Phoenix-Mesa Gateway Airport

DETENTION BASIN WEST-DRAINAGE EVALUATION

PMGAA Project # 3

DRAINAGE REPORT

December, 2010

Dibble Engineering

7500 North Dreamy Draw Drive
Suite 200
Phoenix, Arizona 85020
P 602.957.1155
F 602.957.2838
www.dibblecorp.com

A024.319

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PhxMesa **Gateway** Airport

Registered Professional Engineer (Civil)
CERTIFICATE NO.
37878
JOSHUA E.
PAPWORTH
Date Signed 12.23.10
ARIZONA, U.S.A.
Expires 09/30/11

Registered Professional Engineer (Civil)
CERTIFICATE NO.
24433
KENNETH L.
SNYDER
Date Signed 12.23.10
ARIZONA, U.S.A.
Expires 06/30/13

Dibble Engineering™

7500 North Dreamy Draw Drive
Suite 200
Phoenix, Arizona 85020
P. 602.957.1155
F. 602.957.2838
www.dibblecorp.com

Dibble Job#10-0821.1102

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I. INTRODUCTION

A. Background

Phoenix-Mesa Gateway Airport (Gateway) is located in southeast Mesa, Arizona, within Sections 32 and 33 of Township 1 South, Range 7 East (**Figure 1**). The Detention Basin West drainage area, a.k.a. South Area, encompasses approximately 0.3 square miles (~180 acres) and is bounded by Sossaman Road on the west, Taxiway 'V' on the north, the alignment of Vapor Trail (previously known as Verona Road) on the south and Taxiway 'A' on the east (**Figure 2**). This area was originally studied as part the *Master Drainage Plan for Williams Gateway Airport*, Dibble & Associates in 1997 and was updated as *Hydrology Study/Drainage Master Plan*, Gilbertson & Associates, Inc. (Master Plan) in October of 2001. Since then, several airport parcels have been leased and/or developed and a number of master-planned drainage improvements have been implemented. These drainage improvements are a partial fulfillment of the ultimate design proposed by the Master Plan.

In 2008, Dibble Engineering completed the *South Area Drainage Evaluation: Detention Basin West Phasing Implementation* and the subsequent *Final Drainage Report South Area Drainage Phase I & II*. These studies provide the phasing plan and the design of the Phase I and Phase II of the Detention Basin West storm drain system and retention basin. In the latter report the Master Plan model was updated to include airport development that had occurred since the Master Plan was completed. These developments include:

- Taxilane Lima Phase I (Complete)
- City of Mesa Fire and ARFF Station (Complete)
- Aero Business Park (Partial Build-out)
- Hangar 1084 ARFF Basin (Design only)

In addition, areas of Sossaman Road and a low lying inlet across Sossaman Road were added to the total area originally outlined by the Master Plan because they drain to a Sossaman Road storm drain recently completed (2005 AMEC) that is ultimately mitigated by Detention Basin West. These areas increase the runoff to Detention West but more importantly, the existing catch basin west of Sossaman Road, near the Intel property is a half-foot lower than the lowest inlet envisioned in the Master Plan, and below the Master Plan high-water

high-water elevation in the basin, reducing the basin's maximum storage depth and potentially flooding this catch basin on the west side of Sossaman Road, see **Figure 3** (Sub-basin S-6).

Finally, the infield area bordered by Runway 12R/30L, and Taxiways "A", "K1", and "L" were also added into the model because it will drain to Detention West until the drainage infrastructure to the south is built in a future phase.

In July of 2010, the design of Vapor Trail, a roadway providing access to a developing industrial area within the southwest portion of the airport entitled Aero Business Park, was completed. The Master Plan and all subsequent planning reports for Detention Basin West had planned that the Aero Business Park was to be split in half with the north half mitigated by Detention Basin West and the south half being mitigated by Detention Basin South. However, current planning prescribes that the Master Plan be modified to drain these areas to Detention Basin West.

