City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 7, 1994

Bob Ryals
Ryals Engineering
4929 Idlewilde SE
Albuquerque, NM 87108

RE: ENGINEER CERTIFICATION FOR DOUG ZIMMERMAN OFFICE WAREHOUSE
(D-18/D28) CERTIFICATION STATEMENT DATED 12/23/93

Dear Mr. Ryals:

Based on the information provided on your January 3, 1994 submittal, Engineer Certification for the above referenced site is acceptable.

If I can be of further assistance, please feel free to contact me at 768-2667.

Sincerely,

Bernie J. Montoya

Bernie J. Montoya, CE
Engineering Associate

BJM/ses/WPHYD8217

xc: Alan Martinez
File

PUBLIC WORKS DEPARTMENT

Walter H. Nickerson, Jr., P.E.
Assistant Director Public Works

ENGINEERING GROUP

Telephone (505) 768-2500

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 2, 1993

Bob Ryals
Ryals Engineering
4929 Idlewilde SE
Albuquerque, NM 87108

RE: REVISED DRAINAGE PLAN FOR DOUG ZIMMERMAN OFFICE WAREHOUSE
(D18-D28) REVISION DATED 7/16/93.

Dear Mr. Ryals:

Based on the information provided on your July 20, 1993 resubmittal, the above referenced site is approved for Building Permit.

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

Engineer Certification per the D.P.M. checklist will also be required prior to Certificate of Occupancy release.

If I can be of further assistance, please feel free to contact me at 768-2667.

