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Project Oak Cliff 3rd Addition

Item West Channel Drainage

I Check channel design section with the addition of 92.6 cfs from Westlink 18th.

Total Q = 174 cfs (see Drainage Plan) + 93 = 267 cfs

$Q = 267 = \frac{1.486}{n} AR^{2/3} S^{1/2}$  where  $n = 0.035$   
 $S = 0.003$

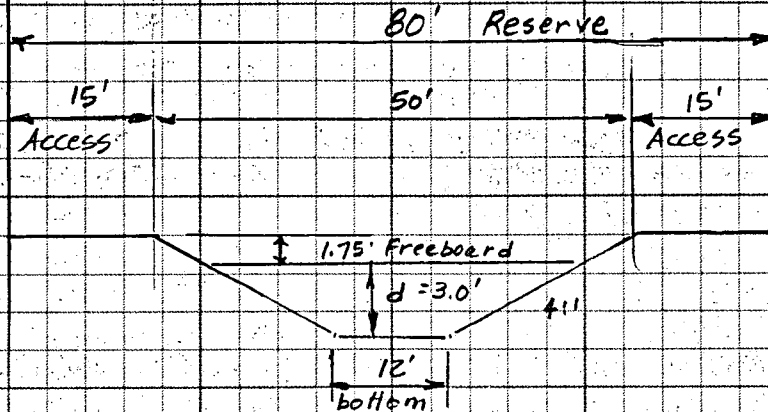
$267 = \frac{1.486}{0.035} AR^{2/3} (0.003)^{1/2}$

$267 = 42.457 AR^{2/3} 0.05477$

$AR^{2/3} = \frac{267}{42.457 \times 0.05477} = \frac{267}{2.32546}$

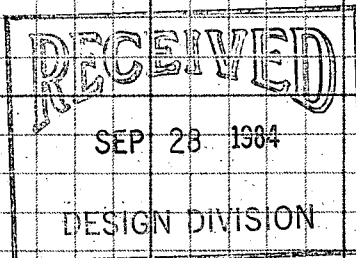
$AR^{2/3} = 114.82$

ALT. 1



<u>d</u>	<u>A</u>	<u>P</u>	<u>R</u>	<u>R<sup>2/3</sup></u>	<u>AR<sup>2/3</sup></u>
3'	72.0	36.739	1.959	1.566	112.7

Use  $d = 3.0'$   $V = \frac{Q}{A} = \frac{267}{72} = 3.7 \text{ fps}$  OK





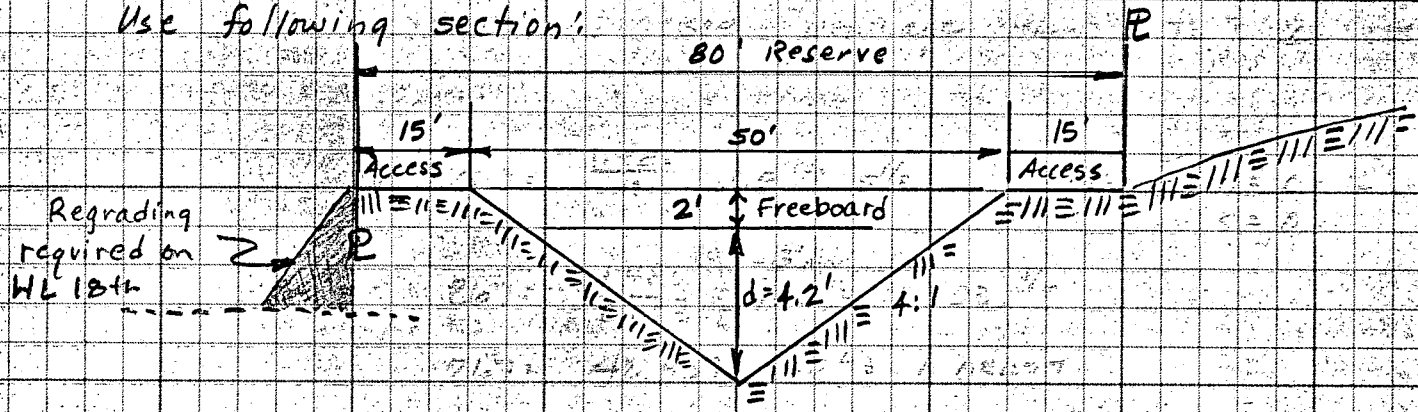
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Project Oak Cliff 3rd Addition