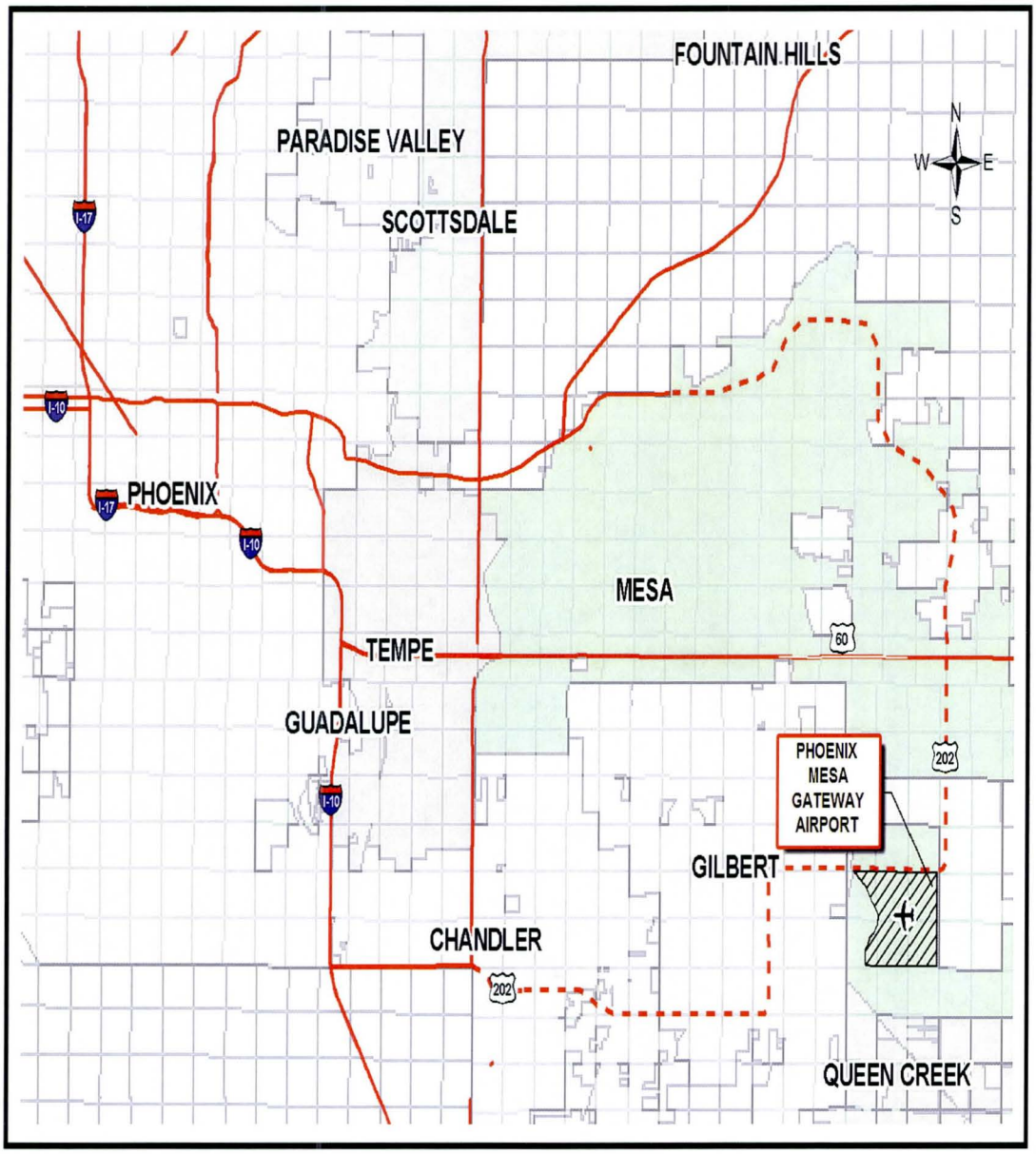
B. Scope of Work

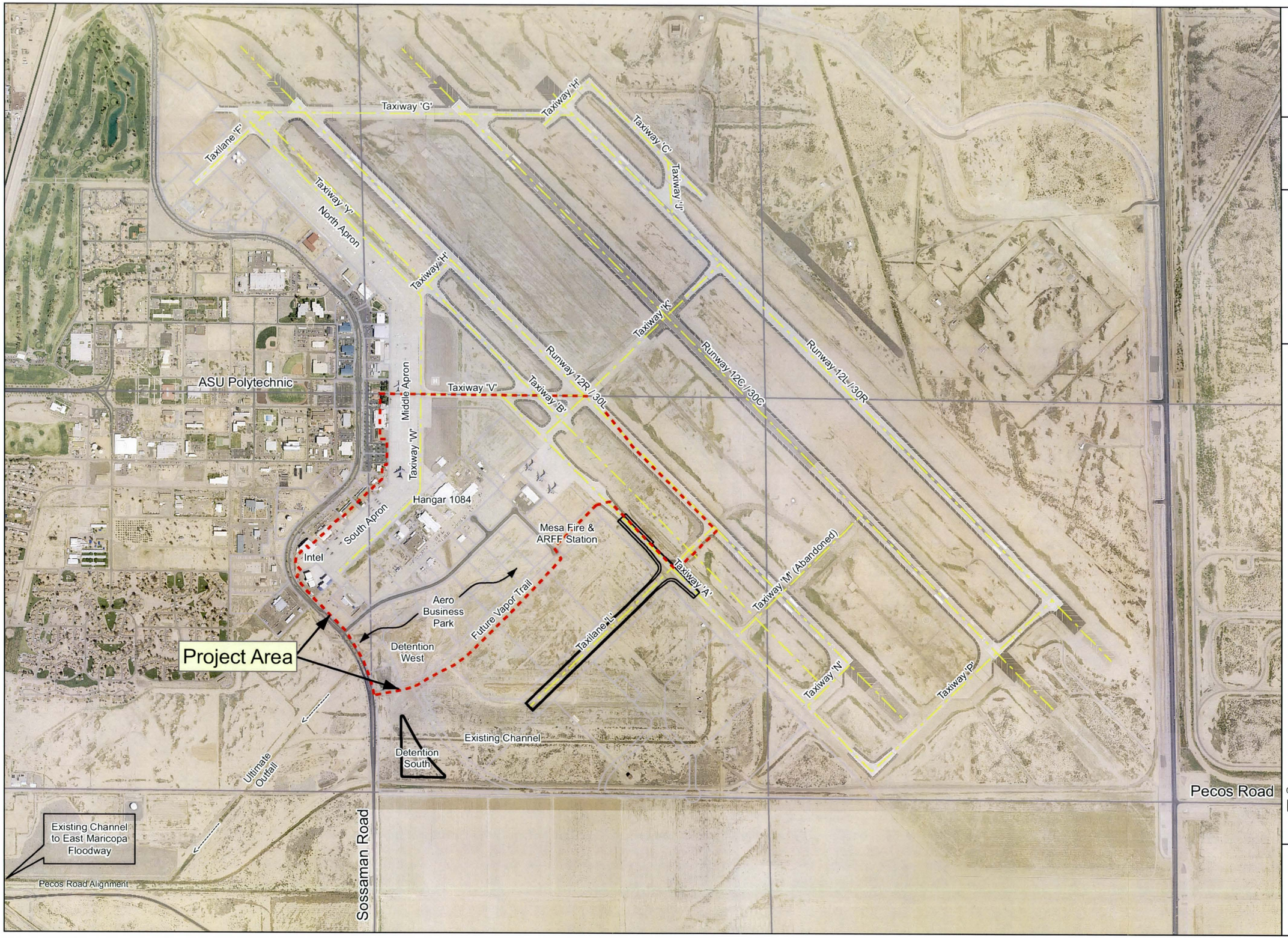
The purpose of this study is to determine the required volume of Detention Basin West to account for additional watershed area associated with the Vapor Trail drainage system and the previous developments incorporated into the Master Plan storm drain model as part of the *South Area Drainage Phase I & II* design described above. The required volume will be used to design modifications to the basin design to meet City of Mesa, FAA, and Flood Control District of Maricopa County (FCDMC) requirements.

The Vapor Trail watershed area is bounded by Vapor Trail on the south, Sossaman Road on the west, Cargo Way on the east and the bisection line of the Aero Business Park on the North. The hydrologic and hydraulic model documented in *Final Drainage Report South Area Drainage: Phase I & II* is the starting point for this project and is updated to include the Vapor Trail storm drain system. For additional background and information on the entire south area drainage system please refer to the report *South Area Drainage Evaluation: Detention Basin West Phasing and Implementation*. For additional background and information specific to the Phase I and II of the Detention Basin West system and the model

updates incorporated at that time please refer to *Final Drainage Report South Area Drainage – Phase I and II*.

Figure 1: Project Vicinity Map

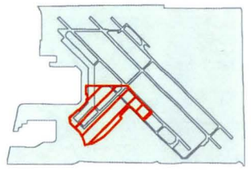




PhxMesa Gateway Airport

Dibble Engineering

Project Site



Legend

Project Area

Center Lines

0 600 1,200 2,400

Feet

Figure 2:

Detention Basin West Study Area

December 2010

II. DESIGN CRITERIA AND METHODOLOGY

