMENT D	2.36 in.	5.02	cfs/ac.

EXISTING CONDITIONS:		PROPOSED CONDITIONS:	
AREA	AREA	AREA	AREA
TREATMENT A	0.00 ac.	0.00 ac.	
TREATMENT B	0.00 ac.	0.06 ac.	
TREATMENT C	0.00 ac.	0.00 ac.	
TREATMENT D	0.06 ac.	0.00 ac.	

EXISTING EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.00 )+( 2.36)x( 0.06 )/ 0.06 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 0.06 )/ 12 = 0.011693 ac-ft = 509 cf

EXISTING PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.00 )+( 5.02)x( 0.06 )= 0.30 cfs

PROPOSED EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.06 )+( 1.29)x( 0.00 )+( 2.36)x( 0.00 )/ 0.06 ac.  
= 0.95 in.  
V100-360 = ( 0.95)x( 0.06 )/ 12.0 = 0.004729 ac-ft = 206 cf

V100-1440 = ( 0.00 )+( 0.00)x( 3.10 - 2.60 )/ 12 = 0.004729 ac-ft = 206 cf

V100-10day = ( 0.00 )+( 0.00)x( 4.90 - 2.60 )/ 12 = 0.004729 ac-ft = 206 cf

PROPOSED PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.06 )+( 3.45)x( 0.00 )+( 5.02)x( 0.00 )= 0.16 cfs

BASIN 102 – HYDRAULICS

DRAINAGE AREA 102 AREA = 0.31 ac.

DRAINAGE ZONE 3  
PRECIPITATION: 360 = 2.60 in.  
1140 = 3.10 in.  
10day = 4.90 in.

EXCESS PRECIPITATION:		PEAK DISCHARGE:	
TREATMENT A	0.66 in.	1.87	cfs/ac.
TREATMENT B	0.92 in.	2.60	cfs/ac.
TREATMENT C	1.29 in.	3.45	cfs/ac.
TREATMENT D	2.36 in.	5.02	cfs/ac.

EXISTING CONDITIONS:		PROPOSED CONDITIONS:	
AREA	AREA	AREA	AREA
TREATMENT A	0.00 ac.	0.00 ac.	
TREATMENT B	0.00 ac.	0.00 ac.	
TREATMENT C	0.01 ac.	0.01 ac.	
TREATMENT D	0.30 ac.	0.30 ac.	

EXISTING EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.01 )+( 2.36)x( 0.30 )/ 0.31 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 0.31 )/ 12 = 0.060414 ac-ft = 2632 cf

EXISTING PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.01 )+( 5.02)x( 0.30 )= 1.55 cfs

PROPOSED EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.01 )+( 2.36)x( 0.30 )/ 0.31 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 0.31 )/ 12.0 = 0.060414 ac-ft = 2632 cf

V100-1440 = ( 0.06 )+( 0.30)x( 3.10 - 2.60 )/ 12 = 0.073072 ac-ft = 3183 cf

V100-10day = ( 0.06 )+( 0.30)x( 4.90 - 2.60 )/ 12 = 0.118642 ac-ft = 5168 cf

PROPOSED PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.01 )+( 5.02)x( 0.30 )= 1.55 cfs

BASIN 105 – HYDRAULICS

DRAINAGE AREA 105 AREA = 0.13 ac.

DRAINAGE ZONE 3  
PRECIPITATION: 360 = 2.60 in.  
1140 = 3.10 in.  
10day = 4.90 in.

EXCESS PRECIPITATION:		PEAK DISCHARGE:	
TREATMENT A	0.66 in.	1.87	cfs/ac.
TREATMENT B	0.92 in.	2.60	cfs/ac.
TREATMENT C	1.29 in.	3.45	cfs/ac.
TREATMENT D	2.36 in.	5.02	cfs/ac.

EXISTING CONDITIONS:		PROPOSED CONDITIONS:	
AREA	AREA	AREA	AREA
TREATMENT A	0.00 ac.	0.00 ac.	
TREATMENT B	0.00 ac.	0.05 ac.	
TREATMENT C	0.00 ac.	0.05 ac.	
TREATMENT D	0.13 ac.	0.01 ac.	

