HYDROLOGY N16/D2 ONE PLAN

N16/D2

1 PLAN

INFORMATION SHEET

PROJECT TITLE NEW MEXICO Flying TYPE OF SUBMITTAL DRAINAGE PLAN

ZONE ATLAS PAGE NO. N 16 CITY ADDRESS N/A

LEGAL DESCRIPTION Airport Fixed Base No 5

ENGINEERING FIRM HALL ENG CONTACT Richard Hall

ADDRESS 337 Eubank PHONE 292 1115

OWNER N. M. Flying Service CONTACT

ADDRESS PHONE

ARCHITECT Ken Hovey CONTACT

ADDRESS PHONE

SURVEYOR HALL Eng CONTACT Richard Hall

ADDRESS PHONE

CONTRACTOR CONTACT Bobby Baca

ADDRESS PHONE

PRE-DESIGN MEETING:

X YES

___NO

X COPY OF CONFERENCE RECAP SHEET PROVIDED

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL

___SKETCH PLAT APPROVAL
___PRELIMINARY PLAT APPROVAL
___SITE DEVELOPMENT PLAN APPROVAL
___FINAL PLAT APPROVAL
X BUILDING PERMIT APPROVAL
___CERTIFICATE OF OCCUPANCY APPROVAL
___ROUGH GRADING PERMIT APPROVAL
___GRADING/PAVING PERMIT APPROVAL
___OTHER _____ (SPECIFY)

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DATE SUBMITTED: Feb 13
BY: Richard Hall

Form 1

DOWNSTREAM ANALYSIS
FOR New Mexico Flying Service

THE RUNOFF EXITS TO the Arroyo going THRU THE U.N.M South Golf course AFTER TRAVELING THRU A STORM SEWER system ORIGINATING AT THE INTERSECTION of Runways 17-35 AND 3-21 AND EXISTING AT ANALYSIS PT 21 of the General Aviation Area Drainage Plan.

THE Anticipated discharge of the 48" RCP AT PT 21 WITH A Slope of 0.94% is between 40 to 45 cfs.

THE CONTRIBUTING DRAINAGE AREA TO THIS system is estimated to be AROUND 46 ACRES with $h \approx 3000$ Feet $\Delta H = 15.75$

Slope = 0.005 FT/FT. T_c overland = 28.5 m

Tc THRU R.C.P 4,161 FT with AN Average Velocity of 4 FT/sec = 17.3 min

$I = 2.3(6.84)(28.5)^{-.51} = 2.85$ $Q = .9(2.85)(46) = 118$ cfs

From Analysis pt 7 TO pt. 21 IS 1898 FT of R.C.P for A Tc of 7.9 min

Analysis PT 7 is the most Remote pt. of entry for runoff from the Site.

Length from Analysis pt 7 TO the NE COR of the Building is ≈ 400 $\Delta H = 4.5$ FT Slope ≈ 1.13%

Tc = 4.4 min Total Tc = 12.3 min

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Entire Drainage Area Hydrograph

