5/16/89

A0000094

REACH 1

Revisions :

1. Entire sheet pile wall moved 0.5' closer to the canal thus increasing the crown width 0.5' along the entire reach.
2. Step elevation lowered from El. 2.0 to El. 1.5.

Submittals :

1. New canalside stability analyses taking into account the above revisions and the correction to the soil shear strength from El. 0.0 to El. -2.0.
2. New landside stabiliy analyses taking into account the above revisions and including calculations at El. -20.5.
2. New sheet pile analyses taking into account the above revisions and the submerged canalside soil weight.

REACH 1
STA. 553+70 TO STA. 568+00

STA.	OFFSET TO EL. 5.5 ON EXISTING BACKSLOPE (FT)	OFFSET TO SHEET PILE (FT)	CROWN WIDTH (FT)	EXISTING BACKSLOPE (H : V)	EXISTING LANDSIDE TOE EL.	DIST. FROM TOE TO GROUND PT. (FT)	EXISTING LANDSIDE GROUND EL.
554+00	219.5	210.5	9.0	3.1 : 1	-1.77	10.0	-2.17
556+00	219.6	209.9	9.7	2.9 : 1	-2.37	10.0	-3.27
558+00	219.8	209.3	10.5	3.1 : 1	-3.04	10.0	-3.24
560+00	218.2	208.7	9.5	3.0 : 1	-3.64	10.0	-4.04
562+00	216.9	208.0	8.9	4.4 : 1	-2.43	10.0	-3.59
564+00	221.4	207.8	13.6	3.6 : 1	-2.03	7.3	-2.03
566+00 (℄ Pt.)	219.3	207.8	11.5	3.8 : 1	-0.43	10.0	-1.44
568+00	218.4	207.7	10.7	3.5 : 1	-3.32	10.0	-3.62

Cross-Section Geometry : Crown El. 5.5 Crown Width Varies
Step El. 1.5 Step Width = 12.0'

Slope Stability Analysis :

The following cross-sections were checked to determine the minimum factor of safety :

Canalside Failure - 562+00, 564+00 and 566+00. The section at Sta. 564+00 governs.
*** Minimum Factor of Safety = 1.32 at El. -36.5 ***

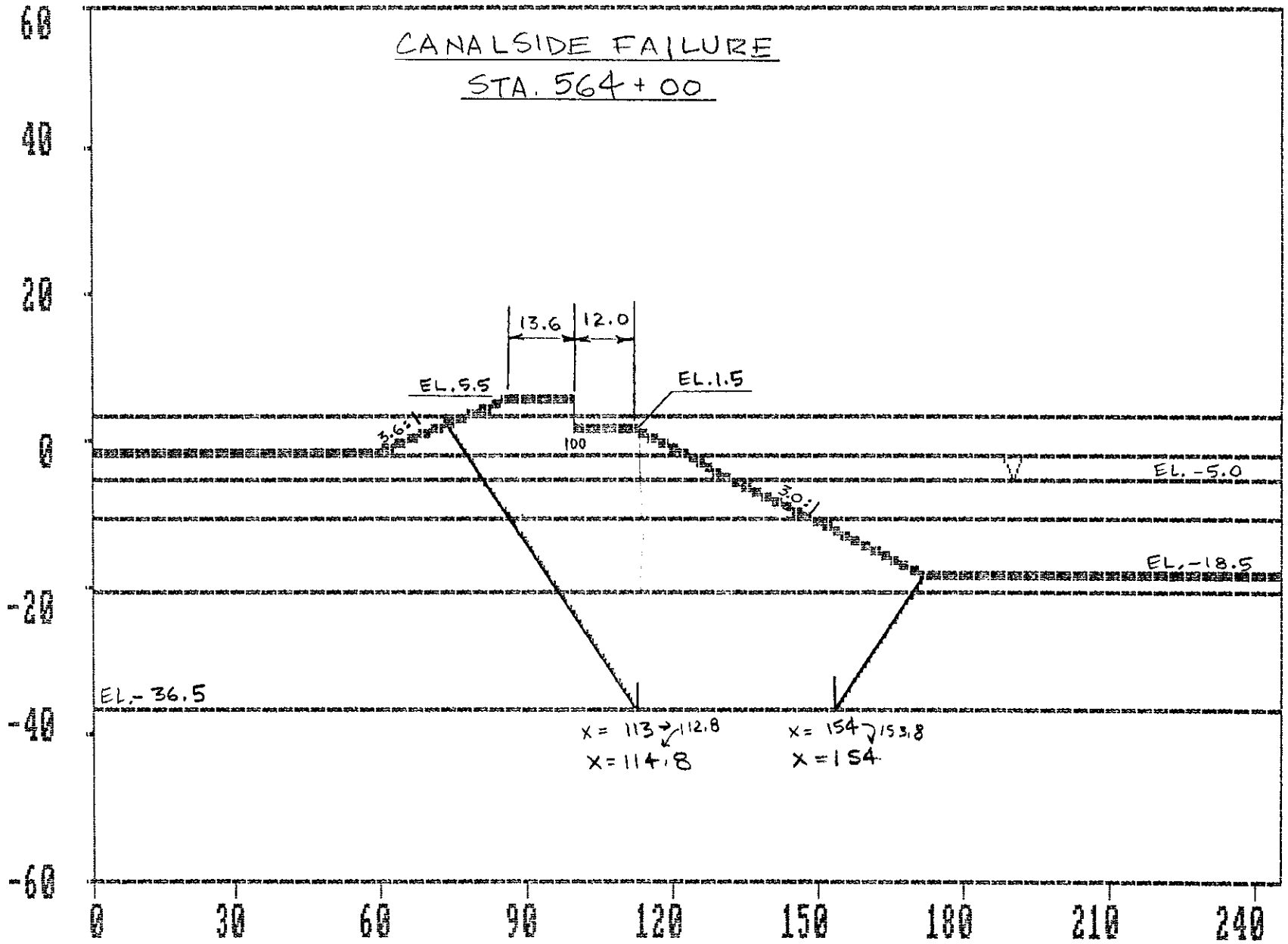
Landside Failure - 554+00, 556+00, 560+00 and 562+00. The section at Sta. 560+00 governs.
*** Minimum Factor of Safety = 1.30 at El. -20.5 ***

Sheet Pile Analysis :

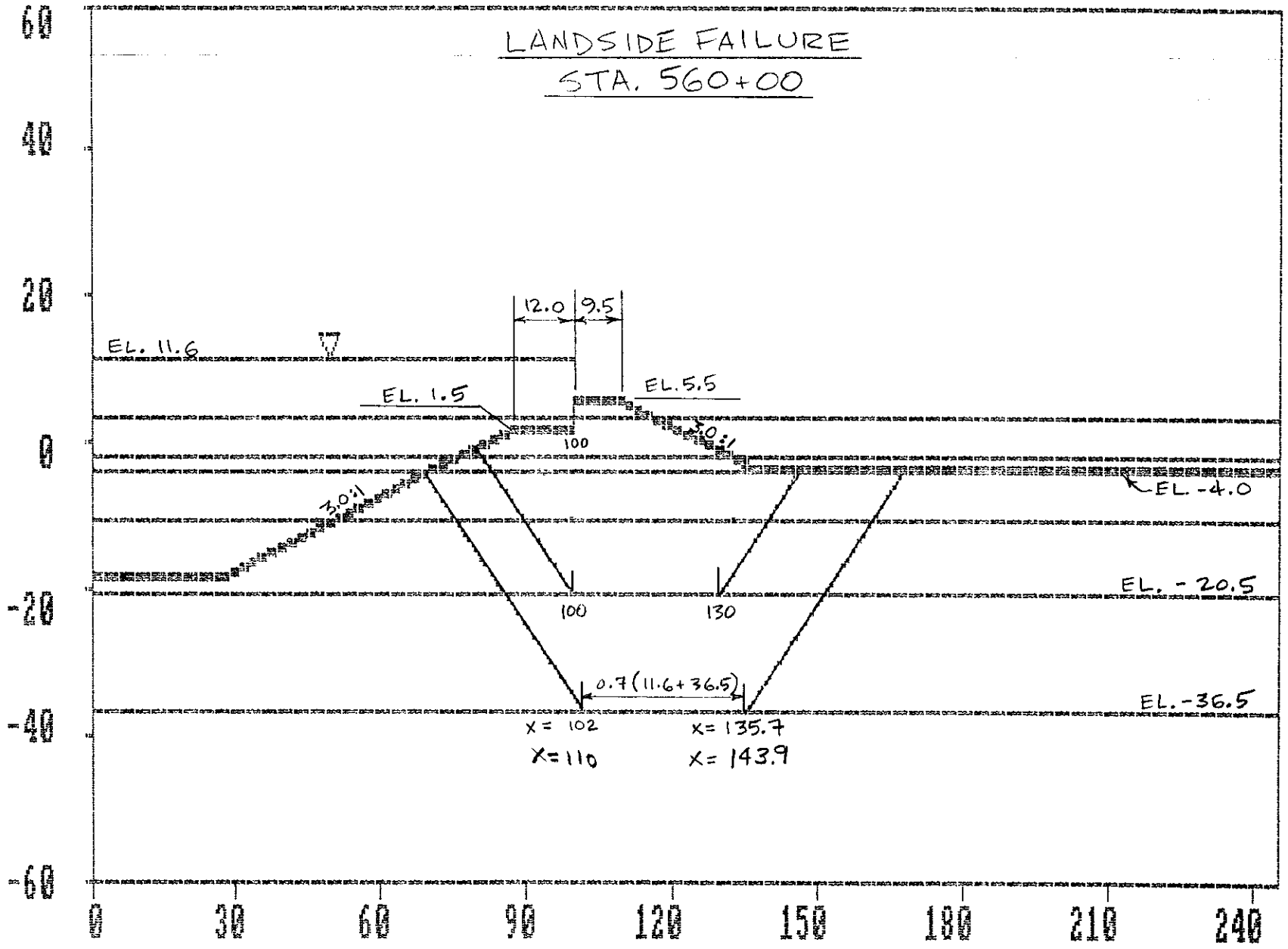
The following cross-sections were checked to determine the required penetration, design bending moment and maximum deflection :

Canalside Failure - 562+00, 564+00 and 566+00.
Landside Failure - 554+00, 556+00, 560+00 and 562+00.

Required Penetration : -12.0 (Landside Failure 3:1 Ratio; S-Case F.S. = 1.37)
Design Bending Moment : 11.9 Ft-K/Ft @ El. -2.9 (Landside Failure 3:1 Ratio; S-Case F.S. = 1.37)
Maximum Deflection : In.



