

K20/D32

1 Plan

CITY OF ALBUQUERQUE

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K20/D32

1 Plan

DRAINAGE INFORMATION SHEET

PROJECT TITLE: ALBQ. RESERVE CENTER ZONE ATLAS/DRNG. FILE #1: K-20/D32
DESCRIPTION: TRACT 3, MUNICIPAL ADDITION No. 2, SOUTHWEST CORNER
PROPERTY ADDRESS: _____

ENGINEERING FIRM: LEEDSHILL-HERKENHOFF, INC. CONTRACT: JOANN ENGLISH

ADDRESS: 500 COPPER NW. ALBUQUERQUE, NM 87102 PHONE: 247-0294

OWNER: CORPS OF ENGINEERS CONTRACT: RALPH BARRETT

ADDRESS: FORT WORTH, TEXAS PHONE: _____

ARCHITECT: LEEDSHILL-HERKENHOFF, INC. CONTRACT: MIGUEL CHEVA-GUJARDO

ADDRESS: ABOVE PHONE: ABOVE

GEYOR: LEEDSHILL-HERKENHOFF, INC. CONTRACT: KIM STELZER

ADDRESS: ABOVE PHONE: ABOVE

CONTRACTOR: NONE AS YET CONTRACT: _____

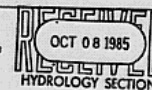
ADDRESS: _____ PHONE: _____

DESIGN MEETING:

☒ YES

☐ NO

☒ COPY OF CONFERENCE RECAP
SHEET PROVIDED



DRB NO. _____

EPC NO. 3-78-68-2 4/18/85

PROJ. NO. _____

TYPE OF SUBMITTAL:

- ☐ DRAINAGE REPORT
- ☒ DRAINAGE PLAN
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SKETCH PLAN APPROVAL
- ☐ PRELIMINARY PLAN APPROVAL
- ☐ SITE DEVELOPMENT PLAN APPROVAL
- ☐ FINAL PLAN APPROVAL
- ☒ BUILDING PERMIT APPROVAL
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY APPROVAL
- ☐ ROUGH GRADING PERMIT APPROVAL
- ☐ GRADING/PAVING PERMIT APPROVAL
- ☐ OTHER _____ (SPECIFY)

DATE SUBMITTED: 7 OCT 85

BY: JOANN ENGLISH



CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION



HYDROLOGY SECTION PROJ. NO. _____ DATE: 4/13/84
PLANNING DIVISION NO. K20

CONFERENCE RECAP

SUBJECT: Removal of Sewer Lines

WHO	REPRESENTING
ATTENDANCE: <u>Paula Givens</u>	
<u>John C. Smith</u>	
<u>Eric J. Brown</u>	

FINDINGS:

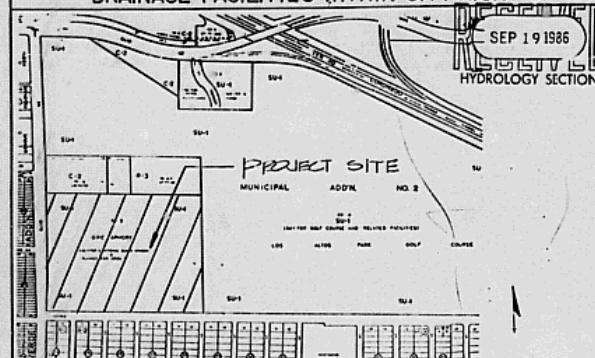
1. Drainage Plan Required per the DPM
2. Construction within City Right-of-Way
3. Construction within City Right-of-Way
4. Construction within City Right-of-Way
5. Construction within City Right-of-Way
6. Construction within City Right-of-Way
7. Construction within City Right-of-Way
8. Construction within City Right-of-Way
9. Construction within City Right-of-Way
10. Construction within City Right-of-Way

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: [Signature] SIGNED: [Signature]
TITLE: _____ TITLE: _____
DATE: 4/13/84 DATE: 4-13-84

CITY OF ALBUQUERQUE

DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY



VICINITY MAP K-20

LEGAL DESCRIPTION

Municipal Addition 2 SW 1/4 of NW 1/4 of Section 20 City of Albuquerque, New Mexico.