Sincerely,

Bernie J. Montoya, CE
Engineer Associate

BJM/dl/WPHYD/7881

xc: Alan Martinez
File

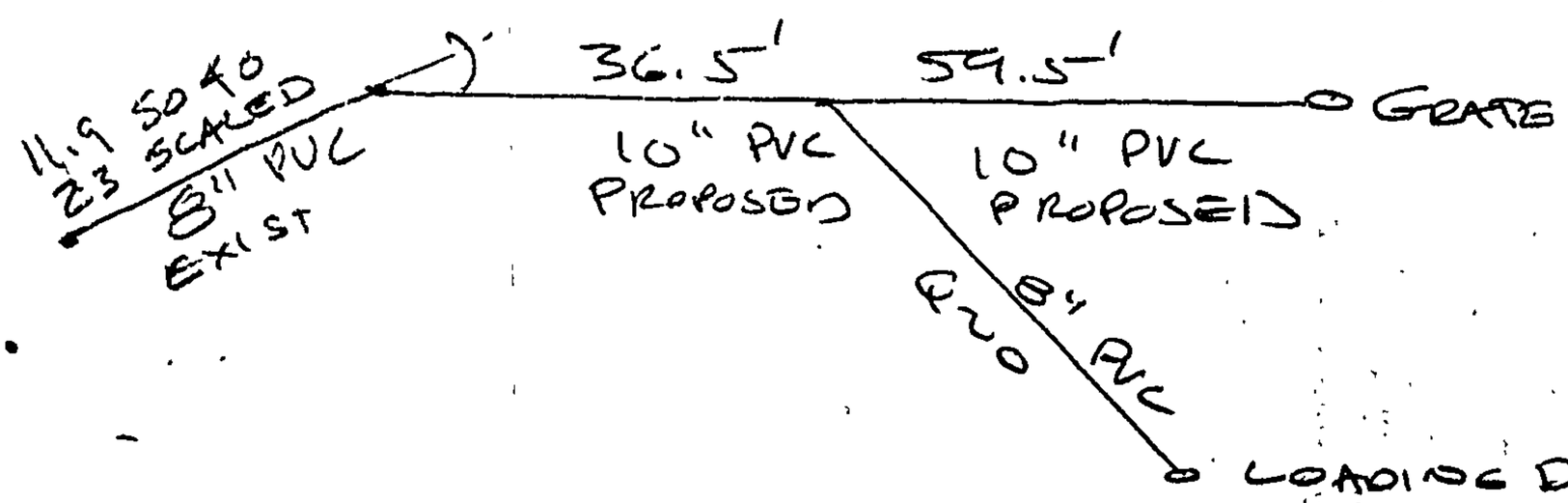
B- ELECTRIC — PIPE ANALYSIS 7-16-93

$Q_p = 2.67$ ONSITE + 0.46 OFFSITE → Q140 IN DRAINAGE EASEMENT NOT TO PIPE

$Q_p = 2.73$ CFS IN PIPE

$\frac{(50 \times 116)}{43560} \times 3.14$ cfs "C" TREATMENT

$Q = Q_{TOT} = 3.13$ CFS



(1.) EQUIVALENT LENGTH OF 8" AS 10" - equal headloss

$L_{actual} \frac{V_8^2}{2g} = L_{eq} \frac{V_{10}^2}{2g}$ $\quad L_{eq} = L_{act}\left(\frac{V_8}{V_{10}}\right)^2$

$\frac{V_8}{V_{10}} = \left(\frac{D_{10}}{D_8}\right)^2$ $\quad L_{eq} = L_{act}\left(\frac{D_{10}}{D_8}\right)^4 = 2.441 \times L_{act}$

$= 2.441 \times 23$ (23 = conserv)

$= 56.15$ say $\underline{56}$ ft

(2) CONTRACTION 10" → 8"

See Streeter & Wylie 7th Ed p 243-244

$h_{contraction} = \left(\frac{1}{C_c} - 1\right)^2 \frac{V_2^2}{2g}$ $\quad V_2 = V_{small}$

from table in Streeter & Wylie for $A_2/A_1 = 8/10 = .80$, $C_c = .613$

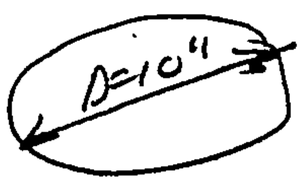
$h_c = \left(\frac{1}{.613} - 1\right)^2 \frac{V_8^2}{2g} = 0.053 \frac{V_8^2}{2g}$

from above, $V_8^2/2g = 2.441 * V_{10}^2/2g$

$\therefore h_c = 2.441 \times 0.053 = 0.129 \approx 0.13 \ V_{10}^2/2g$

D18/

(3) GET HEAD REQUIRE FOR Q AS WEIR EQUATION
DESIGN GRATE SO HEAD REQUIRED FOR GRATE ≤ HEAD FOR WEIR



$D = 10''$ $L = \text{Perimeter} = \pi D = 31.42'' = 2.62'$

$Q = C \cdot L \cdot H^{3/2}$ use $C = 3.0$, H

$2.73 = 3 \cdot 2.62 \times H^{3/2}$ $H^{3/2} = \frac{2.73}{3 \times 2.62} = 0.347$

$V = Q/A = V_{WEIR} = \frac{2.73}{1.49 \times 2.62} = 2.13 \text{ fps}$ $H = 0.347^{2/3} = 0.494' \approx 0.49'$

TRY 18" SQUARE GRATE #4 REBAR @ 4½" OC (5 PER SIDE)
16 MORE SIDES, CONSIDER FOR AREA

$18 - (5 * 4/8) = 15.5''$ per side open area

$15.5^2 = 240.25 \text{ in}^2 = 1.668 \text{ ft}^2$

ORIFICE $Q = CA\sqrt{2gh}$

use $C = 0.60$ for grates - so per Neenah Foundry calcs

$h = \frac{(Q/A)^2}{2g} \frac{1}{C^2} = \frac{(2.73/1.668)^2}{2 \times 32.2} \cdot \frac{1}{(.6)^2} = 0.116' < 0.49'$

(4) FRICTION LOSS IN PVC PIPE

$h_f = 4.727 * \frac{L_{FT}}{D_{FT}^{4.87}} \left(\frac{Q_{cfs}}{C}\right)^{1.85}$ C PVC = 140

$L = L_{@\ 8''} + L_{10''} = 56 + 96 = 152$

conservative

add 10% for minor loss es not including contraction

$L_{use} = 1.1 \times 152 = 167.2$

$h_f = \frac{4.727 \cdot 167.2}{(10/12)^{4.87}} \frac{(2.73)^{1.85}}{(140)^{1.85}} = \frac{1920.589 * 6.411}{140^{1.85}} = \frac{12312.19}{9339.79} = 1.318$