ELEV.	R_A	R_B	R_P	D_A	D_P	F. S.
-36.5	27,668	15,580	13,640	82,429	39,344	1.32
	28,109	14,896	13,480	82,868	39,626	1.31

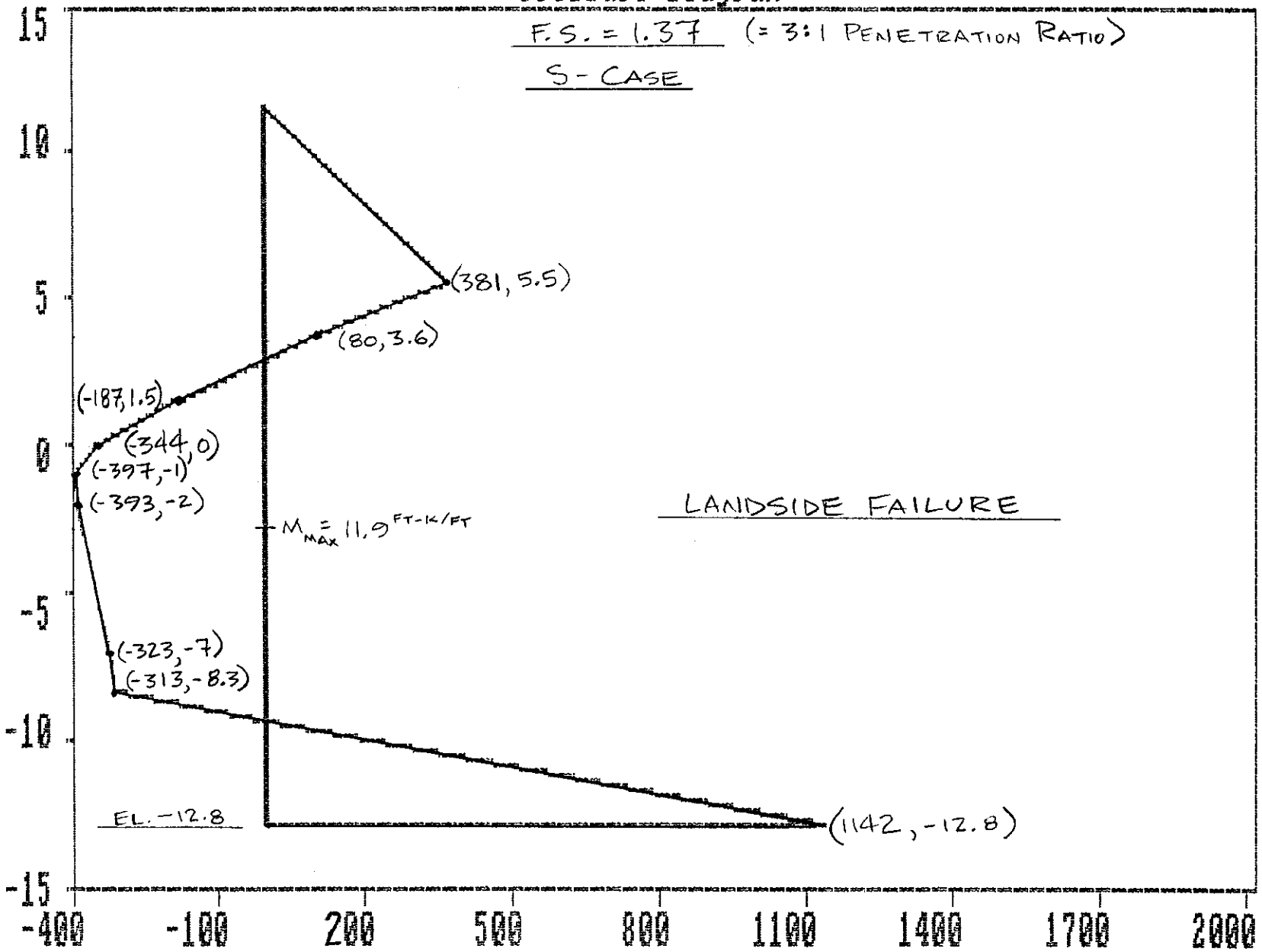


ELEV.	R_A	R_B	R_P	D_A	D_P	F.S.
-20.5	12,412 12,361	11,116 11,400	10,368 10,228	41,551 41,468	15,482 15,263	1.30 1.30
-36.5	22,118	12,806	22,379	97,819	54,154	1.31
	23,269	12,882	22,400	98,323	54,283	1.33

Pressure Diagram

F.S. = 1.37 (= 3:1 Penetration Ratio)

S-Case



REACH 2

Revisions :

1. Entire sheet pile wall moved 0.5' closer to the canal thus increasing the crown width 0.5' along the entire reach.
2. Step elevation lowered from El. 2.0 to El. 1.5.
3. Step width increased from 9.0' to 12.0'.

Submittals :

1. New canalside stability analyses taking into account the above revisions and the correction to the soil shear strength from El. 0.0 to El. -2.0.
2. New landside stabiliy analyses taking into account the above revisions and including calculations at El. -20.5.
2. New sheet pile analyses taking into account the above revisions and the submerged canalside soil weight.

REACH 2
STA. 568+00 TO STA. 589+00

STA.	OFFSET TO EL. 5.5 ON EXISTING BACKSLOPE (FT)	OFFSET TO SHEET PILE (FT)	CROWN WIDTH (FT)	EXISTING BACKSLOPE (H : V)	EXISTING LANDSIDE TOE EL.	DIST. FROM TOE TO GROUND PT. (FT)	EXISTING LANDSIDE GROUND EL.
568+00	218.4	207.7	10.7	3.5 : 1	-3.32	10.0	-3.62
570+00	220.5	207.6	12.9	4.2 : 1	-1.01	10.0	-1.77
572+00	219.1	207.4	11.7	3.6 : 1	-1.08	10.0	-1.48
574+00	218.8	207.3	11.5	3.1 : 1	-2.08	10.0	-2.18
576+00	216.9	207.2	9.7	3.0 : 1	-3.79	6.0	-3.99
578+00	220.7	211.2	9.5	3.1 : 1	-2.79	10.0	-2.99
580+00	225.9	216.1	9.8	3.1 : 1	-2.57	10.0	-2.67
582+00	231.4	220.9	10.5	2.9 : 1	-1.97	10.0	-2.37
584+00	235.6	225.8	9.8	2.6 : 1	-2.46	10.0	-2.86
586+00	242.1	230.7	11.4	2.9 : 1	-1.56	2.0	-1.96
588+00	245.8	235.4	10.4	2.5 : 1	-2.44	10.3	-2.64

Cross-Section Geometry : Crown El. 5.5 Crown Width Varies
Step El. 1.5 Step Width = 12.0'

Slope Stability Analysis :

The following cross-sections were checked to determine the minimum factor of safety :

Canalside Failure - 570+00.
*** Minimum Factor of Safety = 1.35 at El. -34.0 ***

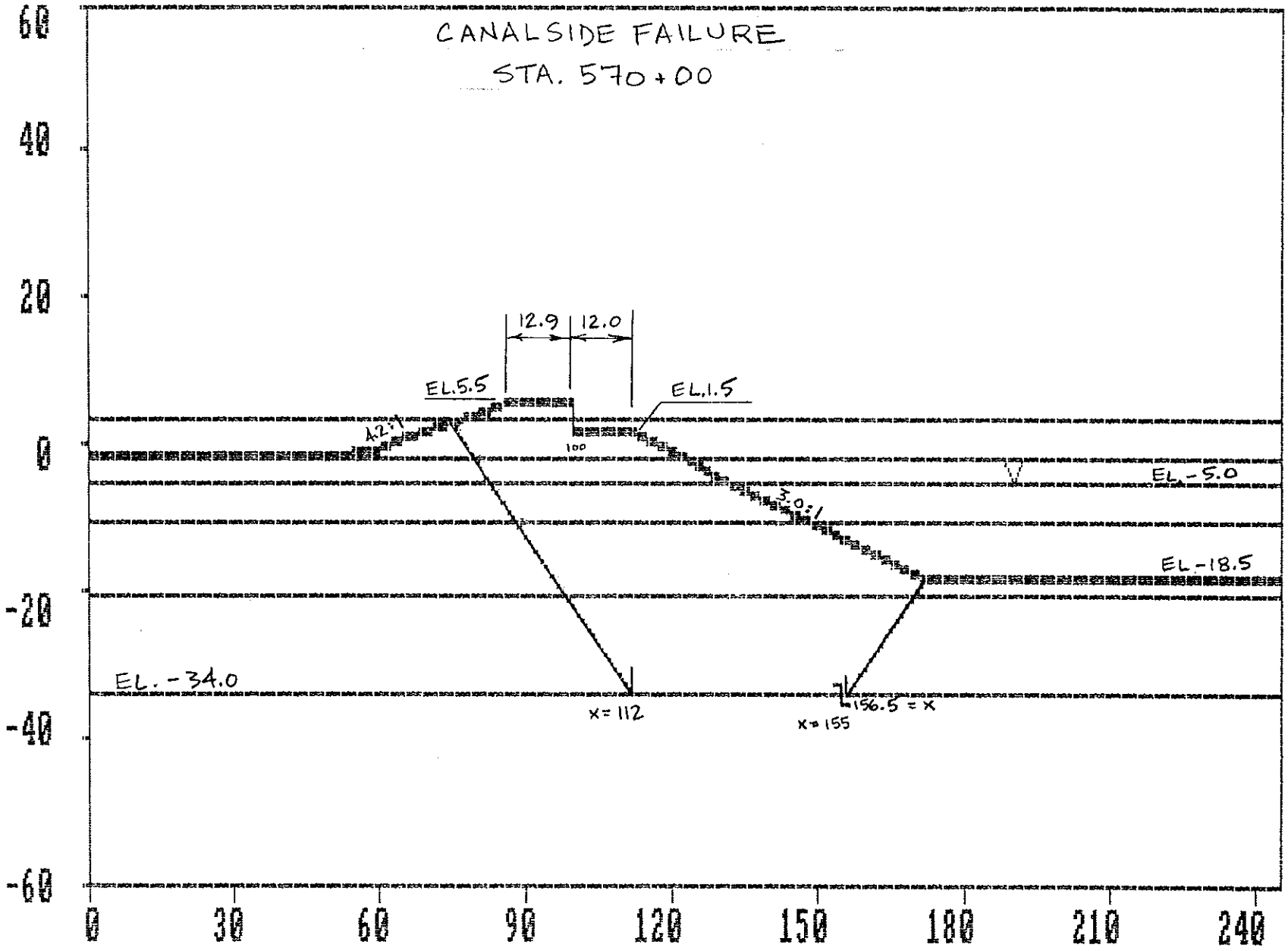
Landside Failure - 576+00, 578+00, 584+00 and 588+00. The section at Sta. 576+00 governs.
*** Minimum Factor of Safety = 1.38 at El. -34.0 ***

Sheet Pile Analysis :