A. On-Site Storm Water Drainage

The design criteria for this project are defined in the Federal Aviation Administration (FAA) document *AC 150/5320-5C*, published circa 2006, and the *Drainage Design Manual for Maricopa County*. The drainage requirements for this site are based on the 10-year storm event (matching the Gilbertson Associates Master Plan design intent) while providing positive flow paths to regional detention basin for the 100-year 2-hour event.

XP Storm hydrology and hydraulics software is used to design new conveyance systems to ensure that 10-yr, 6-hr storm water is conveyed to the site outfall without flooding, and that the 100-yr, 2-hr design storm reaches Detention Basin West. Proposed pipe systems from the Master Plan are modeled and adapted to work with the existing drainage infrastructure and to convey 100-yr flow in critical locations. The proposed design of the Vapor Trail storm drain system and hydrology data for the system are obtained directly from information provided in the *Final Drainage Report for Vapor Trail* for inclusion in the current model.

Because Detention Basin West drains to the East Maricopa Floodway (EMF), additional coordination with the regulatory agency for the EMF, FCDMC, is required. Dibble Engineering received verbal approval from FCDMC to modify the watershed draining to Detention Basin West to accommodate the Vapor Trail watershed on the condition that the peak flow leaving Detention Basin West does not exceed the 100-year 2-hour peak of 221 cfs as reported in the Master Plan. Further the basin must increase in size to prevent flooding of low lying inlets on Sossaman Road near the Intel property. This area was also not included in the Master Plan.