NOTICE TO CONTRACTOR

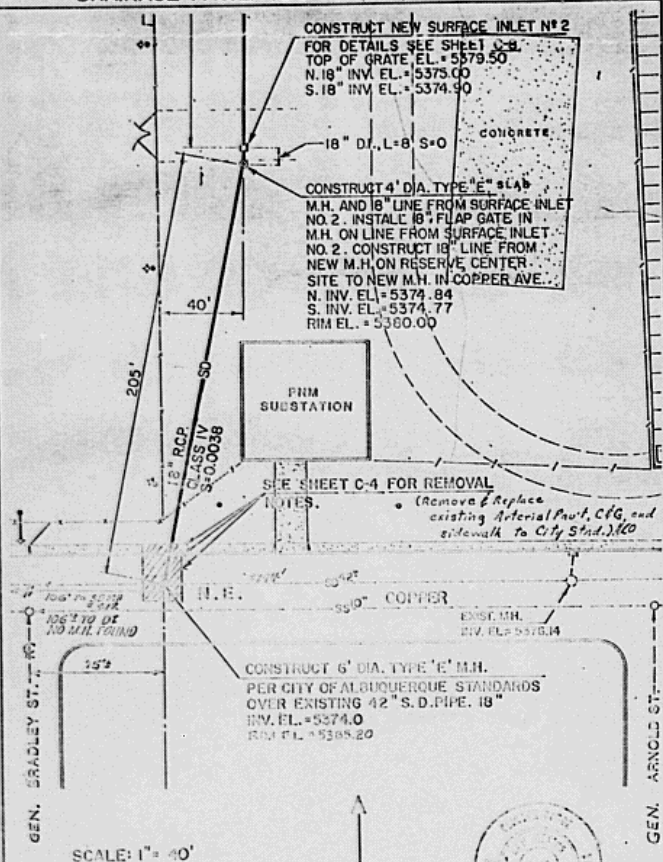
1. An excavation/construction permit will be required before beginning any work within City right-of-way. An approved copy of these plans must be submitted at the time of application for this permit.
2. All work detailed on these plans to be performed, except as otherwise stated or provided hereon, shall be constructed in accordance with "Interim Standard Specifications for Public Works Construction, 1985."
3. Two working days prior to any excavation, contractor must contact Line Locating Service, 765-1234, for location of existing utilities.
4. Prior to construction, the Contractor shall excavate and verify the horizontal and vertical locations of all obstructions. Should a conflict exist, the Contractor shall notify the engineer so that the conflict can be resolved with a minimum amount of delay.
5. Driveway completion shall be according to American street use.
6. Maintenance of these facilities shall be the responsibility of the Owner of the property served.

STANDARD MECHANICAL

ATTORNEYS	NAME	DATE	FILE NO.
ALBUQUERQUE	ALBUQUERQUE	ALBUQUERQUE	ALBUQUERQUE
ALBUQUERQUE	ALBUQUERQUE	ALBUQUERQUE	ALBUQUERQUE
ALBUQUERQUE	ALBUQUERQUE	ALBUQUERQUE	ALBUQUERQUE

CITY OF ALBUQUERQUE

DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY



SCALE: 1" = 40'

1" = 40'



F-62

APPROVED: [Signature] DATE: 11/14/85
 CITY OF ALBUQUERQUE
 ENGINEERING DIVISION
 200 WINNING M.E.
 ALBUQUERQUE, NEW MEXICO



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

DESIGN HYDROLOGY SECTION
 123 Central NW, Albuquerque, NM 87102
 (505) 766-7644

October 28, 1985

Ms. Joann English
 Leedshill-Herkenhoff, Inc.
 500 Copper Avenue NW
 Albuquerque, NM 87103

REF: DRAINAGE PLAN SUBMITTAL OF ALBUQUERQUE RESERVE CENTER (K20-032)
 FOR BUILDING PERMIT APPROVAL, ENGINEERING DRAWINGS STAMPED AND
 DATED 10/7/85, RECEIVED 10/8/85

Dear Joann:

The above referenced submittal is approved for Building Permit.

The required approved permit for construction within public Right-of-Way (S.O. #19) must be included, along with this drainage plan, in the construction drawings before Hydrology sign-off. Also construction drawings must require the contractor to notify Environmental Health Department for a top soil disturbance permit when grading takes place.

If you have any questions, please contact me at 766-7644.

Sincerely,

Roger A. Green, PE
 Roger A. Green, PE
 CE/Design Hydrology

RAG:nrk

MUNICIPAL DEVELOPMENT DEPARTMENT

C. Dwayne Sheppard, P.E., City Engineer

ENGINEERING DIVISION

Telephone (505) 766-7457

AN EQUAL OPPORTUNITY EMPLOYER



City of Albuquerque

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500 Copper Avenue NW
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RAG:mrk

MUNICIPAL DEVELOPMENT DEPARTMENT

C. Dwayne Sheppard, P.E., City Engineer

ENGINEERING DIVISION

Telephone (505) 766-7467

AN EQUAL OPPORTUNITY EMPLOYER



City of Albuquerque

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123 Central NW, Albuquerque, NM 87102
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C. Dwayne Sheppard, P.E., City Engineer

ENGINEERING DIVISION

Telephone (505) 766-7467

AN EQUAL OPPORTUNITY EMPLOYER

TO ROGER GREEN
CITY HYDROLOGY

FROM

LH LEEDSHILL - HERKENHOFF, INC.
Copper Square
P.O. Box 1217
ALBUQUERQUE, NEW MEXICO 87103
(505) 247-0284

SUBJECT: ALBU. RESERVE CENTER (K20/D32) DATE: 10/28/85
FOLD ↓ To confirm our conversation of this morning - storm drain
line from Res. Cntr. site to Copper Ave. will be 18" rather than
24". Erosion control for project will be accomplished by a
stilling pond integral to the site construction. This area is the
unpaved portion on the drainage plan. This will be constructed
before the other areas are paved and will act to slow the
water before it enters the storm drain and allow the sediment
to settle out on the site. Please call if there are any other questions.
PLEASE REPLY TO → SIGNED John English