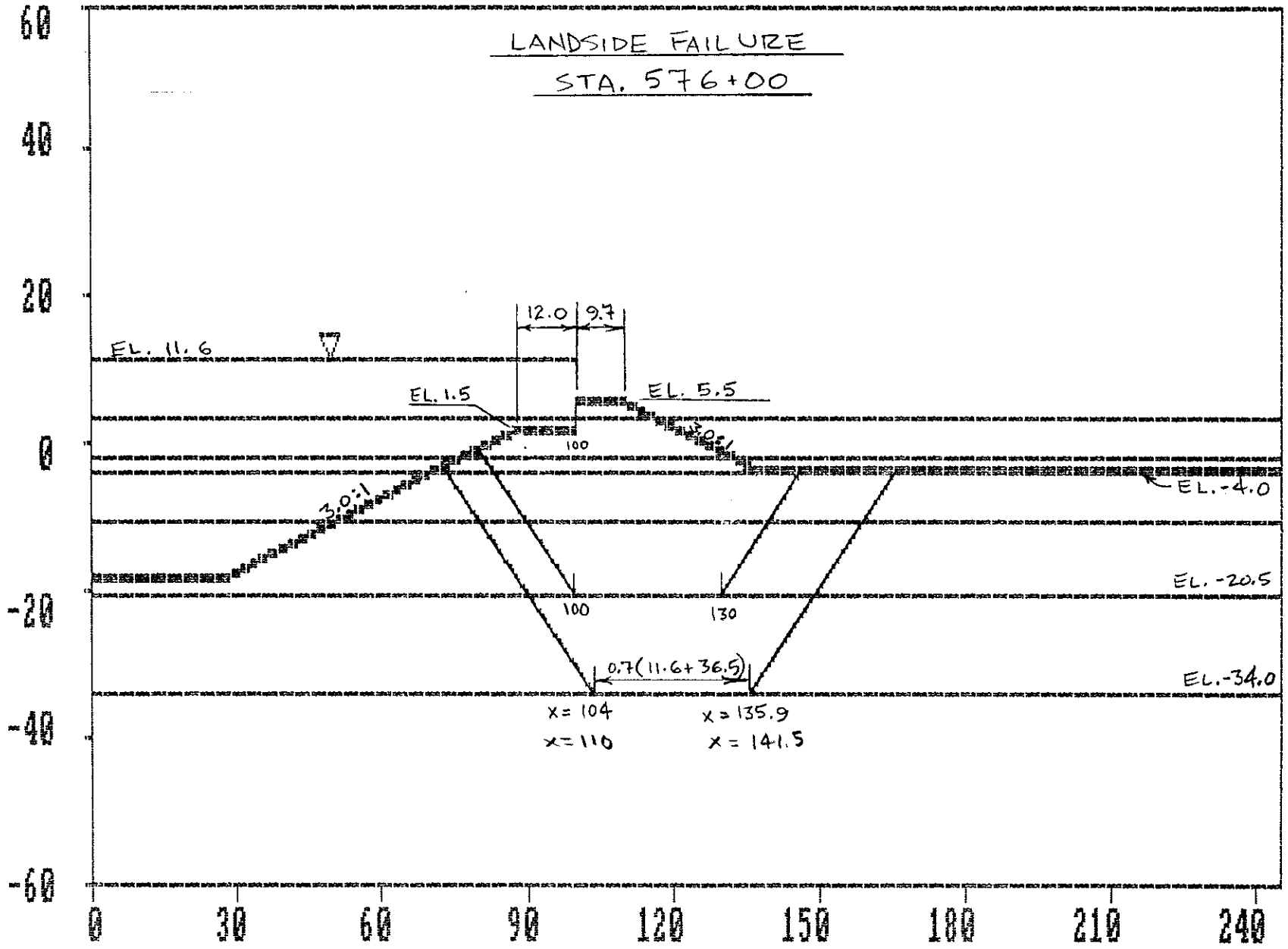
The following cross-sections were checked to determine the required penetration, design bending moment and maximum deflection :

Canalside Failure - 570+00.
Landside Failure - 576+00, 578+00, 584+00 and 588+00.

Required Penetration : -12.8 (Landside Failure 3:1 Ratio; S-Case F.S. = 1.39)
Design Bending Moment : 12.0 Ft-K/Ft @ El. -2.8 (Landside Failure 3:1 Ratio; S-Case F.S. = 1.39)
Maximum Deflection : In.

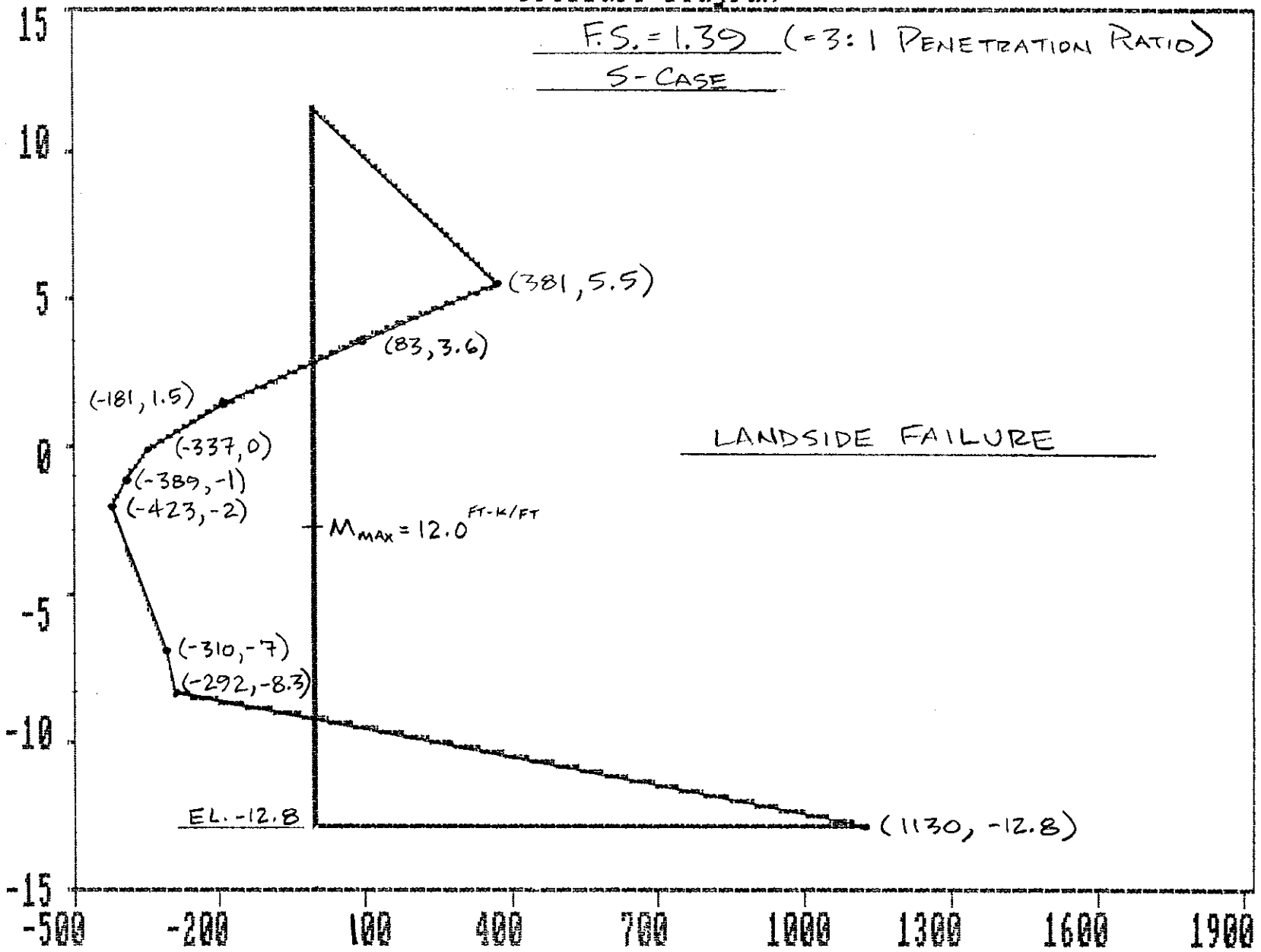


ELEV	R_A	R_B	R_F	D_A	D_F	F.S.
-34.0	26,316	16,899	11,740	73,032	32,469	1.35
	26,029	16,836	11,728	73,589	32,864	1.34



ELEV.	R_A	R_B	R_P	D_A	D_P	F.S.
-20.5	12,361	11,400	10,247	41,468	15,243	1.30
-34.0	20,854	12,122	20,506	87,514	46,254	1.30
	21,772	11,970	20,500	87,646	46,266	1.30

Pressure Diagram



REACH 3

Revisions :

1. Entire sheet pile wall moved 0.5' closer to the canal thus increasing the crown width 0.5' along the entire reach.
2. Step elevation lowered from El. 2.0 to El. 1.5.
3. Step width increased from 9.0' to 12.0'.
4. Add 6" of fill from the levee toe to a distance 30' from the levee toe in the vacant lot referenced.

Submittals :

1. New canalside stability analyses taking into account the above revisions and the correction to the soil shear strength from El. 0.0 to El. -2.0.
2. New landside stabiliy analyses taking into account the above revisions and including calculations at El. -10.5 and El. -20.5.
2. New sheet pile analyses taking into account the above revisions and the submerged canalside soil weight.

Note :

Reach 3 landside stability analysis at El. -32.0 with the active wedge at x=110 and the passive wedge at x=140.5 does yield a lower factor of safety than with the wedges at x=111 and 144.5 respectively, as previously submitted. However, it has since been discovered, that placing the active wedge at x=103 and the passive wedge at x=133.5 yields the lowest factor of safety. Therefore these calculations are being submitted in lieu of the requested location.

REACH 3
STA. 589+00 TO STA. 614+00

STA.	OFFSET TO EL. 5.5 ON EXISTING BACKSLOPE (FT)	OFFSET TO SHEET PILE (FT)	CROWN WIDTH (FT)	EXISTING BACKSLOPE (H : V)	EXISTING LANDSIDE TOE EL.	DIST. FROM TOE TO GROUND PT. (FT)	EXISTING LANDSIDE GROUND EL.
590+00	248.6	239.0	9.6	2.5 : 1	-2.34	9.8	-2.64
592+00	252.6	242.5	10.1	2.7 : 1	-2.59	10.0	-2.99
594+00	258.5	241.0	9.5	1.8 : 1	-1.29	16.5	-1.79
596+00	258.5	239.3	11.2	2.4 : 1	-2.11	9.9	-1.81
598+00	249.3	237.6	11.7	3.0 : 1	-3.01	9.9	-3.41
600+00	246.9	235.9	11.0	3.1 : 1	-2.87	9.5	-3.77
602+00	244.4	234.2	10.2	3.1 : 1	-1.97	8.2	-2.47
604+00 (℄ Pt.)	243.9	232.5	11.4	2.7 : 1	-3.96	10.0	-4.26
606+00	241.8	230.9	10.9	2.7 : 1	-2.86	10.0	-3.56
608+00	243.2	229.3	13.9	3.2 : 1	-2.10	9.9	-3.20
610+00	242.4	228.6	13.8	3.1 : 1	-1.40	10.0	-2.20
612+00	244.0	227.9	16.1	3.6 : 1	-0.89	10.0	-2.09
614+00	242.0	227.2	14.8	3.6 : 1	-0.79	11.5	-2.49

Cross-Section Geometry : Crown El. 5.5 Crown Width Varies
Step El. 1.5 Step Width = 12.0'

Slope Stability Analysis :

The following cross-sections were checked to determine the minimum factor of safety :