Figure 3 displays the onsite drainage areas. Land use consists of Portland Cement Concrete apron pavement, both paved and unpaved infields, and unpaved surface areas. For soil losses, the Green Ampt Method was used. The drainage areas range from 80-percent to 95-percent impervious due to a large percentage of apron, buildings, and pavement.

Specific drainage design criteria and analysis standards used for the hydrology and hydraulics are outlined below:

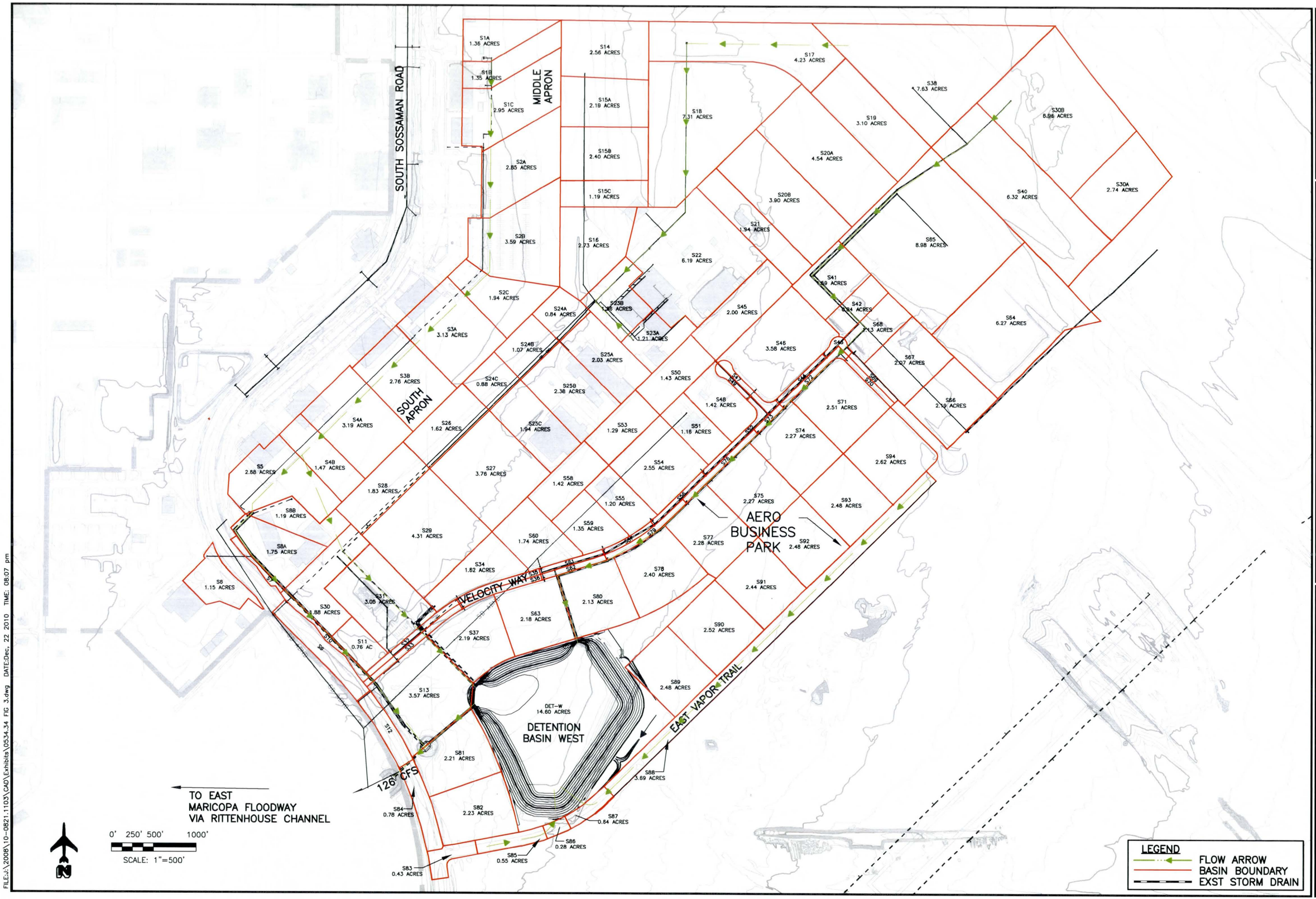
- Minimum time of concentration, Tc=5 min, per FAA *Advisory Circular AC 150/5320-5C*. FAA funding is used for drainage projects within the Detention West drainage region.
- Drainage areas are based off of proposed lot line configurations for developable areas. Areas that will not change have drainage areas set off of existing contours
- Green Ampt Losses for loam soil type:
  - DTHETA = 3.5 for loam
  - PSIF = 3.5 for loam
  - XKSAT = 0.25 for loam
- Kb calculations follow FCDMC guidelines. All drainage areas are assigned one of three sets of Kb data based on their land usage:
  - Urban: m = -.00625; b = 0.04
  - Mixed: m = -.01; b = 0.06
  - Desert: m = -.01375; b = 0.08
- Flow lengths reflect the actual longest flow paths in permanently constructed areas and have flow paths estimated from the centroid to the farthest corner for areas with future development plans.
- Flow line slopes are estimated from the existing contours and using the flow lengths.
- Percent impervious values are estimated for existing areas based on current infrastructure. Future developed areas are given the conservative estimated values as follows:
  - 5% - Detention Basins
  - 80% - Lots expected to have or maintain landscaped areas
  - 90% - Lots without landscaped areas
  - 95% - Areas with current or future apron, and current or future paved roadway
  - 100% - PCCP Parking areas
- All areas with flooding within the model are draining to existing infrastructure for which the airport does not have near-term plans to improve.
- Most pipes have very low cover due to high existing storm drain lines that must be connected to. This causes shallow pipe slopes and low cover resulting in a need to keep the HGL very low and pipe sizes large.
- The Detention Basin West is sized to mitigate the 100-yr, 2-hr design storm per FCDMC standards.
- The allowable discharge of flows from the airport is governed by the historic 100-yr, 6-hr discharges per FCDMC requirements. These values were calculated with the Gilbertson Associates Master Plan in 2001.