REPLY Approved releases Roger & John

DATE:

SIGNED

THIS COPY FOR PERSON ADDRESSED

FROM ROGER GREEN
CITY HYDROLOGY

TO

LH LEEDSHILL - HERKENHOFF, INC.
Copper Square
P.O. Box 1217
ALBUQUERQUE, NEW MEXICO 87103
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RETURN TO → SIGNED John English

REPLY Approved releases Roger & John

DATE:

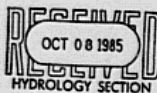
SIGNED

PERSON ADDRESSED RETURN THIS COPY TO SENDER



LEEDSHILL-HERKENHOFF, INC.
101 Copper Avenue N.W.
P.O. Box 1217
Albuquerque, New Mexico 87103
(505) 247-0294

1550-1894.11-85



October 7, 1985

Engineering - Design
Hydrology Section
City of Albuquerque
123 Central Ave. N.W.
Albuquerque, NM 87102

RE: DRAINAGE PLAN FOR ALBUQUERQUE RESERVE CENTER

Transmitted herewith is the proposed drainage plan and accompanying calculations for the Albuquerque Reserve Center located at the northeast corner of Wyoming Boulevard and Copper Avenue. The proposed work on the site is the addition of a building on an existing paved area and construction of a paved parking lot. Runoff is increased due to paving a previously pervious area.

The proposed solution to controlling the increased storm water runoff from the site is to provide an on-site ponding area with controlled discharge to the existing storm drain in Copper Avenue. This presents a two-fold problem in that the storm drain proposed to be tied into is in an 100-year flood plain and the maximum water surface of the ponding area is approximately three feet lower than the water surface elevation in the street. Rather than allow the water from the street to back up into the pond on the Reserve Center site, a flap gate check valve is recommended. This will prevent the pond from becoming a "bubbler" and will not allow discharge from the detention pond to enter the storm drain in Copper Avenue until the flow in the storm drain has decreased.

Flows from offsite and the east drainage area are proposed to be detained completely in the ponding area. This will be contained with a maximum water surface elevation of 81.7, so that there is little possibility of flooding the buildings by the detention pond storage. This also reduces the amount of storm water entering Wyoming Boulevard from 76.4 cfs to 44.7 cfs.

Also included in the package is a "Construction Within Public Right-of-Way" document for the connection of the new pond discharge pipe into the existing Copper Avenue storm drain.

An updated site development plan showing the proposed additions was approved by the Environmental Planning Commission in the spring of this year.

A subsidiary of Gordon Herkenhoff and Associates, Inc.



LEEDSHILL-HERKENHOFF, INC.

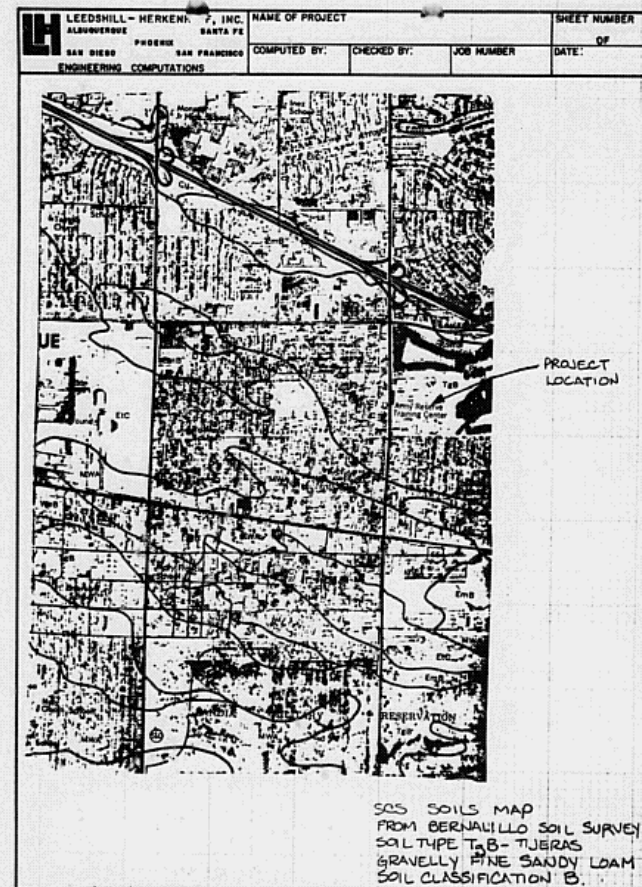
Engineering - Design
Hydrology Section
October 7, 1985
page 2