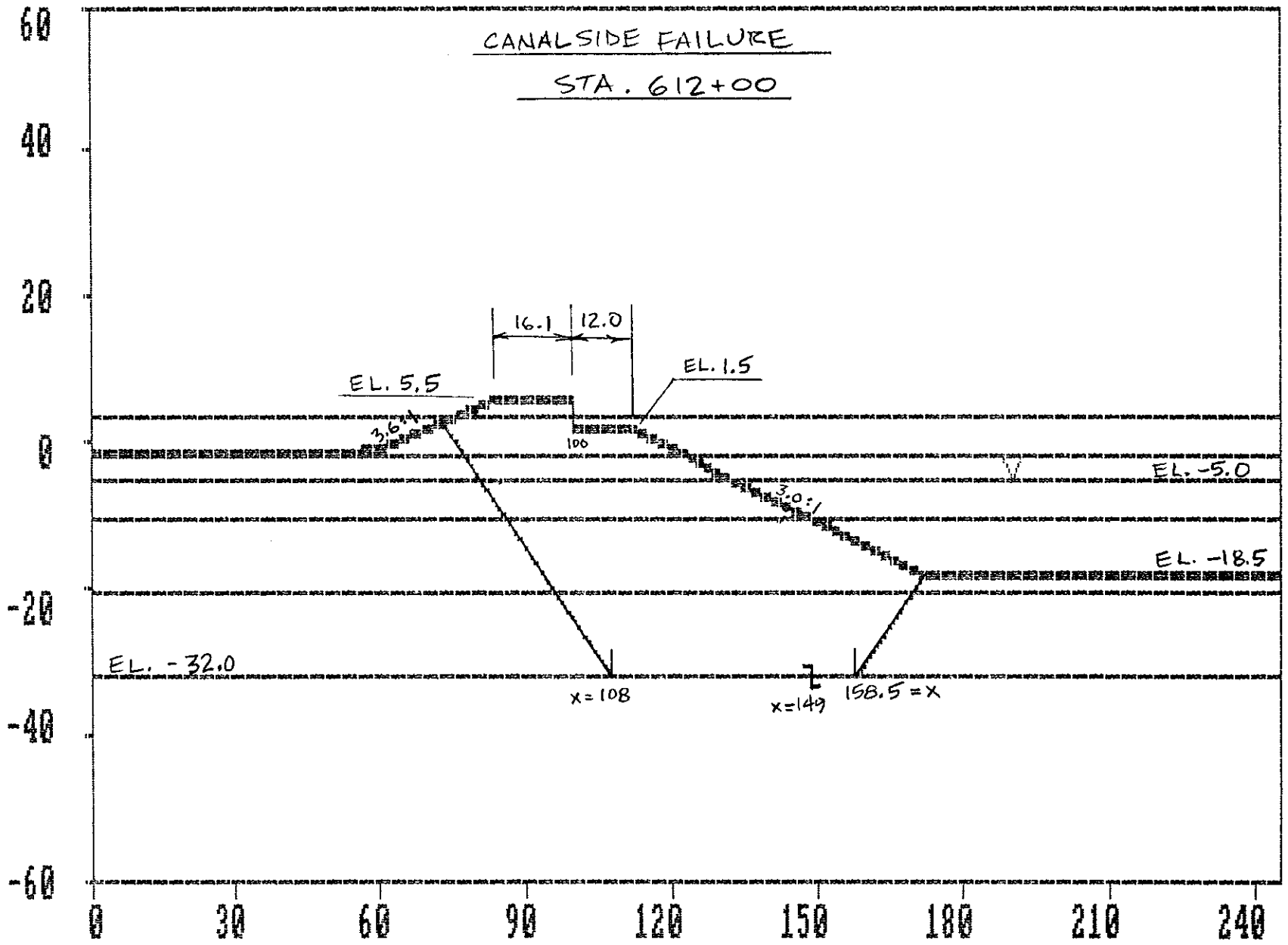
Canalside Failure - 612+00. *** Minimum Factor of Safety = 1.36 at El. -32.0 ***

Landside Failure - 590+00, 592+00, 594+00, 596+00, 600+00, 604+00 and 606+00. The section at Sta. 604+00 governs. *** Minimum Factor of Safety = 1.30 at El. -28.5 ***

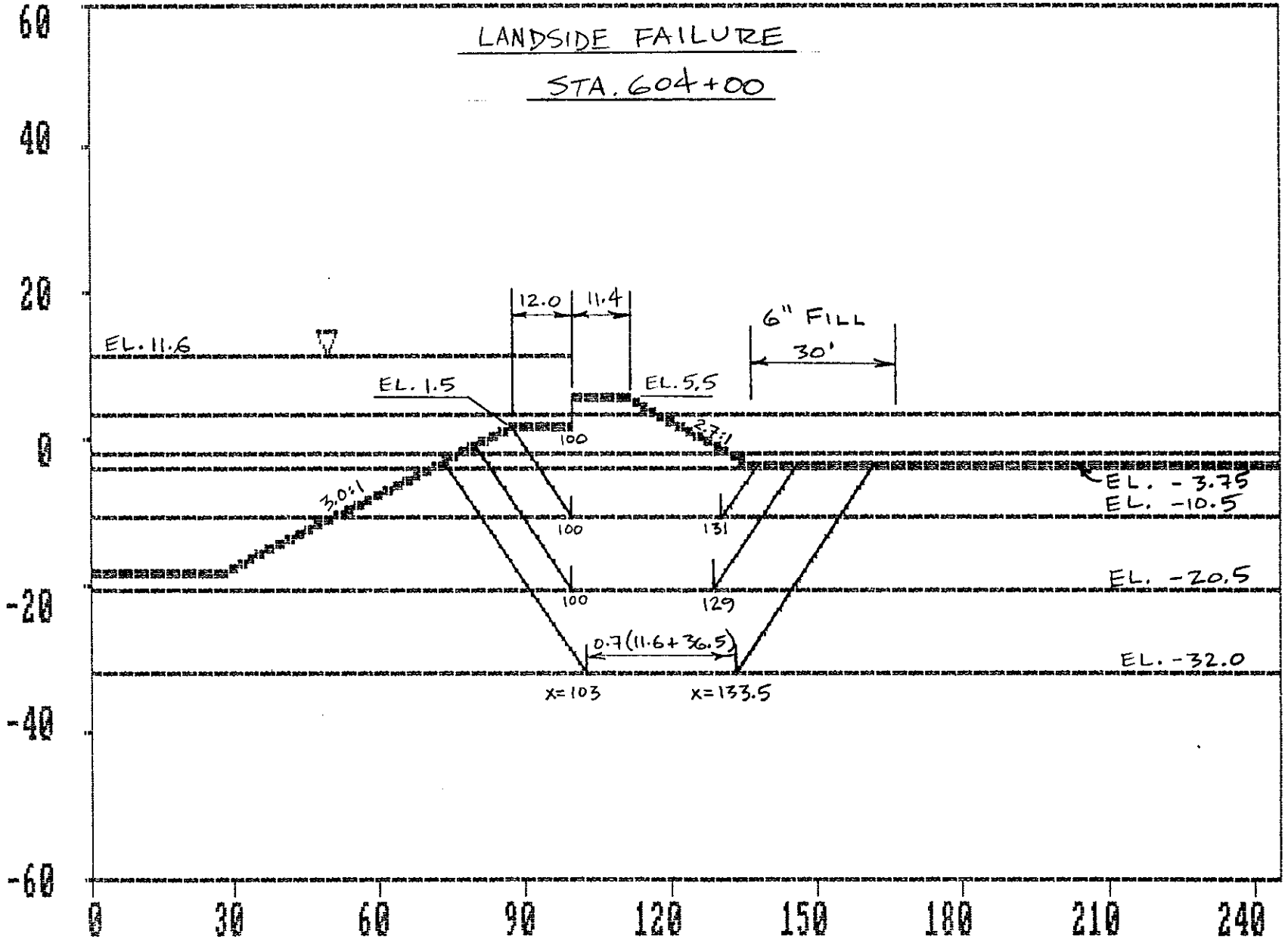
Sheet Pile Analysis :

The following cross-sections were checked to determine the required penetration, design bending moment and maximum deflection : Canalside Failure - 612+00.
Landside Failure - 594+00.

Required Penetration : -12.8 (Landside Failure 3:1 Ratio; S-Case F.S.=1.33)
Design Bending Moment : 11.6 Ft-K/Ft @ El. -2.5 (Landside Failure 3:1 Ratio; S-Case F.S.=1.33)
Maximum Deflection : In.

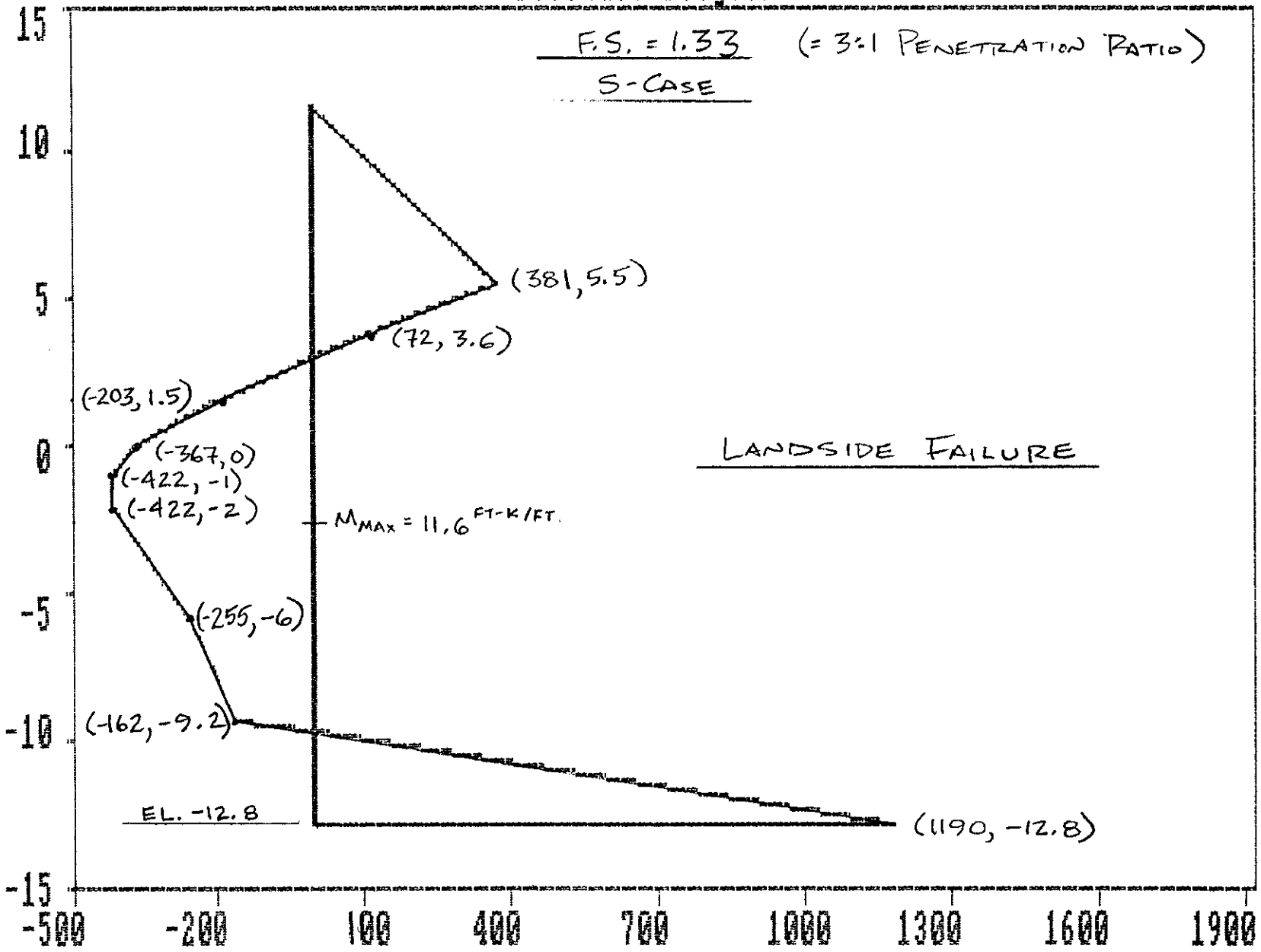


ELEV.	R_A	R_B	R_P	D_A	D_P	F.S.
-32.0	24,681	18,864	10,220	66,914	27,479	1.36
	24,444	18,685	10,087	67,508	27,532	1.33



ELEV.	R_A	R_B	R_P	D_A	D_P	F.S.	
-10.5	8,260	8,680	3,780	16,750	1,492	1.36	1,36
-20.5	12,361	11,020	10,381	32,736	6,765	1.30	1,31
-32.0	19,471	11,590	19,121	54,736	16,199	1.30	
	20,777	11,590	18,812	79,471	40,236	1.30	

Pressure Diagram



REACH 4

Revisions :

1. Entire sheet pile wall moved 0.5' closer to the canal thus increasing the crown width 0.5' along the entire reach.
2. Crown elevation lowered from El. 7.0 to El. 6.5 thus increasing the crown width an additional amount which depends on the backslope at each station.
3. Step elevation lowered from 3.6 to 3.5.
4. Step width increased from 9.0' to 12.0'.

