



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 1, 2001

Debra Dixon, PE
Bohannon Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

**Re: BF Goodrich Aerospace Facility Parking Addition Grading Plan
Engineer's Stamp 1-8-01, (E17/D12A)**

Dear Ms. Dixon,

Based on information contained in your submittal dated 1-8-01, the above referenced site is approved for Paving Permit.

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

Also, please provide a Certified As-built for our file.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Hydrology

C: Don Dixon, AMAFCA
file

**DRAINAGE CALCULATIONS
BF GOODRICH AEROSPACE
ALBUQUERQUE, NM FACILITY**

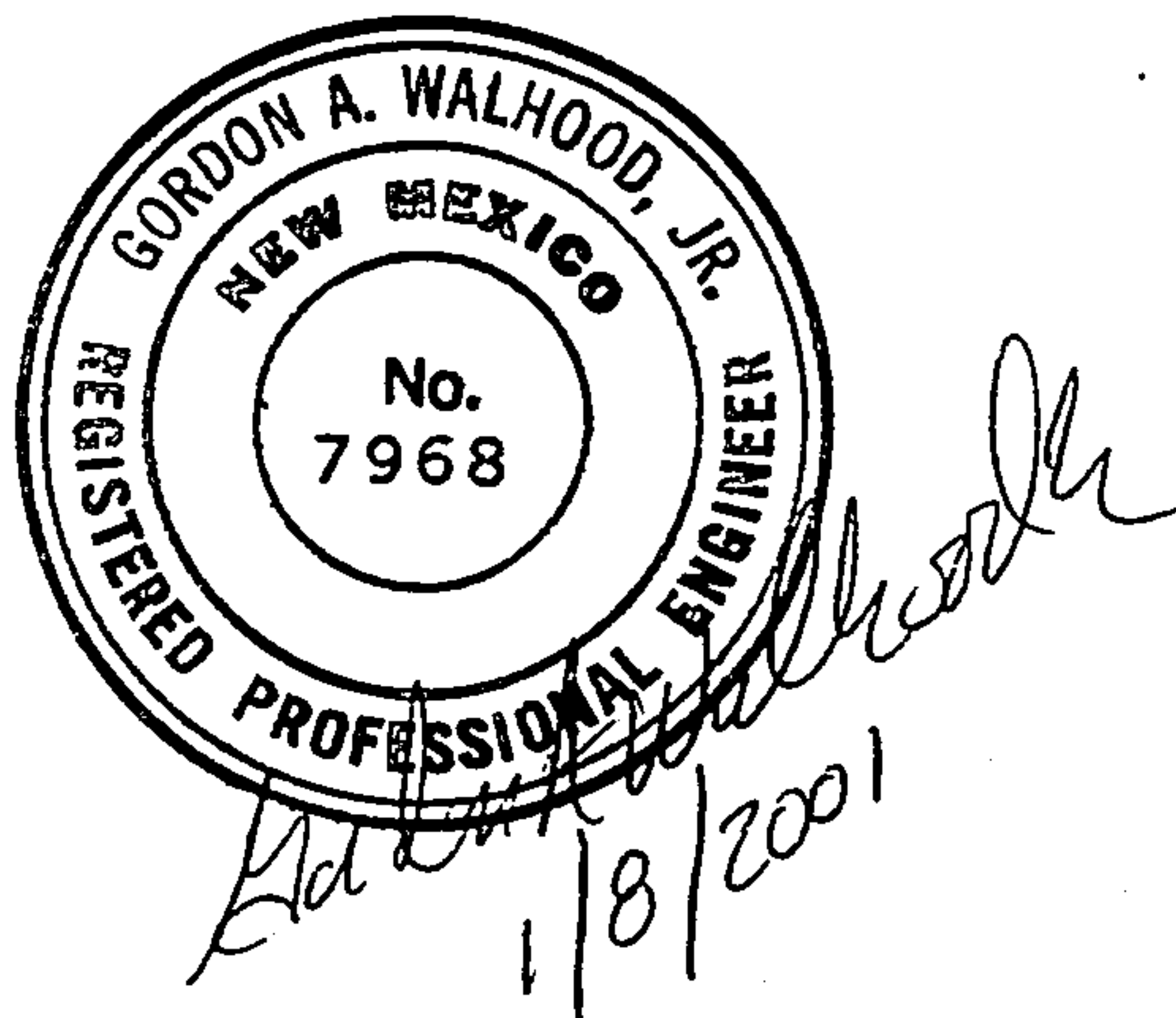
NOVEMBER, 2000

PREPARED FOR:

**BF GOODRICH AEROSPACE
ATTN: BRAD SIMS**

PREPARED BY:

**GORDON WALHOOD, JR. PE
BOHANNAN HUSTON, INC.**



BOHANNAN-HUSTON INC.

ENGINEERS • PLANNERS • PHOTOGRAMMETRISTS • SURVEYORS • LANDSCAPE ARCHITECTS

COURTYARD I, 7500 JEFFERSON NE, ALBUQUERQUE, NM 87109 TEL (505) 823-1000 FAX (505) 821-0892

BF GOODRICH - AEROSPACE PARKING IMPROVEMENTS

DESCRIPTION: PARKING IMPROVEMENTS
PAVING OF EXISTING DIRT LOT, COMPRISING
ABOUT 1.53 ACRES - PAVING + .11 ACRES
SWALE, UNIMPROVED W/ VEGETATION.
CULVERT CONDITION = UNIMPROVED SOIL
PROPOSED CONDITION = ASPHALT PAVING W/
LANDSCAPE ISLANDS
& SOUTH STRIP

RUNOFF FROM EXISTING AREA IS 1.21
ACRES SOIL

ZONE 4.

VOLUME $P_{300} = 2.2$ IN.

CURRENT TREATMENT "A"

$$Q = 2.2(1.21) = 2.7 \text{ cfs}$$

THIS CURRENTLY FLOWS WEST TO THE
CULVERT @ THE WEST SIDE.

PROPOSED TREATMENT - PAVING W/ LANDSCAPE
+ SWALE W SOME VEGETATION

AREA TOTAL = 1.64 acres.

$$Q = 1.53(5.25) + .11(2.2) = 8.3 \text{ CFS}$$

@ OUTLET @ SOUTH ~ 2-12" Ø PIPES



PROJECT NAME GOODRICH AEROSHEET / OF 8
PROJECT NO. BY STW DATE 11/10/00
SUBJECT DRNG BASIC CHD PHD DATE 11/20/00

HEADWALL HEIGHT = 1.5'

$Q = CA\sqrt{2gh}$, NOTE 2 PIPES

$A = .785 \text{ ft}^2 \times 2 = 1.57 \text{ ft}^2$ ✓ $h = 1.5$ to top of berm
see Fig. A below

$C = 0.61$ SHARP PIPE END,

$Q = .61(1.57)\sqrt{2(32.2)(1.5)} = 9.41 \text{ cfs} > 8.3$ ✓

ASSUME 100% FLOWS OVER WEIR

SECTION INTO PIPE INLET

TOTAL LENGTH $L = 8' + 4' + 4' = 16 \text{ LF}$

HT ALLOWABLE (max) = 6" = 0.5'