q_p = 118 cfs

T_p = 28.5 min

$V = \frac{2.3''}{12} \times 46 \times 43{,}560$

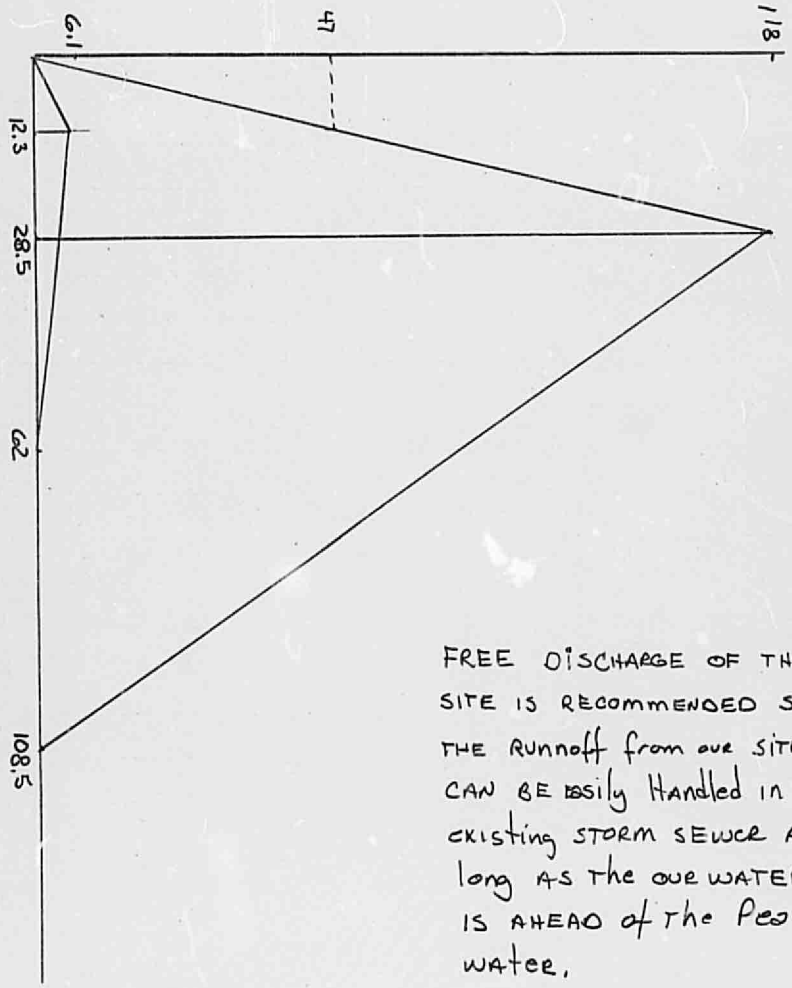
T = 108.5 min

q_p SITE only = 6.1 cfs

T_p = 12.3 min

$V = \frac{2.3}{12} \times 1.37 \times 43560$

T = 62 min



FREE DISCHARGE OF THE SITE IS RECOMMENDED SINCE THE RUNNOFF from our SITE CAN BE easily Handled in the existing STORM SEWER AS long AS the our WATER IS AHEAD of the Peak water.

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CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

June 24, 1985

INTER-OFFICE CORRESPONDENCE

REF. NO._____

TO: Fred Aguirre, Design Hydrologist, City Engineering-Hydrology/MDD

FROM: Russell B. Givler, Senior Civil Engineer, City Engineering-Field/MDD RBG

SUBJECT: AIA, SOUTH GENERAL AVIATION AREA IMPROVEMENTS, PART 4, PROJECT #1632

The final inspection on the referenced project was conducted on August 31, 1984. All work has been accepted and was constructed in accordance with the plans and specifications.

If there are any questions concerning this project or if additional information is required, please contact me.

RBG:dg

cc: File #1632

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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7544

March 7, 1985

Richard Hall
Hall Engineering
337 Eubank Blvd., NE
Albuquerque, New Mexico 87123

RE: DRAINAGE PLAN FOR NEW MEXICO FLYING
(N-16/D2) RECEIVED FEBRUARY 13, 1985

Dear Rick:

The referenced plan dated December 14, 1984, is approved.

Please attach a copy of this approved plan to the construction set prior to Hydrology sign-off.

If I can be of further assistance, please call me at 766-7644.

Cordially,

Billy J. Goolsby

Billy J. Goolsby, P.E.
Design Hydrology Section

BJG/bsj

HALL ENGINEERING COMPANY INC.
337 EUBANK N.E., SUITE 103
ALBUQUERQUE, NEW MEXICO 87123
Phones: (505) 292-1115 & 292-1116

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HYDROLOGY SECTION

February 20, 1985

Mr. Billy Goolsby, P.E.
Hydrology
City of Albuquerque
123 Central NW
Albuquerque, NM 87102

RE: New Mexico Flying Service and Crestview Aviation (N16-D3
(N16-D2

Dear Billy;

Enclosed are copies of the General Aviation Area Storm Sewer layout, Master Grading Plan and Grading Plan between Taxiway T-13 and Runway 12-30 contributing to Crestview Aviations storm runoff. Also, enclosed are Dennis Engineering calculations from project 2161 which relocated one catch basin and added another. Further enclosures include charts for concrete pipes with inlet control from which I estimated the flow in each length of pipe. Finally are the hydrograph calculations to show peak discharge.

If you have any questions, please feel free to call me at 292-1115.