≈ 1.32

(5) Velocity head in 10" pipe $= V^2/2g = Hv$

$V = Q/A \qquad A_{10"} = \frac{\pi (10/12)^2}{4} = 0.545$ sq ft

$V = \frac{2.73}{.545} = 5.009 \sim 5.01$ cfs

$\frac{V^2}{2g} = \frac{V^2}{2 \times 32.2} = 0.390$ FT

(6) TOTAL HEAD REQUIRED

SUM OF LOSSES + HEAD OVER WEIR

SINCE $V_{WEIR} = 2.21$ fps $<<$ V_{PIPE} 5.0 fps, ASSUME CONSERVE MUST GENERATE VELOCITY HEAD, WHICH IS LOST AS FLOW ENTERS CHANNEL

$H_{TOT} = H_F + H_{WEIR} + H_{CONTRACTION} + H_{VELOCITY} + H_{EXIT\ LOSS}$

$= 1.32 + 0.49 + \frac{V_{10}^2}{2g}(0.13 + 1 + 0. + 0.0)$ ($= 0.39$; 0.0 ← CONSERVATIVE ✓)

$= 1.81 + 0.44 = 2.25'$

$H_{GL} + H_{TOT} = 22.2 + 2.25 = 24.45$

(7) H_{TOT} EXCLUSIVE OF WHAT NEEDED TO GET FLOW INTO PIPE

$1.81 + 0.13 \times 0.39 = 1.86'$

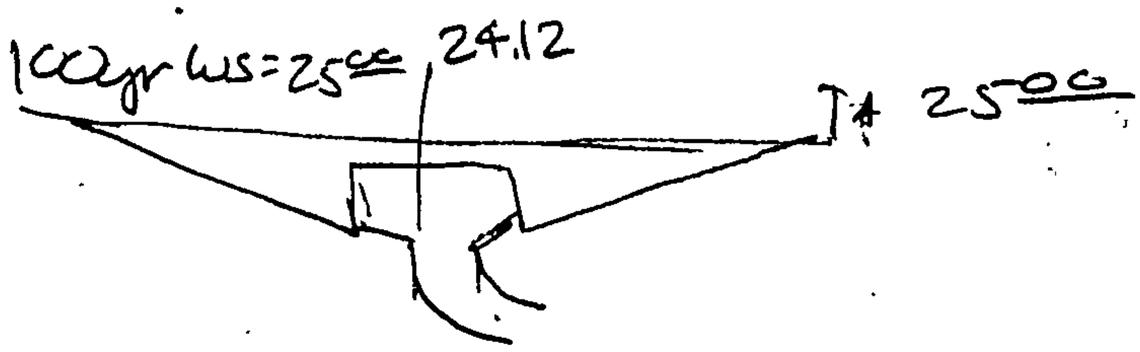
$22.2 + 1.86 = 24.06$

SET PIPE ENTRY ABOVE 24.06 FOR DESIGN

(8) H_T TO GET FLOW INTO PIPE $H_{WEIR} + H_V$ & CONSERVE

$0.49 + 0.39 = 0.88$

$TA - 0.88 = 24.12 > 24.06$ OK



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 14, 1993

Bob Ryals
Ryals Engineering
4929 Idlewilde SE
Albuquerque, NM 87108

RE: REVISED DRAINAGE PLAN FOR DOUG ZIMMERMAN OFFICE WAREHOUSE (D18-D28)
ENGINEER'S STAMP DATED 7/2/93.

Dear Mr. Ryals:

Based on the information provided on your July 6, 1993 submittal, listed are some concerns that will need to be addressed prior to final approval:

1. Copy of signed and recorded replat.

2. Hydraulics for the original concept where done using 1.12 cfs as the total flowrate. You must analyze the Hydraulics using a new total of 3.13 cfs. Show hydraulics for the inlet and pipes.

3. You may need to design for storage of the excess flows that the inlet and pipes will not be able to carry. Use the D.P.M. checklist as a guide for ponding requirements.

If I can be of further assistance, please feel free to contact me at 768-2667.

