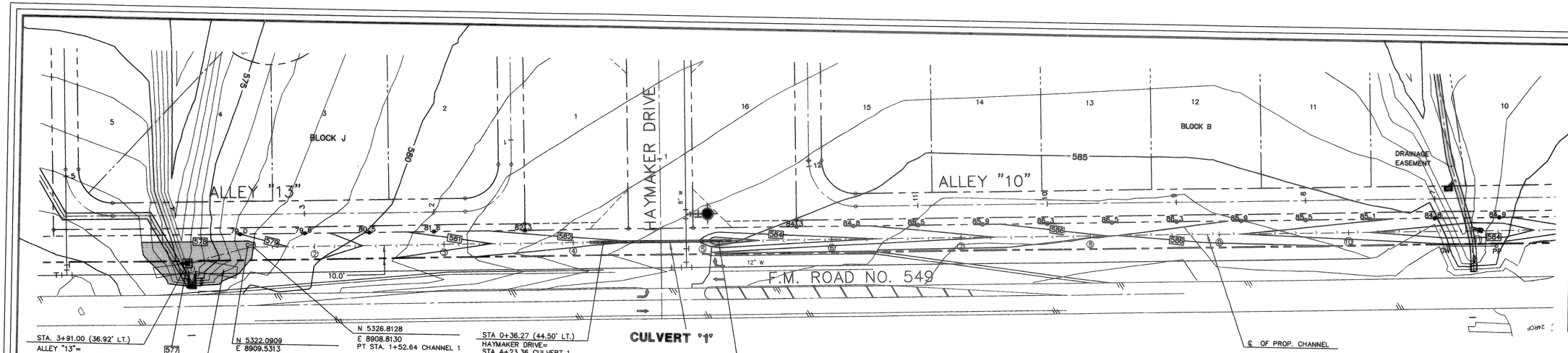


CURVE TABLE

CURVE	RADIUS	DELTA	TANGENT	LENGTH	CHORD	BEARING
C-1	20.00'	13°42'57"	2.41'	4.79'	4.78'	N08°38'58"W

CULVERT DESIGN CALCULATIONS

CULVERT LOCATION: LOFLAND FARMS PHASE 5B, ROCKWALL, TEXAS
LENGTH, L 89.00 FT DESIGN STORM FREQ. 100-YR
ROUGHNESS COEFF., n 0.012 MAX. VEL. 12.0 ft/sec
TAILWATER 0.90' D.S. CHANNEL WIDTH TRIANGULAR
ENTRANCE DESCRIPTION 5 DESIGN DISCHARGE 2.25 cfs

RDWY. ELEV. 586.00 | U.S. CULV. F.L. 582.44
U.S. CULV. F.L. 582.36 | D.S. CULV. F.L. 582.00
DIFFERENCE 3.64' | DIFFERENCE 0.445
REQ'D. FREEBOARD 1.0 FT. | CULV. SLOPE, S_o = DIFF. FT. / LENGTH FT.
ALLOW. HEADWATER 2.64 FT. | $S_o = \frac{0.445}{89.0} = 0.50\%$

DOWNSTREAM CHANNEL CALCULATIONS

Q_{100}= 2.25 cfs
n = 0.035
SIDE SLOPE (LT. & RT.) = 3:1
LONGITUDINAL SLOPE = 1.00%
DEPTH OF FLOW = 0.62 ft
AVERAGE VELOCITY = 1.95 fps

NOTE:
FIG. 26, 28 & 30 ARE THE NOMOGRAPHS OF BREAU OF PUBLIC ROADS, JAN. 1963, PAGE NO. G-26, G-28, G-30

TRIAL CULVERT					POSSIBLE CULVERT SIZES				HEADWATER CALCULATION																
		DEPTH RANGE D.R.							INLET CONTROL (Using Figure 26)				OUTLET CONTROL (Using Figure 28 & 30)											The Greater Controlling Head Water (Inlet or Outlet) (feet)	SELECTED CONDUIT SIZE
														CASE III HW = H + TW − L X S_o (feet)				CASE IV HW = H + h_o − L X S_o (feet)								
Trial Area of Opening $T.A_c = \frac{Q}{V_{max}}$ (sq. ft.)	Channel Width "W" (feet)	$\frac{T.A_c}{W}$ (feet)	AHW (feet)	Try Diameter "D" (inch)	No. Openings	Pipe Dia. "D" (inch)	Total Culvert Area "Ac" (sf)	"Q" Each Opening (c.f.s.)	Entrance Type	Case No.	$\frac{HW}{D}$ (figure 26)	HW (feet)	Entrance Coeff. K_e	"H" (figure 28) (feet)	"TW" (feet)	L X S_o (feet)	"HW" (feet)	"H" (figure 28) (feet)	$h_o = \frac{d_c+D}{2}$ or h_o = TW (use larger) d_c (figure 30) (feet)	$\frac{d_c+D}{2}$ (feet)	"TW" (feet)	h_o (feet)	L X S_o (feet)	"HW" (feet)		
1	2	3	4	5	6	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
0.19	TRIANGULAR	–	2.64	18"	1	18"	1.77	2.25	5	1	0.58	0.87	0.20	0.20	0.62	0.30	0.52	0.20	0.57	1.03	0.62	1.03	0.30	0.93	0.93' (OUTLET)	18" RCP

