Appendix F

Stormwater Management Data

DRAINAGE AREA "6"
497.7 AC

DRAINAGE AREA "11"
2.86 AC

DRAINAGE AREA "7"
28.15 AC (1,226,188 SF)
24.75 AC (1,078,188 SF)

DRAINAGE AREA "5"
63.3 AC

DRAINAGE AREA "4"
421.7 AC

DRAINAGE AREA "1"
180.83 AC

DRAINAGE AREA "8"
*45.54 AC.

DRAINAGE AREA "10"
7.22 AC

DRAINAGE AREA "9"
5.25 AC

DRAINAGE AREA "2"
372.2 AC

DRAINAGE AREA "3"
268.7 AC

OUTFALL No. 1
OUTFALL No. 2
OUTFALL No. 3
OUTFALL No. 4
OUTFALL No. 5
OUTFALL No. 6
OUTFALL No. 7
OUTFALL No. 8

* = DRAINAGE AREA "8" IS LESS
DRAINAGE AREAS "9" AND "10".

KEY

POINT OF STORMWATER DRAINAGE DISCHARGE FROM PROPERTY	
X	STORMWATER SAMPLING POINT
28.15 AC	(TOTAL DRAINAGE AREA TO THE POINT OF EXIT) (DRAINAGE AREA TO THE POINT OF EXIT WITHIN AIRPORT PROPERTY)
— — —	DRAINAGE AREA LIMITS
— · · —	AIRPORT PROPERTY LIMITS
- - - →	RUNOFF PATH — LONGEST TIME OF CONCENTRATION
	EXISTING 5' CONTOUR
	STORM SEWER/CULVERT
	STORM STRUCTURE
—100' W	DISTANCE FROM EDGE OF PAVEMENT TO STORM STRUCTURE

REVISION BLOCK

DESCRIPTION	DATE	DESCRIPTION	DATE
Update Drainage Map	Nov 2013		

POST DEVELOPMENT DRAINAGE
AREA MAP

AKRON-CANTON AIRPORT
STORM WATER DRAINAGE STUDY

NORTH

0   500   1000
GRAPHIC SCALE IN FEET

AUSTIN SAND FILTER DESIGN

*FOR DESIGN, REFERENCE RAINWATER & LAND DEVELOPMENT MANUAL, SECTION 2.8

handwritten (top right): PARKING GARAGE AND TERMINAL EXPANSION

1) $WQV = 0.75 \times C \times (A/12)$

C = 0.9 — ASSUME ALL HARD SURFACE

DIAMTER (FT) = 5 (60" PIPE)

C = 0.9
A = 1.82 AC

A = DRAINAGE AREA (ACRES)

A = 178634.23 SF

WQV = 0.102375 AC-FT = 4459.46 CF

SEDIMENT STORAGE VOLUME = 0.2 x WQV = 891.89 CF

handwritten: DRAINAGE AREA IS 9.1 AC. SINCE THIS IS REDEVELOPMENT. TREAT 20% FOR POST CONSTRUCTION WATER QUALITY

3) SEDIMENTATION CHAMBER DESIGN

*FOR THIS DESIGN, A 60-INCH PIPE DIAMETER IS ASSUMED

CHAMBER VOLUME = 5351.35 CF

$A_s = (1.2 \times WQV) / d_s + FREEBOARD$

*EQUATION IS NOT APPLICABLE DUE TO USE OF CIRCULAR PIPE SYSTEM

NOTE: THE 60 INCH DIAMETER UNDERGROUND PIPING SYSTEM IS USED TO PROVIDE THE SEDIMENTATION BASIN AND STORM WATER MANAGEMENT (PRE VS POST CONSTRUCTION).