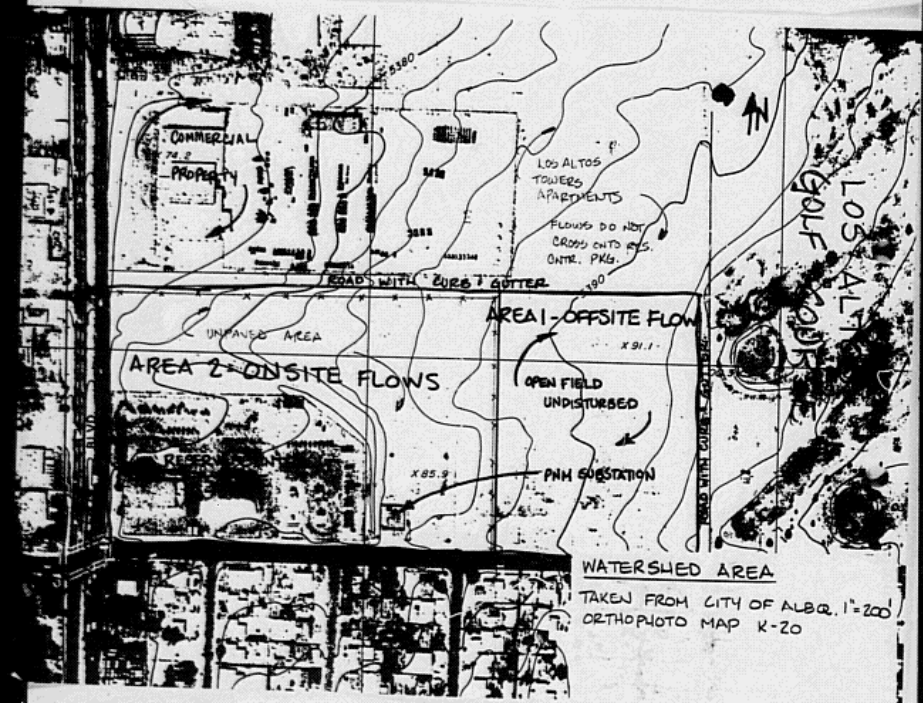
This should complete the requirements of the DPM and comply with the findings of the attached memo dated 13 April 84. If there is any additional information requested, please call.

Joann English
JOANN ENGLISH

bz

Enc.





LEEDSMILL - HERRINGHOFF ALBUQUERQUE 1000 1st St. N.E. ALBUQUERQUE, N.M. 87102 ENGINEERING COMPUTATIONS		NAME OF PROJECT Albuquerque Reserve Center	SHEET NUMBER 1 of 9
COMPUTED BY: SEO	CHECKED BY: JJE	JOB NUMBER 1894-11	DATE: SEPT 85

OFF - SITE FLOWS

1. WATERSHED AREA (As denoted on enclosed map) = 7.1 Acres.
The historic flow path is East to West, with discharge into Wyoming Boulevard. Offsite flows are limited to the open, undisturbed field to the East of the Reserve Center. This field is bounded on the North and East by access roads with curb and gutter. The South boundary is Copper Avenue (with curb and gutter). The Western boundary is the Albuquerque Reserve Center site. Offsite area has a good stand of native grass and is largely undisturbed.
2. STORM FLOWS:

Calculate the Time of Concentration -

$$L = 500'$$

$$\Delta E = 6.5' \text{ Avg.}$$

$$S = .013$$

$$T_c = .0078 \left(\frac{500^{0.77}}{.013^{0.385}} \right) = 4.97 \text{ minutes}$$

∴ Use T_c minimum value = 10 minutes.

Calculate Rainfall Intensity -

$$100 \text{ year rainfall} - 6 \text{ hr storm} = 2.45" \quad \checkmark$$

$$10 \text{ year} = .637 (2.45") = 1.61" \quad \checkmark$$

See 22.2 D-1

$$I_{100} = 2.114 (2.45") = 5.18" / \text{hr} \quad \checkmark$$

$$I_{10} = .657 (5.18) = 3.40" / \text{hr} \quad \checkmark$$

Calculate Runoff Quantity ($Q = CIA$)

$$C = .70 \quad 0.34 \quad \text{Soil type B, 0\% impervious}$$

$$Q_{100} = .7 (5.18) (7.1) = 25.7 \text{ cfs}$$

$$Q_{10} = .657 (25.7) = 16.9 \text{ cfs}$$

LEEDSHILL - HERKENHOFF, ALBUQUERQUE SANTA FE PHOENIX SAN FRANCISCO ENGINEERING COMPUTATIONS	NAME OF PROJECT Abby Reserve Center		SHEET NUMBER 2 of 9
	COMPUTED BY: SEO	CHECKED BY: JE	JOB NUMBER 1894.11 DATE: Sept 85

Calculate Flow Depth and Velocity - 100 year storm -

Initially assume $d = .05'$ Use 22.2 B-1, $S = .013$

$$V = 0.66 \text{ ft/sec}$$

$$Q = 25.7 \text{ cfs}$$

$$\text{check } A = Q/V = \frac{25.7}{0.66} = 38.9 \text{ ft}^2$$

$$d = A/W = \frac{38.9}{630} = .062' \text{ --- close enough}$$

Calculate Runoff Volumes -

$$V_{100} = \frac{1}{2} (7.1) (2.45/12) = 0.49 \text{ ac-ft}$$

$$V_{10} = .657 (1.01) = .67 \text{ ac-ft}$$

3. PROPOSED TREATMENT:

No modifications are recommended for the off-site area; therefore no rights-of-way and/or easements are required.