Sincerely,

Richard Hall

Richard Hall
P.E. 7918

RH:jh

enclosures

HALL ENGINEERING COMPANY INC.
337 EUBANK N.E., SUITE 103
ALBUQUERQUE, NEW MEXICO 87123
Phones: (505) 292-1115 & 292-1116

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DOWNSTREAM CAPACITY
of
CRESTVIEW AVIATION BUILDINGS
in
FIXED BASE OPERATIONS #3

The drainage area begins at the intersection of Taxiway T-2 and Runway 12-30. This is a long narrow basin sloping at .005 ft/ft. to inlet number 22.

$$T_c = 0.0078 \frac{1400^{.77}}{.005^{.385}} = 15.9 \text{ minutes}$$

Area = 260,000 ft^2 or 5.97 acres

C = 0.54 30% impervious

I = 3.84 in/hr

Q = 12.4 cfs

Assuming the pipe is to flow full Q = A x V, 12.4 = 3.14 x V for a 24" pipe the average velocity will be 4 ft/sec.

Now from here, point 22, to the exit at point 29, the water travels through 24" RCP expanding to 42" RCP over 2114 total length.

The velocity will increase through each section of pipe until exiting at analysis point 29 onto rip rap. I will be very conservative and use a 5 ft/sec. average velocity in the pipe. If the average velocity were faster, (which it is), then the peak discharge would be less, but using this constant rate will allow us to show that the peak for Fixed Base Operations #3 easily is ahead of the peak for the entire drainage area.

T_c for 45 acres of drainage basin for Crestview Downstream Analysis

2114 ft ÷ 5 ft/sec. = 7 minutes

+ 15.9 minutes for overland flow = 23 minutes

$I = 2.3 \times 6.84 \times 23^{-0.51} = 3.2$
Q = CIA = .9 x 3.18 x 45 = 129 cfs 100yR
Storm Sewer Capacity x 48 cfs
V = 375,705 ft^3
T = 97 minutes

The T_c for the Crestview Site will be less than 10 minutes even though the entire Fixed Base Operations #3 is 4 acres. There are three collection points instead of the two originally designed. Please see the first submittal for

CRESTVIEW AVIATION BUILDINGS
PAGE 2

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CRESTVIEW SITE HYDROLOGY CALC

Crestview by Dennis Engineering of Socorro.