THE STORMWATER MANAGEMENT VOLUME (VOLUME DETAINED) IS : ~~6388 CF~~   THIS PLUS THE SEDIMENTATION VOLUME : 5351 CF

GIVES A TOTAL REQUIRED VOLUME IN THE 60 INCH PIPE SYSTEM OF : ~~11739~~ CF → 5351

handwritten: STORM WATER IS DETAINED IN EXISTING DETENTION BASIN

AREA OF 60" PIPE = $\pi \times (r)^2$ = 19.63 SF

LENGTH OF 60" PIPE REQUIRED = ~~598~~ LF   **273 LF**

5) FILTRATION CHAMBER DESIGN

$A_f = (WQ_v \times d_f) / (k \times (h + d_f) \times t_f)$ = 318.53 SF

WQ_v = 4459.46 CF

d_f = 1.5 FT FOR SAND FILTER BED DEPTH

A_f = 10 x 18.67 = 186.7 SF

k = 3.5 FT/DAY - GIVEN

h = 4.50 1/2 MAX ALLOWABLE WATER DEPTH COVER OVER FILTER (9 FT)

318.53 / 186.7 = 1.7061194

t_f = 1 DAYS - GIVEN

NUMBER OF FILTER UNITS = 2 FILTER UNITS   OK

6) FILTRATION CHAMBER DESIGN

$A_f = (WQ_v \times d_f) / (k \times (h + d_f) \times t_f) =$				**6388.15 SF**	$WQ_v =$		89434.13 CF	
					$d_f =$		1.5 FT FOR SAND FILTER BED DEPTH	
$A_f =$	10	x	18.67	=	**186.7 SF**	$k =$	3.5 FT/DAY - GIVEN	
						$h =$	4.50 1/2 MAX ALLOWABLE WATER DEPTH COVER OVER FILTER (9 FT)	
	6388.15	/	186.7	=	34.216132	$t_f =$	1 DAYS - GIVEN	
		NUMBER OF FILTER UNITS =		35 FILTER UNITS				

FILTERS REQ'D

35 PRECAST UNITS — 10'×20' EACH, W/ 9FT HEAD WATER DEPTH

CONSIDER CAST-IN-PLACE UNITS

TOTAL REQ'D FILTER AREA = 6389 SF

TRY 3 UNITS → 6389/3 = 2130 SF EACH

TRY 75'× 30' = 2250 SF > 2130 SF — OK

20' 30' 20' 30' 20' 30' 20'   75'
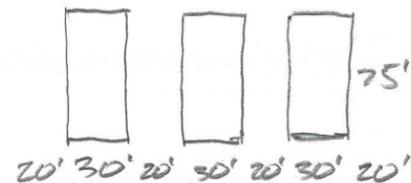
75'+20'+20' = 115'

(30×3)+(20×4) = 170'

TOTAL AREA = 115'×170'

30 AC AVIATION DEVELOPMENT (A1)
PLUS PART OF WEST SIDE
PARALLEL TAXIWAY

AUSTIN SAND FILTER DESIGN

*FOR DESIGN, REFERENCE RAINWATER & LAND DEVELOPMENT MANUAL, SECTION 2.8

WQV = 0.75 x C x (A/12)   C = 0.9 - ASSUME ALL HARD SURFACE   DIAMTER (FT) =   5   (60" PIPE)

C =   0.9   A = DRAINAGE AREA (ACRES)
A =   67.00   AC   A =   178634.23   SF

WQV =   3.76875 AC-FT   =   164166.75   CF

SEDIMENT STORAGE VOLUME = 0.2 x WQV   =   32833.35   CF

SEDIMENTATION CHAMBER DESIGN

*FOR THIS DESIGN, A 60-INCH PIPE DIAMETER IS ASSUMED

CHAMBER VOLUME =   197000.10   CF

A_s = (1.2 x WQV) / ds + FREEBOARD   *EQUATION IS NOT APPLICABLE DUE TO USE OF CIRCULAR PIPE SYSTEM

NOTE: THE 60 INCH DIAMETER UNDERGROUND PIPING SYSTEM IS USED TO PROVIDE THE SEDIMENTATION BASIN AND STORM WATER MANAGEMENT (PRE VS POST CONSTRUCTION).
THE STORMWATER MANAGEMENT VOLUME (VOLUME DETAINED) IS :   235170 CF   THIS PLUS THE SEDIMENTATION VOLUME :   197000 CF
GIVES A TOTAL REQUIRED VOLUME IN THE 60 INCH PIPE SYSTEM OF :   432170 CF