B. Off-Site Storm Water Drainage

Off-site overland flows are not a factor due to the presence of topographic high points or improvements on all sides of this drainage study. The study area is isolated by the crown of Runway 12R/30L on the east side, Taxiway "Victor" to the north, Sossaman Road on the west, and Vapor Trail on the south side.

C. Federal Emergency Management Agency (FEMA) Floodplain

The project area is located within an area designated as Flood Zone D (FEMA Flood Insurance Rate Map (FIRM) Map Number 04013C2685 G & 04013C2695 G). A Zone D area is defined as "areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted." The Phoenix-Mesa Gateway Airport is outside of the limits of the Zone A flood hazard zone associated with the East Maricopa Floodway. As such, there are no FEMA requirements associated with this project. The FEMA FIRM is provided in **Appendix A**.



REV	DATE	DESCRIPTION
1	09/16/2010	VAPOR TRAIL AND INDUSTRIAL

Dibble Engineering
7500 N. Dreamy Draw Drive
Suite 200
Phoenix, AZ 85020
P 602.957.1155

PhxMesa Gateway Airport
WILLIAMS GATEWAY AIRPORT AUTHORITY
8535 SOUTH SOSSAMAN ROAD
MESA, ARIZONA 85212
(480) 988-7600
www.phxmesagateway.org

DATE:	9/23/10
DESIGNED BY:	LW
DRAWN BY:	DSO
REVIEWED BY:	DSR
FILE NAME:	0534.34 FIG 3

DETENTION BASIN WEST-RESIZE
PROJECT NO. WGAA - #3

DRAINAGE AREA SUB-BASIN MAP

FIGURE 3

SHEET #: 1 OF 1

FILE:J:\2008\10-0821.1103\CAD\Exhibits\0534.34 FIG 3.dwg DATE:Dec. 22, 2010 TIME: 08:07 pm

III. RESULTS AND RECOMMENDATIONS

XP Storm output can be found in **Appendix D** (10-year 6-hour) and **Appendix E** (100-year 2-hour). A revised grading plan for Detention Basin West is provided as **Appendix F**. Results suggest that the 100-yr, 2-hr flows will reach Detention West during peak discharge via pipe networks and short overland flow paths between adjacent catch basins. During the peak storm, the storm drain system capacity is exceeded at the upstream limits of the system. All water refused by the conveyance system travels towards Sossaman Road via overland flow. Since the storm water traveling in the conveyance system moves more efficiently than overland flow, the storm peak passes before the overland flow reaches Sossaman, allowing it to be intercepted by downstream catch basins and flow to Detention Basin West. The proposed 100-year 2-hour required volume is 27.4 ac-ft. The new high water surface elevation at this volume is 1340.5. The maximum 100-year 2-hour discharge to the EMF delivery channel is 125 cfs (Pipe P-100, **Appendix E**). The peak discharge is less than the maximum value outline in the Master Plan, 221 cfs.

IV. REFERENCES

1. *Airport Drainage Advisory Circular.* Department of Transportation, Federal Aviation Administration. *Advisory Circular #150/5320-5C: Surface Drainage Design*. 9/29/2006.

2. *Drainage Design Manual for Maricopa County, Arizona-Volume I (Hydrology).* Flood Control District of Maricopa County, January 1995.

3. *Master Drainage Plan for Williams Gateway Airport,* Dibble & Associates. 1996.

4. *Hydrology Study/Drainage Master Plan,* Gilbertson & Associates, Inc. October 10, 2001.