V = 2.3/12 x 4 x 43560 = 33,396
Q = CIA = .9 x 4.8 x 4 = 14.5 cfs

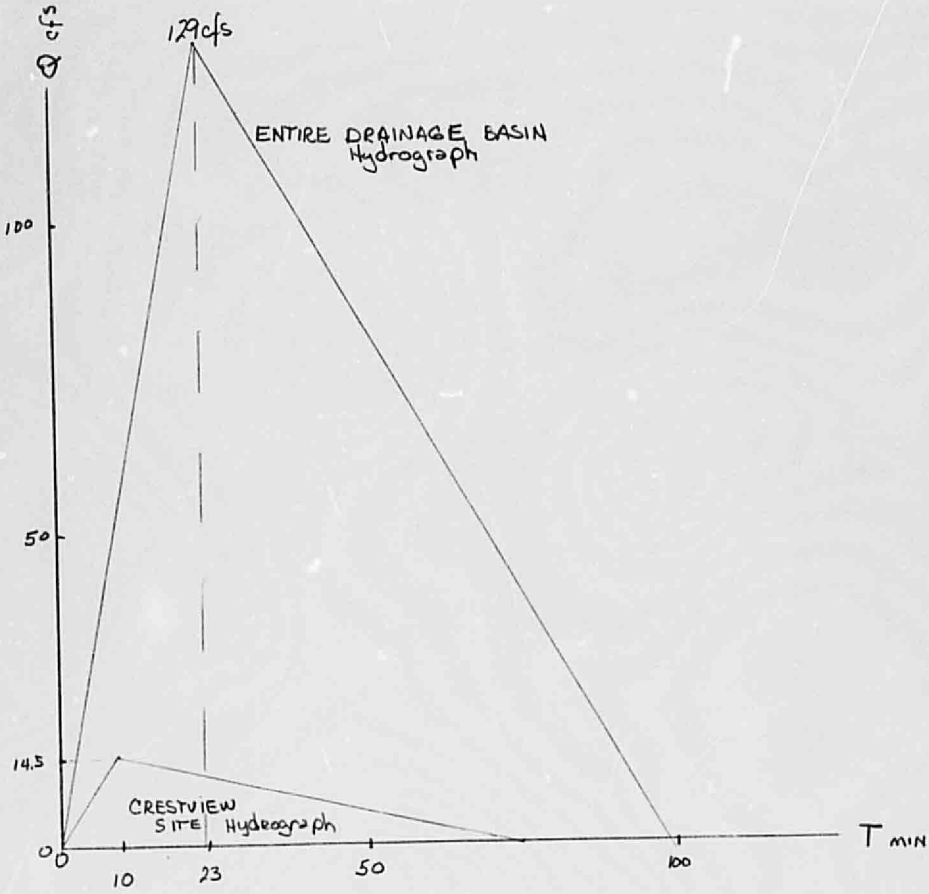
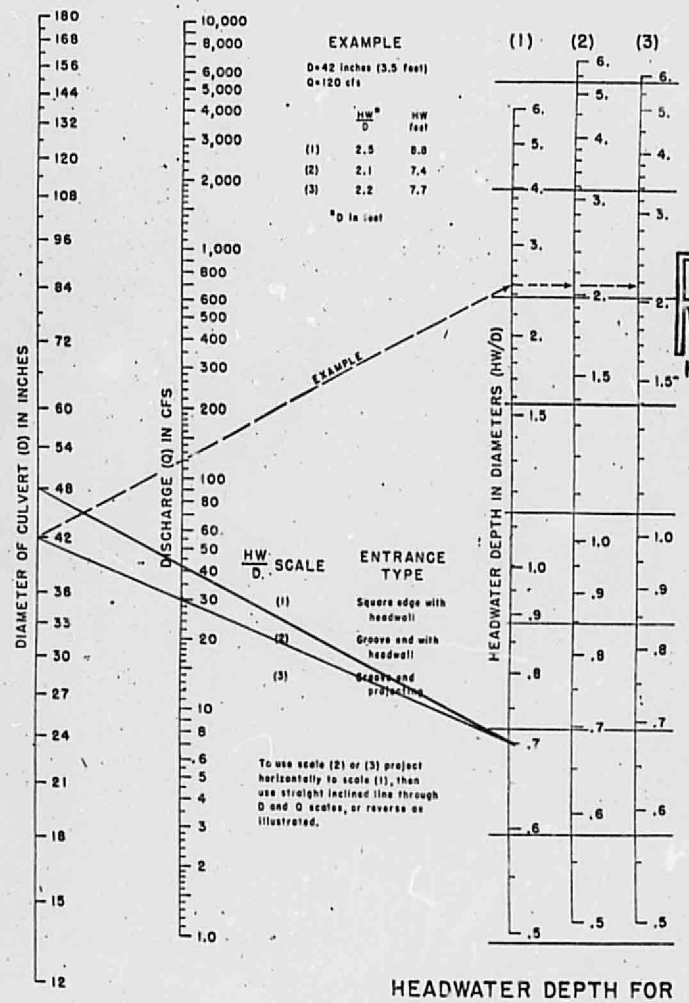


CHART 2



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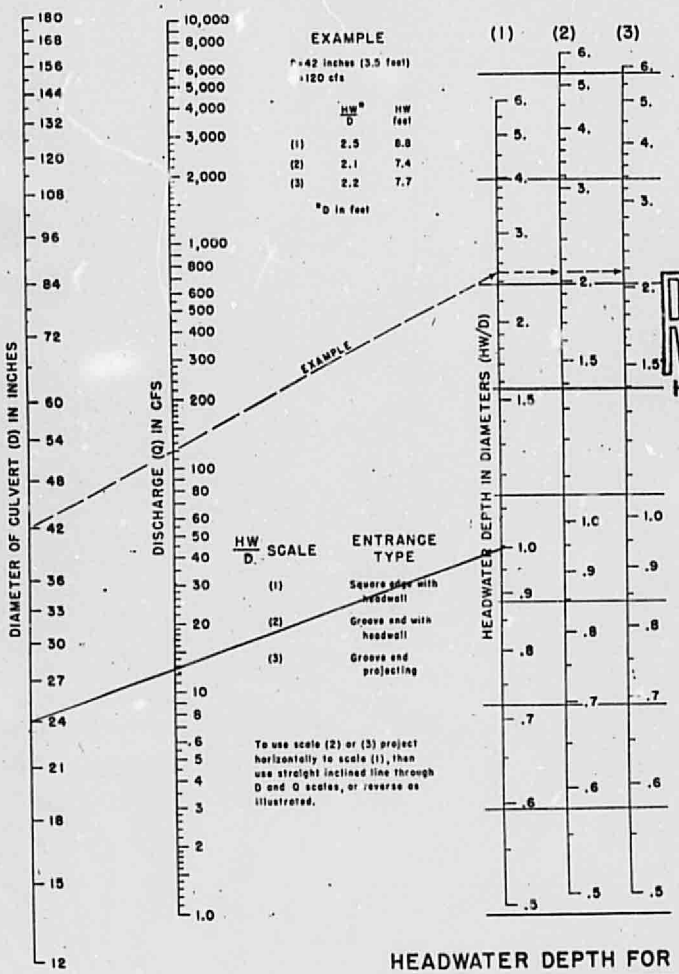
HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