OH - SITE FLOWS

1. WATERSHED AREA (As denoted on enclosed map) = 13.9 Acres
Again, the historic flow path is East to West with discharge into Wyoming Boulevard. The site is bounded on the East by an open field (Off-site), on the South by Copper Avenue, on the West by Wyoming Boulevard and on the North by an access road with curb and gutter.

2. STORM FLOWS:

Calculate the Time of Concentration -

$$L = 960'$$

$$\Delta E = 11' \text{ Avg.}$$

$$S = .0115$$

$$T_c = .0078 \left(\frac{960^{0.77}}{.0115^{0.95}} \right) = 8.61 \text{ minutes}$$

$\therefore$ Use T_c minimum value = 10 minutes.

LEEDSHILL - HERKENHOFF, ALBUQUERQUE SANTA FE PHOENIX SAN FRANCISCO ENGINEERING COMPUTATIONS	NAME OF PROJECT Abby Reserve Center		SHEET NUMBER 3 of 9
	COMPUTED BY: SEO	CHECKED BY: JE	JOB NUMBER 1894.11 DATE: Sept 85

Rainfall intensity is the same as Off-site

$$I_{100} = 5.18 \text{ in/hr}$$

$$I_{10} = 3.40 \text{ in/hr}$$

Calculate Runoff Quantity ($Q = CIA$)

Existing Conditions

$$C_p = (9.4/13.9) .90 + (4.5/13.9) .70 = .889$$

$$Q_{p100} = .889 (5.18) (13.9) = 64.0 \text{ cfs}$$

$$Q_{p10} = .657 (4.4) = 2.9 \text{ cfs}$$

After 2.1 Acres additional pavement. (Building additions are not considered as the area concerned is already impervious.)

$$C_p = (11.5/13.9) .90 + (2.4/13.9) .70 = .932$$

$$Q_{p100} = .932 (5.18) (13.9) = 67.1 \text{ cfs}$$

$$Q_{p10} = .657 (4.4) = 2.9 \text{ cfs}$$

NOTE: A runoff due to development = $67.1 - 64.0 = 3.1 \text{ cfs}$ (100yr)

Calculate Flow Depth and Velocity - 100 year storm -

Again, flow is historically East to West, most of the storm flow is discharged into Wyoming Boulevard through two drive pads. Each drive pad is 24' wide and has a slope of 2.2%. Velocity in the drive pads is dependant on depth of flow (which can be calculated from Mannings Equation).

$$Q = \frac{1.49}{.017} A \left(\frac{A}{W.P.} \right)^{2/3} S^{1/2}$$

For this case $S = .022$ and $R = A/W.P. = 24' / 24' + 24'$
Where $d =$ flow depth

$$Q = 13 (24') \left(\frac{24'}{24' + 24'} \right)^{2/3}$$

LEEDSHILL - HERGENROT, ALBUQUERQUE SANTA FE NEW MEXICO ENGINEERING COMPUTATIONS	NAME OF PROJECT Abq. Reserve Center		SHEET NUMBER 4 of 9	
	COMPUTED BY: SEB	CHECKED BY: JE	JOB NUMBER 1894-11	DATE: Sept 85

Assuming that each drive pad carries approximately
 $\frac{1}{2}$ the total flow ($Q_T = 25.7 + 44 = 69.7 \text{ cfs}$), ← existing
 44.85 cfs is discharged through each drive pad.
 38.2 Under existing conditions
 Solving for d by trial & error,
 Assume $d = .3$ $Q = 13(24 \times .3) \left(\frac{24 \times .3}{(2 \times .3) + 24} \right)^{4/3}$
 $= 41.26 \text{ cfs}$ ← too low OK
 Assume $d = .32$ $Q = 45.9 \text{ cfs}$ (close enough)
 Based on $d = .32$ $V = Q/A = \frac{44.85}{.32(24)} = 5.84 \text{ ft/sec}$
 in each drive pad.
 NOTE: Per CDA design criteria, excess runoff
 $= \Delta \text{ runoff must be held on-site until existing}$
 $\text{storm drain system can hold it. } \therefore d = .32; V = 5.84 \text{ ft/s}$
 apply to both existing and proposed conditions.
 Calculate Runoff Volume -
 Existing $.79$
 $V_{10} = .889(13.9) \left(\frac{2.45}{12} \right) = 2.24 \text{ ac-ft}$
 $V_{10} = .657 \left(\frac{2.62}{2.24} \right) = 1.66 \text{ ac-ft}$
 Proposed $.89$
 $V_{100} = .932(13.9) \left(\frac{2.45}{12} \right) = 2.52 \text{ ac-ft}$
 $V_{10} = .657 \left(\frac{2.64}{2.52} \right) = 1.74 \text{ ac-ft}$
 NOTE: $\Delta \text{ runoff volume} = 2.64 - 2.52 = .12 \text{ ac-ft}$ ← 100yr
 This is the pond volume that will be required
 to hold additional runoff due to development in
 view of downstream flooding (per Fred Aguirre's
 memo dated 9-13-84, attached)
 3. PROPOSED TREATMENT:
 The proposed treatment is to grade the site to allow for