$Q = CLH^{3/2} = 2.70(16)(0.5)^{3/2} = 15.3 \text{ cfs} > 8.3$ ✓

CONSERVATIVE, SINCE IT NEGLECTS FLOW UNDER THE TRASH COLLECTOR GRATE

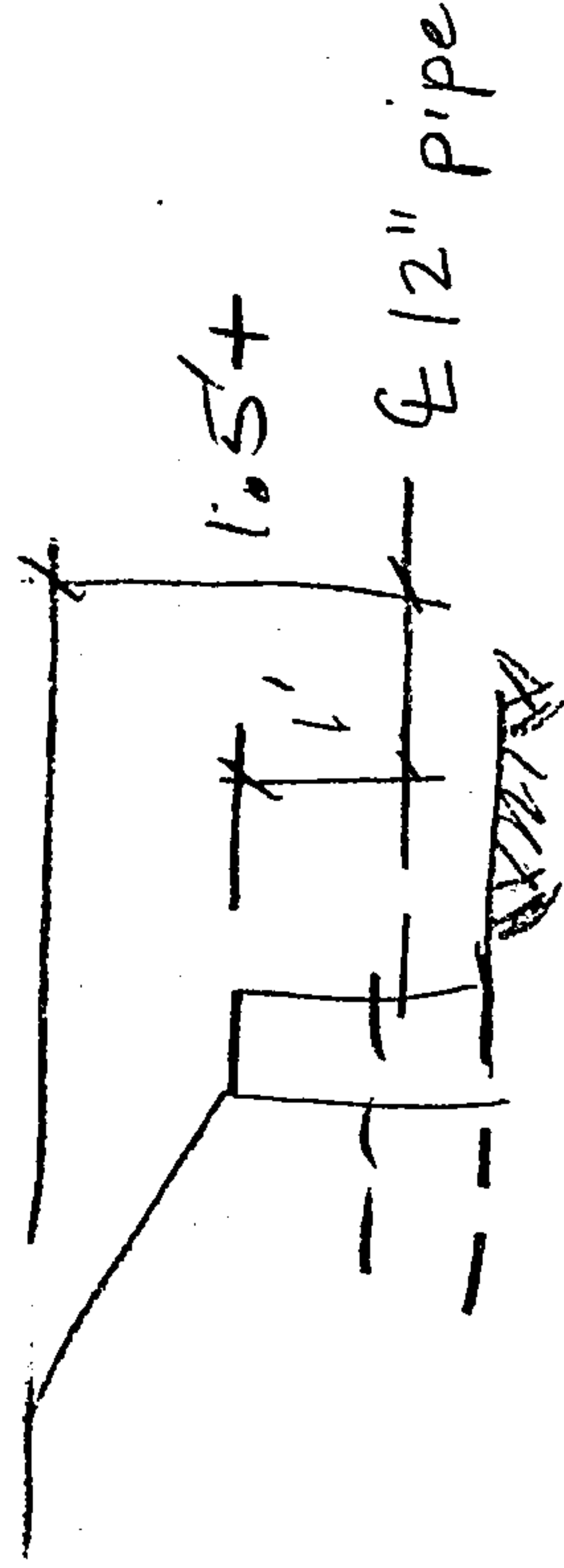


Fig. A

PROJECT NAME GOODRICH ASH SHEET 2 OF 8
PROJECT NO. BY GTW DATE 11/00
SUBJECT OUTFLOW PIPE CH'D DWO DATE 11/20/00



CHECK DEPTH IN EARTH SWALE

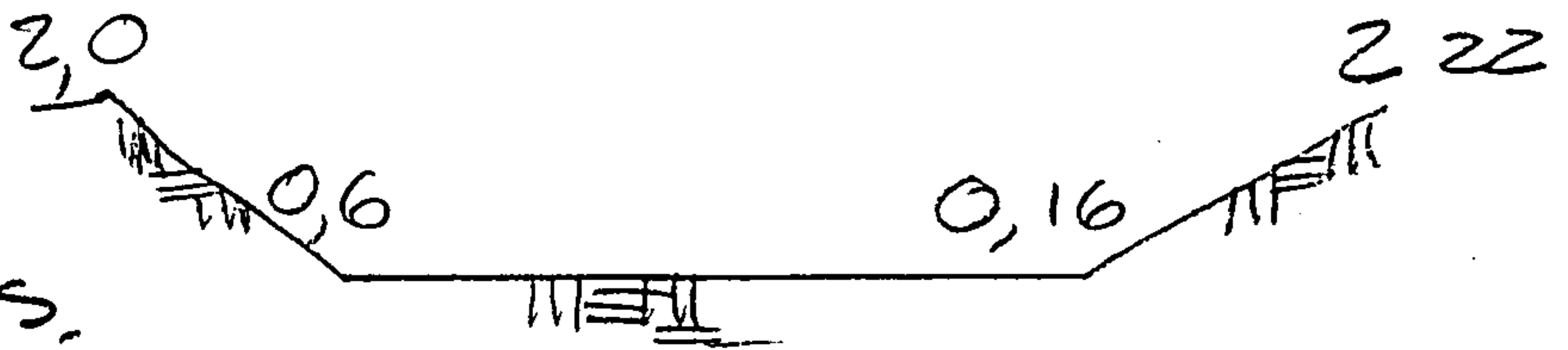
$$Q = 8.3 \text{ CFS}, \quad S = \frac{1.93'}{183} = 0.0105$$