AREA OF 60" PIPE = π x (r)^2 =   19.63 SF

LENGTH OF 60" PIPE REQUIRED =   22010   LF

FILTRATION CHAMBER DESIGN

A_f = (WQ$_v$ x d$_f$) / (k x (h + d$_f$) x t$_f$) =   11726.20 SF   WQ$_v$ =   164166.75 CF
                                                        d$_f$ =   1.5 FT FOR SAND FILTER BED DEPTH
A_f =   10   x   18.67   =   186.7 SF   k =   3.5 FT/DAY - GIVEN
                                                        h =   4.50 1/2 MAX ALLOWABLE WATER DEPTH COVER OVER FILTER (9 FT)
         11726.20   /   186.7   =   62.807694   t$_f$ =   1 DAYS - GIVEN

NUMBER OF FILTER UNITS =   63   FILTER UNITS

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46 AC AVIATION DEVELOPMENT (AZ)
PLUS PORTION OF WEST SIDE
PARALLEL TAXIWAY

PIPE REQ'D

432170 ÷ 19.63 = 22016 LF - 60" PIPE
                OR
432170 ÷ 28.27 = 15287 LF - 72" PIPE

USE 60" PIPE, ESTIMATE 18 ROWS

22016 ÷ 18 = 1224 LF PER ROW

FILTERS REQ'D

63 PRECAST UNITS AT 10'x20' EACH, W/9' HEADWATER
TRY CAST-IN-PLACE FILTERS
REQ'D FILTER AREA = 11727 SF
TRY 5 FILTERS 11727/5 = 2346 SF - EA
TRY 80'x30' = 2400 SF > 2346 SF - OK

80'+20'+20' = 120'
(5x30)+(6x20) = 270'

AUSTIN SAND FILTER DESIGN

*FOR DESIGN, REFERENCE RAINWATER & LAND DEVELOPMENT MANUAL, SECTION 2.8

1)

$WQV = 0.75 \times C \times (A/12)$

		C = 0.9 - ASSUME ALL HARD SURFACE	DIAMTER (FT) = 5 (60" PIPE)
C =	0.9	A = DRAINAGE AREA (ACRES)	
A =	6.50 AC	A = 178634.23 SF	

WQV = 0.365625 AC-FT = **15926.63** CF

SEDIMENT STORAGE VOLUME = 0.2 x WQV = **3185.33** CF

3) SEDIMENTATION CHAMBER DESIGN

*FOR THIS DESIGN, A 60-INCH PIPE DIAMETER IS ASSUMED

CHAMBER VOLUME = **19111.95** CF

$A_s = (1.2 \times WQV) / d_s + FREEBOARD$ *EQUATION IS NOT APPLICABLE DUE TO USE OF CIRCULAR PIPE SYSTEM

NOTE: THE 60 INCH DIAMETER UNDERGROUND PIPING SYSTEM IS USED TO PROVIDE THE SEDIMENTATION BASIN AND STORM WATER MANAGEMENT (PRE VS POST CONSTRUCTION).

THE STORMWATER MANAGEMENT VOLUME (VOLUME DETAINED) IS :   **22815** CF   THIS PLUS THE SEDIMENTATION VOLUME :   **19112** CF