LEEDSHILL - HERGENROT, ALBUQUERQUE SANTA FE NEW MEXICO ENGINEERING COMPUTATIONS	NAME OF PROJECT Abq. Reserve Center		SHEET NUMBER 5 of 9	
	COMPUTED BY: SEB	CHECKED BY: JE	JOB NUMBER 1894-11	DATE: Sept 85

a small ponding area capable of holding $V = 0.12 \text{ ac-ft}$. The
 rest of the site will be graded so that the historic flow
 pattern is maintained. Two new catch basins will be installed
 at low points in the ponding areas to allow for removal of
 the ponded water as soon as the storm drain system is
 capable of taking the additional runoff. The two catch
 basins will be connected by a new 18" RCP storm drain.
 The new catch basins and storm drain will be connected to
 the existing 42" RCP storm drain in Copper Avenue via a new
 24" RCP storm drain. Both of the new storm drains will be
 constructed at $S_{min} = .005$.
 18" RCP on plans
 Grate Capacity Calculation -
 In this case, we have orifice conditions
 $\therefore Q = CA \sqrt{2gh}$
 $= .8(3.6) \sqrt{2(32.2)(3.5)}$
 $= 43.24 \text{ cfs}$
 Pipe Capacity Calculation -
 18" -
 $Q = 1.49/.013 \left(\frac{7}{4} (10/12)^2 \right) (.25 (10/12))^{3/2} (.005)^{1/2}$
 $= 7.45 \text{ cfs}$
 24" -
 $Q = 1.49/.013 \left(\frac{7}{4} (2)^2 \right) (.25 (2))^{3/2} (.005)^{1/2}$
 $= 16.04 \text{ cfs}$
 42" -
 $Q = 1.49/.013 \left(\frac{7}{4} (4 1/2)^2 \right) (.25 (4 1/2))^{3/2} (.005)^{1/2}$
 $= 90.23 \text{ cfs}$
 Accordingly, the carrying capacity of the new system (total)
 will be 16 cfs, which is more than adequate for the 7.0 cfs
 required. ← plans use 18" dia
 just must drain Pond in 24 hrs

LEEDSHILL - HERKENHOFF, INC. ALBUQUERQUE SAN DIEGO ENGINEERING COMPUTATIONS	NAME OF PROJECT Albuq. Reserve Center		SHEET NUMBER 6 of 9
	COMPUTED BY: JE	CHECKED BY:	JOB NUMBER 1894.11 DATE: Sept 85

The Albuquerque Master Drainage Study indicates that the existing 42" storm drain in Copper is carrying 75 cfs at AP 701 @ General Arnold Street and Copper Avenue. Between the analysis point and Wyoming Boulevard, 4 single C and 5 double C catch basins discharge into the 42" storm drain. This area is identified as a flood plain under 100 year storm conditions also per the DPM. It can therefore be assumed that the 42" storm drain is flowing full and is under pressure. Because of this, do not want to increase the already surcharged condition of the pipe by adding more water from the detention pond on the Reserve Center site. Must determine if an orifice plate for control is necessary in the proposed catch basins. An orifice plate will be required if the head developed at the pond is large enough to drive water into the pipe, i.e. the hydraulic head at the pond is greater than the hydraulic head in the street.

Elevations

Max pond elevation 81.7
Grade elevation 80.50

Catch basin no. 2 invert 76.05

Invert of 42" pipe at connection 72.99

Street elevation at pipe connection = 85.25

ΔE street and pipe = $85.25 - 72.99 = 12.26'$

ΔE max. pond elevation and pipe = $81.7 - 72.99 = 8.71'$

$\therefore$ Hydraulic head of water normally entering storm drain is significantly greater than head driving water entering from pond. Water from street will enter first, should not have to control flow from pond, as pressurized flow in pipe will limit entering flows from pond.

LEEDSHILL - HERKENHOFF, INC. ALBUQUERQUE SAN DIEGO ENGINEERING COMPUTATIONS	NAME OF PROJECT Albuq. Reserve Center		SHEET NUMBER 7 of 9
	COMPUTED BY: JE	CHECKED BY:	JOB NUMBER 1894.11 DATE: Sept. 85

PROBLEM EXISTS WITH PONDING AS PROPOSED:

Pond water surface elevation is approximately 3.5 feet lower than max. water surface elevation in Copper Avenue, therefore proposed catch basins will act as bubblers. This is not acceptable - must prevent flow backwards through pipe.

Alternatives for this are:

1. Eliminate discharge line from pond, pond becomes retention pond. This is not desirable because it does not meet City criteria and would be a nuisance at the site.
2. Install a sump pump. This is not desirable because of maintenance required.

3. Install a flap gate on the discharge line from the pond.

This appears to be the most desirable alternative in that flow from the storm drain in Copper Avenue could not enter the pond, and discharge from the pond could not enter drain until line emptied enough to accept flow - line could not be further surcharged.

