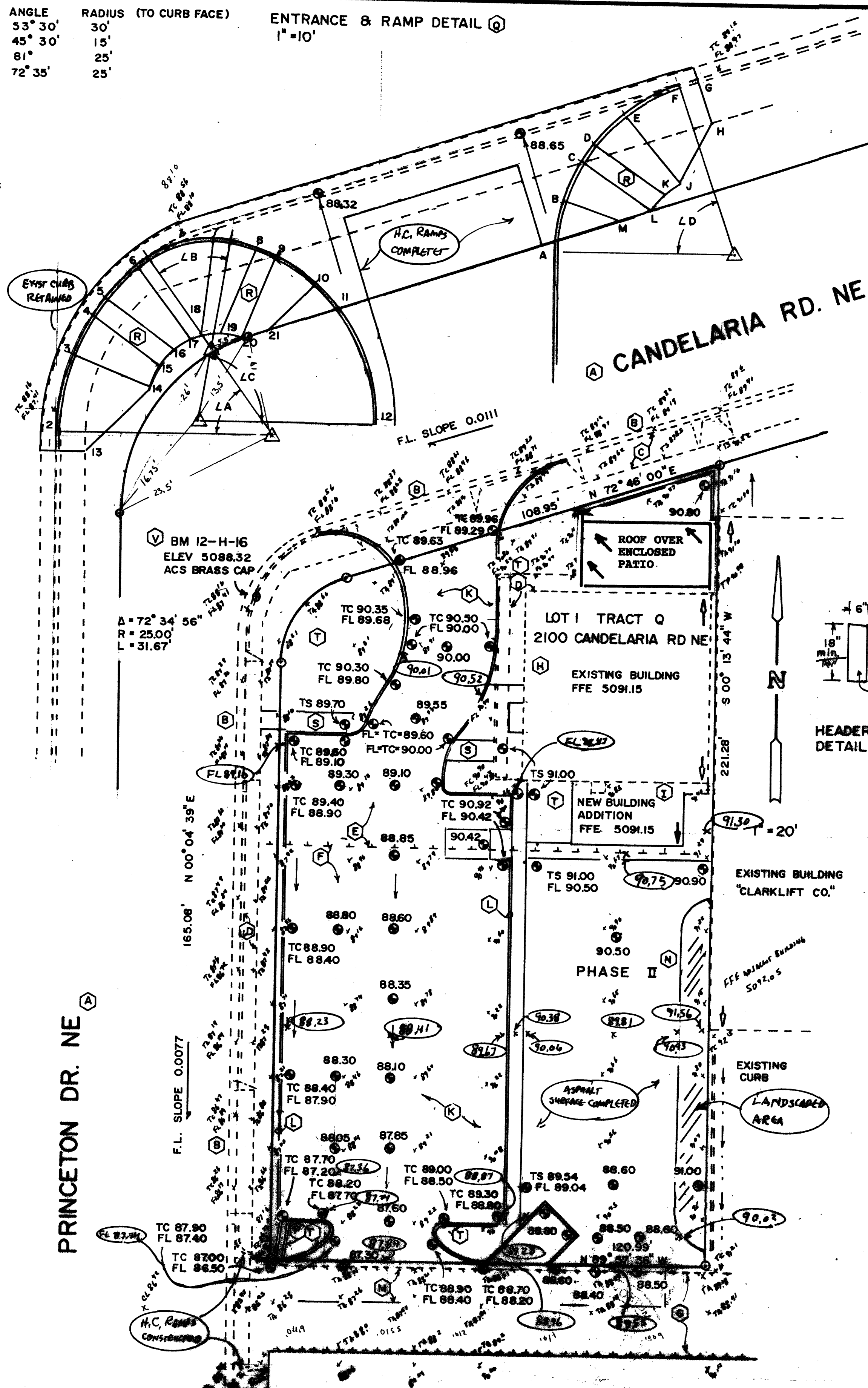


ANGLE	A	ANGLE	B	RADIUS (TO CURB FACE)	ENTRANCE & RAMP DETAIL
	53° 30'		45° 30'	30'	1"=10'
	81°		81°	25'	
	72° 35'		72° 35'	25'	

SPOT ELEVATIONS

1	TC	88.03
2	FL	87.36
3	FL	87.38
4	TC	88.26
5	FL	87.72
6	TC	88.39
7	FL	87.92
8	TC	88.96
9	FL	88.29
10	TC	88.63
11	FL	88.59
12	TC	89.34
13	FL	88.68
14	TC	89.07
15	FL	88.79
16	TC	88.72
17	FL	88.79
18	TC	88.92
19	FL	88.92
20	TC	89.49
21	FL	88.96

A	TC	89.96
B	TC	89.29
C	TC	89.88
D	TC	89.21
E	TC	89.18
F	TC	89.14
G	TC	89.10
H	TC	89.69
I	TC	89.02
J	TC	89.57
K	TC	88.90
L	TC	89.61
M	TC	88.94
N	TC	89.73
O	TC	90.00
P	TC	90.10
Q	TC	90.14
R	TC	90.00



LEGEND	EXISTING	PROPOSED
CONTOUR LINE	---	---
SPOT ELEVATION	●	●
TOP OF WALL	---	---
TOP OF PAVEMENT	---	---
FLOW LINE INVERT	---	---
TOP OF CURB	---	---
TOP OF SIDEWALK	---	---
STRUCTURE	---	---
SWALE	---	---
ROOF DRAIN	---	---

BENCHMARK: Station 12-B16, located on the curb at the southeast quadrant at the intersection of Candelaria Road and Princeton Drive, NE. Elevation is 5088.32.

NOTES

- The streets in the public right-of-way of Candelaria Road and Princeton Drive are presently surfaced with an asphalt surface with a standard 8" high curb and gutter.
- Existing standard driveway cut.
- Existing 6' wide sidewalk.
- Existing 4' wide sidewalk.
- Existing asphalt surface.
- Existing gravelled surface.
- Existing asphalt surfaced alleyway.
- Existing building to be remodeled.
- New building addition. For detailed building dimensions see architectural drawings.
- New parking area, with hard surface and landscaping.
- New header curb, see detail.
- Remove asphalt surfacing in alleyway as shown and resurface to elevations shown on this plan.
- Existing gravel surface to be graded to drain, generally to surface elevations shown. Phase II will consist of surfacing this area with an asphalt surface to elevations as shown, with partial landscaping.
- Runoff channel, 12" wide with 6" high side curbs.
- Private entrance, see City of Albuquerque standard drawing 2426.
- Wheel Chair Ramp, see City of Albuquerque standard drawing 2441.
- Wheel chair access ramp.
- Landscaped area.
- All berms and earthwork supporting non-building structures must be compacted to 95% of maximum dry density (Modified Proctor Test) to depth of undisturbed earth. Buildings may require separate subsurface soils testing and preparation.
- The contractor shall notify the City of Albuquerque Surveyor prior to any disturbing of the permanent survey benchmark.

May 20, 1996

Runoff for Lot 1, Tract Q, Menaul Development Area, Milly's Sandwich Shop, 2100 Candelaria Road, NE

TABLE A
Runoff Estimate: For On-site Basin of .56 acres, (Lot 1).

