HYDROLOGY K14/D11 NO PLANS

K14/D11

NO PLANS

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE June 7, 1983 REF. NO._____

TO: Fred Aguirre, Civil Engineer/Hydrology

FROM: Phil Fischer, Civil Engineer P.F.

SUBJECT: COPPER AVENUE PARKING STRUCTURE DRAINAGE REQUIREMENTS

Construction of the Copper Avenue Parking Structure was inspected by a City Inspector and is in substantial compliance with the drainage requirements as detailed in the construction drawings.

PF/tal

400 Copper N.W

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

K14-D 11

July 28, 1982

Mr. Rick Grauke
Flatow, Moore, Bryan & Associates
P.O. Box 8266
Albuquerque, N.M. 87108

RE: DRAINAGE REPORT FOR COPPER AVENUE PARKING STRUCTURE

Dear Rick:

I have reviewed the referenced report and concur with the design as it relates to drainage. Therefore, the report is hereby approved.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/tsl

To DR file

ALLISON ENGINEERING, INC.
Post Office Box 4111 Albuquerque, New Mexico 87106
Telephone (505) 266-5621

RECEIVED
SEP 07 1982
CITY ENGINEER

F14-D11

3 September 1982

Mr. Bryan Barnett
CITY OF ALBUQUERQUE
City Engineering Office
P. O. Box 1293
Albuquerque, New Mexico 87103

RE: CITY OF ALBUQUERQUE PARKING STRUCTURE
400 COPPER AVENUE NORTHWEST
ALBUQUERQUE, NEW MEXICO

Dear Mr. Barnett:

This is written to recap our telephone conversation on September 2, 1982 regarding the referenced project. The Contract Documents indicate a 10-inch storm drain line terminating at a storm drain inlet located on 5th Street at the intersection of 5th Street and Copper Avenue. The Contractor has requested permission to connect the storm line to a storm drain inlet located on Copper Avenue at the intersection of 5th Street and Copper Avenue. This change was requested because the invert elevation of the inlet on Copper Avenue is 8-inches lower than that of the inlet on 5th Street, thereby allowing an increase to the slope on the 10-inch line. According to our telephone conversation, this change has been granted.

Sincerely,

ALLISON ENGINEERING INC.

Jeff L. McCullough

Jeff L. McCullough

JLM:nlc

cc: Mr. David Ashcraft, Ashcraft Plumbing
Mr. David Weatherman, Flatow, Moore, Bryan

OK
BGB
9/7/82

DRAINAGE REPORT FOR COPPER AVENUE PARKING GARAGE

The site is the north half of block II, Original Townsite of Albuquerque, as shown on zone atlas map K-14-Z.

Present usage is an at-grade parking lot approximately 90% hard surfaced. The ground slopes northwest and northeast at an average 0.5% gradient.

$T_c = .0078 \times 220^{.77} / .005^{.385} = 3.8$ minutes

Composite runoff coefficient:
area = 0.98 acres.

CRC = $0.88 \times 0.9 + 0.10 \times 0.4 / 0.98 = 0.85$

i = $6.84 \times T_c^{-0.51} = 3.45$

Q_{100} = $0.85 \times 3.45 \times 0.[illegible] = 2.87$ cfs

Q_5 = $2.87 \times 0.541 = [illegible].55$ cfs

Drainage Conditions after Development.

The site will be occupied by a 5 story parking garage. Planting areas are small so the site will be treated as 100% hard surfaced.

The storm water will be conveyed from the upper open deck thru roof drain lines to the existing storm sewer inlet at the southeast corner of 5th and Copper. (See the enclosed Plumbing Drawings).

Runoff from the upper deck will be treated in 2 portions as there is considerable difference in slope. (See enclosed Sheet S-8).

Southern half:

$T_c = .0078 \times 260^{.77} / .0229^{.385} = 2.4$ minutes

$i = 6.84 \times 2.4^{-0.51} = 4.38$

$Q_{100} = 0.90 \times 4.38 \times .98 / 2 = 1.93$ cfs

$Q_5 = 1.93 \times 0.541 = 1.04$ cfs

Northern half

$T_c = .0078 \times 205^{.77} / .0068^{.385} = 3.2$ minute

$i = 3.78$

$Q_{100} = 0.90 \times 3.78 \times .98 / 2 = 1.67$ cfs

$Q_5 = 1.67 \times 0.541 = 0.90$ cfs

Total $Q_5 = 1.04 + 0.90 = 1.94$ cfs = 870 gpm

Since the system will be under head pressure from the vertical drop, the flow calculations were treated accordingly.

Pipe Flow:

Darcy Formula: $K = (f\ L/D)$ where:

K = 1.0 (sharp edged end)
D = 10/12 = 0.833
L = equivalent length
f = 0.06 (friction factor from Moody diagram)

$L = K/f\ (D) = 1.0 / 0.06\ (0.833) = 13.88$ - 14 equiv. ft.

Total length of 10" pipe = 115'

Friction loss = (14 + 115) / 100 (0.464) = 0.599' head loss.

Total static pressure = 55 X .4329 = 23.8'

Flow pressure = 23.8 - 0.599 = 23.211 OK for 900 gpm.

If flow increases to 2400 gpm:

14 + 115 / 100 X 3.15 = 4.064 ft. head loss. Still OK 2400 ÷ 900 = 2.7 safety factor.

In the event that the roof drain line becomes plugged outside the building, the configuration of the structure (sloping decks) will allow surface drainage which will discharge at the building exists.

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In the event that the roof drain line becomes plugged outside the building, the configuration of the structure (sloping decks) will allow surface drainage which will discharge at the building exists.

ALLISON ENGINEERING, INC.
Post Office Box 4111 Albuquerque, New Mexico 87196 Telephone (505) 266-5621

31 August 1981

Mr. Chuck Easterling
CITY OF ALBUQUERQUE
Fourth Floor City Engineering Office
P. O. Box 1293
Albuquerque, New Mexico 87103

K 14-D 11

RE: CITY OF ALBUQUERQUE PARKING STRUCTURE
400 COPPER AVENUE NORTHWEST
ALBUQUERQUE, NEW MEXICO

Dear Mr. Easterling:

This is written to recap our meeting on August 24, 1981, regarding storm drainage for the referenced project. After analyzing existing storm drain lines in the vicinity of the proposed Parking Structure, it was determined that the roof drainage from this building shall discharge into storm drain inlets located at the intersection of 5th Street and Copper Avenue. As discussed, the storm drain inlet will be detailed on the drawing.

If you have any questions on the above, please contact me.

Sincerely,

ALLISON ENGINEERING, INC.

Jeff L. McCullough

Jeff L. McCullough

JLM:rr

cc: Mr. Bob Woodward, Flatow, Moore, Bryan & Associates

BAB-
Called 9/9/81.
Informed Jeff
of Q's developed
release rate.

RECEIVED
SEP 02 1981
CITY ENGINEER

RSH	ADM
PRO	SUR
CDS	COUN
DES	SEC
INSP	FILE
HYDRO	RETURN