Sincerely,

Bernie J. Montoya

Bernie J. Montoya, CE
Engineer Associate

BJM/dl/WPHYD/7847

xc: File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 21, 1992

August F. Mosimann
Engineering Associates, Inc.
540 Chama, NE Suite #11
Albuquerque, New Mexico 87108

RE: REVISED DRAINAGE PLAN FOR 6000 SAN FRANCISCO, NE (D-18/D3)
REVISION DATED MAY 18, 1992

Dear Mr. Mosimann:

Based on the information provided on your submittal of May 18, 1992, the above referenced plan is approved for Building Permit.

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

Prior to Certificate of Occupancy release, Engineer's Certification per the DPM Checklist will be required.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

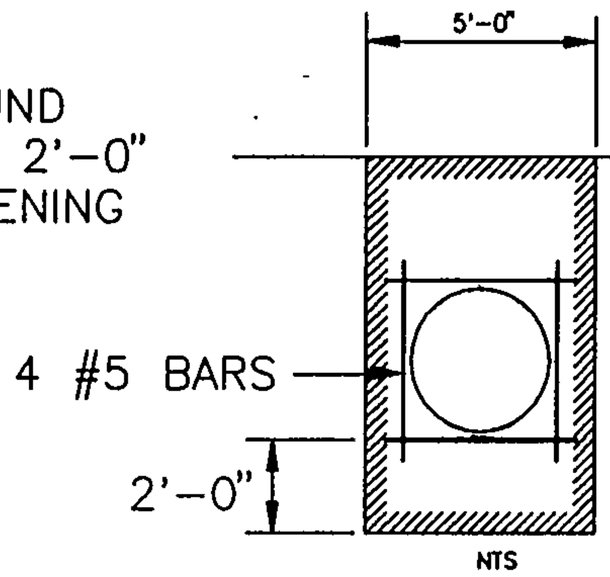
Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

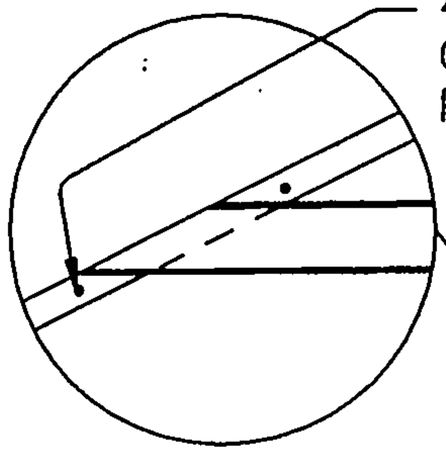
xc Alan Martinez

BJM/bsj
(WP+3319)

NOTE: IF PIPE IS INSTALLED AFTER CHANNEL LINING IS IN PLACE FOLLOW THIS DETAIL



1. SAW CUT AS SHOWN. DO NOT REMOVE REINFORCING STEEL.
2. PLACE PIPE AND RECOMPACT SOIL.
3. PLACE ADDITIONAL STEEL AROUND OPENING.
4. POUR NEW CONCRETE.



4–#5 BARS AROUND OPENING. EXTEND 2'–0" PAST END OF OPENING

℄ NORTH PINO CHANNEL

LOT 12-A

PROPERTY LINE

11.89' FIELD VERIFY

5219.00 OUTLET INVERT

1% SLOPE

PROVIDE COUPLING AT PROPERTY LINE

INSTALL 8 IN. DIA, SCHEDULE 40 PVC PIPE BETWEEN NORTH PINO CHANNEL AND LOT 12A PROPERTY LINE

AUGUST F. MOSIMANN
STATE OF
NO. 6148
NEW MEXICO
REGISTERED PROFESSIONAL ENGINEER

DETAIL

SCALE: 1"=10'