EXISTING EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.00 )+( 1.29)x( 0.00 )+( 2.36)x( 0.13 )/ 0.13 ac.  
= 2.34 in.  
V100-360 = ( 2.34)x( 0.13 )/ 12 = 0.025335 ac-ft = 1104 cf

EXISTING PEAK DISCHARGE:

Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.00 )+( 3.45)x( 0.00 )+( 5.02)x( 0.13 )= 0.65 cfs

PROPOSED EXCESS PRECIPITATION:

Weighted E = ( 0.66)x( 0.00 )+( 0.92)x( 0.05 )+( 1.29)x( 0.05 )+( 2.36)x( 0.01 )/ 0.13 ac.  
= 1.12 in.  
V100-360 = ( 1.12)x( 0.13 )/ 12.0 = 0.012133 ac-ft = 529 cf

V100-1440 = ( 0.01 )+( 0.01)x( 3.10 - 2.60 )/ 12 = 0.012675 ac-ft = 552 cf

V100-10day = ( 0.01 )+( 0.01)x( 4.90 - 2.60 )/ 12 = 0.014625 ac-ft = 637 cf

PROPOSED PEAK DISCHARGE:

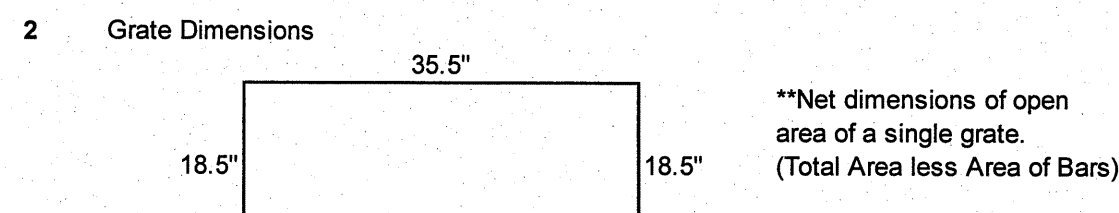
Q100 = ( 1.87)x( 0.00 )+( 2.60)x( 0.05 )+( 3.45)x( 0.05 )+( 5.02)x( 0.01 )= 0.38 cfs

INLET CAPACITY

Inlet Worksheet (Sump Condition) for Basin LIN3

**Objective:** Design a Double C Inlet in Sump Condition for a 100-year flow of: 13.23 cfs

- Inlet to collect discharge before overtopping curb.  
Standard 8" curb and gutter.  
Dmax=10.75 in (0.9 ft) - Not 8" because standard inlet has 10.75" depression.



Weir Perimeter - Double 'C' = 2x18.5" + 2x35.5" = 9.00 ft  
Area of Orifice - Double 'C' = 18.5" x (2x35.5") = 9.12 sq ft

- Calculate Orifice and Weir Flow into Grate at Design Depth (0.9 ft)

Orifice Equation	Weir Equation
Where Q = 0.6 x A x (2 x g x h) <sup>1/2</sup> A = 9.120 sq. ft. g = 32.2 ft <sup>2</sup> /sec h = 0.9 ft Therefore Q = 41.65913778 cfs	Where Q=2.65 x P x H <sup>1/2</sup> P = 9.000 ft H = 0.9 ft Therefore Q = 23 cfs

Weir Equation controls  
Double "C" Inlet flow @ TBC = 23 cfs

- Apply 25% Clogging Factor to determine allowable design flow into inlet

23 x 0.75 17 cfs

Therefore Capacity of Double C Inlet in Sump Condition = 17 cfs.

- Compute the minimum inlet depth required, based on the orifice equation operating on the inlet discharge pipe.

Q to be discharged = 9.8 cfs

Orifice Equation
Where Q = 0.6 x A x (2 x g x h) <sup>1/2</sup> A = 1.767 sq. ft. ( 18 " pipe.) g = 32.2 ft <sup>2</sup> /sec h = 3.915 ft Therefore Q = 16.84 cfs

EXISTING 18" STORM DRAIN CAPACITY

Worksheet  
Worksheet for Circular Channel

Project Description	
Worksheet	Circular Channel
Flow Element	Circular Channel
Input	Manning's Formula
Solve For	Discharge
Input Data	
Manning's Coeff.	0.013
Channel Slope	0.00233 1/ft
Depth	1.80 ft
Diameter	18.0 in.
Results	
Discharge	5.97 cfs
Flow Area	1.6 ft <sup>2</sup>
Wetted Perim.	4.71 ft
Top Width	0.00 ft
Critical Depth	0.94 ft
Percent Full	100.0 %
Channel Slope	0.00233 1/ft
Velocity	3.36 ft/s
Velocity Head	0.16 ft
Specific Energy	1.68 ft
Froude Number	0.00
Maximum Disch	6.43 cfs
Discharge Full	5.97 cfs
Slope Full	0.00233 1/ft
Flow Type	Subcritical

Designed By:  
**HUITT-ZOLLARS**  
Huitt-Zollars, Inc.  
330 Rio Rancho Drive NE, Suite 101  
Rio Rancho, New Mexico 87124  
Phone (505) 892-5141 Fax (505) 892-3259



TITLE: <b>BJ'S BUILDING PERMIT DRAINAGE PLAN</b>			
Design	Review	Committee	City Engineer
Last Update		Mo./Day/Yr.	Mo./Day/Yr.
City Project No.		Zone Map No. <b>J-18-Z</b>	Sheet <b>C101</b> Of