Runoff Factors			UNDEVELOPED			PROPOSED USE				
Zone 2										
Land use	Peak	Total	Area	Percent	Peak	Total	Area	Percent	Peak	Total
	CFS/acre	inches	SF		Runoff	Runoff	SF		Runoff	Runoff
A	1.56	0.53	24450	1.000	0.9	1079.9	0	0.000	0.0	0.0
B	2.28	0.78	0	0.000	0.0	0.0	3800	0.155	0.2	247.0
C	3.14	1.13	0	0.000	0.0	0.0	0	0.000	0.0	0.0
D	4.70	2.12	0	0.000	0.0	0.0	20650	0.845	2.2	3648.2
TOTALS			24450	1.000	0.9	1079.9	24450	1.000	2.4	3895.2
			0.561	acre						

TABLE B-1
Runoff Estimate: For Off-site Basin of 40 acres, (Candelaria Road basin)

Zone 2			UNDEVELOPED USE				PROPOSED USE			
Land use	Peak CFS/acre	Total inches	Area SF	Percent	Peak Runoff CFS	Total Runoff CF	Area SF	Percent	Peak Runoff CFS	Total Runoff CF
A	1.56	0.53	1750000	1.000	62.7	77291.7	0	0.000	0.0	0.0
B	2.28	0.78	0	0.000	0.0	0.0	250000	0.143	13.1	16250.0
C	3.14	1.13	0	0.000	0.0	0.0	0	0.000	0.0	0.0
D	4.70	2.12	0	0.000	0.0	0.0	1500000	0.857	161.8	265000.0
TOTALS			1750000	1.000	62.7	77291.7	1750000	1.000	174.9	281250.0
			40.174 acre							

TABLE B-2
Runoff Estimate: For Off-site Basin of 4 acres, ALLEYWAY.

Runoff Factors			UNDEVELOPED USE			PROPOSED USE				
Zone 2										
Land use	Peak	Total	Area	Percent	Peak	Total	Area	Percent	Peak	Total
	CFS/acre	inches	SF		Runoff	Runoff			Runoff	Runoff
					CFS	CF			CFS	CF
A	1.56	0.53	174500	1.000	6.2	7707.1	0	0.000	0.0	0.0
B	2.28	0.78	0	0.000	0.0	0.0	25000	0.143	1.3	1625.0
C	3.14	1.13	0	0.000	0.0	0.0	0	0.000	0.0	0.0
D	4.70	2.12	0	0.000	0.0	0.0	149500	0.857	16.1	26411.7
TOTALS			174500	1.000	6.2	7707.1	174500	1.000	17.4	28036.7
			4.006 acre							

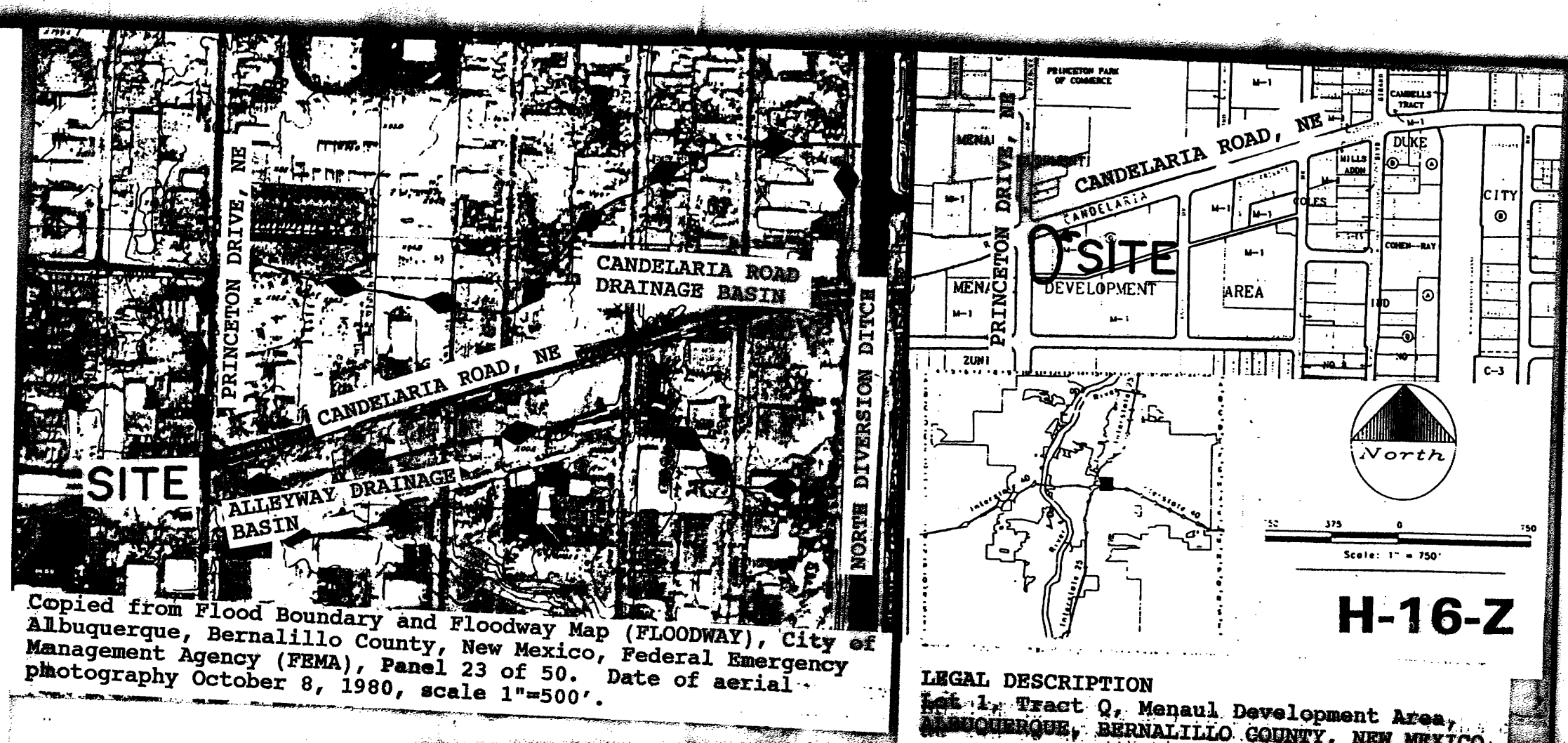
NOTES:

- Runoff factors from Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, City of Albuquerque, Bernalillo County and AMAFCA, January, 1993
- Land use descriptions: A. Uncompacted soil, unlined arroyos
B. Lawn, shrubs, undeveloped 10%-29% slopes
C. Compacted soil, undeveloped 20% or more slope
D. Impervious areas
- Peak runoff = Area (acres) x factor (CFS/acre) = CFS
- Total runoff = Area (SF) x factor (inches) / 12 (inches/foot) = CF
- Peak and total runoff is based on 6 hour, 100 year frequency storm
- The undeveloped use is for the site in its natural state.