GIVES A TOTAL REQUIRED VOLUME IN THE 60 INCH PIPE SYSTEM OF :   **41927** CF

AREA OF 60" PIPE = $\pi \times (r)^2$ =   19.63 SF

LENGTH OF 60" PIPE REQUIRED = **2135** LF

2135 ÷ 4 = 533.75 LF.   USE 534 LF PER ROW
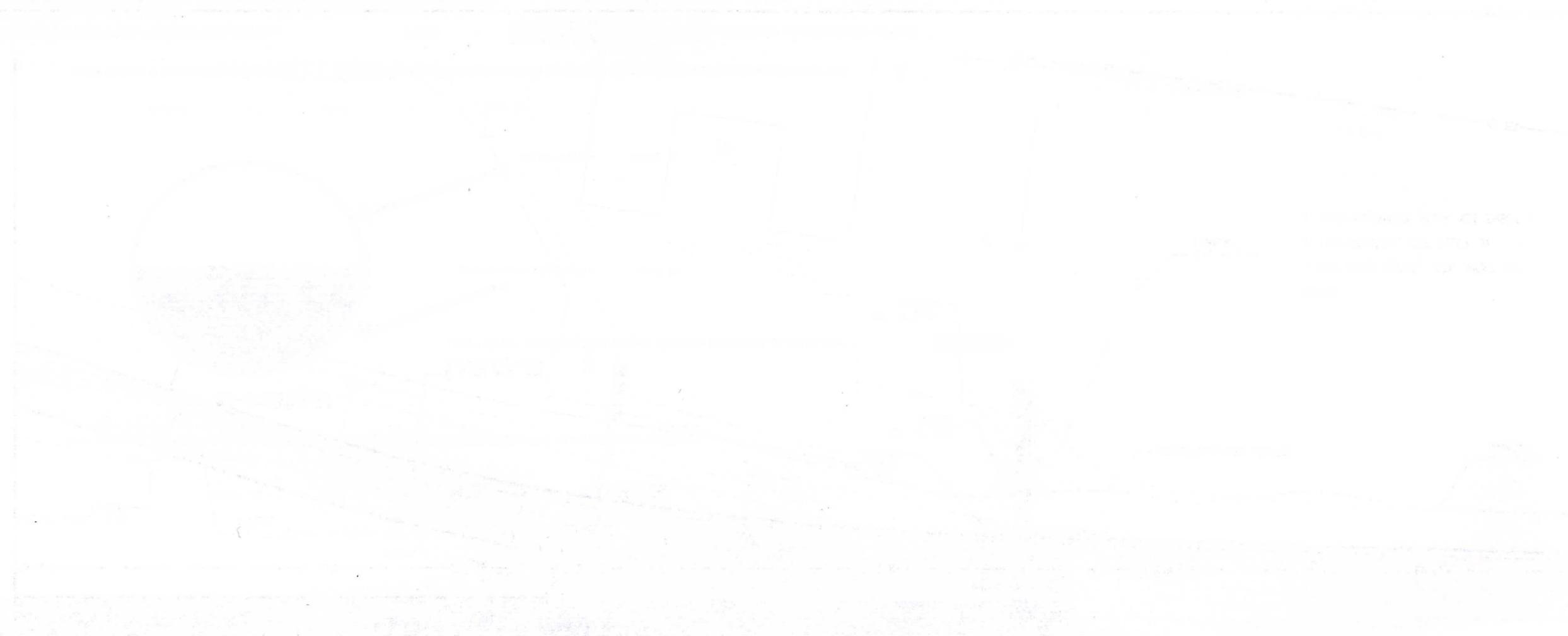
PORTION OF WEST SIDE
PARALLEL TAXIWAY

AUSTIN SAND FILTER DESIGN

*FOR DESIGN, REFERENCE RAINWATER & LAND DEVELOPMENT MANUAL, SECTION 2.8

1)

$WQV = 0.75 \times C \times (A/12)$

C =	0.9
A =	30.00 AC

C = 0.9 - ASSUME ALL HARD SURFACE
A = DRAINAGE AREA (ACRES)
A = 178634.23 SF

DIAMTER (FT) = 5   (60" PIPE)

WQV = 1.6875 AC-FT   =   73507.50 CF

SEDIMENT STORAGE VOLUME = 0.2 x WQV   =   14701.50 CF

3)   SEDIMENTATION CHAMBER DESIGN

*FOR THIS DESIGN, A 60-INCH PIPE DIAMETER IS ASSUMED

CHAMBER VOLUME =   88209.00 CF

$A_S = (1.2 \times WQV) / ds + FREEBOARD$ *EQUATION IS NOT APPLICABLE DUE TO USE OF CIRCULAR PIPE SYSTEM

NOTE: THE 60 INCH DIAMETER UNDERGROUND PIPING SYSTEM IS USED TO PROVIDE THE SEDIMENTATION BASIN AND STORM WATER MANAGEMENT (PRE VS POST CONSTRUCTION).
THE STORMWATER MANAGEMENT VOLUME (VOLUME DETAINED) IS :   105300 CF   THIS PLUS THE SEDIMENTATION VOLUME :   88209 CF
GIVES A TOTAL REQUIRED VOLUME IN THE 60 INCH PIPE SYSTEM OF :   193509 CF