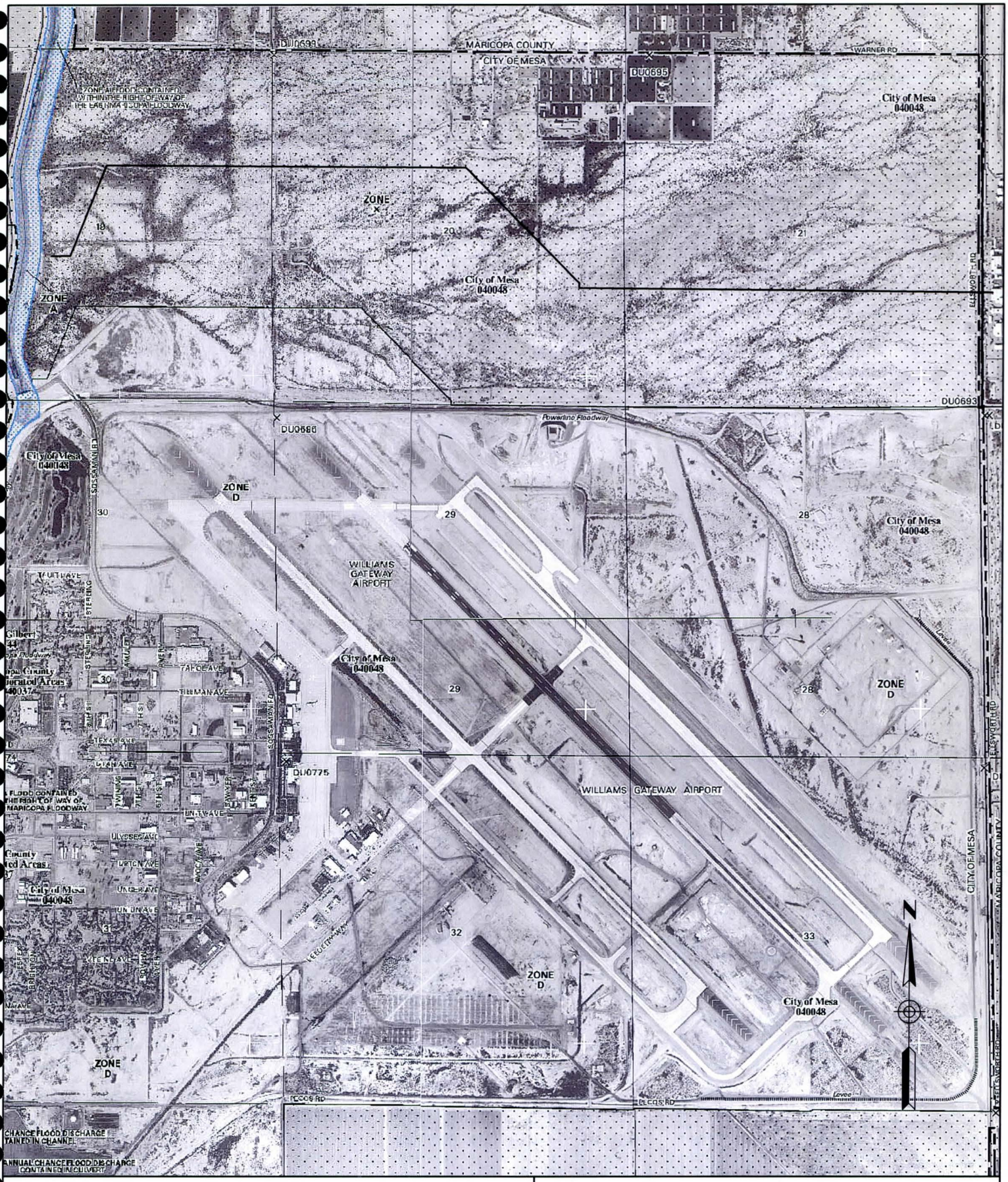
5. *Soil Survey of Aquila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona".* U.S. Dept. of Agriculture-Soil Conservation Service. April 1986.

6. *South Area Drainage Phase I & II Final Drainage Report*, Dibble Engineering July 30, 2008.

7. *Final Drainage Report for Vapor Trail*, Wood/Patel, July 9, 2010.

Appendix A:

FIRM Panel 04013C2685 G & 04013C2695 G



A PORTION OF FEMA FIRM MAPS
4013C2685H AND 4013C2695H
T1S, R7E SECTIONS 29 & 30

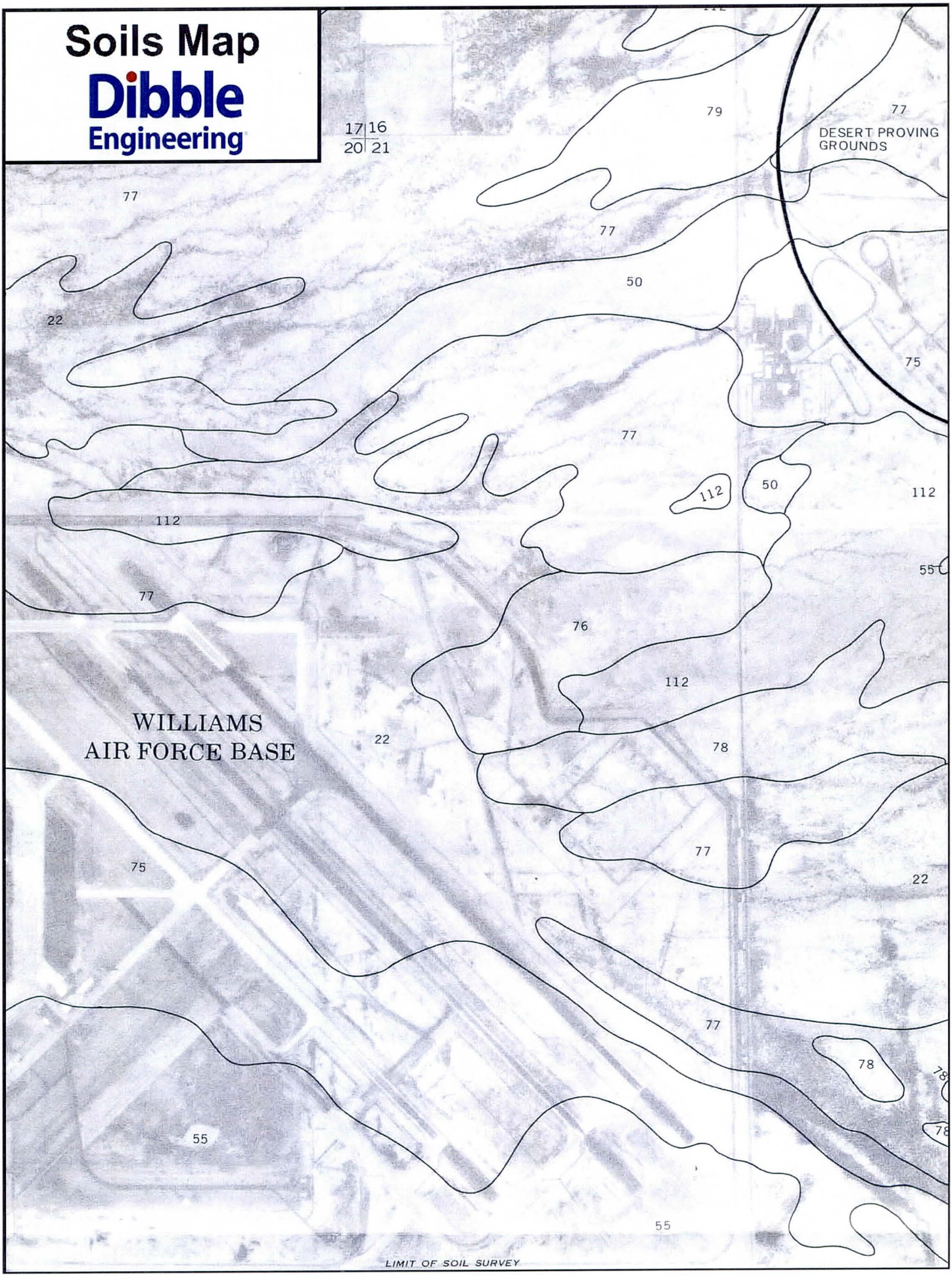
Dibble Engineering
7500 N. Dreamy Draw Drive
Suite 200
Phoenix, AZ 85020
P 602.957.1155
F 602.957.2838
www.dibblecorp.com

Appendix B:

Soils Map

Soils Map

Dibble Engineering



Appendix C:

D-D-F/Precipitation Worksheet

RAINFALL DEPTH-DURATION-FREQUENCY (D-D-F) WORKSHEET

PHOENIX-MESA GATEWAY AIRPORT: MESA, AZ

Determine rainfall depths from the isopluvial maps:

2-yr, 6-hr	1.10
2-yr, 24-hr	1.35
100-yr, 6-hr	3.00
100-yr, 24-hr	3.60

Determine the short-duration rainfall zone (Phx-Metro = 6): 8

Duration [min]	Ratio	
	2-yr	100-yr
5	0.34	0.30
10	0.51	0.46
15	0.62	0.59
30	0.82	0.80

Rainfall depths for rainfall duration (t) for rainfall frequency (T) given by the formula:

$$P_{T,t} = (X)(P_{2,t}) + (Y)(P_{100,t})$$

Frequency (T-yr)	X	Y
5-yr	0.674	0.278
10-yr	0.496	0.449
25-yr	0.293	0.669
50-yr	0.146	0.835
500-yr	-0.337	1.381