CHART 2



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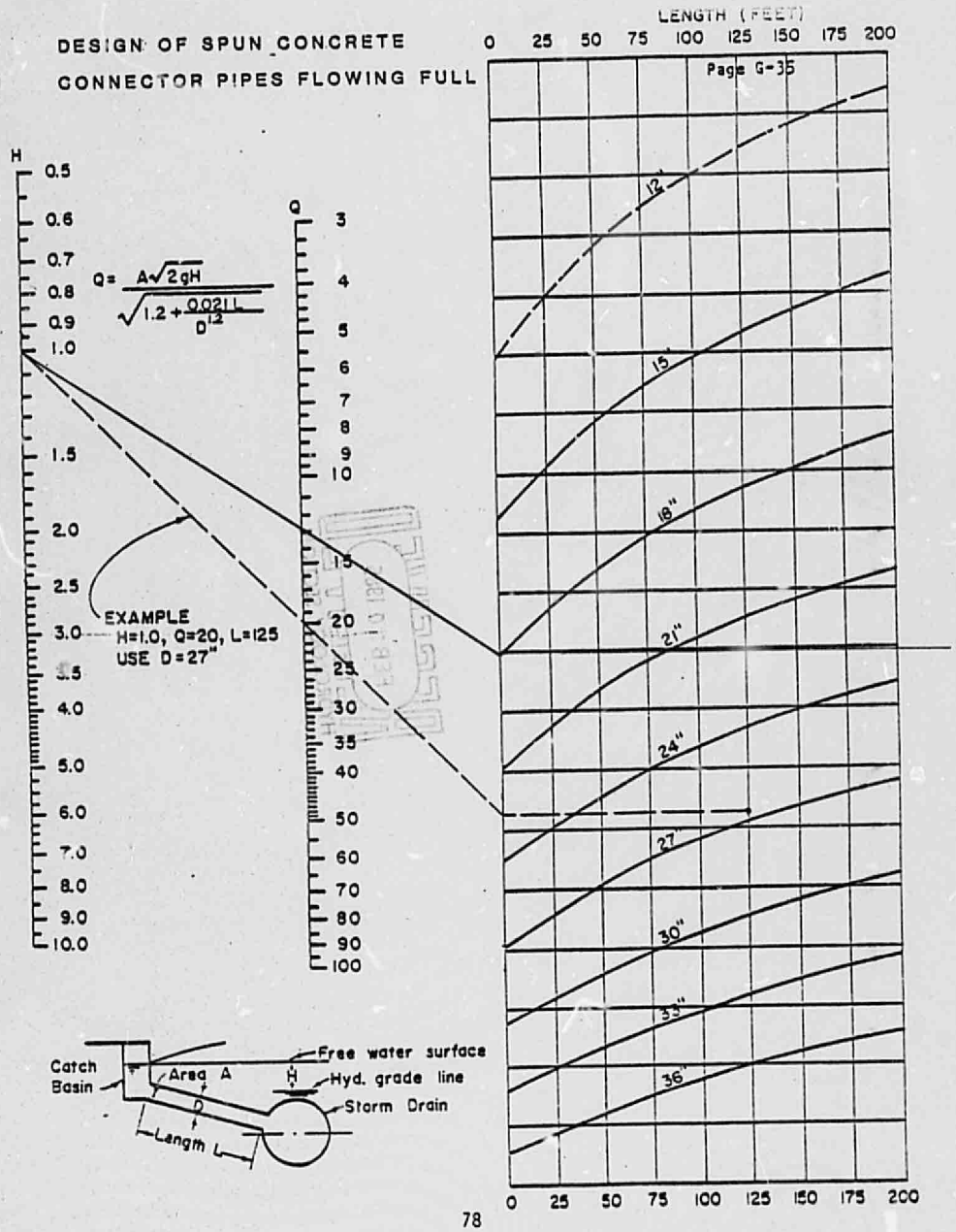
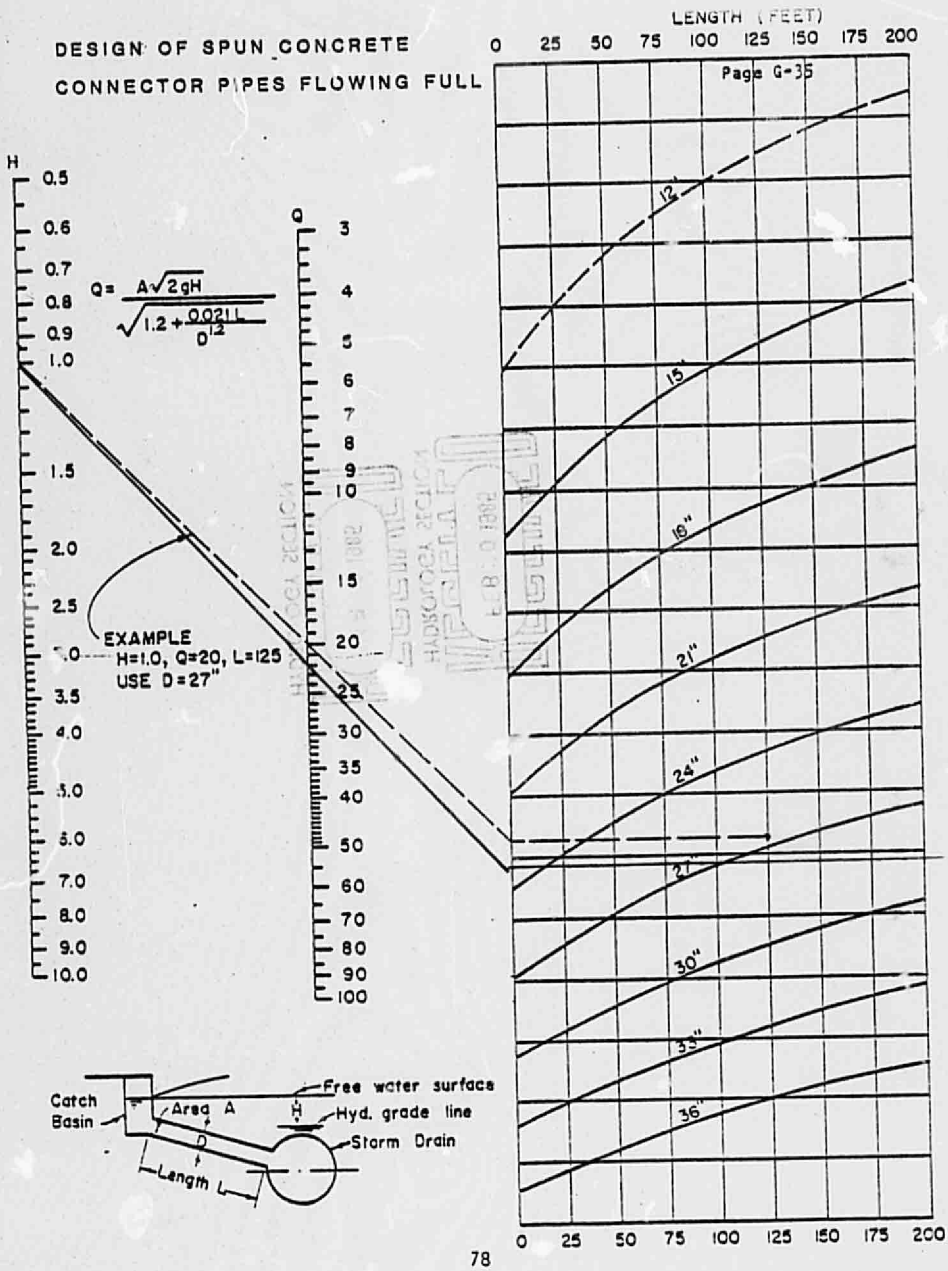
HEADWATER DEPTH FOR
CONCRETE PIPE CULVERTS
WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

DESIGN OF SPUN CONCRETE CONNECTOR PIPES FLOWING FULL



DESIGN OF SPUN CONCRETE CONNECTOR PIPES FLOWING FULL



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HYDROLOGIC AND ENGINEERING CALCULATIONS RELATING TO THE CRESTVIEW AVIATION SITE AT THE ALBUQUERQUE INTERNATIONAL AIRPORT

PREPARED BY

DENNIS ENGINEERING COMPANY

SOCORRO, NEW MEXICO

MARCH 8, 1984

RAYMOND L. F... NEW MEXICO 4115 LAND SURVEYOR REGISTERED PROFESSIONAL ENG...