AREA OF 60" PIPE = $\pi \times (r)^2$ =   19.63 SF

LENGTH OF 60" PIPE REQUIRED =   9855 LF

Handwritten note: 30 ACRE AVIATION DEVELOPMENT AREA A1

Handwritten note: 9855 ÷ 12 = 822' ~ use 12 rows @ 822' each

AUSTIN SAND FILTER DESIGN

*FOR DESIGN, REFERENCE RAINWATER & LAND DEVELOPMENT MANUAL, SECTION 2.8

(handwritten, top right) RECONFIGURED TW B & TWD AND REMOTE PARKING LOT

A) $WQV = 0.75 \times C \times (A/12)$

C = 0.9 - ASSUME ALL HARD SURFACE   DIAMTER (FT) = 5   (60" PIPE)

C = 0.9
A = 36.00 AC

A = DRAINAGE AREA (ACRES)
A = 178634.23 SF

WQV = 2.025 AC-FT = 88209.00 CF

SEDIMENT STORAGE VOLUME = 0.2 x WQV = 17641.80 CF

B) SEDIMENTATION CHAMBER DESIGN

*FOR THIS DESIGN, A 60-INCH PIPE DIAMETER IS ASSUMED

CHAMBER VOLUME = 105850.80 CF

$A_S = (1.2 \times WQV) / d_s + FREEBOARD$ *EQUATION IS NOT APPLICABLE DUE TO USE OF CIRCULAR PIPE SYSTEM

NOTE: THE 60 INCH DIAMETER UNDERGROUND PIPING SYSTEM IS USED TO PROVIDE THE SEDIMENTATION BASIN AND STORM WATER MANAGEMENT (PRE VS POST CONSTRUCTION).
THE STORMWATER MANAGEMENT VOLUME (VOLUME DETAINED) IS :   126360 CF   THIS PLUS THE SEDIMENTATION VOLUME :   105851 CF
GIVES A TOTAL REQUIRED VOLUME IN THE 60 INCH PIPE SYSTEM OF :   232211 CF

AREA OF 60" PIPE = $\pi \times (r)^2$ = 19.63 SF

LENGTH OF 60" PIPE REQUIRED = 11826 LF   _(handwritten)_ VOID

C) FILTRATION CHAMBER DESIGN

$A_f = (WQ_v \times d_f) / (k \times (h + d_f) \times t_f) =$ 6300.64 SF

WQ_v = 88209.00 CF
d_f = 1.5 FT FOR SAND FILTER BED DEPTH

A_f = 10 x 18.67 = 186.7 SF

k = 3.5 FT/DAY - GIVEN
h = 4.50 1/2 MAX ALLOWABLE WATER DEPTH COVER OVER FILTER (9 FT)

6300.64 / 186.7 = 33.747418 t_f = 1 DAYS - GIVEN

NUMBER OF FILTER UNITS = 34 FILTER UNITS

(handwritten bottom left)

PIPE REQ'D
PLMT REMOVED 4.2 AC

4.2/36 = 0.117

0.117 x 126360 = 14742

126360 - 14742 = 111618

111618 + 105851 = 217469 CF

217469 ÷ 19.63 = 11079 LF - 60", OR
217469 ÷ 28.27 = 7693 LF - 72"

USE 60" PIPE

11079 ÷ 800 = 14 ROWS
14 × 8 = 112' WIDE

(handwritten bottom right)

FILTERS REQ'D

34 PRECAST UNITS - 10' × 20' EA W/ 9' HEADWATER
CONSIDER CAST-IN-PLACE UNITS
REQ'D FILTER AREA = 6301 SF
TRY 3 FILTERS → 6301/3 = 2100.3 SF EACH
TRY 85' × 25' → 2125 SF > 2100.3 SF — OK

