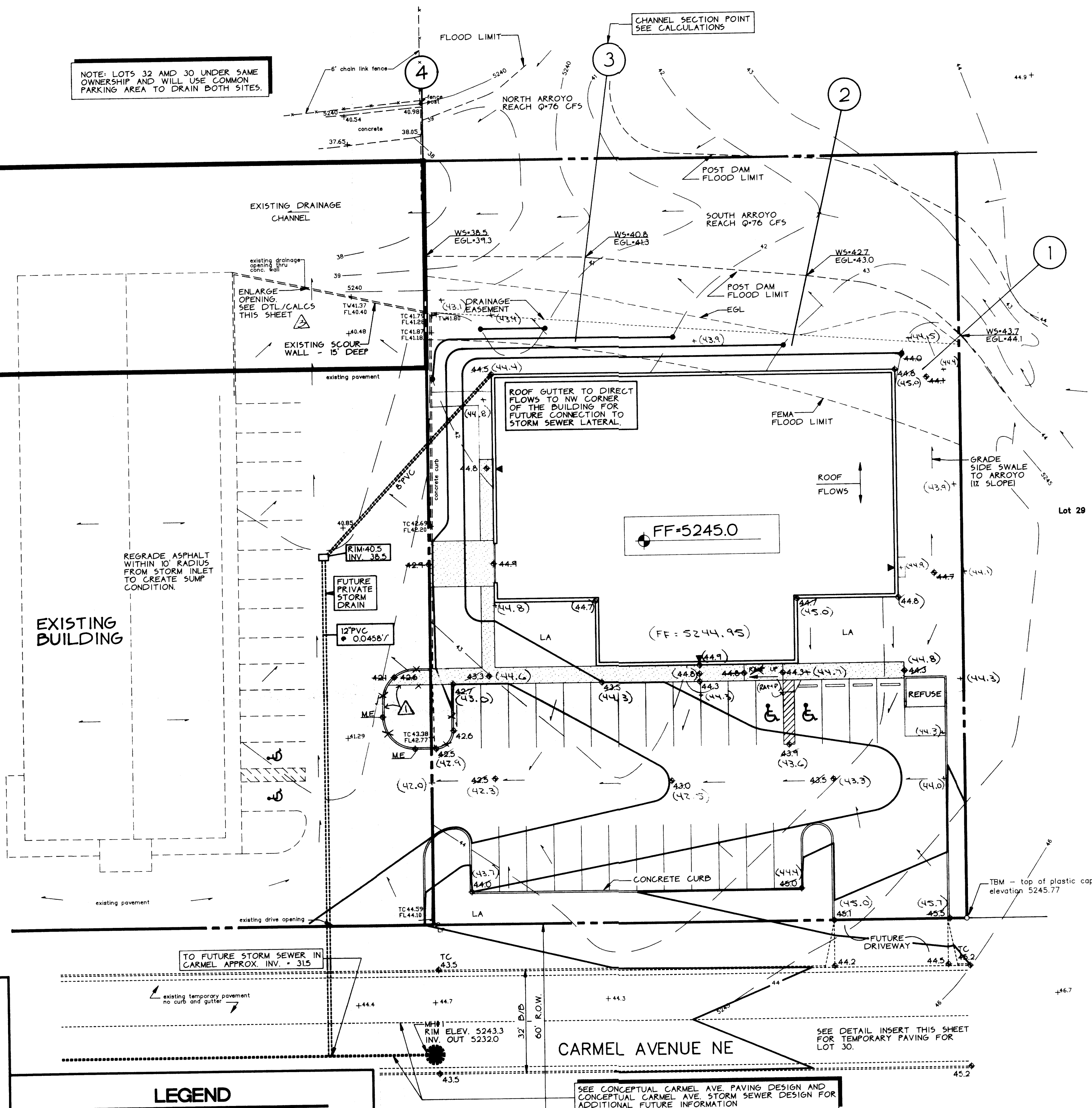


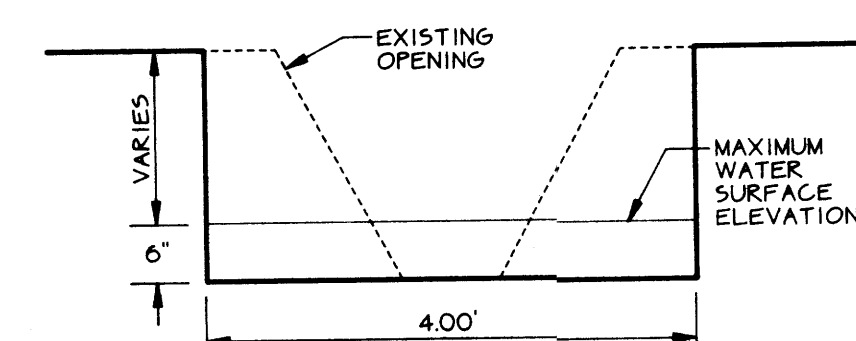


NOTE: LOTS 32 AND 30 UNDER SAME OWNERSHIP AND WILL USE COMMON PARKING AREA TO DRAIN BOTH SITES

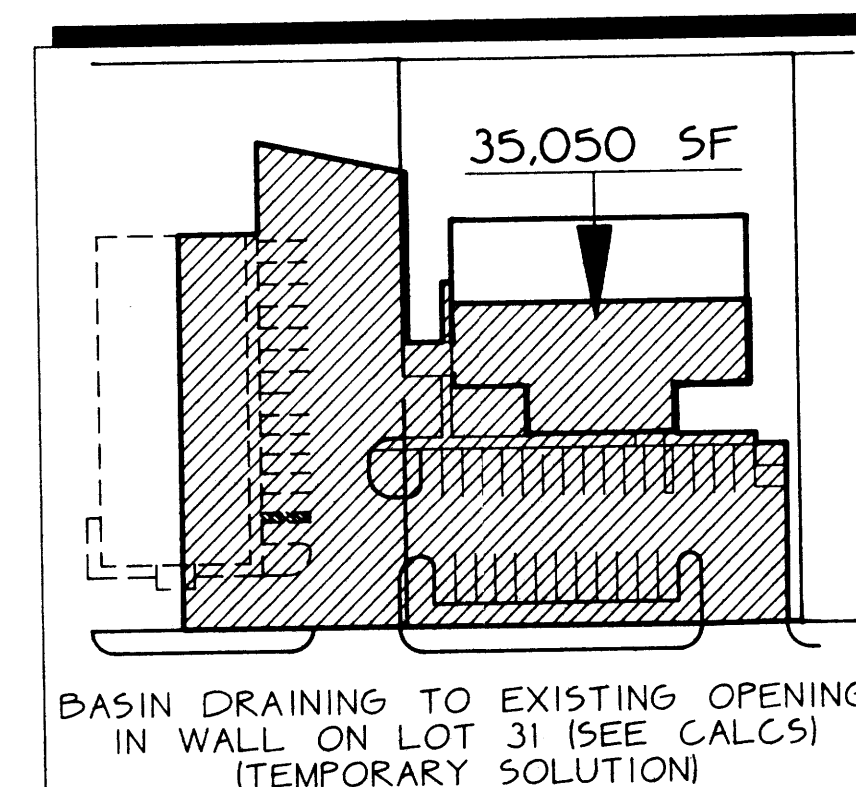


## LEGEND

	SIDEWALK, CURB AND GUTTER (EXISTING, PROPOSED)
	PROPOSED PAVED DRIVE
	BUILDING EXISTING, PROPOSED
	PROPERTY LINE
	EXISTING SPOT ELEVATION
	EXISTING CONTOUR
	PROPOSED SPOT ELEVATION
	PROPOSED CONTOUR
	SURFACE FLOW DIRECTION (EXISTING, PROPOSED)
	LANDSCAPED AREA
	MATCH EXISTING PAVING ELEVATION
	TOP OF RETAINING WALL (> 15' HIGH)
	TOP OF ASPHALT
	TOP OF CURB
	FLOW LINE
	FINISHED FLOOR
	PROPERTY LINE
	POWER POLE
	ENTRY / EXIT LOCATION



ENLARGE DRAINAGE OPENING  
IN CONC. WALL




BASIN DRAINING TO EXISTING OPENING  
IN WALL ON LOT 31 (SEE CALCS)  
(TEMPORARY SOLUTION)

## KEYNOTES

**AREAS OF MODIFICATION BETWEEN APPROVED DRAINAGE GRADING PLAN AND ACTUAL AS-BUILT**

1. Curb / Walk / Landscaped area not constructed. Does not affect Drainage / Grading.
2. As-built pond elevations differ from approved drainage / grading plan. Required volume is available (see attached Pond As-Built Information and Calculations).
3. Enlargement of existing opening in concrete wall not constructed per plan. Due to temporary storage of this opening (future flows to be collected in future storm drain), analysis indicates that this will have minimal effect on the storage. Based on calculations, the peak discharge flows will back up to an approximate depth of 1'. This will not effect adjacent buildings.