$$n = 0.030$$

$$\text{DEPTH} \approx 0.35'$$

$$\text{VELOCITY} \approx 2.35 \text{ CFS}$$

SEE ATTACHED CALC.



* CALC CURB CUT REQMS TO CONVEY RUNOFF FROM PKG. LOT TO SWALE:

$$Q_{\text{peak}} = 8.0 \text{ cfs}$$

Assume weir flow conditions

$$Q = CLH^{3/2}$$

$$C \approx 3.0$$

$$= 3 L H^{3/2} \quad H \leq 6''$$

$$\frac{8}{3(.5)^{3/2}} = L = 7.5'$$

Use 1-8' wide curb opening.

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PROJECT NAME GOODRICH AERO
PROJECT NO.
SUBJECT SWALE

SHEET 3
BY GAW
CH'D DW

OF 8
DATE 11/00
DATE 11/15/00

PC PROGRAM STREAM

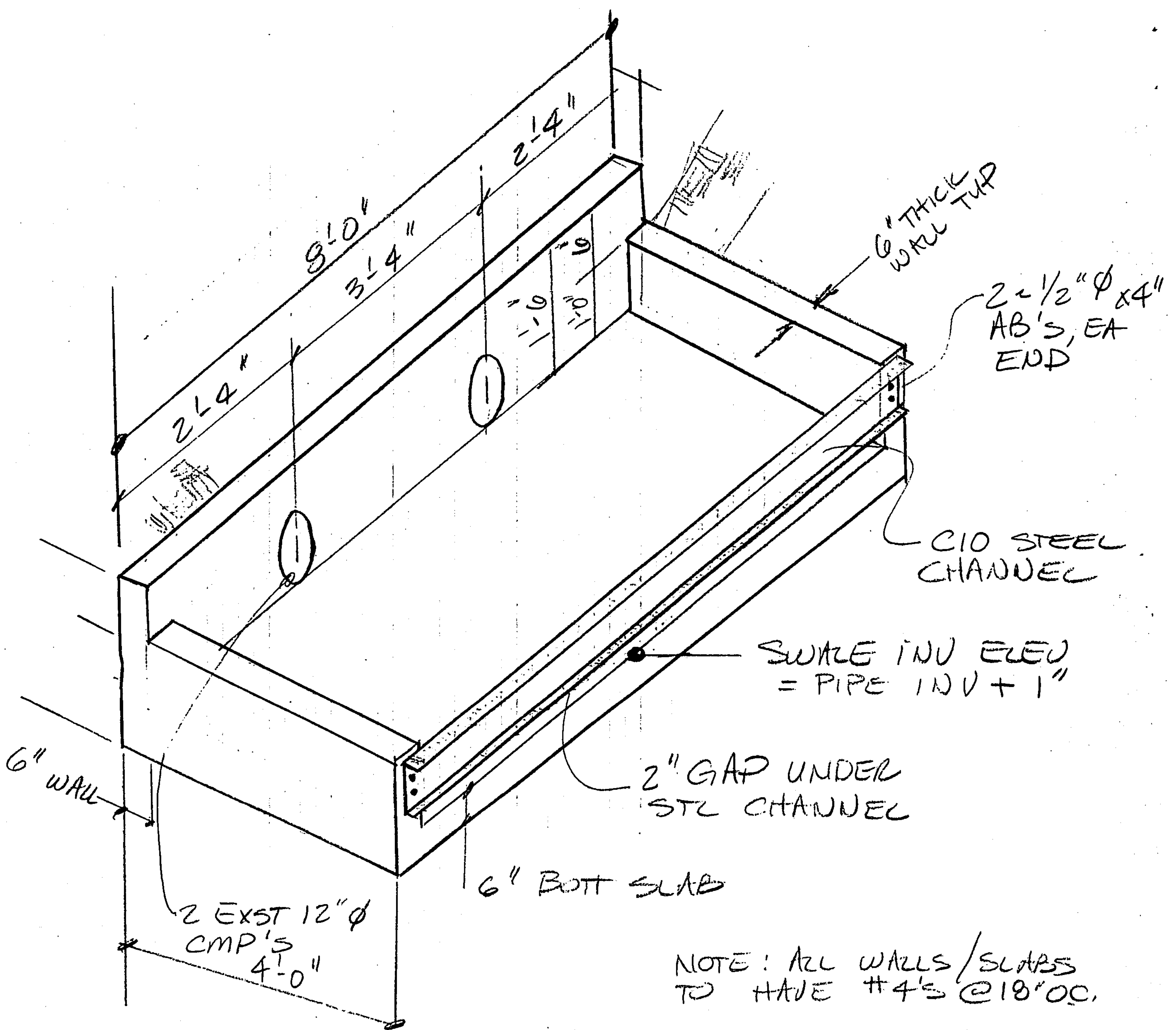
SEPTEMBER 1994

SWALE AT SOUTH

MANNING'S N= .03 SLOPE= .0105

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	2.00	3	16.00	0.00			
2	6.00	0.00	4	22.00	2.00			
WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	VEL	ENERGY
	INC	AREA	RATE	PER	VEL		HEAD	HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.10	0.10	1.03	1.1	10.63	1.07	10.60	0.02	0.12