If out fall from pond is constricted during periods of high flows, pond will fill beyond required volume at elevation 81.7. If this occurs, water will pond to a higher elevation of approximately 82.5 before it is high enough to exit in its historic path and enter Wyoming Boulevard. If water is allowed to pond at this elevation, there is a possibility that the maintenance buildings could be flooded.

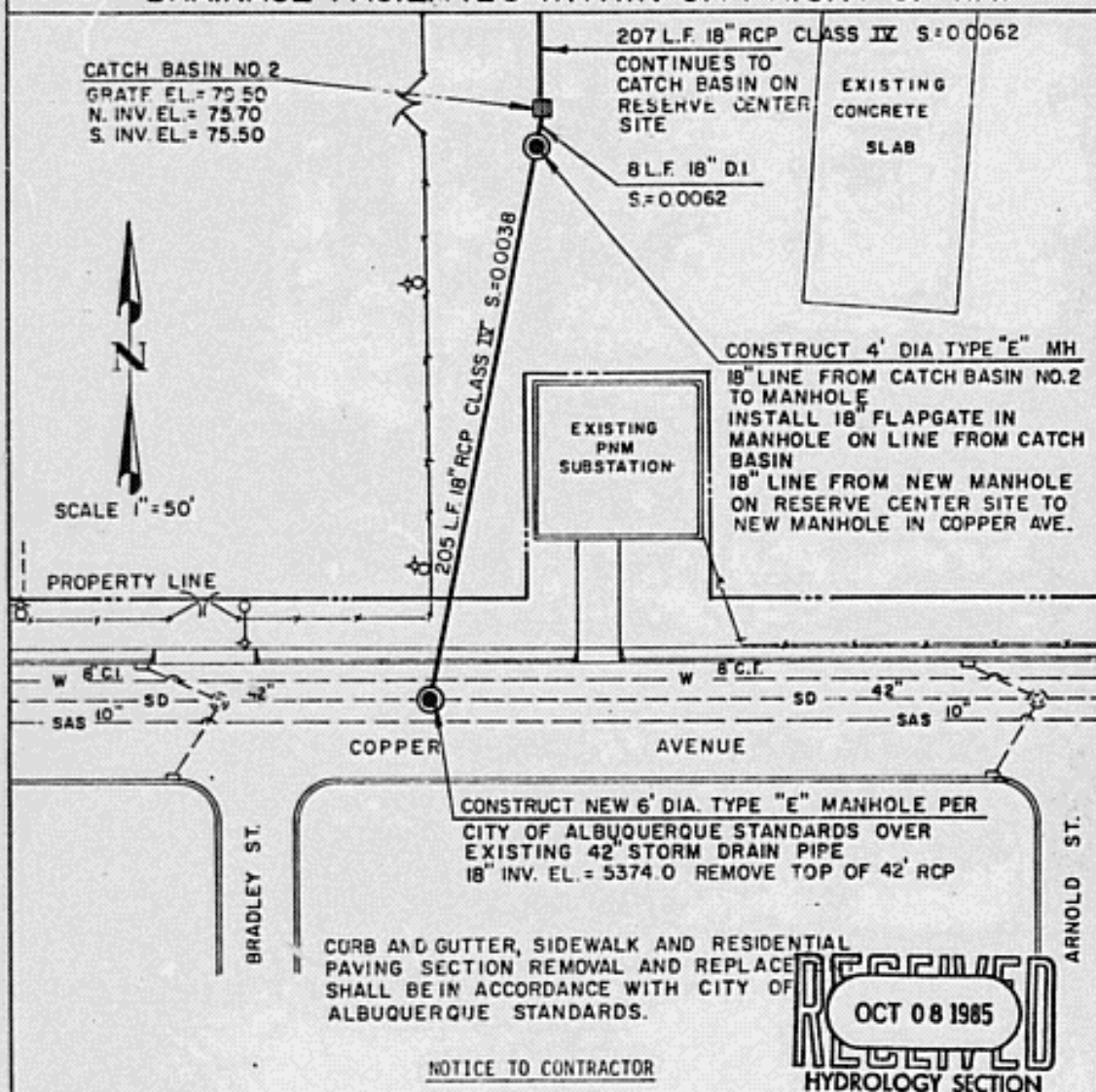
Rather than allow this to occur, recommend detaining all water from offsite and east onsite drainage flows in pond at an elevation less than or equal to 82.0.