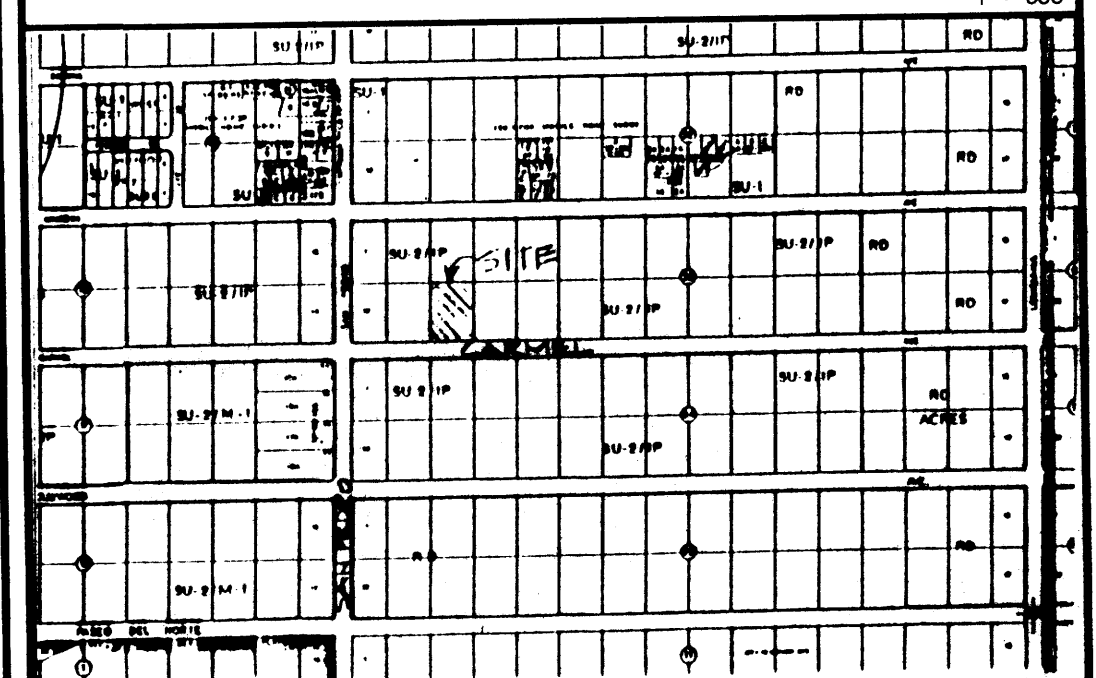
I, Christopher L. Weiss, P.E. hereby certify that the as-built information shown is in substantial compliance with the approved drainage / grading plan.

  
 Christopher L. Weiss, P.E. #0053

Date 6-29-96

As-Built Survey provided by Forstbauer Surveying Co. • June 1996

## VICINITY MAP #C-18



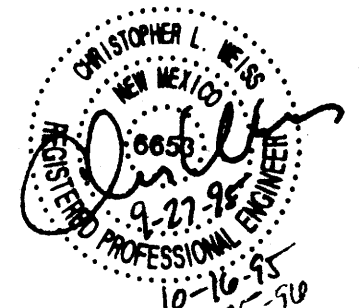
## FEMA MAP #10



**C.L. WEISS ENGINEERING, INC.**



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LOT 30 BLOCK 33 TRACT A UNIT B  
NORTH ALBUQUERQUE ACRES

Scale: 1" = 20'	Drawn By: DJP	Checked By: CLW	Job Number:	Date: OCT. 1995
<p><b>Drainage and Grading Plan</b></p> <p>JUN 25 1996</p>				<p><b>C-1</b></p> <p>SH. 1 OF 2</p>

10/17/95 09:57:31



Calculations are based on the Drainage Design Criteria for City of Albuquerque, Section 22.2, DPM, Vol. 1, dated Jan., 1993

AREA OF SITE: 38,823 SF = 0.89 Ac.