0.20	0.20	2.12	3.5	11.26	1.67	11.20	0.04	0.24
0.30	0.30	3.27	7.0	11.90	2.15	11.80	0.07	0.37
0.40	0.40	4.48	11.5	12.53	2.56	12.40	0.10	0.50
0.50	0.50	5.75	16.8	13.16	2.92	13.00	0.13	0.63
0.60	0.60	7.08	23.0	13.79	3.25	13.60	0.16	0.76
0.70	0.70	8.47	30.1	14.43	3.56	14.20	0.20	0.90
0.80	0.80	9.92	38.1	15.06	3.84	14.80	0.23	1.03
0.90	0.90	11.43	47.0	15.69	4.11	15.40	0.26	1.16
1.00	1.00	13.00	56.7	16.32	4.36	16.00	0.30	1.30
1.10	1.10	14.63	67.3	16.96	4.60	16.60	0.33	1.43
1.20	1.20	16.32	78.8	17.59	4.83	17.20	0.36	1.56
1.30	1.30	18.07	91.2	18.22	5.05	17.80	0.40	1.70
1.40	1.40	19.88	104.5	18.85	5.26	18.40	0.43	1.83
1.50	1.50	21.75	118.8	19.49	5.46	19.00	0.46	1.96
1.60	1.60	23.68	134.0	20.12	5.66	19.60	0.50	2.10
1.70	1.70	25.67	150.1	20.75	5.85	20.20	0.53	2.23
1.80	1.80	27.72	167.3	21.38	6.03	20.80	0.57	2.37
1.90	1.90	29.83	185.4	22.02	6.21	21.40	0.60	2.50
2.00	2.00	32.00	204.5	22.65	6.39	22.00	0.63	2.63