Submittals :

1. New canalside stability analyses taking into account the above revisions, the correction to the soil shear strength from El. 0.0 to El. -2.0, and the piezometric headline of El. -2.4 in the sand.
2. New landside stabiliy analyses taking into account the above revisions.
3. New sheet pile analyses taking into account the above revisions and the submerged canalside soil weight.

REACH 4
STA. 614+00 TO STA. 625+00

STA.	OFFSET TO EL. 7.0 ON EXISTING BACKSLOPE (FT)	OFFSET TO SHEET PILE (FT)	CROWN WIDTH (FT)	EXISTING BACKSLOPE (H : V)	EXISTING LANDSIDE TOE EL.	DIST. FROM TOE TO GROUND PT. (FT)	EXISTING LANDSIDE GROUND EL.
614+00	236.6	227.2	11.2	3.6 : 1	-0.79	11.5	-2.49
616+00	233.9	226.5	9.0	3.9 : 1	-0.55	10.0	-1.65
618+00	234.2	225.8	10.0	3.4 : 1	-1.25	10.0	-3.05
620+00	234.3	225.0	10.9	3.2 : 1	-2.62	10.0	-3.12
622+00	233.3	224.3	10.6	3.1 : 1	-2.62	10.2	-3.02
624+27	232.1	223.5	10.2	3.3 : 1	-1.52	14.5	-2.62

Cross-Section Geometry : Crown El. 6.5 Crown Width Varies
Step El. 3.5 Step Width = 12.0'

Slope Stability Analysis :

The following cross-sections were checked to determine the minimum factor of safety :

Canalside Failure - 614+00 and 616+00. The section at Sta. 614+00 governs.
*** Minimum Factor of Safety = 1.30 at El. -23.5 ***

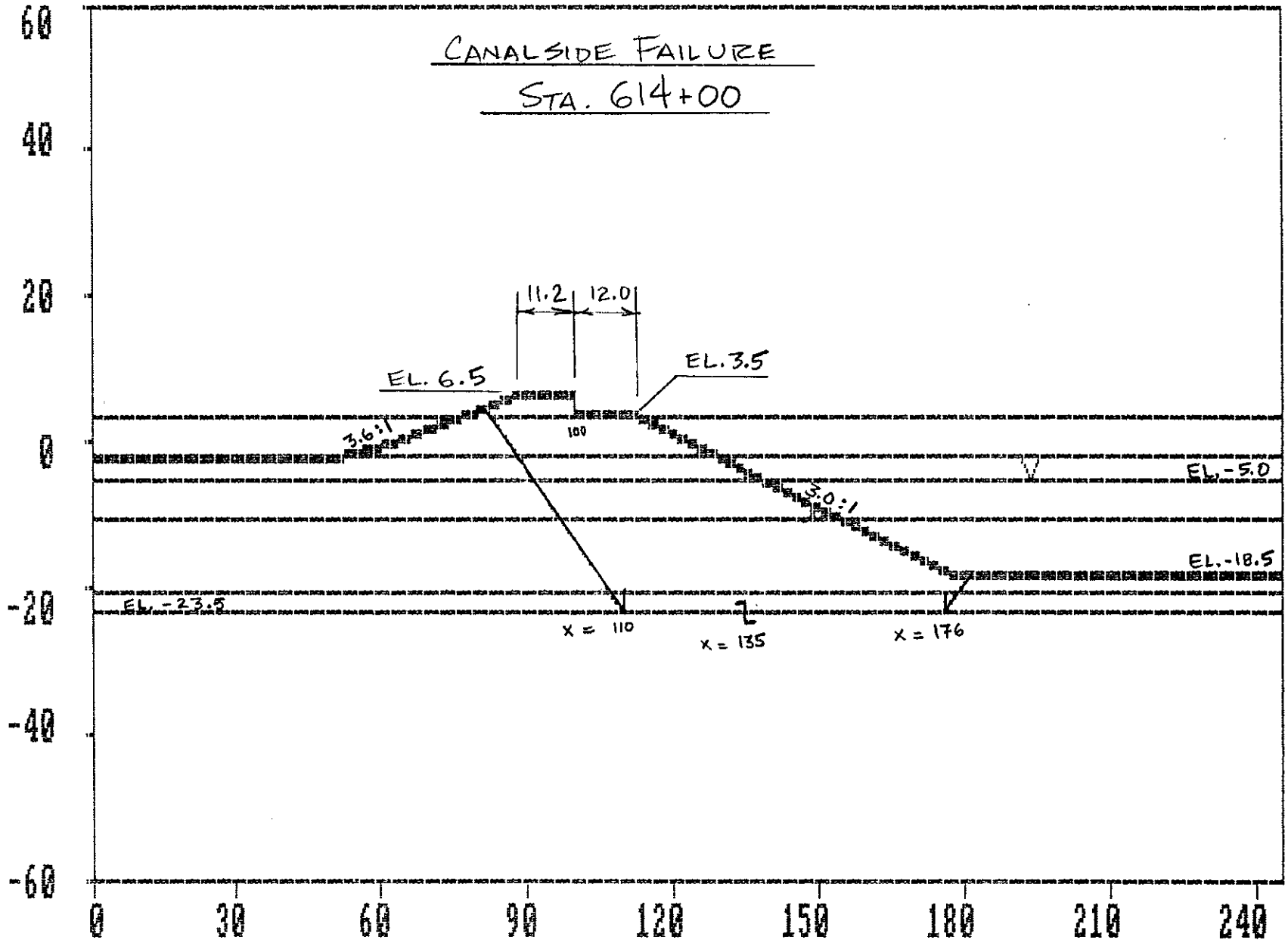
Landside Failure - 616+00, 618+00, 620+00, 622+00 and 624+27. The section at Sta. 622+00 governs.
*** Minimum Factor of Safety = 1.37 at El. -23.5 ***

Sheet Pile Analysis :

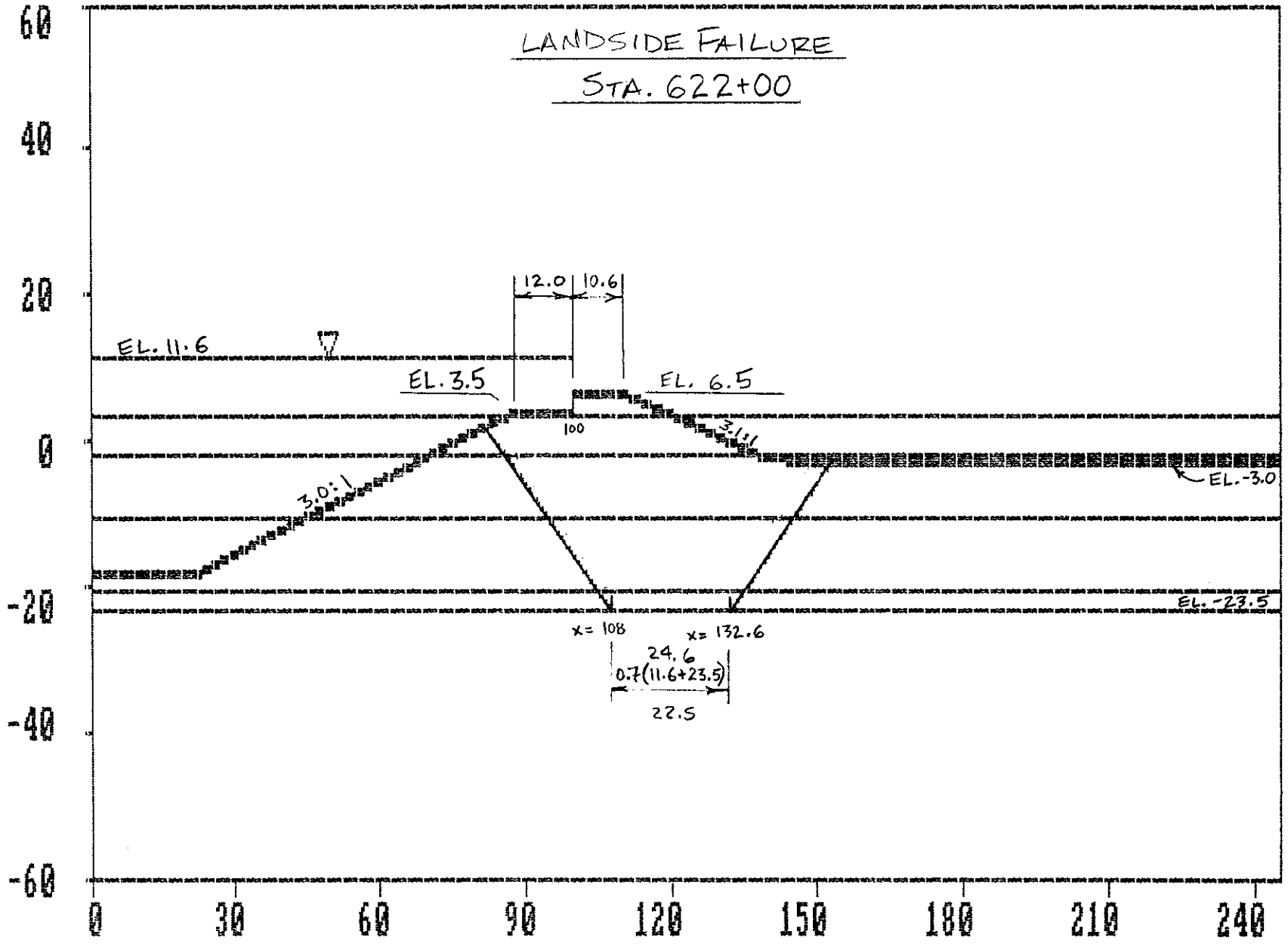
The following cross-sections were checked to determine the required penetration, design bending moment and maximum deflection :

Canalside Failure - 614+00 and 616+00.
Landside Failure - 616+00, 618+00, 622+00 and 624+27.

Required Penetration : -7.7 (Landside Failure Sta. 616+00; S-Case F.S.=1.5)
Design Bending Moment : 7.0 Ft-K/Ft @ El. -8.2 (Landside Failure Sta. 616+00; S-Case F.S.=1.5)
Maximum Deflection : In.