HISTORIC FLOWS:	DEVELOPED FLOWS:	EXCESS PRECIPITATION:
On-Site Land Condition	On-Site Historic Flow Rate	Prop. Zone
Area a = 38,823 SF	Area a = 12,428 SF	Ea = 0.66
Area b = 0 SF	Area b = 5,159 SF	Eb = 0.92
Area c = 0 SF	Area c = 0 SF	Ec = 1.29
Area d = 0 SF	Area d = 21,236 SF	Ed = 2.36
Total Area = 38,823 SF	Total Area = 38,823 SF	

On-Site Weighted Excess Precipitation (100-Year, 6-Hour Storm)	
Weighted E = $EaAa + EbAb + EcAc + EdAd$	
Historic E = 0.66 in.	Proposed E = 1.62 in.
On-Site Volume of Runoff, V360 = $E \cdot A / 12$	
Historic V360 = 2135 CF	Proposed V360 = 5255 CF
On-Site Peak Discharge Rate: $Qp = QpaAa + QpbAb + QpcAc + QpdAd / 43,560$	
For Precipitation Zone 3	
Qpa = 1.87	Qpc = 3.45
Qpb = 2.60	Qpd = 5.02
Historic Qp = 1.7 CFS	Proposed Qp = 3.3 CFS

#### APPROVED DESIGN

#### OPEN CHANNEL - UNIFORM FLOW

Section 1 - Trapezoidal Channel	Section 2 - Triangular Channel
Bottom Width 8.00 ft	Left side slope 37.00:1
Left side slope 9.00:1	Right Side Slope 24.00:1
Right Side Slope 6.00:1	Manning's n 0.025
Manning's n 0.025	Channel Slope 0.0214 ft/ft
Channel Slope 0.0130 ft/ft	Discharge 76.0 cfs
Discharge 76.0 cfs	Depth 0.74 ft
Depth 0.97 ft	Velocity 4.50 fps
Velocity 5.11 fps	EG 0.3 ft
EG 0.4 ft	

Section 3 - Triangular Channel	Section 4 - Trapezoidal Channel
Bottom Width 17.00:1	Bottom Width 26.00 ft
Left side slope 27.00:1	Left side slope 19.00:1
Right Side Slope 27.00:1	Right Side Slope 9.00:1
Manning's n 0.025	Manning's n 0.025
Channel Slope 0.0280 ft/ft	Channel Slope 0.0385 ft/ft
Discharge 76.0 cfs	Discharge 152 cfs
Depth 0.80 ft	Depth 0.61 ft
Velocity 5.40 fps	Velocity 7.23 fps
EG 0.5 ft	EG 0.8 ft

From field inspection and FEMA contour map analysis, the total flows within the common parking lot between Lots 31 and 30 will discharge into the arroyo via the existing opening in the concrete wall. (See insert for Basin area - sheet one of two)

Total SF of basin = 36750 SF = 0.8 Ac.

The following calculations are based on Treatment areas as shown in table to the right.

Off-Site Weighted Excess Precipitation (see formula above)	
Weighted E = 2.25 in.	
Off-Site Volume of Runoff (see formula above)	
V360 = 6900 CF	
Off-Site Peak Discharge Rate: (see formula above)	
Qp = 4.1 cfs	

TREATMENT
A = 0%
B = 0%
C = 10%
D = 90%

These flows enter the arroyo thru the modified opening in the concrete wall. Existing native grasses and asphalt remnants will help to minimize erosion in this area.

Widen existing opening	Q = 4.1 cfs
Broad Crested Weir For C	Q = 3.79 cfs
H	= 0.5 ft
L	= 3.9 ft

Designed for L = 4.0' OK

#### INTERIM SOLUTION

A pond will be constructed at the north end of Lot 31 (same owner) to pick up the fully developed vol. from Lot 30 of 5255 CF.

POND VOLUME CALCS	AREA (SF)	VOLUME (CF)
Area of 37 contour = 4599		
Area of 36 contour = 3237	3918	
Area of 35.5 contour = 2604	1460	

5378 > 5255 OK

#### BASIN SWAP

See Sheet one of two for Basin Swap boundaries for Lots 30 and 31.

From as-built and proposed grades provided, by locating the storm inlet on Lot 31 as shown, the volume from Lot 31 diverted to the Carmel storm drain =

Total SF of basin = 8276 SF = 0.2 Ac.