LEGEND

PP	Power Pole
WV	Water Valve
SN	Sign
TSN	Traffic Signs
LP	Light Pole
W	Water Line
OH	Overhead Power Lines
742	Proposed Contour Line
742	Existing Contour Line

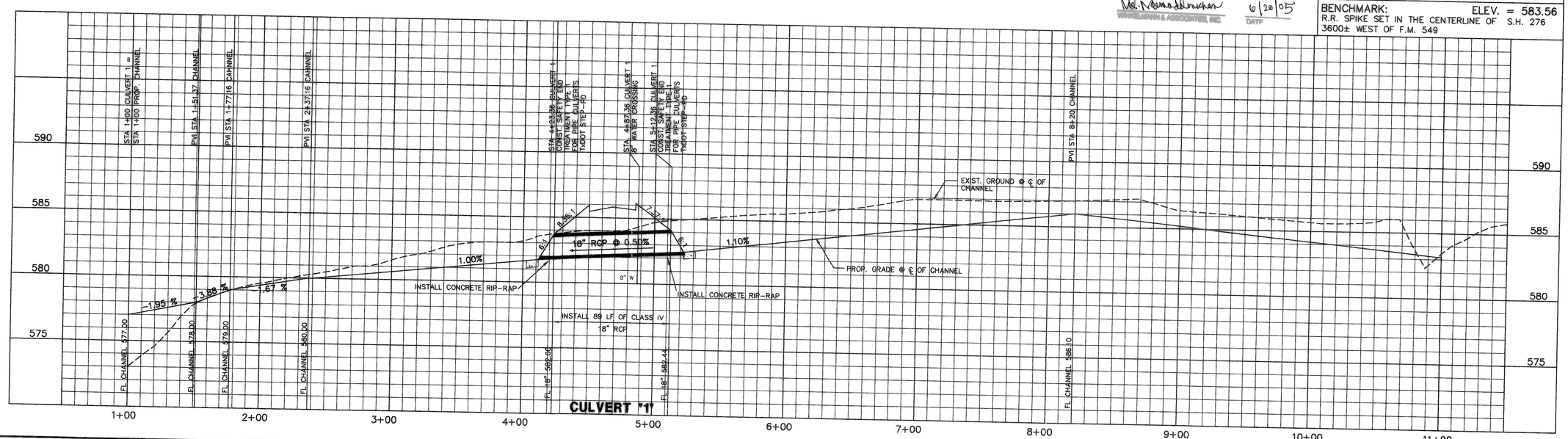
N

0' 20' 40' 80'
Scale 1"=40'

AS-BUILT
Winkelmann & Associates, Inc. hereby states that this plan, to the best of our knowledge is "As Built." Modifications from the originally approved construction documents have been made as per information provided by the contractor. Winkelmann & Associates, Inc. does not certify as to the correctness or quality of construction as no field inspection was performed.
WINKELMANN & ASSOCIATES, INC. 6/20/05 DATE

BENCHMARK: ELEV. = 600.69
CITY OF ROCKWALL R-19
BRASS MONUMENT AT THE N/W CORNER OF SILVERVIEW & DIAMOND WAY. 500' ± SOUTH OF S.H. 276.

BENCHMARK: ELEV. = 583.56
R.R. SPIKE SET IN THE CENTERLINE OF S.H. 276 3600± WEST OF F.M. 549



THESE CONSTRUCTION PLANS WERE PREPARED UNDER THE RESPONSIBLE SUPERVISION OF MD. NAIM UDDIN KHAN, REGISTERED PROFESSIONAL ENGINEER NO. 87776. 6/20/05

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MD. NAIM UDDIN KHAN, P.E. #87776

NO.	DATE	REVISION	APPROV.

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LOFLAND FARMS, PHASE 5B
W.H. BAIRD SURVEY, ABSTRACT NO. 25
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
D R HORTON
4306 MILLER ROAD, SUITE A
ROWLETT, TEXAS 75088

CULVERT PLAN, PROFILE & CALCULATIONS

Scale : H. 1"=40' V. 1"=4' | Date : 05/30/04
Designed By : NK
Drawn By : NK
Checked By : NK
File : 32004SBCUL.dwg | View :
Project No. : 32004.00

SHEET 15 OF 28