The proposed use is for full development of the basin, under present zoning

Manning's n	Ditch slope	Side slope	Bottom width	Depth ft	Area SF	Wetted Perimeter ft	Hydraulic Radius ft	Velocity FPS	Capacity CFS	Froude # V/(gD) ^{.5}	Sequent depth		Sloped (B) Ft
											Rectangular (C)	(D) Ft	
CHANNEL SECTION AT SECTION A-A, CANDELARIA ROAD NORTH OF LOT 1													
1	0.013	11.000	0	60.0	0.30	18.0	60.600	0.297	5.337	96.064	1.72	0.59	0.69
2	0.013	11.000	0	60.0	0.40	24.0	60.800	0.395	6.451	154.825	1.80	0.84	0.97
3	0.013	11.000	0	60.0	0.50	30.0	61.000	0.492	7.469	224.084	1.86	1.09	1.27
REQUIRED Q100 = 174.9 CFS													
CHANNEL SECTION AT SECTION B-B, ALLEYWAY SOUTH OF LOT 1													
1	0.013	11.000	0	20.0	0.10	2.0	20.200	0.099	2.566	5.131	1.43	0.16	0.19
2	0.013	11.000	0	20.0	0.30	6.0	20.600	0.291	5.268	31.605	1.69	0.58	0.68
3	0.013	11.000	0	20.0	0.50	10.0	21.000	0.476	7.311	73.105	1.82	1.06	1.24
REQUIRED Q100 = 17.4 CFS													

- Ft(vertical)/1000 Ft(horizontal)
- Ft(horizontal)/1 Ft(vertical)
- Froude No. (Fn)=velocity/(g x area/top width)^{0.5}
- Sequent depth for rectangular channel, $y_2=(y_1/2)((1+8 \times Fn^2)^{.5}) - y_1$
- Sequent depth for sloping rectangular channel, $y_2=((y_1/2)/\cos \text{ slope angle}) \times ((1+8((10^{-1.027 \times \text{ slope angle}})^2 \times Fn^2)^{.5}) - y_1)$
- Correction factor for trapezoidal channel, figure 3.4
- Reference: Richard H French, Open Channel Hydraulics, 1985



PURPOSE:

The purpose of this grading and drainage plan is to obtain approval for a building permit for an addition to an existing building. The existing building is a restaurant, with a walled, open to the sky patio. The owner now requests approval to enclose the patio area, to include a roof.

Soils on lot are identified by reference C as Cut and fill land. The exposed surface shows gravel and sand which is well compacted from prior use as a parking area. The existing asphalt surface shows very little sign of subsurface failures. The soil appears suitable for pavement with subgrade compaction to 95% of maximum dry density.

DISCUSSION:
A. The existing restaurant building and parking lot were completed in 1996 according to the Grading and Drainage Plan H-16/D-118, approved on June 18, 1996, with Certification accepted on September 30, 1996.
B. The 1996 approved plan included a paved patio area. The owner now proposes to cover the area with a roof. The runoff from the roof area will enter the gravel mulched landscaped area surrounding the roof area. Capture of the water within the landscape is proposed as a method of water harvest to conserve tap water.
C. The covering of the patio area will convert about 60 square feet of gravel mulched landscape which is now inside the walled area to impervious roof area. The increase in runoff from the site will not result in additional hazard to on-site or off-site facilities.
D. The addition to the building is not within an identified flood plain.

CONCLUSIONS:
A. The proposed construction is not within a designated 100 year floodplain.
B. Construction as proposed will not increase the hazard from flooding to downstream properties.
C. This Grading and Drainage Plan does not propose changes to the FLOODWAY or FIRM maps.

REFERENCES:
A. Bernalillo County Ordinance No. 90-6
B. Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, for the City of Albuquerque...Bernalillo County...AMAFCA, January 1993.
C. Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, USDA-SCS.
D. Flood Insurance Rate Map (FIRM), City of Albuquerque, Bernalillo County, New Mexico, Federal Emergency Management Agency (FEMA), Panel 23 of 50. Date of aerial photography October 8, 1980, scale 1"=500'.
E. Flood Boundary and Floodway Map (FLOODWAY), City of Albuquerque, Bernalillo County, New Mexico, Federal Emergency Management Agency (FEMA), Panel 23 of 50. Date of aerial photography October 8, 1980, scale 1"=500'.
F. Open-channel Hydraulics, Richard H. French, McGraw-Hill Book Company, 1985.

Add roof to patio MRK Sep 21, 1999

Marvin R. Kortum		May 20, 1996	
BY		DATE	
CHANGES			
GRADING AND DRAINAGE PLAN LOT 1, TRACT Q, MENAUL DEVELOPMENT AREA 2100 CANDELARIA RD. NE MILLY'S SANDWICH SHOP			
PROJECT NO.		MAP NO.	
H-16/D118		H-16	
SHEET		OF	
1		1	

ANGLE	A	ANGLE	RADIUS (TO CURB FACE)	ENTRANCE & RAMP DETAIL
"	B	53° 30'	30'	1"=10'
"	C	45° 30'	15'	
"	D	81°	25'	
"	E	72° 35'	25'	

SPOT ELEVATIONS

1 TC 88.03
FL 87.36
2 TC 88.05
FL 87.38
3 TC 88.26
FL 87.59
4 TC 87.76
FL 87.72
5 TC 87.83
FL 87.79
6 TC 88.59
FL 87.92
7 TC 88.96
FL 88.29
8 TC 88.53
FL 88.49
9 TC 88.63
FL 88.59
10 TC 89.43
FL 88.76
11 TC 89.63
FL 88.96
12 TC 90.34
FL 89.68
13 TS 88.07
FL 88.49
14 TS 87.59
FL 88.72
15 TS 88.72
FL 88.96
16 TS 88.79
FL 89.21
17 TS 88.92
FL 89.29
18 TS 89.29
FL 89.49
19 TS 89.49
FL 89.59
20 TS 89.59
FL 89.65

A TC 89.96
FL 89.29
B TC 89.88
FL 89.21
C TC 89.18
FL 89.14
D TC 89.14
FL 89.10
E TC 89.69
FL 89.02
F TC 89.57
FL 88.90
G TC 89.61
FL 88.94
H TS 89.73
J TS 90.00
K TS 90.10
L TS 90.14
M TS 90.00



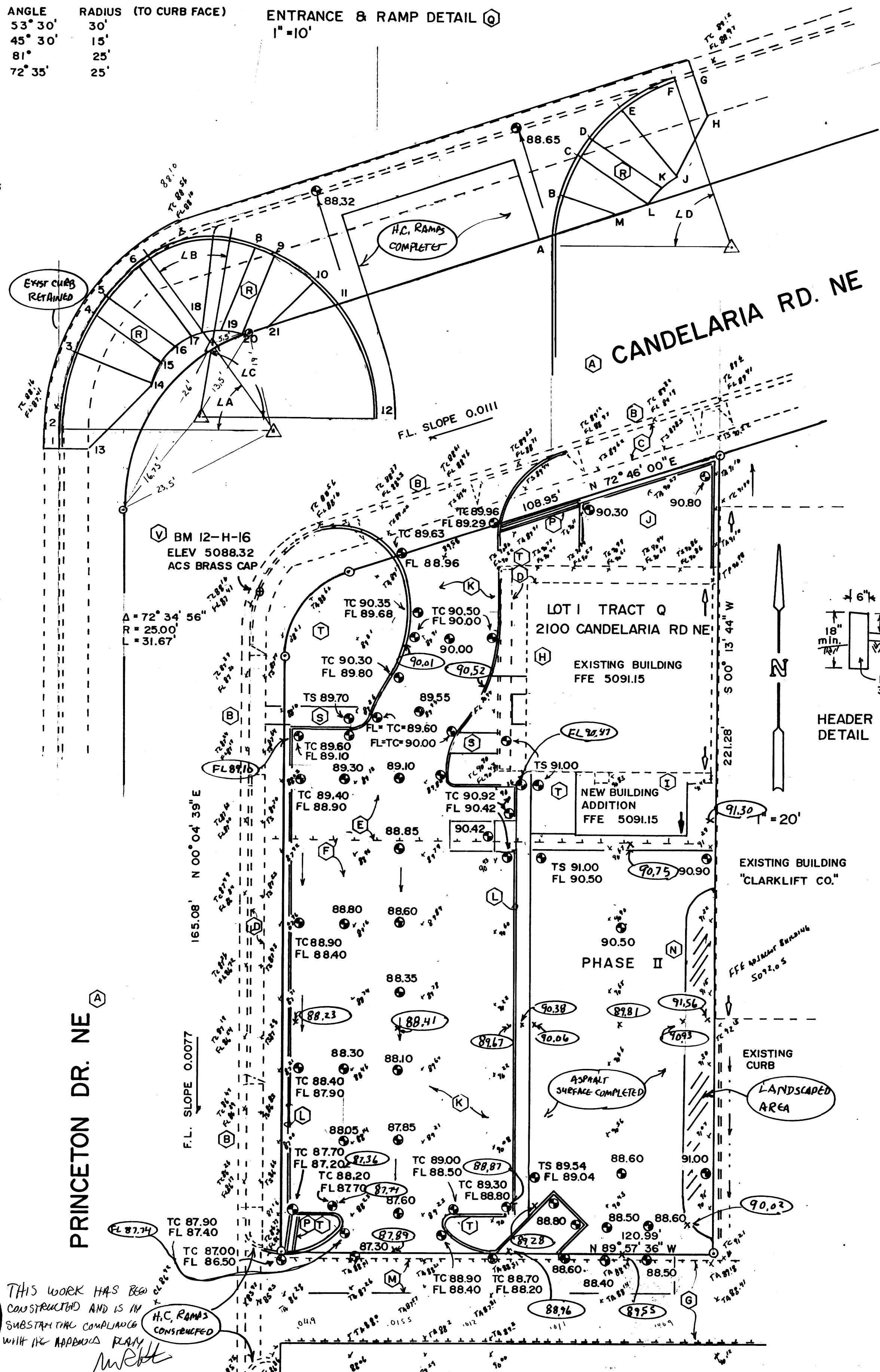
THIS WORK HAS BEEN
CONSTRUCTED AND IS IN
SUBSTANTIAL COMPLIANCE
WITH THE APPROVED PLAN
DATE 5/27/1996