LEEDSHILL - HERKENHOFF, INC. ALBUQUERQUE SAN DIEGO PHOENIX SAN FRANCISCO ENGINEERING COMPUTATIONS	NAME OF PROJECT Albq. Reserve Center		SHEET NUMBER B of 9												
	COMPUTED BY: JE	CHECKED BY:	DATE: Sept 85												
CHECK WATER DRAINING INTO DETENTIONAL POND ONLY FROM OFF SITE, $Q_{100} = 12.5 \text{ cfs}$ ONSITE AREA $\sim 440 \times 615 = 270,600 \text{ SF} = 6.21 \text{ AC}$ PERVIOUS AREA $= 230 \times 540 = 124,200 = 2.8 \text{ AC}$ Composite C_n FOR THIS PORTION OF SITE. 54% IMPERVIOUS $= C_n = 0.60$ $Q_{100} = .6(5.18)(6.21) = 19.3 \text{ cfs}$ $\downarrow$ OFFSITE $= 0.49 \text{ AC-FT (FROM PAGE 2)}$ $\downarrow$ LNEITE $= .6(2.45)(6.21) = .76 \text{ AC-FT}$ TOTAL POND VOLUME REQD $= .49 + .76 = 1.25 \text{ AC-FT}$ PROPOSE TO KEEP PONDING AREA WITHIN UNPAVED PORTION AND WANT POND TO RETAIN ALL OF THE WATER DRAINING ONTO THIS AREA. KEEP POND EL TO B2.0 IF POSSIBLE TO ELIMINATE POSSIBILITY OF FLOODING BUILDING. BASED ON GRADING PLAN ATTACHED, VOLUMES ARE AS CALCULATED: <table border="0"> <tr> <td>EL. B0.0</td> <td>AREA = 17750 SF</td> <td>$\bar{A}$</td> <td>$\downarrow$</td> </tr> <tr> <td>EL. B1.0</td> <td>AREA = 33000 SF</td> <td>$> 25375 \text{ SF}$</td> <td>$\downarrow$</td> </tr> <tr> <td>EL. B2.0</td> <td>AREA = 40500 SF</td> <td>$> 46750 \text{ SF}$</td> <td>$\downarrow$</td> </tr> </table> $\Sigma \downarrow = 72125 \text{ CF}$ $\frac{72125 \text{ CF}}{24 \text{ HRS} \times 60 \text{ MIN} \times 60 \text{ SEC}} = 0.835 \text{ cfs}$ $\frac{0.835 \text{ cfs}}{1.14} = 1.66 \text{ AC-FT}$ THIS EXCEEDS REQUIRED PONDING VOLUME, OK This will reduce the runoff volume entering Wyoming Boulevard from the existing 2.24 AC-FT to 0.99 AC-FT and provides a controlled outfall to the existing storm drain in Copper Avenue. This also reduces the peak runoff entering Wyoming. Working backwards, $Q = 1.25 \text{ AC-FT} \left(\frac{12''}{\text{FT}} \right) \times 2.114 (\text{intensity factor } 100 \text{ yr}) = 31.7 \text{ cfs}$ This decreases runoff from the site $\downarrow 76.4 - 31.7 = 44.7 \text{ cfs}$				EL. B0.0	AREA = 17750 SF	$\bar{A}$	$\downarrow$	EL. B1.0	AREA = 33000 SF	$> 25375 \text{ SF}$	$\downarrow$	EL. B2.0	AREA = 40500 SF	$> 46750 \text{ SF}$	$\downarrow$
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LEEDSHILL - HERKENHOFF, INC. ALBUQUERQUE SAN DIEGO PHOENIX SAN FRANCISCO ENGINEERING COMPUTATIONS	NAME OF PROJECT Albq. Reserve Center		SHEET NUMBER 9 of 9
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This decreases the quantity of water leaving site via drivepads - Recalculate the flow depth and velocity of the water exiting onto Wyoming Boulevard. Solve by trial and error: $Q = 44.7/2 = 22.35 \text{ cfs}$ Assume $d = .18$ $Q = 13(24 \times .18) \left(\frac{24 \times .18}{.36 + 24} \right)^{2/3} = 17.6 \text{ cfs}$ $d = .20$ $Q = 13(24 \times .2) \left(\frac{24 \times .2}{.36 + 24} \right)^{2/3} = 20.99 \text{ cfs}$ $d = .21$ $Q = 13(24 \times .21) \left(\frac{24 \times .21}{.36 + 24} \right)^{2/3} = 22.76 \text{ cfs}$ Close enough Calculate velocity: $V = \frac{Q}{A} = \frac{22.35}{.21(24)} = 4.43 \text{ fps}$			

CITY OF ALBUQUERQUE

DRAINAGE FACILITIES WITHIN CITY RIGHT-OF-WAY



1. An excavation/construction permit will be required before beginning any work within City right-of-way. An approved copy of these plans must be submitted at the time of application for this permit.
2. All work detailed on these plans to be performed, except as otherwise stated or provided hereon, shall be constructed in accordance with City of Albuquerque Interim Standard Specifications Public Works Construction 1985.
3. Two working days prior to any excavation, contractor must contact Line Locating Services, 765-1234, for location of existing utilities.
4. Prior to construction, the contractor shall excavate and verify the horizontal and vertical locations of all obstructions. Should a conflict exist, the contractor shall notify the engineer so that the conflict can be resolved with a minimum amount of delay.
5. Backfill compaction shall be according to residential street use.

APPROVALS	NAME	DATE	TITLE: CONNECTION OF RESERVE CENTER STORM DRAIN TO EXISTING STORM DRAIN	
ACE / DESIGN				
INSPECTOR				
ACE / FIELD			PERMIT NO. SHEET 1 OF 1	MAP NO. K-20