Item West Channel Drainage

Based on DWS (See Sheet 3) channel needs to be at least 6.3' deep to contain backwater from Maple Street Structure

Use following section:

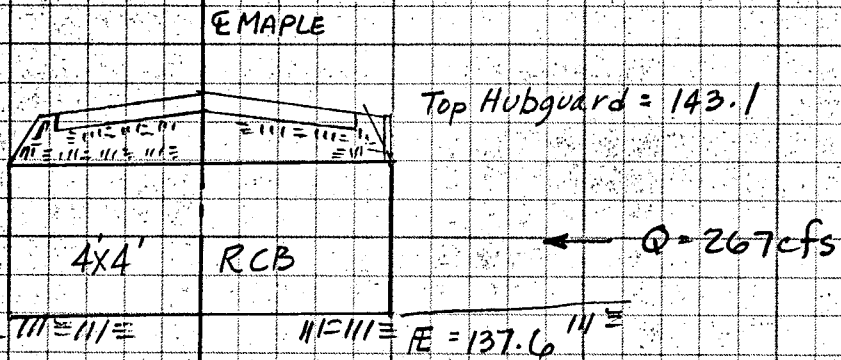


d	A	P	R	$R^{2/3}$	$AR^{2/3}$
4.0	164.0	32.98	1.94	1.556	99.5
4.5'	81.0	37.11	2.10	1.683	136.3
4.3'	73.96	35.46	2.00	1.632	120.73
4.2'	70.76	34.63	2.04	1.610	113.93 ←

USE  $d = 4.2'$        $V = \frac{Q}{A} = \frac{267}{70.76} = 3.77 \text{ fps OK}$



II Determine DWS @ Maple structure (Existing Conditions)



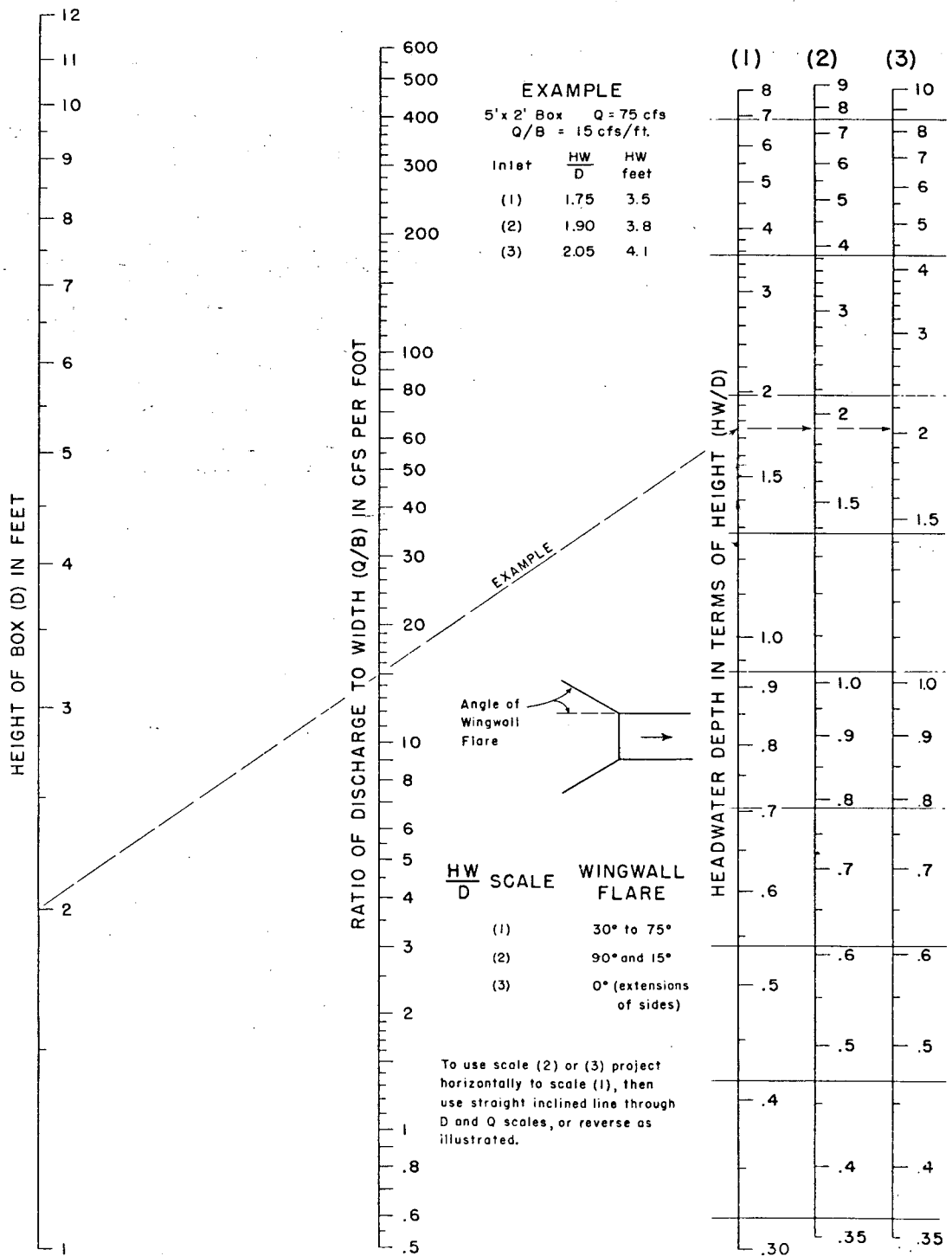
H	HW Elev	HW/D	Q/B	Q <sub>box</sub> (= 4 x Q/B)	H (weir)	Q <sub>weir</sub> (over top road)	Q <sub>total</sub>
3.0'	140.6	0.75	15	60	0	0	60
4.0'	141.6	1.00	23	92	0	0	92
5.0'	142.6	1.25	30	120	0	0	120
5.5'	143.1	1.375	34	136	0	0	136
6.0'	143.6	1.50	37	148	0.5'	53	201
6.1'	143.7	1.53	38	152	0.6'	70	222
6.2'	143.8	1.55	39	156	0.7'	88	244
6.3'	143.9	1.575	39	156	0.8'	107	263 ← close enough