Certification for Grading and Drainage Plan for Lot 1, Tract Q, Menaul Development (2100 Candelaria NE, corner of Candelaria Road and Princeton Drive NE) (Map No. H-13) (Drainage Plan # H16/D118)

I certify that I have inspected the completed site and find that the construction has been completed substantially according to the approved design. Phase II pavement has been completed, as well, with a landscaping strip as shown on this as-built drawing. As-built elevations and notes are as shown.

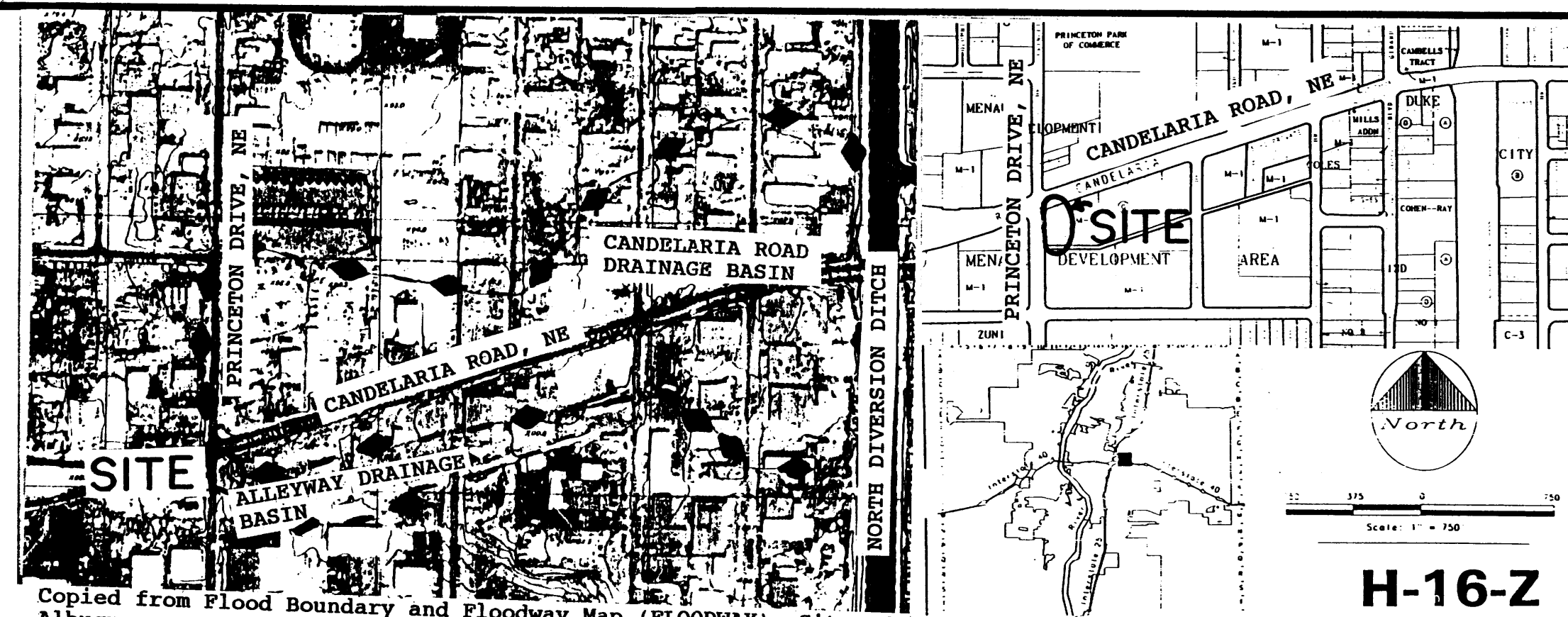
Marvin R. Kortum
NMP# 6519

BENCHMARK: Station 12-B16, located on the curb at the southeast quadrant at the intersection of Candelaria Road and Princeton Drive, NE. Elevation is 5088.32.



LEGEND	EXISTING	PROPOSED
CONTOUR LINE	---	---
SPOT ELEVATION	---	---
TOP OF WALL	---	---
TOP OF PAVEMENT	---	---
FLOW LINE INVERT	---	---
TOP OF CURB	---	---
TOP OF SIDEWALK	---	---
STRUCTURE	---	---
SWALE	---	---
ROOF DRAIN	---	---

NOTES
A. The streets in the public right-of-way of Candelaria Road and Princeton Drive are presently surfaced with an asphalt surface with a standard 8" high curb and gutter.
B. Existing standard driveway cut.
C. Existing 6' wide sidewalk.
D. Existing 4' wide sidewalk.
E. Existing asphalt surface.
F. Existing gravelled surface.
G. Existing asphalt surfaced alleyway.
H. Existing building to be remodeled.
I. New building addition. For detailed building dimensions see architectural drawings.
J. New patio dining area, with hard surface and landscaping.
K. New asphalt surfaced driveway and parking area.
L. New header curb, see detail.
M. Remove asphalt surfacing in alleyway as shown and resurface to elevations shown on this plan.
N. Existing gravel surface to be graded to drain, generally to surface elevations shown. Phase II will consist of surfacing this area with an asphalt surface to elevations as shown, with partial landscaping.
P. Runoff channel, 12" wide with 6" high side curbs.
Q. Private entrance, see City of Albuquerque standard drawing 2426.
R. Wheel Chair Ramp, see City of Albuquerque standard drawing 2441.
S. Wheel chair access ramp.
T. Landscaped area.
U. All berms and earthwork supporting non-building structures must be compacted to 95% of maximum dry density (Modified Proctor Test) to depth of undisturbed earth. Buildings may require separate subsurface soils testing and preparation.
V. The contractor shall notify the City of Albuquerque Surveyor prior to any disturbing of the permanent survey benchmark.