The following calculations are based on Treatment areas as shown in table to the right.

Off-Site Weighted Excess Precipitation (see formula above)	
Weighted E = 2.36 in.	
Off-Site Volume of Runoff (see formula above)	
V360 = 1628 CF	
Off-Site Peak Discharge Rate: (see formula above)	
Qp = 1.0 cfs	

TREATMENT
A = 0%
B = 0%
C = 0%
D = 100%

From as-built and proposed grades provided, the volume from Lot 30 which will continue to drain to the North arroyo is

Total SF of basin = 13504 SF = 0.3 Ac.

The following calculations are based on Treatment areas as shown in table to the right.

Off-Site Weighted Excess Precipitation (see formula above)	
Weighted E = 0.90 in.	
Off-Site Volume of Runoff (see formula above)	
V360 = 1016 CF	
Off-Site Peak Discharge Rate: (see formula above)	
Qp = 0.8 cfs	

TREATMENT
A = 70%
B = 0%
C = 25%
D = 5%

BASIN SWAP: 1.0 cfs > 0.8 cfs

Thus, the basin swap is successful and actually reduces the flows to the north arroyo by 0.2 cfs.

INLET ANALYSIS
Grate: Neenah R-3348
Q (cfs) = $C \cdot A \cdot 2gh$
Where
C = 0.6
A = 1.9
h = 0.5
Q (cfs) Capacity = 6.5
Q (cfs) Actual = 3.5 OK

#### CULVERT SIZING

From Drainage / Grading Plan Analysis:

Flow to on-site storm sewer system = 3.5 cfs (All Lot 30 = 3.3 cfs, less Lot 30 Basin draining to arroyo = 0.8 cfs + Lot 31 flows = 1.0 cfs)

Max Flows: 3.5 CFS

Based on Manning's Equation, a 12" dia. pvc pipe with n = 0.01, s = 0.00507', the full flow capacity 3.6 CFS

#### SCOPE

The proposed improvements include an approximately 10,000 SF (approx. footprint) building area with adjacent concrete and asphalt paved walkways / parking areas, general site work and site regrading.

The present site is an undeveloped commercial property which slopes at appx. 3% to the northwest. Carmel Avenue, NE abuts the property to the south.

The intent of this plan is to show:

- Grading relationships between the existing ground elevations and proposed finished elevations in order to facilitate positive drainage to designated discharge points.
- The extent of proposed site improvements, including buildings, walks and pavement.
- The flow rate/volume of rainfall runoff across or around these improvements and methods of handling these flows to meet City of Albuquerque requirements for drainage management.
- The relationship of on-site improvements with existing neighboring property to insure an orderly transition between proposed and surrounding grades.

LEGAL: Lot 30, Block 33, T. A, U. B North Albuquerque Acres, Albuquerque, NM.

SURVEYOR: Ron Forstbauer Surveying Co. / Topographical.

B.M.: City of Albuquerque 11-D18, a brass cap set in concrete located in the southeast quadrant of the intersection of San Pedro Drive and Paseo Del Norte NE. Elev. = 5235.67 ft (M.S.L.D.)

T.B.M.: South east corner of site, Top of plastic cap. Elev. = 5245.77

SOILS: Soil classification per USGS Soil survey, Embudo-Tijeras Complex: (EIC) soil is predominately gravelly fine sandy loam. Hydrologic soil group: B.

FLOOD ZONE: The site is presently shown in a 100 yr. flood zone defined by the North Domingo Baca Arroyo. This arroyo is contained by a flood control dam which was designed by RTI, Inc. and completed this year.

Mr. Don Dixon, RTI, Inc., supplied the following updated flood data for the remaining basin downstream from the existing dam. This basin is divided into two flow paths, the south reach, which passes across the NE corner of the site, and the north reach, which joins up with the south reach at the west limits of the property.

- Existing downstream conditions with dam = 41cfs, each arroyo reach. (This refers to the existing basin conditions with the dam in place)
- Future downstream conditions with dam = 76 cfs, each arroyo reach. (This refers to the developed basin conditions with the dam in place)
- "After-dam" flows are assumed to follow the present arroyos. Once development occurs upstream of the site, there will be a high likelihood that these flows will be intercepted by future street and storm drainage improvements, thus reducing or eliminating this flow route. However, this is not a given, so the building site will be developed under the 76 cfs criteria.