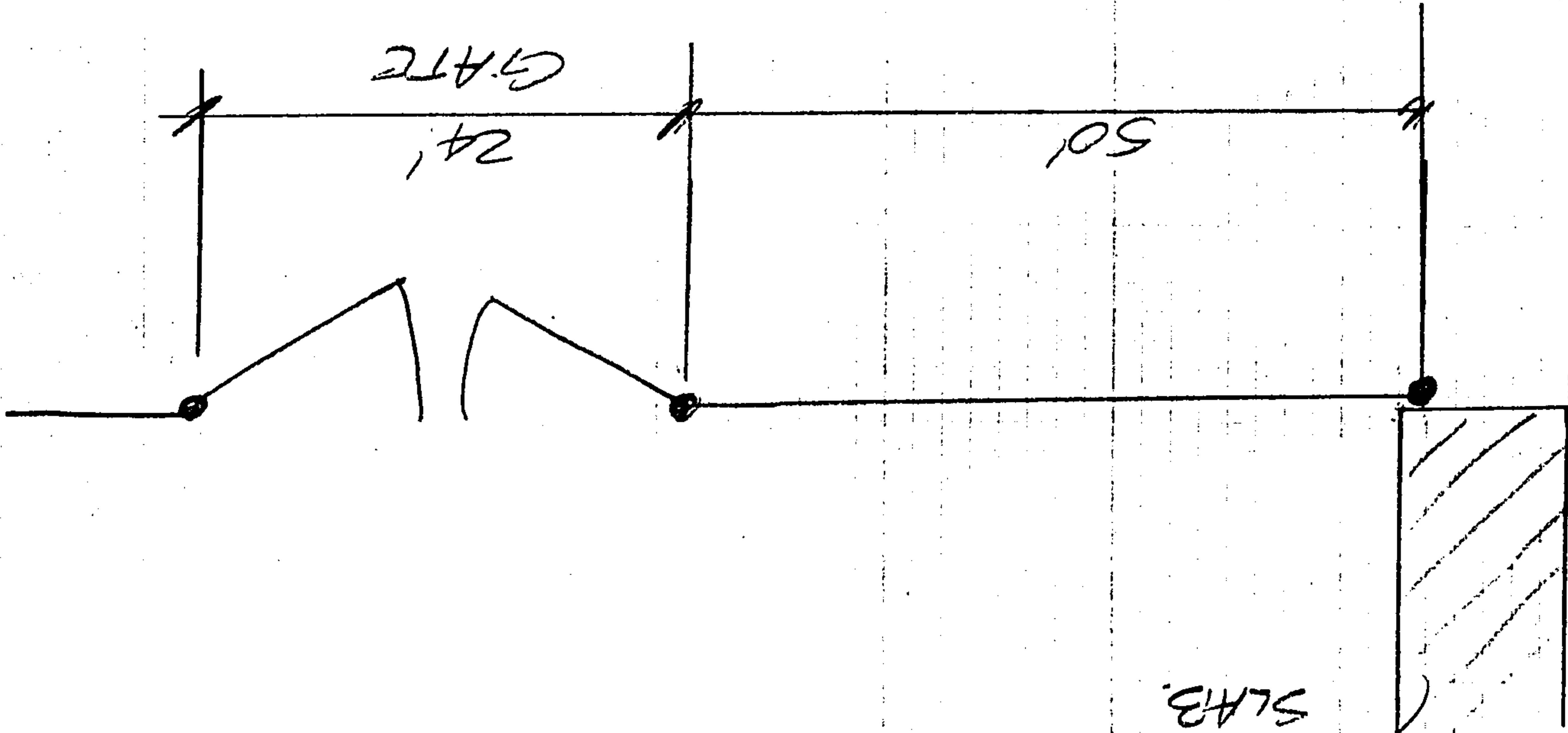
PROJECT NAME **GOODRICH AERO** SHEET **5** OF **8**
 PROJECT NO. **11/00**
 SUBJECT **OUTLET STR.** DATE **11/20/00**
 BY **CHD** **CHD**
 ENGINEER **BOHANNAN** **HUSTON**
 CHECKED **CHD**



NOTE: ALL WALLS/SLABS
 TO HAVE #4'S @ 18" OC.

N

EXIST
SLAB.