Copied from Flood Boundary and Floodway Map (FLOODWAY), City of Albuquerque, Bernalillo County, New Mexico, Federal Emergency Management Agency (FEMA), Panel 23 of 50. Date of aerial photography October 8, 1980, scale 1"=500'.

LEGAL DESCRIPTION
Lot 1, Tract Q, Menaul Development Area,
ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO

May 20, 1996
RUNOFF FOR LOT 1, TRACT Q, MENAUL DEVELOPMENT AREA, MILLY'S SANDWICH SHOP, 2100 CANDELARIA ROAD, NE

TABLE A										
Runoff Estimate: For On-site Basin of .56 acres, (LOT 1).										
Runoff Factors			UNDEVELOPED			PROPOSED USE				
Zone 2										
Land use	Peak	Total	Area Percent		Peak	Total	Area	Percent	Peak	T
	CFS/acre	inches	SF		Runoff	Runoff	SF		Runoff	Run
A	1.56	0.53	24450	1.000	0.9	1079.9	0	0.000	0.0	
B	2.28	0.78	0	0.000	0.0	0.0	3800	0.155	0.2	2
C	3.14	1.13	0	0.000	0.0	0.0	0	0.000	0.0	
D	4.70	2.12	0	0.000	0.0	0.0	20650	0.845	2.2	36
TOTALS			24450	1.000	0.9	1079.9	24450	1.000	2.4	38

TABLE B-1										
Runoff Estimate: For Off-site Basin of 40 acres, (Candelaria Road basin)										
Runoff Factors			UNDEVELOPED USE				PROPOSED USE			
Zone 2										
Land use	Peak	Total	Area Percent		Peak	Total	Area Percent		Peak	Total
	CFS/acre	inches	SF		CFS	CF	SF		CFS	CF
A	1.56	0.53	1750000	1.000	62.7	77291.7	0	0.000	0.0	0.0
B	2.28	0.78	0	0.000	0.0	0.0	250000	0.143	13.1	16250.0
C	3.14	1.13	0	0.000	0.0	0.0	0	0.000	0.0	0.0
D	4.70	2.12	0	0.000	0.0	0.0	1500000	0.857	161.8	265000.0
TOTALS			1750000	1.000	62.7	77291.7	1750000	1.000	174.9	281250.0
			40.174	acre			40.174	acre		

TABLE B-2

Runoff Estimate: For Off-site Basin of 4 acres, ALLEYWAY.

40.174 acre

Runoff Factors			UNDEVELOPED USE			PROPOSED USE				
Zone 2										
Land use	Peak	Total	Area	Percent	Peak	Total	Area	Percent	Peak	Total
	CFS/acre	inches	SF		Runoff	Runoff	SF		Runoff	Runoff
A	1.56	0.53	174500	1.000	6.2	7707.1	0	0.000	0.0	0.0
B	2.28	0.78	0	0.000	0.0	0.0	25000	0.143	1.3	1625.0
C	3.14	1.13	0	0.000	0.0	0.0	0	0.000	0.0	0.0
D	4.70	2.12	0	0.000	0.0	0.0	149500	0.857	16.1	26411.7
TOTALS			174500	1.000	6.2	7707.1	174500	1.000	17.4	28036.7
			4.006 acre				4.006 acre			

NOTES:
a. Runoff factors from Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, City of Albuquerque, Bernalillo County and AMAPCA, January, 1993
b. Land use descriptions: A. Uncompacted soil, unlined arroyos
B. Lawn, shrubs, undeveloped 10%-29% slopes
C. Compacted soil, undeveloped 30% or more slope
D. Impervious areas
c. Peak runoff = Area (acres) x factor (CFS/acre) = CFS
d. Total runoff = Area (SF) x factor (inches) / 12 (inches/foot) = CF
e. Peak and total runoff is based on 6 hour, 100 year frequency storm
f. The undeveloped use is for the site in its natural state.
The proposed use is for full development of the basin, under present zoning

TABLE C
Ditch capacities adjacent to lot 1, Milly's Sandwich Shop.
Q=Area x Velocity; Velocity=1.486 x (Rh)^{0.667} x (s)^{-1/3}

Mannings	Ditch	side	Bottom	Area	Wetted	Hydraulic	Velocity	Capacity	Froude	Sequent	depth
n	slope	width	depth	SF	Perimeter	Radius	FT/S	CFS	(C)	(D)	(E)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
CHANNEL SECTION AT SECTION A-A, CANDELARIA ROAD NORTH OF LOT 1											
1	0.013	11.000	0	60.0	0.30	18.0	60.600	0.297	5.337	96.064	1.72
2	0.013	11.000	0	60.0	0.40	24.0	60.800	0.395	6.451	154.825	1.80
3	0.013	11.000	0	60.0	0.50	30.0	61.000	0.492	7.469	224.084	1.86
REQUIRED Q100 = 174.9 CFS											
CHANNEL SECTION AT SECTION B-B, ALLEYWAY SOUTH OF LOT 1											
1	0.013	11.000	0	20.0	0.10	2.0	20.200	0.099	2.566	5.131	1.43
2	0.013	11.000	0	20.0	0.30	6.0	20.600	0.291	5.268	31.605	1.69
3	0.013	11.000	0	20.0	0.50	10.0	21.000	0.476	7.311	73.105	1.82
REQUIRED Q100 = 17.4 CFS											

(A) Ft(vertical)/1000 Ft(horizontal)
(B) Ft(horizontal)/1 Ft(vertical)
(C) Froude No. (Fn)=velocity/(g x area/top width)^{0.5}
(D) Sequent depth for rectangular level channel, y2=(y1/2)x((1+8 x Fn²)^{0.5} -1)
(E) Sequent depth for sloping rectangular channel
y2=((y1/2)/(cos slope angle) x ((1+8 x ((10⁻³ x slope angle)² x Fn²)^{0.5} -1)
(F) Correction factor for trapezoidal channel, figure 4-4
(G) Reference: Richard H French, Open channel Hydraulics, 1985

PURPOSE:
The purpose of this grading and drainage plan is to obtain approval for a building permit for an addition to an existing building which is to be remodeled into a restaurant.

SOILS:
Soils on lot are identified by reference C as Cut and fill land. The exposed surface shows gravel and sand which is well compacted from prior use as a parking area. The existing asphalt surface shows very little sign of subsurface failures. The soil appears suitable for pavement with subgrade compaction to 95% of maximum dry density.

DISCUSSION:
A. The existing building is situated on the high portion of the lot, with runoff from the building and the lot leaving the lot over four driveway cuts onto Candelaria Road and Princeton Drive, and over the gravel area on the south onto the paved alleyway.
B. The revised grading plan will direct runoff, partially to the north, onto Candelaria Road, flowing off the lot on the paved entryway, and partially through the parking area onto the paved alleyway. Quantities of runoff are shown on table A.
C. Runoff leaving the site flows into the gutter along Princeton Drive, flowing then to the south where the runoff flows into the subsurface storm sewer system. There is no diversion of runoff into a different drainage system.
D. There is no runoff onto the site from upstream properties. The upstream property, adjacent to the east (Clarklift Co.), controls runoff by means of curbs adjacent to the property line, those flows then entering the public right-of-way on Candelaria Road and the paved alleyway.
E. There is runoff from upstream properties which cross past lot 1, flowing in the paved street system on Candelaria Road and Princeton Drive, and the paved alleyway. The drainage basin flowing onto Candelaria Road is about 40 acres, with an estimated peak flow of 174.9 CFS, and a depth of flow on Candelaria Road of less than 0.5'. The basin flowing onto the alleyway is about 4 acres, with an estimated depth of less than 0.3' for the peak flow of 17.4 CFS (see tables B and C). The building on lot 1 is set 2' above the flowline on Candelaria, and 4' above the flowline on Princeton and the alleyway, so there is no hazard to the building on lot 1 from off-site flows.
F. The lot is not within an identified flood plain.