(sketch of three rectangles labeled 20, 20, 20, 20 on top; 25, 25, 25 on bottom; 85' on right side)
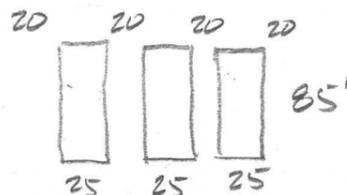
85 + 20 + 20 = 125'
(20×4) + (25×3) = 155'
TOTAL AREA = 125' × 155'

AUSTIN SAND FILTER DESIGN

*FOR DESIGN, REFERENCE RAINWATER & LAND DEVELOPMENT MANUAL, SECTION 2.8

1)

$WQV = 0.75 \times C \times (A/12)$

C = 0.9 - ASSUME ALL HARD SURFACE

DIAMTER (FT) = 5 (60" PIPE)

$C = $ 0.9

$A = $ 7.80 AC

A = DRAINAGE AREA (ACRES)

A = 178634.23 SF

$WQV = $ 0.43875 AC-FT = 19111.95 CF

SEDIMENT STORAGE VOLUME = 0.2 x WQV = 3822.39 CF

3) SEDIMENTATION CHAMBER DESIGN

*FOR THIS DESIGN, A 60-INCH PIPE DIAMETER IS ASSUMED

CHAMBER VOLUME = 22934.34 CF

$A_s = (1.2 \times WQV) / d_s + FREEBOARD$ *EQUATION IS NOT APPLICABLE DUE TO USE OF CIRCULAR PIPE SYSTEM

NOTE: THE 60 INCH DIAMETER UNDERGROUND PIPING SYSTEM IS USED TO PROVIDE THE SEDIMENTATION BASIN AND STORM WATER MANAGEMENT (PRE VS POST CONSTRUCTION).

THE STORMWATER MANAGEMENT VOLUME (VOLUME DETAINED) IS : 27378 CF   THIS PLUS THE SEDIMENTATION VOLUME : 22934 CF

GIVES A TOTAL REQUIRED VOLUME IN THE 60 INCH PIPE SYSTEM OF : 50312 CF

AREA OF 60" PIPE = $\pi \times (r)^2 =$ 19.63 SF

LENGTH OF 60" PIPE REQUIRED = 2562 LF   TRY 3 ROWS → 2562 ÷ 3 = 854 LF PER ROW

6) FILTRATION CHAMBER DESIGN

$A_f = (WQ_v \times d_f) / (k \times (h + d_f) \times t_f) =$ 1365.14 SF

$WQ_v =$	19111.95 CF				
$d_f =$	1.5 FT FOR SAND FILTER BED DEPTH				

$A_f = $ 10 x 18.67 = 186.7 SF

$k = $ 3.5 FT/DAY - GIVEN

1365.14 / 186.7 = 7.3119405

$h = $ 4.50 1/2 MAX ALLOWABLE WATER DEPTH COVER OVER FILTER (9 FT)

$t_f = $ 1 DAYS - GIVEN

NUMBER OF FILTER UNITS = 8 FILTER UNITS

FILTERS REQ'D

8 PRECAST UNITS, 10' x 20' EACH W/ 9' HEADWATER
TRY CAST IN PLACE
TOTAL REQ'D FILTER AREA = 1366 SF
ESTIMATE 2 UNITS → 1366 ÷ 2 = 683 SF
TRY 50' x 15' FILTER = 750 SF > 683 SF ✓ OK
USE 2 UNITS AT 50' x 15'
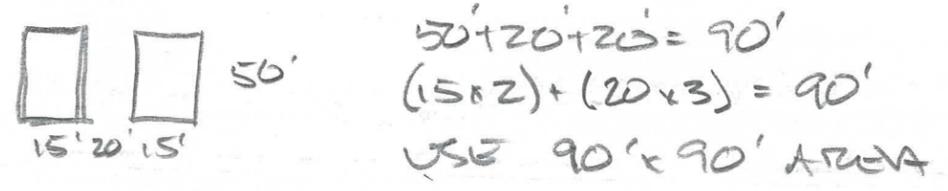
50'