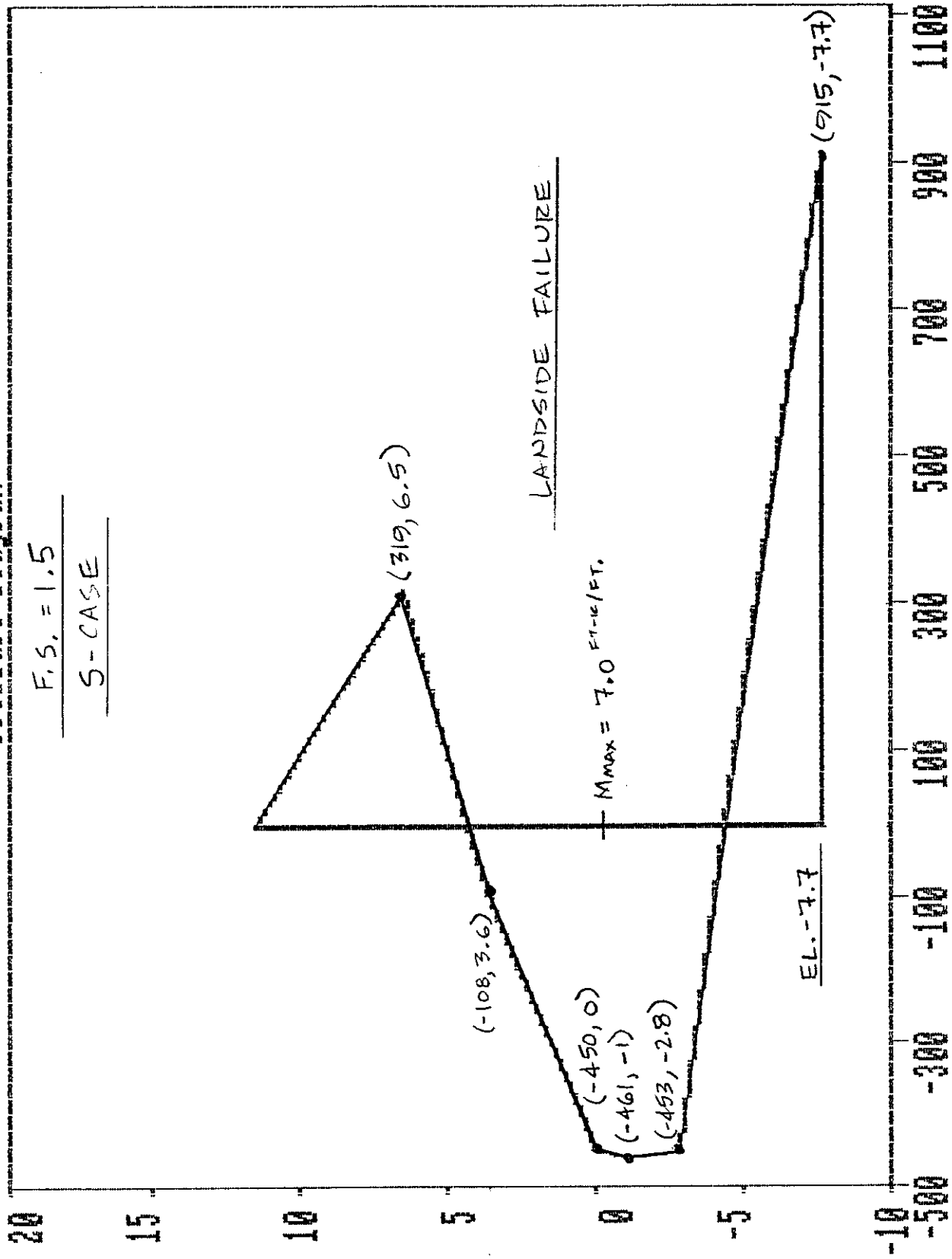


ELEV.	R_A	R_B	R_P	D_A	D_P	F.S.
-23.5	20,221	17,497	3,760	43,150	11,199	1.30
	19,685	18,506	3600	43,258	11,188	1.30



ELEV	R_A	R_B	R_P	D_A	D_P	F.S.
-23.5	17,391	9,348	13,070	51,709	22,719	1.37
	17,891	8557	13,080	51,659	22 771	1.37

RUN COMPLETED
Stop - Program terminated



REACH 5

Revisions :

1. Step elevation lowered from 5.5 to 4.5.
2. Step width increased from 8.5' to 14.5'.

Submittals :

1. New canalside stability analyses taking into account the above revisions, the correction to the soil shear strength from El. 0.0 to El. -2.0, and the piezometric headline of El. -2.4 in the sand.
2. New sheet pile analyses taking into account the above revisions and the submerged canalside soil weight.

REACH 5
STA. 625+00 TO STA. 635+00

STA.	OFFSET TO EL. 7.5 ON EXISTING BACKSLOPE (FT)	OFFSET TO SHEET PILE (FT)	CROWN WIDTH (FT)	EXISTING BACKSLOPE (H : V) *	EXISTING LANDSIDE TOE EL.	DIST. FROM TOE TO GROUND PT. (FT)	EXISTING LANDSIDE GROUND EL.
627+28	229.9	220.7	9.2	3.9 : 1	-0.72	13.6	-1.62
628+00	227.3	219.4	7.9	3.5 : 1	-1.92	13.7	-3.02
630+00	224.4	215.9	8.5	3.4 : 1	-1.72	14.4	-3.32
632+00	219.9	212.4	7.5	3.4 : 1	-2.23	13.5	-3.73
634+00 (4 Pt.)	215.1	208.9	6.2	3.7 : 1	-0.53	17.4	-1.23

Cross-Section Geometry : Crown El. 7.5 Crown Width Varies
Step El. 4.5 Step Width = 14.5'

Slope Stability Analysis :

The following cross-sections were checked to determine the minimum factor of safety :

Canalside Failure - 627+28.
*** Minimum Factor of Safety = 1.38 at El. -14.5 ***

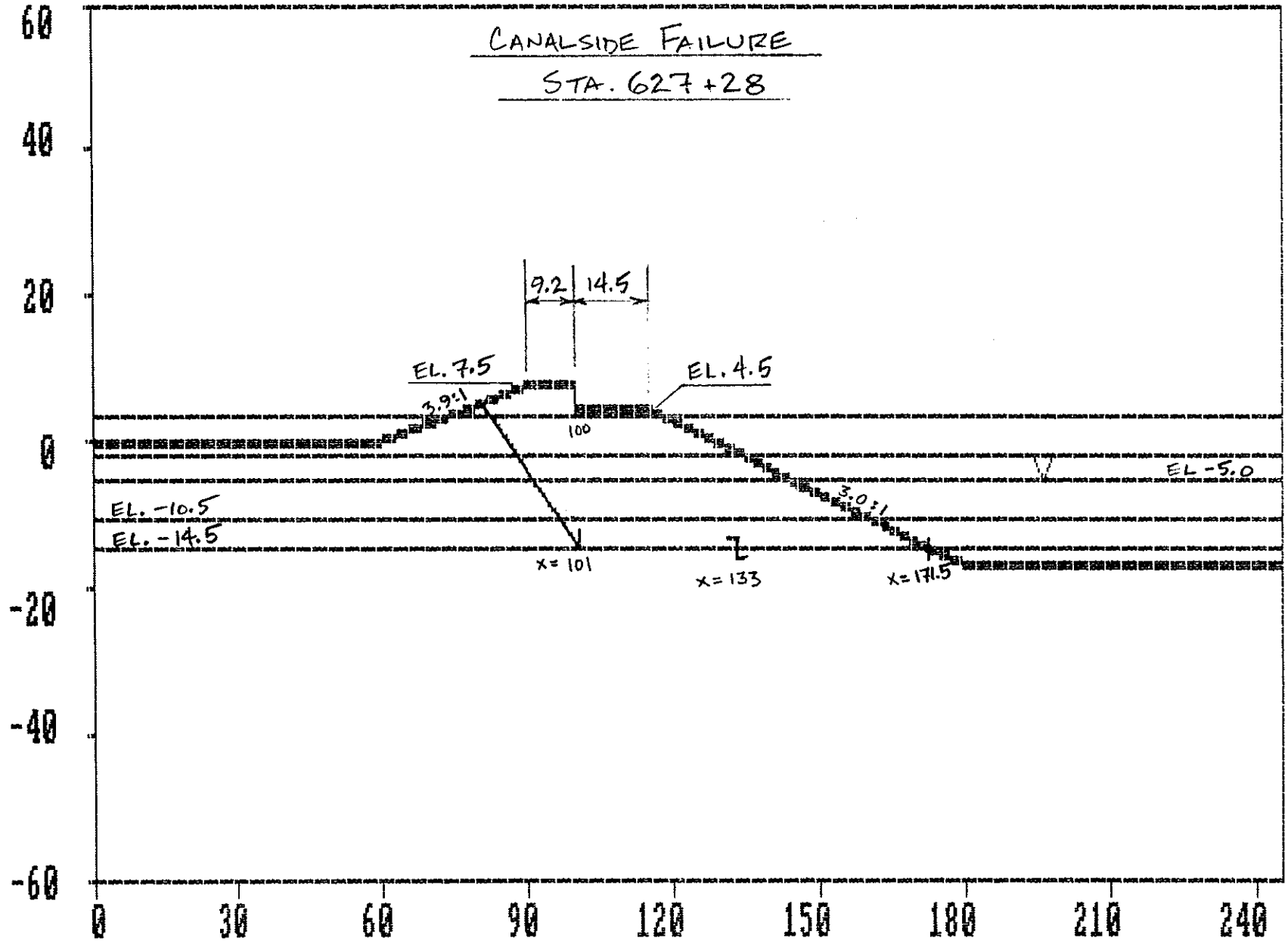
Landside Failure - No additional landside failure analysis was done.

Sheet Pile Analysis :

The following cross-sections were checked to determine the required penetration, design bending moment and maximum deflection :