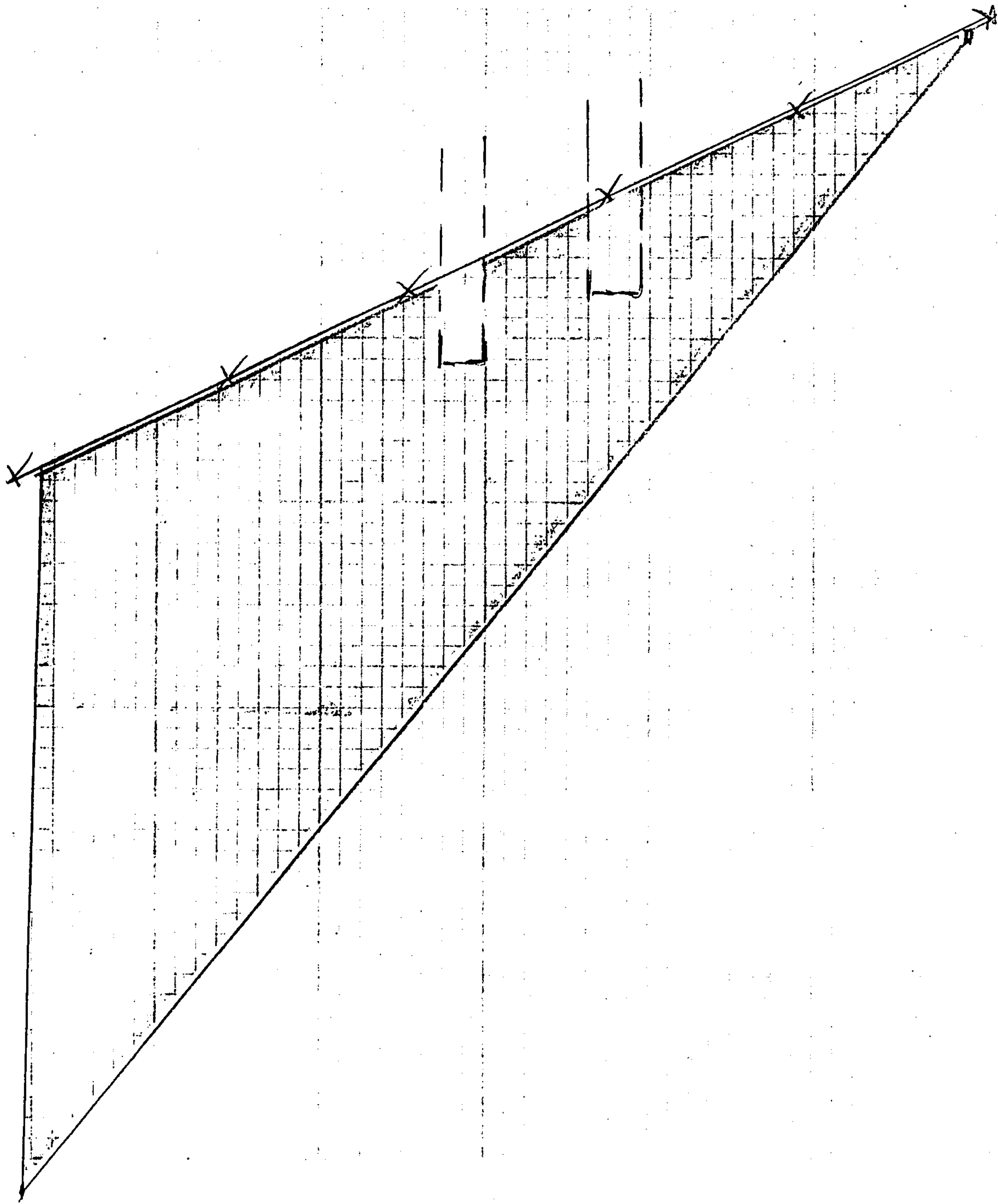
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PROJECT NAME
PROJECT NO.
SUBJECT