Raymond L. ..., P.E.

It is the intent of Crestview Aviation. Inc. to construct two buildings on a site at the Albuquerque International Airport. This site has previously had a engineering plan adopted and has been developed accordingly. The new construction will alter previous drainage details for the area and require relocation of an existing storm sewer.

This paper is submitted to accompany plans noting existing and proposed drainage and to enlighten interested parties as to drainage area and ponding volume changes. These calculations are as follow:

1. <u>Drainage Area Calculations</u>

   (a) Existings Drainage Area for Drop Inlet

   112512 sq. ft. = 2.58 ac. (By planimeter)

   (b) Proposed Drainage Area for New Drops

   120865sq ft. = 2.77 ac. (By planimeter)

2. <u>Ponding Volume Calculations</u>

   (a) Existing Pond Volume Calculations
   Maximum Elevation of Existing Ponding (During Spillover)

   09.10 ft.

   Rim Elevation of Existing Drop Inlet

   08.41 ft.

   Area of Ponding at Spillover (Water Elev. = 09.10 ft.)

   61245 sq. ft.

Volume of Ponding at Spillover (Using formula for volume of a cone)

Vol = .333 Ah Where A = Area of Surface
Where h = Maximum Depth

Vol = .333 (61245 sq. ft.) (9.10 - 8.41 ft.)
= 14086 cu. ft.
= 0.32 ac. ft.

(b) Proposed Pond Volume Calculations (By End Area Method)
Refer to Cross Sections
North Ponding Area West of Buildings

Limit of Ponding Area is: 30 ft. North of Section AA - End Area = 0 sq. ft.

Section AA End Area = 31.25 sq. ft.

Section BB End Area = 97.00 sq. ft.

Section CC End Area = 14.25 sq. ft.

South Limit of Ponding Area is 40 ft. South of ?

Section CC - End Area = 0 sq. ft.

Section No.	Area	Distance Bet. Sections	Volume
Limit	0		
		30 ft.	468 cu. ft.
AA	31.25 s.f.		
		165 ft.	10580 cu. ft.
BB	97.00 s.f.		
		130 ft.	7231 cu. ft.
CC	14.25 s.f.		
		40 ft.	285 cu. ft.
So. Limit	0		
			18564 cu. ft. ok

Ponding Area East of Building B This pond does not exist.

North Limit is 75 ft. North of Section DD - End Area = 0 sq. ft.

Section DD End Area = 17.50 sq. ft.

Section EE End area = 53.75 sq. ft.

South Limit is 10 ft. South of Section EE - Use Section EE - End Area = 53.75 sq. ft.

Sectior	Area	Distance Bet. Sections	Volume
North Limit	0		
		75 ft.	656 cu. ft.
DD	17.50 s.f.		
		70 ft.	2493 cu. ft.
EE	53.75		
		10 ft.	537 cu. ft.
South Limit	53.75		
			3686 cu. ft.

Total Volume: 18564 + 3686 = 22250 cu. ft.
= 0.51 ac. ft.

It should be noted that the drainage area and ponding volume are both increased by the proposed system. In addition the pipe sizes and grades are adequate to handle a 100 year, 6 hour duration storm.

No ponding should occur unless plugging occurs in the storm sewer or grates. In the event that this does happen, water may accumulate to a depth of 0.77 ft. at the prop inlet north of Building A before spilling over a retaining wall; at the prop inlet west of the buildings, water may be as deep as 1.33 ft. before spilling over a curb in the southwest corner of the area. Because of the nature of the area, it is of low probability that enough debris could accumulate to block either the pipes or grates, and therefore, these possibilities are not anticipated.

For any details relating to proposed design the reader is referred to the plans. Sheet 1 is a Grading Plan showing both existing and proposed grades and topography, sheet 2 is a plan and profile sheet of the proposed storm sewer changes, and sheet 3 is a cross section sheet relating to ponding volume calculations found previously in this paper.