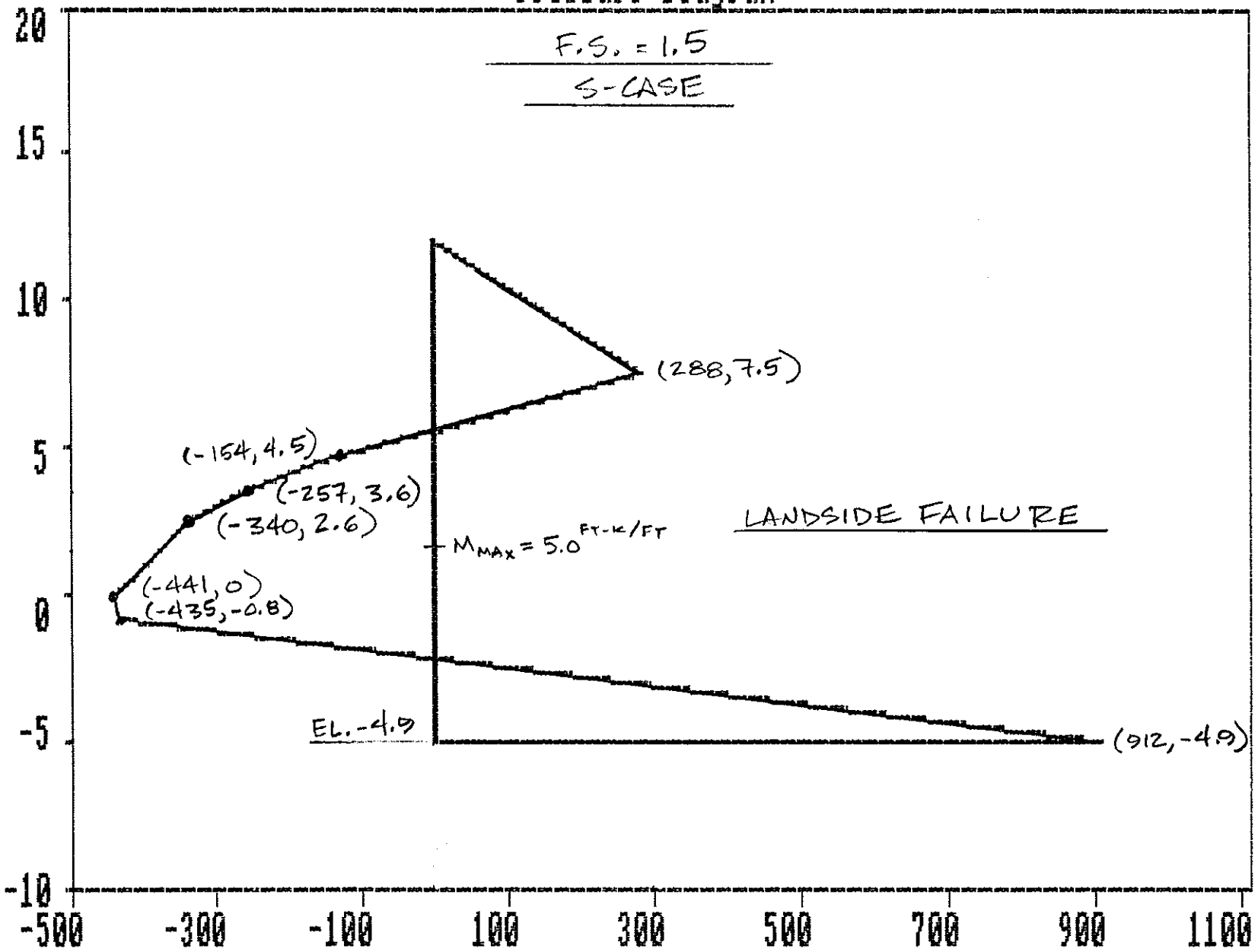
Canalside Failure - 627+28.
Landside Failure - 632+00 and 634+00.

Required Penetration : -4.9 (Landside Failure Sta. 634+00; S-Case F.S.=1.5)
Design Bending Moment : 5.0 Ft-K/Ft @ El. 1.6 (Landside Failure Sta. 634+00; S-Case F.S.=1.5)
Maximum Deflection : In.



ELEV.	R_A	R_B	R_P	D_A	D_P	F.S.
-14.5	14,251	13,588	0	24,191	2816	1.30
	14,438	13,197	0	23788	2761	1.31

Pressure Diagram



REACH 6

Revisions :

None

Submittals :

1. New sheet pile analyses taking into account the submerged canalside soil weight.

REACH 6
STA. 635+00 TO STA. 643+00

STA.	OFFSET TO EL. 9.5 ON EXISTING BACKSLOPE (FT)	OFFSET TO SHEET PILE (FT)	TOTAL CROWN WIDTH (FT)	EXISTING BACKSLOPE (H : V)	EXISTING LANDSIDE TOE EL.	DIST. FROM TOE TO GROUND EL. (FT)	EXISTING LANDSIDE GROUND EL.
636+00	224.3	213.1	13.2	3.8 : 1	-1.64	10.0	-1.64
638+31	226.6	217.9	10.7	3.9 : 1	-8.64	10.0	-1.54

Cross-Section Geometry : Crown El. 9.5 Crown Width on Land Side of Wall Varies
Crown Width on Canal Side of Wall = 2.0'

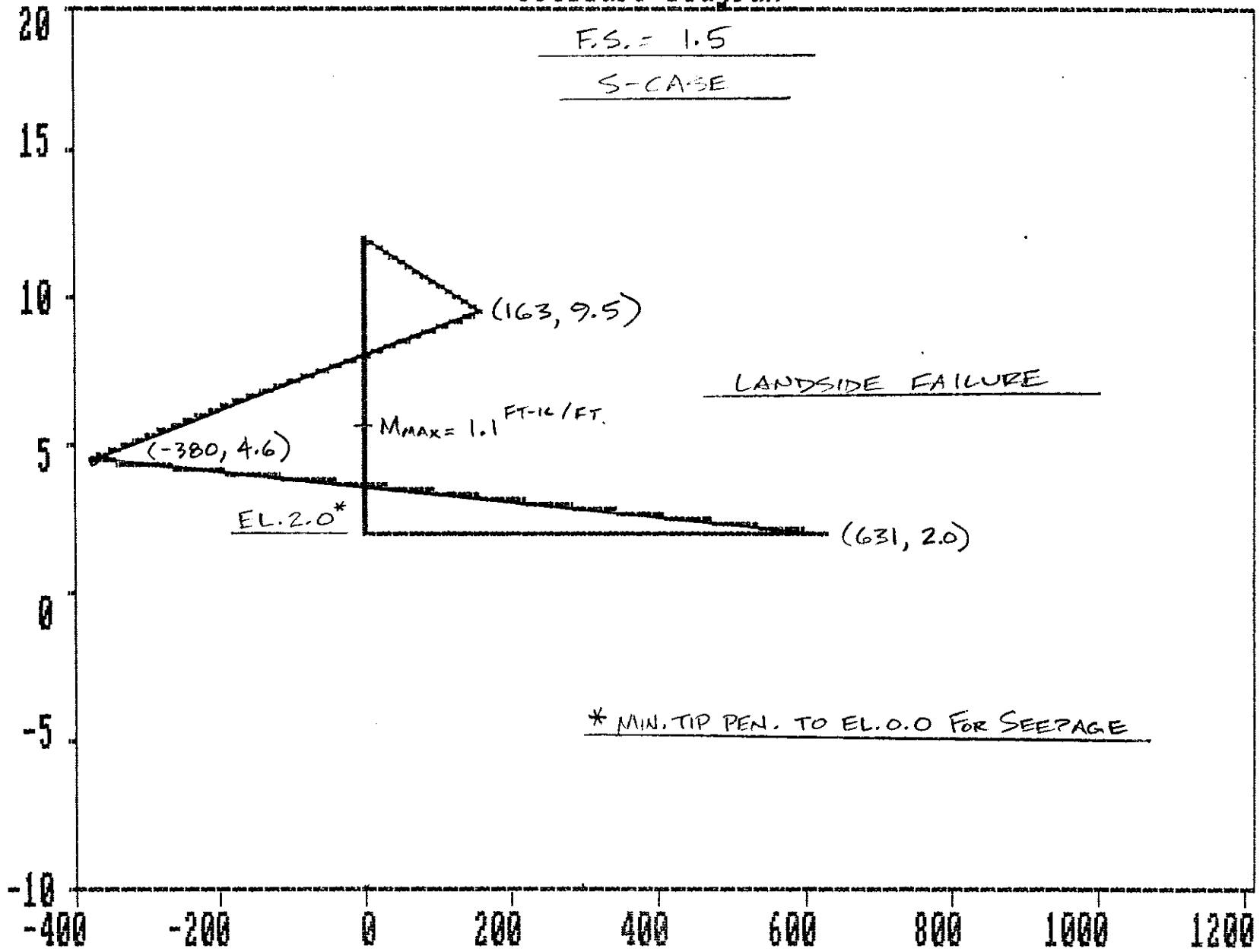
Slope Stability Analysis :

No additional stability analysis was done.

Sheet Pile Analysis :

Required Penetration : 8.0 (Governed by Seepage)
Design Bending Moment : 1.1 Ft-K/Ft @ El. 5.6 (Landside Failure Sta. 638+31; S-Case F.S.=1.5)
Maximum Deflection :

Pressure Diagram



REACH 7

Revisions :

1. Sheet pile alignment changed. (Maximum change in baseline offset is 1.3')

Submittals :

None

REACH 7
STA. 643+00 TO STA. 663+00

STA.	OFFSET TO EL. 12.0 ON EXISTING BACKSLOPE (FT)	OFFSET TO SHEET PILE (FT)	OFFSET TO EL. 12.0 ON EXISTING CANALSLOPE (FT)	TOTAL CROWN WIDTH * (FT)	EXISTING BACKSLOPE (H : V)
643+00	235.9	224.8	221.3	14.6	3.3 : 1
645+00	233.8	223.4	218.6	15.2	2.1 : 1
647+00	233.8	222.9	219.6	14.2	2.7 : 1
649+00	235.1	222.3	220.1	15.8	4.8 : 1
651+00	233.2	221.7	217.1	16.1	3.8 : 1
653+00	238.8	221.1	214.8	15.2	6.6 : 1
655+00	231.6	220.6	215.4	16.2	3.3 : 1
657+00	(4 Pt.) 231.7	220.8	215.6	16.1	3.5 : 1
659+00	234.6	224.8	218.8	15.8	2.9 : 1
661+00	238.8	227.8	223.2	14.8	2.1 : 1
663+00	(See Reach 8)				

Cross-Section Geometry : Crown El. 12.8 Crown Width on Land Side of Wall Varies
Crown Width on Canal Side of Wall Varies

Slope Stability Analysis :

No additional stability analysis was done.

* Total Crown Width Includes Width on Canal Side of Sheet Pile Wall.

REACH 8

Revisions :

1. Sheet pile alignment changed.
2. Crown elevation lowered from El. 12.0 to El. 11.0.
3. Crown width behind the sheet pile wall changed from a constant 8.0' to a varying width between the sheet pile wall and El. 11.0 on the existing backslope.
4. Step elevation raised from El. 2.0 to El. 7.0.
5. Step width changed based on the above revisions.

Submittals :

1. New canalside stability analyses taking into account the above revisions and the piezometric headline of El. -2.4 in the sand.

REACH 8
STA. 663+00 TO STA. 670+00

STA.	OFFSET TO EL. 11.0 ON EXISTING BACKSLOPE (FT)	OFFSET TO SHEET PILE (FT)	OFFSET TO TOP OF SLOPE (FT)	TOTAL CROWN WIDTH* (FT)	STEP WIDTH (FT)	EXISTING BACKSLOPE (H : V)
663+00 (℄ Pt.)	244.6	230.0	228.0	16.6	4.3	2.8 : 1
665+00	242.1	230.0	228.0	14.1	5.6	2.8 : 1
667+00	237.1	230.0	228.0	9.1	12.3	4.2 : 1
669+87	237.5	230.0	228.0	9.5	16.2	15.6 : 1

Cross-Section Geometry :

Crown El. 11.0 — Crown Width on Land Side of Wall Varies; Crown Width on Canal Side of Wall = 2.0'