SHEET 6 OF 8
BY
CH'D
DATE
DATE



PROJECT NAME
PROJECT NO. ---
SUBJECT

SHEET 7 OF 8
BY
CH'D
DATE
DATE

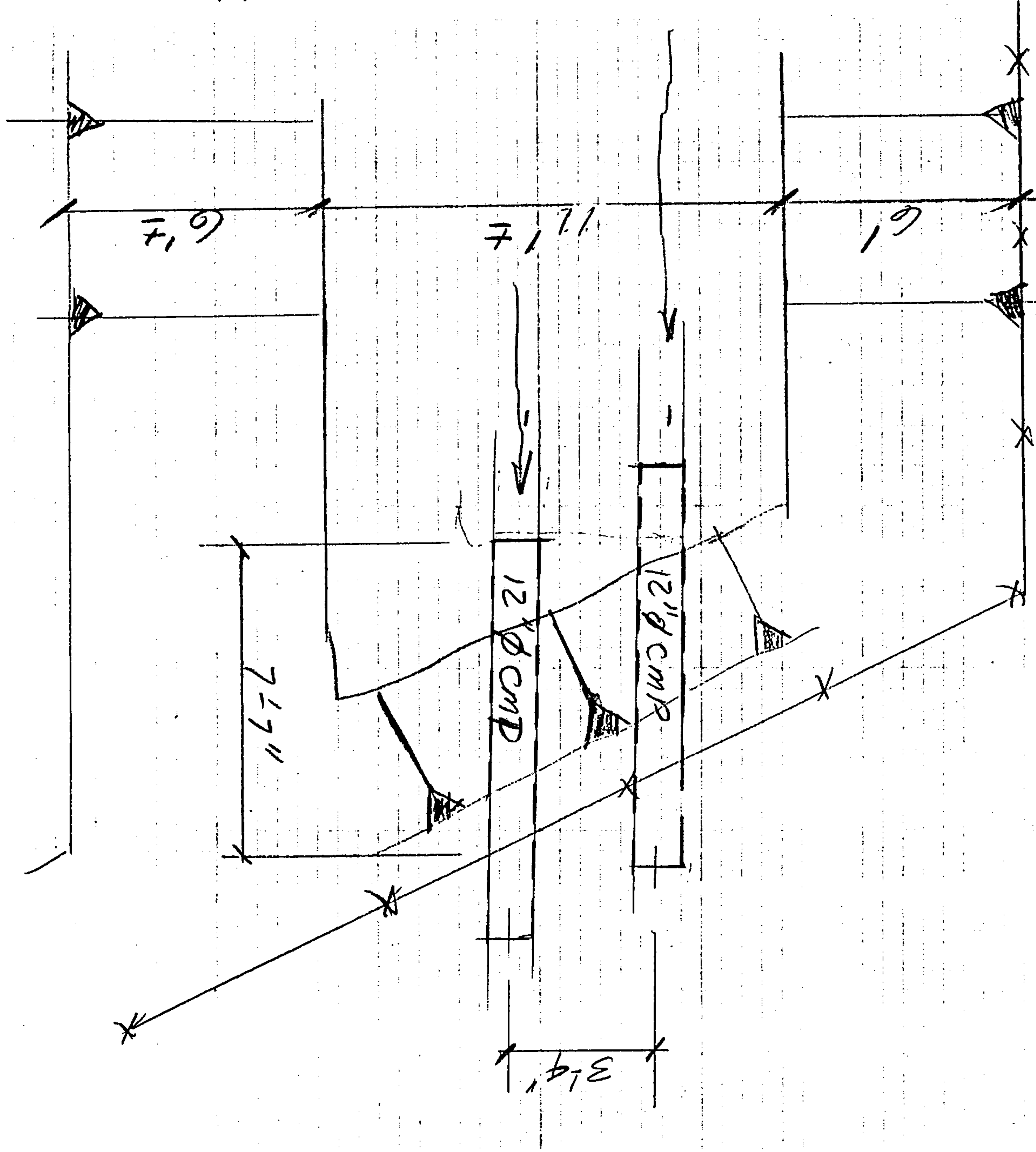
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A

"Q-1" = 1/4"



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PROJECT NAME GOODRICH FIELD SHEET 8 OF 8

PROJECT NO.

BY

DATE

SUBJECT

CH'D

DATE

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