#### DESIGN CRITERIA

Per COA guidelines, this site will not be allowed to discharge its developed flows into the present channel at the rear of Lot 30. Two actions are presently being completed which will have an effect on this channel.

- The flood plain maps are being amended to remove this area from a flood status. This action reflects the presence of the recently completed Domingo Baca Dam, which will capture these flows and outlet through a 48" dia. storm sewer located in Anaheim Ave.
- An R-1 subdivision is being planned for the area east of this site referenced as Phase 2 of the La Cueva Oeste Subdivision. This area now comprises the remaining basin and accounts for a peak flow rate of 156 cfs which presently drains through this property's channel. As part of the development process for the subdivision, Mr. Terry Brown relayed to us that the developer will be required to take all flows to the adjoining streets within storm sewers in order to "dry" up the channel. We have checked with Mr. Brown concerning the connection of our site to the proposed system in Carmel (by others) and have provided the ultimate storm sewer data on the drainage / grading plan provided with this submital.

As an interim solution to the problem, (to be utilized until the proposed Carmel storm drain is constructed), we would like to propose the following:

Referencing the documents provided by the City Floodplain Administrator, Ms. Susan Calongne - i.e., the La Cueva Oeste Subdivision, Phase 1 Drainage Report, dated September 1, 1995, prepared by RTI - it can be seen that this site (lot 30) is designated as part of the drainage basin that drains to the Carmel Ave. system. However, the proposed finished site improvements (lot 30) will be tied to the existing drainage patterns of the adjoining site (lot 31 - same Owner) that presently drains to the historic arroyo on the north. Lot 31 is part of the developed basin which will continue to drain to the historic channel, which in the ultimate condition, will contribute 14 cfs to a future storm drainage system draining to the Anaheim pipe (reference page #4, last paragraph of the La Cueva Oeste Subdivision, Phase 1 Drainage Report). Any additional flows to AP1 will be restricted because the Anaheim pipe and downstream outfall arroyos will flow at capacity.

What we propose is to allow the flows generated by the site improvements of lot 30 to continue to flow to the arroyo via the existing drainage patterns of lot 31, but capture the Lot 30 on-site developed volume in a pond depression located in the arroyo bed behind the existing building of lot 31 (same owner see plan). This pond depression will be maintained by Owner as part of the interim solution. Once the ultimate solution is completed, the interim pond area can be removed - see interim solution inset, DG sheet one of two.

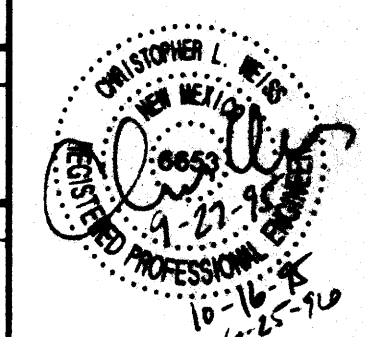
When the ultimate drainage system is established for the area, in particular, when the SS is installed in Carmel Ave. as part of the development required for the La Cueva Oeste Subdivision, Phase 2, Owner will install a private storm inlet in the flow path of lots 30 and 31 to intercept the equivalent peak / volume generated by lot 30 alone and direct the outflow to the SS in Carmel Ave. (see plan). This solution will accomplish an interbasin transfer by reducing the basin draining to San Pedro while allowing a portion of lot 30 to continue draining to the arroyo with no change of the final peak of 14 cfs. Additionally, the placement of the inlet at the midpoint of the existing parking for lot 31 will enable a storm drain connection to Carmel Ave. without having to regrade either lot. The preliminary grades for the inlet as shown indicate that a connection can be made to the Carmel Ave. SS for a 6 to 7' depth range.

In addition to addressing the drainage situation for this property, we have also included a typical street section and final grades for Carmel, directly adjacent to Lot 30. In discussions with Mr. Terry Brown, we agreed to establish street grades for the section of Carmel Ave. between San Pedro and the east side of Lot 30 approximately one foot below existing ground. He will be establishing street grades for Carmel Ave. to the east within their site.

## KEYNOTES

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LOT 30 BLOCK 33 TRACT A UNIT B  
NORTH ALBUQUERQUE ACRES

Scale: 1" = 20'  
Drawn By: BJB  
Checked By: CLW  
Job Number:  
Date: SEPT. 1995

Drainage and  
Grading Plan Information  
C-2  
SH. 2 OF 2