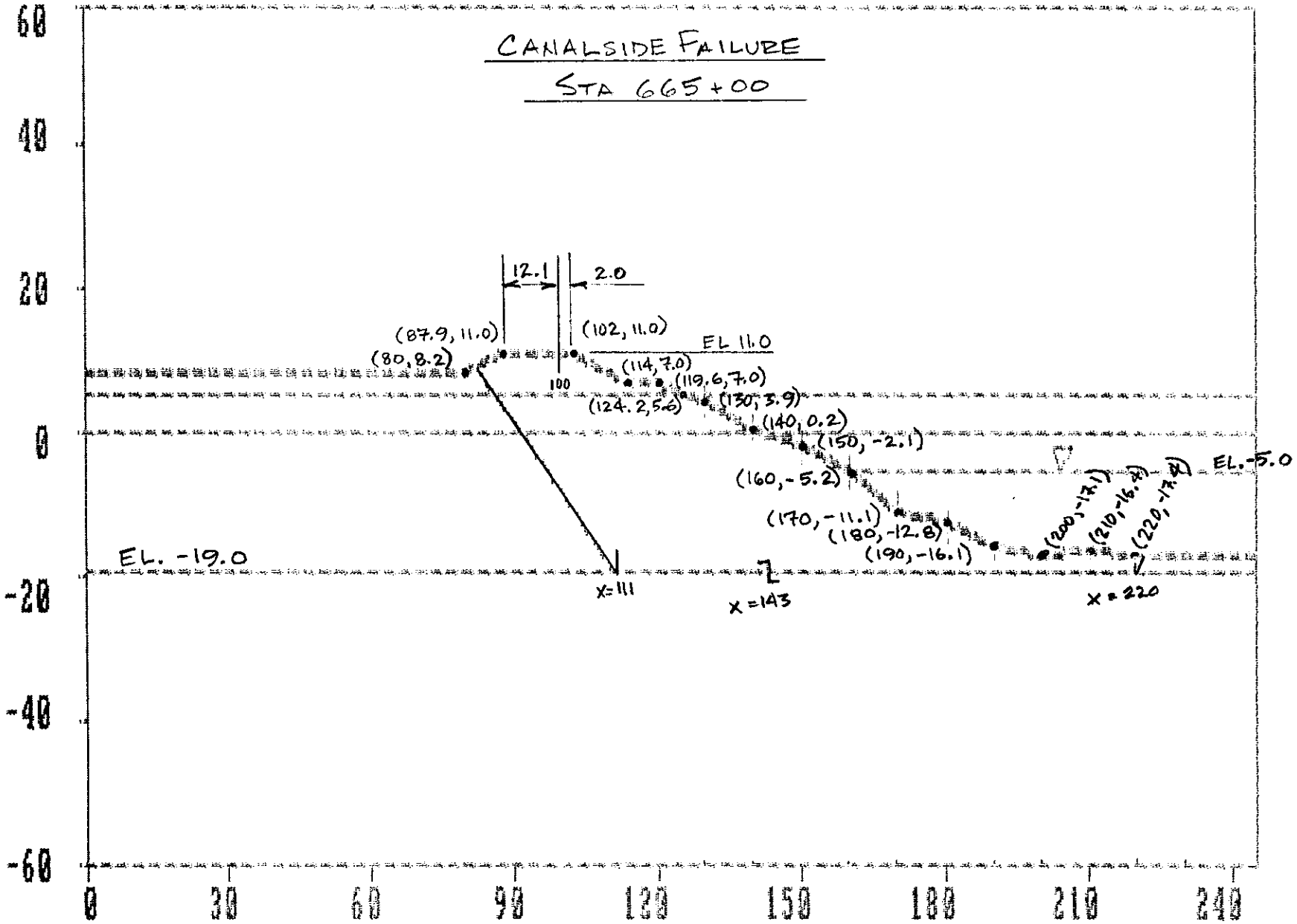
Step El. 7.0 — Step Width Varies

Slope Stability Analysis :

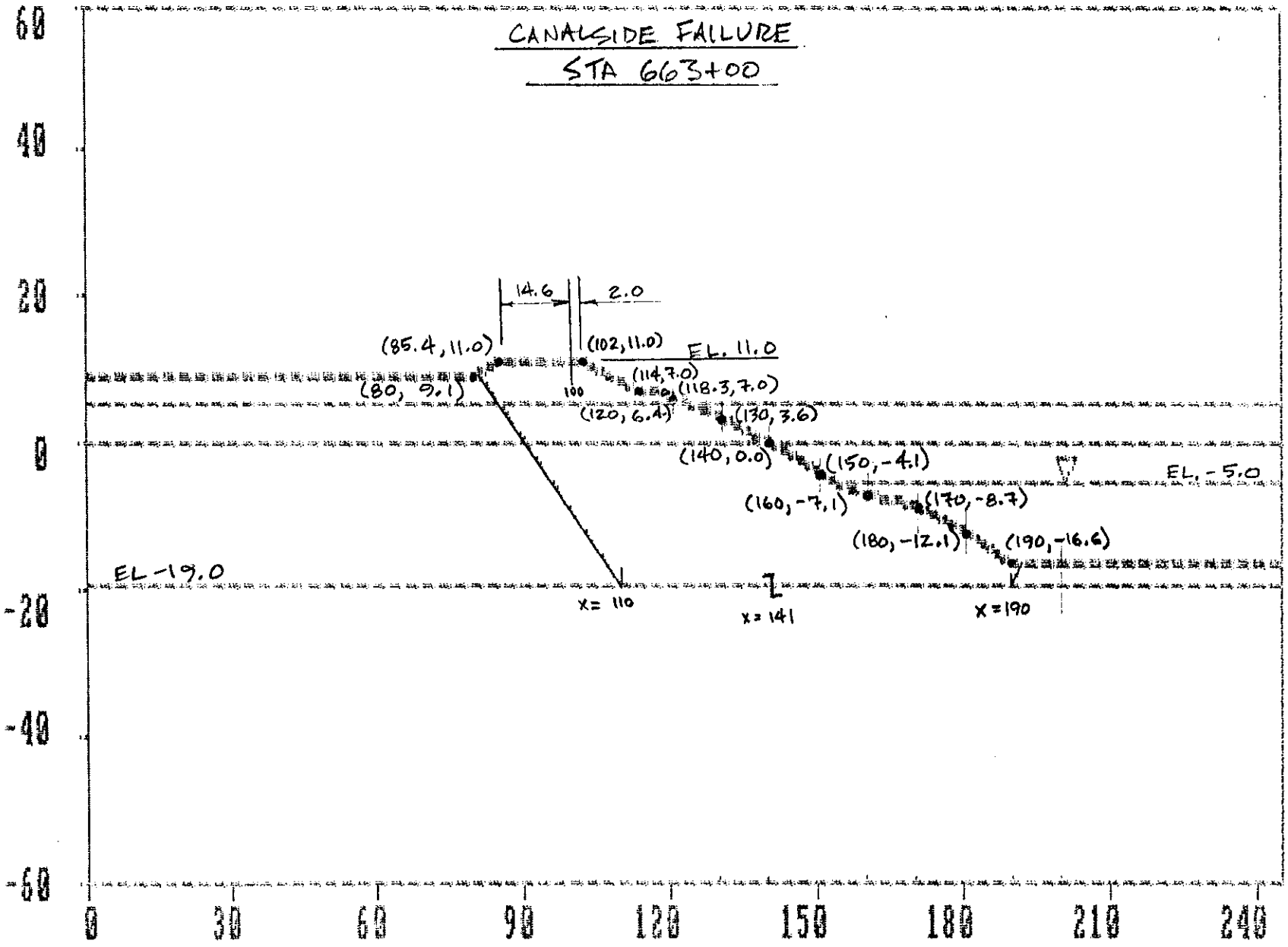
Canalside Failure - All cross-sections were checked. The section at Sta. 665+00 governs.
*** Minimum Factor of Safety = 1.32 at El. -19.0 ***

Landside Failure - No additional landside failure analysis was done.

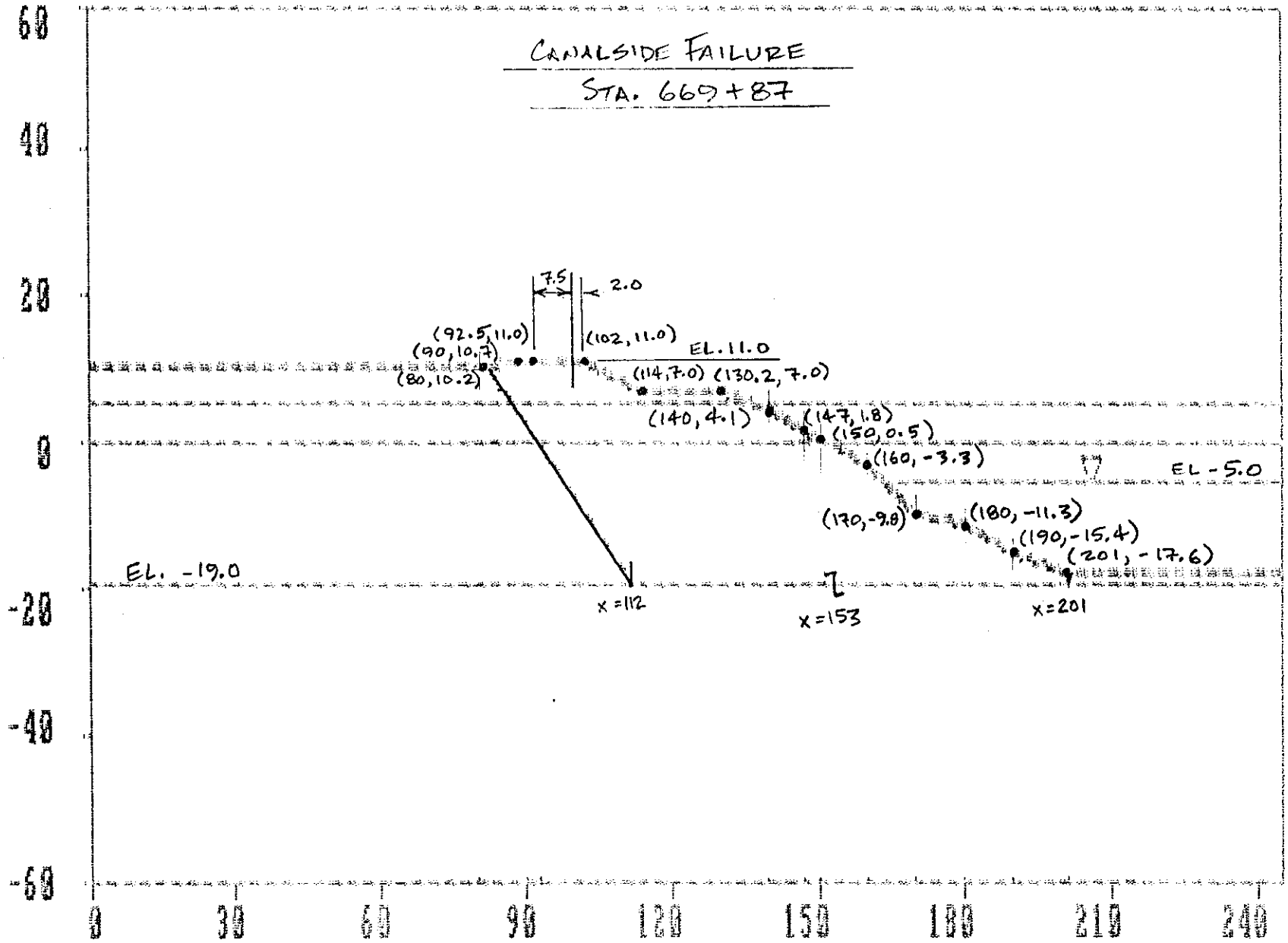
* Total Crown Width Includes Width on Canal Side of Sheet Pile Wall.



ELEV.	R_A	R_B	R_P	D_A	D_P	F.S.
-19.0	25,071	27,446	1,722	47,316	6,172	1.32
	24,486	28,529	1661	47,476	6209	1.32



ELEV	R_A	R_B	R_P	D_A	D_P	F.S.
-19.0	25,551	26,925	2,563	47,932	6,244	1.32



ELEV.	P_A	P_B	P_F	D_A	D_P	F.S.
-19.0	26,438	29,680	1,509	47,194	6,159	1.40