USE HW = 6.3'  
HW elev = 143.9 = DWS<sub>100</sub>

USE MIN. PAD = 144.9

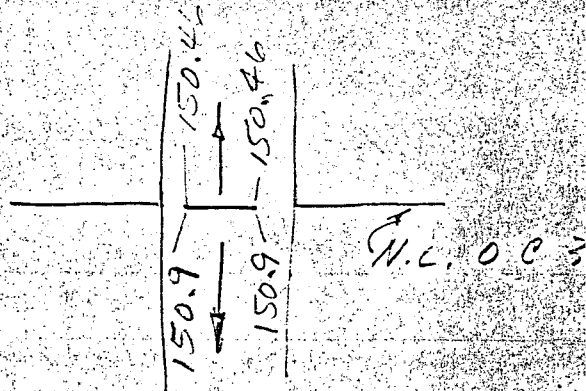
\* Weir assumed 50' wide (L=50')  
 $Q_{weir} = cL H^{3/2}$   
 $= 3.0 \times 50' \times H^{3/2}$   
 $= 150 H^{3/2}$

# CHART I

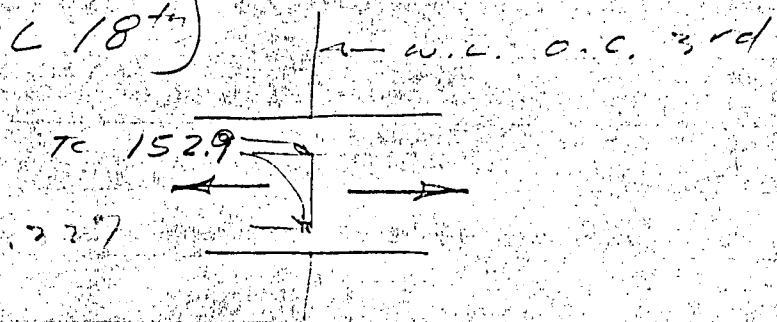


## HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

Parkdale (WL 17<sup>th</sup>)



1<sup>st</sup> St (WL 18<sup>th</sup>)



Maple

4' x 4' RCBC  
(85' ± E. of W.L. O.C. 3<sup>rd</sup>)  
65' ± W. of old loc. Prescott)  
Top proposed curb = 143.8  
# = 137.6 ±  
143.1 top hubgd.