15' 20' 15'

50 + 20 + 20 = 90'
(15 x 2) + (20 x 3) = 90'
USE 90' x 90' AREA

AUSTIN SAND FILTER DESIGN

*FOR DESIGN, REFERENCE RAINWATER & LAND DEVELOPMENT MANUAL, SECTION 2.8

HIGH SPEED TWL *(handwritten)*

.) $WQV = 0.75 \times C \times (A/12)$ C = 0.9 - ASSUME ALL HARD SURFACE   DIAMTER (FT) = 5   (60" PIPE)

C = 0.9   A = DRAINAGE AREA (ACRES)

A = 5.20 AC   A = 178634.23 SF

WQV = 0.2925 AC-FT   =   12741.30 CF

SEDIMENT STORAGE VOLUME = 0.2 x WQV   =   2548.26 CF

SEDIMENTATION CHAMBER DESIGN

*FOR THIS DESIGN, A 60-INCH PIPE DIAMETER IS ASSUMED

CHAMBER VOLUME =   15289.56 CF

$A_s = (1.2 \times WQV) / ds + FREEBOARD$ *EQUATION IS NOT APPLICABLE DUE TO USE OF CIRCULAR PIPE SYSTEM

NOTE: THE 60 INCH DIAMETER UNDERGROUND PIPING SYSTEM IS USED TO PROVIDE THE SEDIMENTATION BASIN AND STORM WATER MANAGEMENT (PRE VS POST CONSTRUCTION).

THE STORMWATER MANAGEMENT VOLUME (VOLUME DETAINED) IS :   18252 CF   THIS PLUS THE SEDIMENTATION VOLUME :   15290 CF

GIVES A TOTAL REQUIRED VOLUME IN THE 60 INCH PIPE SYSTEM OF :   33542 CF

AREA OF 60" PIPE = $\pi \times (r)^2$ =   19.63 SF

USE 3 ROWS OF 60" PIPE, 570 LF EACH *(handwritten)*

LENGTH OF 60" PIPE REQUIRED =   1708 LF

FILTRATION CHAMBER DESIGN

$A_f = (WQ_v \times d_f) / (k \times (h + d_f) \times t_f) =$ 910.09 SF WQ_v =   12741.30 CF

d_f =   1.5 FT FOR SAND FILTER BED DEPTH

A_f =   10   x   18.67   =   186.7 SF   k =   3.5 FT/DAY - GIVEN

h =   4.50 1/2 MAX ALLOWABLE WATER DEPTH COVER OVER FILTER (9 FT)

910.09   /   186.7   =   4.874627 t_f =   1 DAYS - GIVEN

NUMBER OF FILTER UNITS =   5 FILTER UNITS   **OK   FOOTPRINT = 110'x40'** *(handwritten)*

AUSTIN SAND FILTER DESIGN

*FOR DESIGN, REFERENCE RAINWATER & LAND DEVELOPMENT MANUAL, SECTION 2.8

Handwritten note (top right): NEW TAXIWAY BETWEEN TAXIWAY E & RUNWAY 23

A.)

$WQV = 0.75 \times C \times (A/12)$

C = **0.9**

A = **5.00** AC

C = 0.9 - ASSUME ALL HARD SURFACE

A = DRAINAGE AREA (ACRES)

A = 178634.23 SF

DIAMTER (FT) = 5 (60" PIPE)

WQV = 0.28125 AC-FT = **12251.25** CF

SEDIMENT STORAGE VOLUME = 0.2 x WQV = **2450.25** CF

B.) SEDIMENTATION CHAMBER DESIGN

*FOR THIS DESIGN, A 60-INCH PIPE DIAMETER IS ASSUMED

CHAMBER VOLUME = **14701.50** CF

$A_s = (1.2 \times WQV) / ds + FREEBOARD$

*EQUATION IS NOT APPLICABLE DUE TO USE OF CIRCULAR PIPE SYSTEM

NOTE: THE 60 INCH DIAMETER UNDERGROUND PIPING SYSTEM IS USED TO PROVIDE THE SEDIMENTATION BASIN AND STORM WATER MANAGEMENT (PRE VS POST CONSTRUCTION).