CONCLUSIONS:
A. The proposed construction is not within a designated 100 year floodplain.
B. Construction as proposed will not increase the hazard from flooding to downstream properties.
C. The proposed grading and construction will protect the property from reasonable changes in the flood plain as designated on the current floodway map.
D. This Grading and Drainage Plan does not propose changes to the FLOODWAY or FIRM maps.

REFERENCES:
A. Bernalillo County Ordinance No. 90-6
B. Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, for the City of Albuquerque...Bernalillo County...AMAPCA, January, 1993.
C. Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, USDA-SCS.
D. Flood Insurance Rate Map (FIRM), City of Albuquerque, Bernalillo County, New Mexico, Federal Emergency Management Agency (FEMA), Panel 23 of 50. Date of aerial photography October 8, 1980, scale 1"=500'.
E. Flood Boundary and Floodway Map (FLOODWAY), City of Albuquerque, Bernalillo County, New Mexico, Federal Emergency Management Agency (FEMA), Panel 23 of 50. Date of aerial photography October 8, 1980, scale 1"=500'.
F. Open-channel Hydraulics, Richard H. French, McGraw-Hill Book Company, 1985.

CERTIFICATION OF COMPLETION MARK SEP 27, 1996

Preliminary	Marvin R Kortum	May 20, 1996
APPROVALS	CHANGES	DATE
SEP 27 1996	MR. Kortum	
SEP 27 1996	MARVIN R. KORTUM, P.E.	
	Civil Engineering	
	NM PE 6519	
	1605 Speakman Drive, S.E.	
	Albuquerque, New Mexico 87123	
	(505) 299-0774	

GRADING AND DRAINAGE PLAN
LOT 1, TRACT Q, MENAUL DEVELOPMENT AREA
2100 CANDELARIA RD. NE
MILLY'S SANDWICH SHOP

PROJECT NO. H-16/D118 MAP NO. H-16 SHEET OF 11

ANGLE	ANGLE	RADIUS (TO CURB FACE)
A	53° 30'	30'
B	45° 30'	15'
C	81°	25'
D	72° 35'	25'

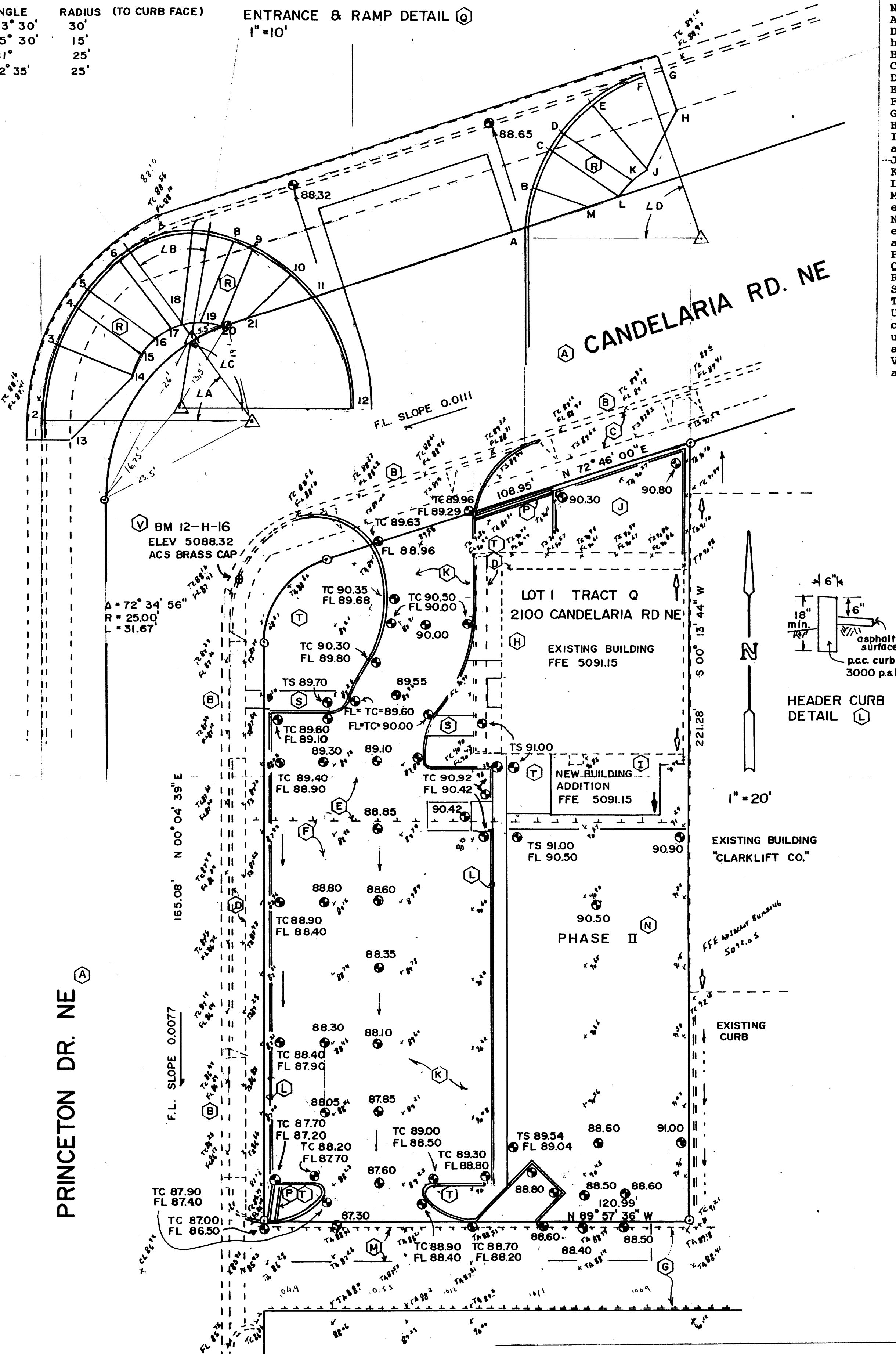
ENTRANCE & RAMP DETAIL 1"=10'

SPOT ELEVATIONS

1 TC	88.03
FL	87.36
2 TC	88.05
FL	87.38
3 TC	88.26
FL	87.59
4 TC	87.76
FL	87.72
5 TC	87.83
FL	87.79
6 TC	88.59
FL	87.92
7 TC	88.96
FL	88.29
8 TC	88.53
FL	88.49
9 TC	88.63
FL	88.59
10 TC	89.43
FL	88.76
11 TC	89.63
FL	88.96
12 TC	90.34
FL	89.68
13 TS	88.07
14 TS	87.59
15 TS	88.72
16 TS	88.79
17 TS	88.92
18 TS	89.29
19 TS	89.49
20 TS	89.59
21 TS	89.65

A TC	89.96
FL	89.29
B TC	89.88
FL	89.21
C TC	89.18
FL	89.14
D TC	89.14
FL	89.10
E TC	89.69
FL	89.02
F TC	89.57
FL	88.90
G TC	89.61
FL	88.94
H TS	89.73
J TS	90.00
K TS	90.10
L TS	90.14
MTS	90.00

PRINCETON DR. NE

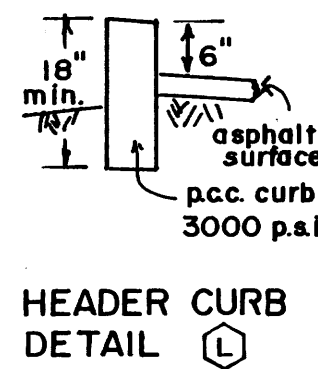


BENCHMARK: Station 12-H16, located on the curb at the southeast quadrant at the intersection of Candelaria Road and Princeton Drive, NE. Elevation is 5088.32.