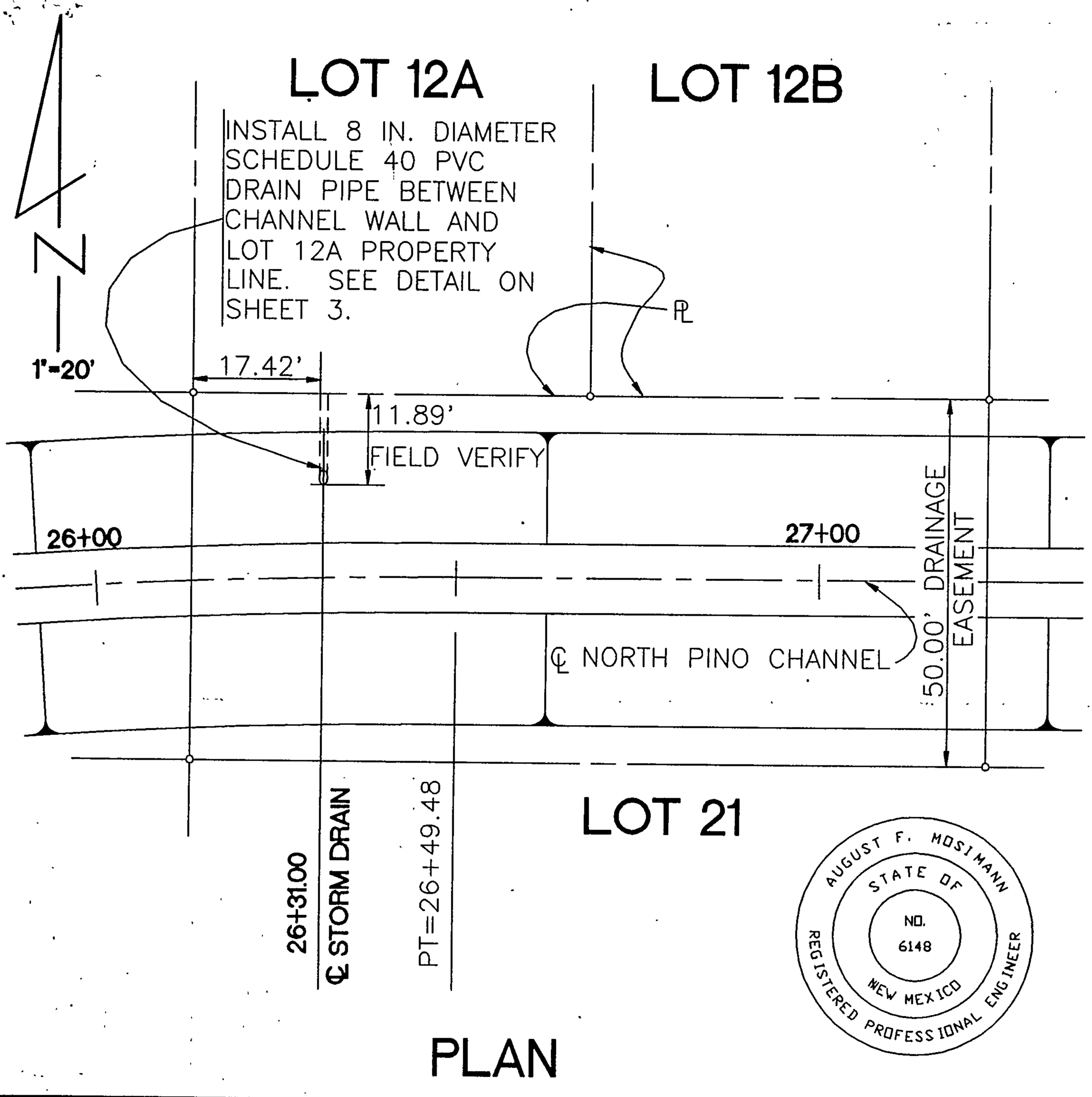
APPROVED FOR RECORD DRAWINGS	APPROVED FOR CONSTRUCTION
CHIEF CONSTRUCTION ENGINEER — DATE	CITY ENGINEER — DATE

CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE
D.R.C. CHAIRPERSON		
WATER/ WASTE WATER		
HYDROLOGY		

TITLE: BALDWIN OFFICE/WAREHOUSE STORM DRAIN INSTALLATION

PROJECT NO. 4056.91	MAP NO. D–18 SHEET 3 OF 3



PLAN

APPROVED FOR RECORD DRAWINGS

CHIEF CONSTRUCTION ENGINEER _____ DATE

APPROVED FOR CONSTRUCTION

CITY ENGINEER _____ DATE

CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE
D.R.C. CHAIRPERSON		
WATER/ WASTE WATER		
HYDROLOGY		

TITLE: BALDWIN OFFICE/WAREHOUSE STORM DRAIN INSTALLATION

PROJECT NO. 4056.91

MAP NO. D-18

SHEET 2 OF 3