THE STORMWATER MANAGEMENT VOLUME (VOLUME DETAINED) IS : **17550** CF   THIS PLUS THE SEDIMENTATION VOLUME : **14702** CF

GIVES A TOTAL REQUIRED VOLUME IN THE 60 INCH PIPE SYSTEM OF : **32252** CF

AREA OF 60" PIPE = $\pi \times (r)^2$ = 19.63 SF

LENGTH OF 60" PIPE REQUIRED = **1643** LF

Handwritten note: FOR 3 ROWS OF 60" PIPE, USE 548 LF PER ROW

C.) FILTRATION CHAMBER DESIGN

$A_f = (WQ_v \times d_f) / (k \times (h + d_f) \times t_f)$ = **875.09** SF

A_f = 10 x 18.67 = **186.7** SF

875.09 / 186.7 = 4.6871413

NUMBER OF FILTER UNITS = **5** FILTER UNITS   OK

WQ_v = 12251.25 CF

d_f = 1.5 FT FOR SAND FILTER BED DEPTH

k = 3.5 FT/DAY - GIVEN

h = **4.50** 1/2 MAX ALLOWABLE WATER DEPTH COVER OVER FILTER (9 FT)

t_f = 1 DAYS - GIVEN

AUSTIN SAND FILTER DESIGN

*FOR DESIGN, REFERENCE RAINWATER & LAND DEVELOPMENT MANUAL, SECTION 2.8

A.)

$WQV = 0.75 \times C \times (A/12)$ C = 0.9 - ASSUME ALL HARD SURFACE   DIAMTER (FT) = 5   (60" PIPE)

C = **0.9**   A = DRAINAGE AREA (ACRES)

A = **2.60** AC   A = 178634.23 SF

WQV = 0.14625 AC-FT   =   6370.65 CF

SEDIMENT STORAGE VOLUME = 0.2 x WQV   =   **1274.13** CF

BETWEEN RW 19 & GA HANGERS

B.) SEDIMENTATION CHAMBER DESIGN

*FOR THIS DESIGN, A 60-INCH PIPE DIAMETER IS ASSUMED

CHAMBER VOLUME =   **7644.78** CF

$A_s = (1.2 \times WQV) / ds + FREEBOARD$ *EQUATION IS NOT APPLICABLE DUE TO USE OF CIRCULAR PIPE SYSTEM

NOTE: THE 60 INCH DIAMETER UNDERGROUND PIPING SYSTEM IS USED TO PROVIDE THE SEDIMENTATION BASIN AND STORM WATER MANAGEMENT (PRE VS POST CONSTRUCTION).

THE STORMWATER MANAGEMENT VOLUME (VOLUME DETAINED) IS :   9126 CF   THIS PLUS THE SEDIMENTATION VOLUME :   7645 CF

GIVES A TOTAL REQUIRED VOLUME IN THE 60 INCH PIPE SYSTEM OF :   **16771** CF

AREA OF 60" PIPE = $\pi \times (r)^2$ =   19.63 SF

LENGTH OF 60" PIPE REQUIRED =   **854** LF

C.) FILTRATION CHAMBER DESIGN

$A_f = (WQ_v \times d_f) / (k \times (h + d_f) \times t_f) =$ **455.05 SF** $WQ_v =$ 6370.65 CF

$d_f =$ 1.5 FT FOR SAND FILTER BED DEPTH

$A_f =$ 10   x   18.67   =   **186.7 SF** $k =$ 3.5 FT/DAY - GIVEN

$h =$ **4.50** 1/2 MAX ALLOWABLE WATER DEPTH COVER OVER FILTER (9 FT)

455.05   /   186.7   =   2.4373135 $t_f =$ 1 DAYS - GIVEN

NUMBER OF FILTER UNITS =   **3** FILTER UNITS

FOR 60" PIPE: USE 2 ROWS @ 430 LF EACH

FOR FILTERS: USE 3 PRECAST UNITS, 10' x 20' EACH