LEGEND	EXISTING	PROPOSED
CONTOUR LINE	---	---
SPOT ELEVATION	•	•
TOP OF WALL	TW	TW
TOP OF PAVEMENT	TA	TA
FLOW LINE INVERT	FL	FL
TOP OF CURB	TC	TC
TOP OF SIDEWALK	TS	TS
STRUCTURE	---	---
SWALE	---	---
ROOF DRAIN	---	---

NOTES

- The streets in the public right-of-way of Candelaria Road and Princeton Drive are presently surfaced with an asphalt surface with a standard 8" high curb and gutter.
- Existing standard driveway cut.
- Existing 6' wide sidewalk.
- Existing 4' wide sidewalk.
- Existing asphalt surface.
- Existing gravelled surface.
- Existing asphalt surfaced alleyway.
- Existing building to be remodeled.
- New building addition. For detailed building dimensions see architectural drawings.
- New patio dining area, with hard surface and landscaping.
- New asphalt surfaced driveway and parking area.
- New header curb, see detail.
- Remove asphalt surfacing in alleyway as shown and resurface to elevations shown on this plan.
- Existing gravel surface to be graded to drain, generally to surface elevations shown. Phase II will consist of surfacing this area with an asphalt surface to elevations as shown, with partial landscaping.
- Run-down channel, 12" wide with 6" high side curbs.
- Private entrance, see City of Albuquerque standard drawing 2426.
- Wheel Chair Ramp, see City of Albuquerque standard drawing 2441.
- Wheel chair access ramp.
- Landscaped area.
- All berms and earthwork supporting non-building structures must be compacted to 95% of maximum dry density (Modified Proctor Test) to depth of undisturbed earth. Buildings may require separate subsurface soils testing and preparation.
- The contractor shall notify the City of Albuquerque Surveyor prior to any disturbing of the permanent survey benchmark.



May 20, 1996
RUNOFF FOR LOT 1, TRACT Q, MENAUL DEVELOPMENT AREA, MILLY'S SANDWICH SHOP, 2100 CANDELARIA ROAD, NE

TABLE A		Runoff Estimate: For On-site Basin of .56 acres, (LOT 1).		Zone 2		PROPOSED USE	
Land use	Peak	Total	Area Percent	Peak	Total	Area Percent	Peak
	CFS/acre	inches	SF	CFS	CF	SF	CFS
A	1.56	0.53	24450	1.000	0.9	1079.9	0.0
B	2.28	0.78	0	0.000	0.0	0.0	0.0
C	3.14	1.13	0	0.000	0.0	0.0	0.0
D	4.70	2.12	0	0.000	0.0	0.0	0.0
TOTALS			24450	1.000	0.9	1079.9	2.4
			0.561 acre			0.561 acre	3895.2

TABLE B-1		Runoff Estimate: For Off-site Basin of 40 acres, (Candelaria Road basin)		Zone 2		PROPOSED USE	
Land use	Peak	Total	Area Percent	Peak	Total	Area Percent	Peak
	CFS/acre	inches	SF	CFS	CF	SF	CFS
A	1.56	0.53	1750000	1.000	62.7	77291.7	0.0
B	2.28	0.78	0	0.000	0.0	0.0	0.0
C	3.14	1.13	0	0.000	0.0	0.0	0.0
D	4.70	2.12	0	0.000	0.0	0.0	0.0
TOTALS			1750000	1.000	62.7	77291.7	174.9
			40.174 acre			40.174 acre	281250.0

TABLE B-2		Runoff Estimate: For Off-site Basin of 4 acres, ALLEYWAY.		Zone 2		PROPOSED USE	
Land use	Peak	Total	Area Percent	Peak	Total	Area Percent	Peak
	CFS/acre	inches	SF	CFS	CF	SF	CFS
A	1.56	0.53	174500	1.000	6.2	7707.1	0.0
B	2.28	0.78	0	0.000	0.0	0.0	0.0
C	3.14	1.13	0	0.000	0.0	0.0	0.0
D	4.70	2.12	0	0.000	0.0	0.0	0.0
TOTALS			174500	1.000	6.2	7707.1	17.4
			4.006 acre			4.006 acre	28036.7

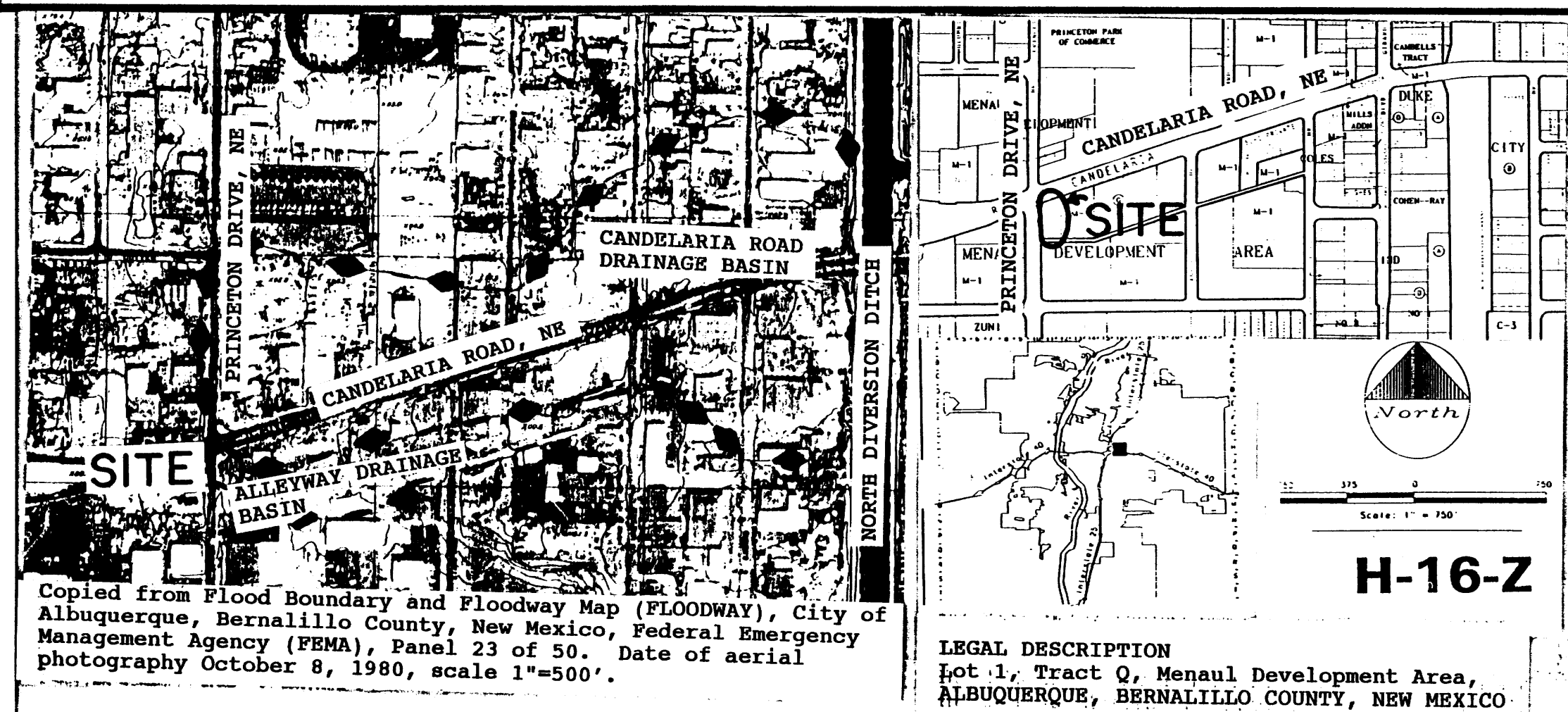
NOTES:

- Runoff factors from Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, City of Albuquerque, Bernalillo County and AMAFCA, January, 1993.
- Land use descriptions: A. Uncompacted soil, unlined arroyos
B. Lawn, shrubs, undeveloped 10%-29% slopes
C. Compacted soil, undeveloped 30% or more slope
D. Impervious areas
- Peak runoff = Area (acres) x factor (CFS/acre) = CFS
- Total runoff = Area (SF) x factor (inches) / 12 (inches/foot) = CF
- Peak and total runoff is based on 6 hour, 100 year frequency storm
- The undeveloped use is for the site in its natural state.

The proposed use is for full development of the basin, under present zoning
Ditch capacities adjacent to lot 1, Milly's Sandwich Shop.
 $Q = \text{Area} \times \text{Velocity}$; $\text{Velocity} = 1.486/n \times (Rh)^{.6667} \times (s)^{.5}$

Mannings	Ditch	Side	Bottom	Depth	Area	Wetted	Hydraulic	Velocity	Capacity	Froude	Sequent
n	slope	slope	width	ft	SF	Perimeter	Radius	ft	FPS	(C)	depth
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
CHANNEL SECTION AT SECTION A-A, CANDELARIA ROAD NORTH OF LOT 1											
1	0.013	11.000	0	60.0	0.30	18.0	60.600	0.297	5.337	96.064	0.59
2	0.013	11.000	0	60.0	0.40	24.0	60.800	0.395	6.451	154.825	0.84
3	0.013	11.000	0	60.0	0.50	30.0	61.000	0.492	7.469	224.084	1.09
REQUIRED Q100 = 174.9 CFS											

CHANNEL SECTION AT SECTION B-B, ALLEYWAY SOUTH OF LOT 1											
1	0.013	11.000	0	20.0	0.10	2.0	20.200	0.099	2.566	5.131	0.16
2	0.013	11.000	0	20.0	0.30	6.0	20.600	0.291	5.268	31.605	0.58
3	0.013	11.000	0	20.0	0.50	10.0	21.000	0.476	7.311	73.105	1.06
REQUIRED Q100 = 17.4 CFS											
(A) Ft(vertical)/1000 Ft(horizontal) (B) Ft(horizontal)/1 Ft(vertical) (C) Froude No. (Fn)=velocity/(g x area/top width) ^{.5} (D) Sequent depth for rectangular level channel, y2=(y1/2)x(((1+8 x Fn ²) ^{.5})-1) (E) Sequent depth for sloping rectangular channel y2=((y1/2)/cos slope angle) x (((1+8 x ((10 ³ /(10 ³ x slope angle) ² x Fn ²)) ^{.5})-1) (F) Correction factor for trapezoidal channel, figure 3.4 (G) Reference: Richard H French, Open Channel Hydraulics, 1985											



LEGAL DESCRIPTION
Lot 1, Tract Q, Menaul Development Area,
ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO

PURPOSE:
The purpose of this grading and drainage plan is to obtain approval for a building permit for an addition to an existing building which is to be remodeled into a restaurant.

SOILS:
Soils on lot are identified by reference C as Cut and fill land. The exposed surface shows gravel and sand which is well compacted from prior use as a parking area. The existing asphalt surface shows very little sign of subsurface failures. The soil appears suitable for pavement with subgrade compaction to 95% of maximum dry density.

DISCUSSION:
A. The existing building is situated on the high portion of the lot, with runoff from the building and the lot leaving the lot over four driveway cuts onto Candelaria Road and Princeton Drive, and over the gravel area on the south onto the paved alleyway.
B. The revised grading plan will direct runoff, partially to the north, onto Candelaria Road, flowing off the lot on the paved entryway, and partially through the parking area onto the paved alleyway. Quantities of runoff are shown on table A.
C. Runoff leaving the site flows into the gutter along Princeton Drive, flowing then to the south where the runoff flows into the subsurface storm sewer system. There is no diversion of runoff into a different drainage system.
D. There is no runoff onto the site from upstream properties. The upstream property, adjacent to the east (Clarklift Co.), controls runoff by means of curbs adjacent to the property line, those flows then entering the public right-of-way on Candelaria Road and the paved alleyway.
E. There is runoff from upstream properties which cross past lot 1, flowing in the paved street system on Candelaria Road and Princeton Drive, and the paved alleyway. The drainage basin flowing onto Candelaria Road is about 40 acres, with an estimated peak flow of 174.9 CFS, and a depth of flow on Candelaria Road of less than 0.5'. The basin flowing onto the alleyway is about 4 acres, with an estimated depth of less than 0.3' for the peak flow of 17.4 CFS (see tables B and C). The building on lot 1 is set 2' above the flowline on Candelaria, and 4' above the flowline on Princeton and the alleyway, so there is no hazard to the building on lot 1 from off-site flows.
F. The lot is not within an identified flood plain.

CONCLUSIONS:
A. The proposed construction is not within a designated 100 year floodplain.
B. Construction as proposed will not increase the hazard from flooding to downstream properties.
C. The proposed grading and construction will protect the property from reasonable changes in the flood plain as designated on the current floodway map.
D. This Grading and Drainage Plan does not propose changes to the FLOODWAY or FIRM maps.

REFERENCES:
A. Bernalillo County Ordinance No. 90-6
B. Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, for the City of Albuquerque...Bernalillo County...AMAFCA, January 1993.
C. Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, USDA-SCS.
D. Flood Insurance Rate Map (FIRM), City of Albuquerque, Bernalillo County, New Mexico, Federal Emergency Management Agency (FEMA), Panel 23 of 50. Date of aerial photography October 8, 1980, scale 1"=500'.
E. Flood Boundary and Floodway Map (FLOODWAY), City of Albuquerque, Bernalillo County, New Mexico, Federal Emergency Management Agency (FEMA), Panel 23 of 50. Date of aerial photography October 8, 1980, scale 1"=500'.
F. Open-channel Hydraulics, Richard H. French, McGraw-Hill Book Company, 1985.

Preliminary
APPROVAL CHANGES
MARVIN R KORTUM
BY
MAY 2 1996
DATE
MARVIN R. KORTUM, P.E.
Civil Engineering
NM PE 6519
1605 Speakman Drive, S.E.
Albuquerque, New Mexico 87123
(505) 299-0774

GRADING AND DRAINAGE PLAN
LOT 1, TRACT Q, MENAUL DEVELOPMENT AREA
2100 CANDELARIA RD. NE
MILLY'S SANDWICH SHOP

PROJECT NO. MAP NO. SHEET OF
H-16 1 1