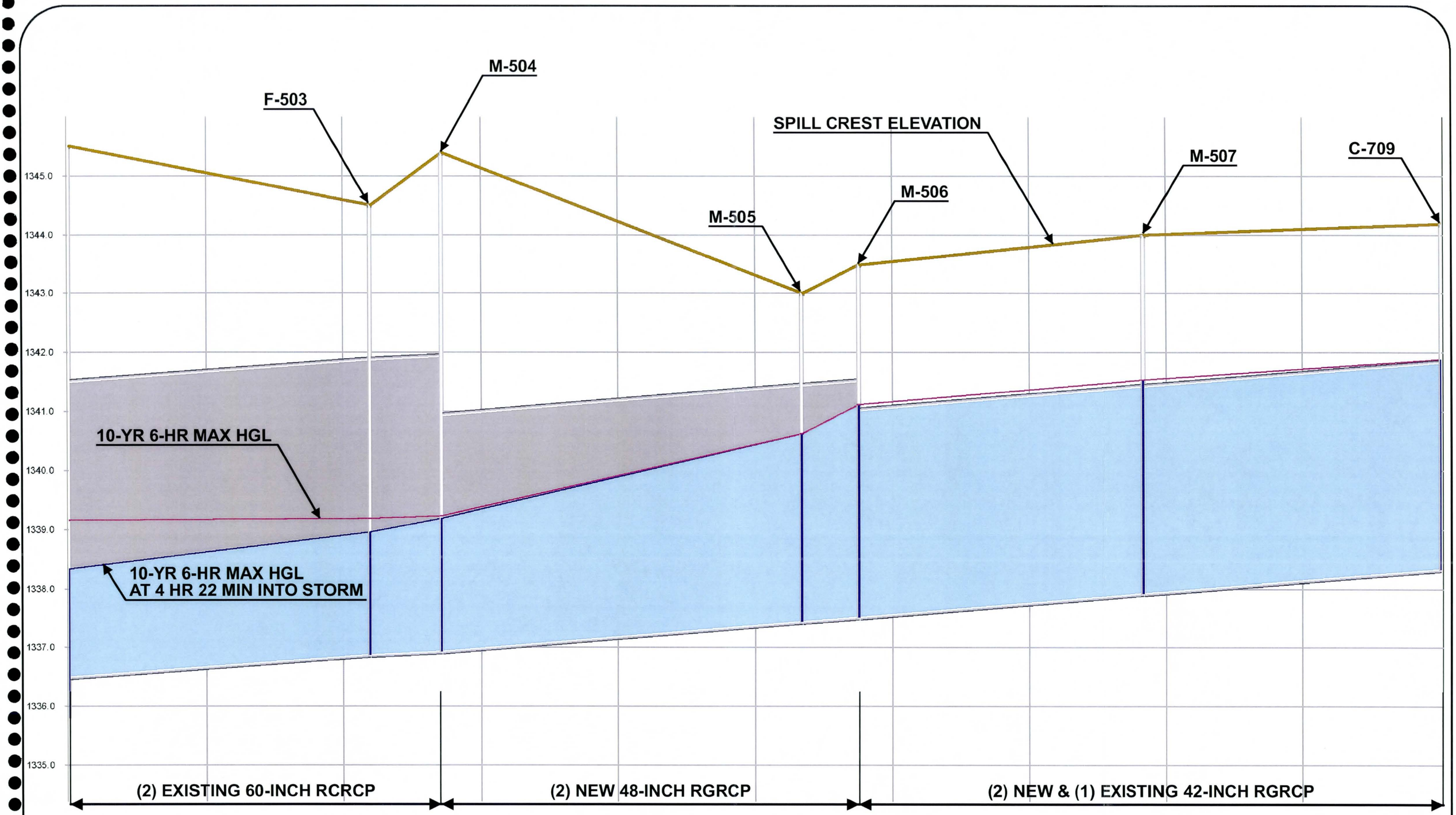
Duration [min]	Rainfall Depth [in]						
	Frequency [yr]						
	2	5	10	25	50	100	500
5	0.28	0.39	0.46	0.56	0.64	0.71	0.89
10	0.42	0.59	0.70	0.86	0.98	1.10	1.37
15	0.52	0.74	0.89	1.09	1.25	1.41	1.77
30	0.68	0.99	1.19	1.47	1.69	1.91	2.40
60	0.83	1.22	1.48	1.84	2.11	2.38	3.01
120	0.92	1.34	1.62	2.01	2.30	2.59	3.27
180	0.99	1.42	1.72	2.12	2.43	2.73	3.44
360	1.10	1.58	1.89	2.33	2.67	3.00	3.77
720	1.23	1.74	2.09	2.57	2.93	3.30	4.14
1440	1.35	1.91	2.29	2.80	3.20	3.60	4.52

Duration/Tc [min]	Rainfall Intensity [in/hr]						
	Frequency [yr]						
	2	5	10	25	50	100	500
5	3.40	4.67	5.54	6.73	7.66	8.57	10.69
10	2.55	3.55	4.22	5.14	5.86	6.57	8.22
15	2.07	2.96	3.55	4.37	4.99	5.62	7.07
30	1.37	1.98	2.39	2.95	3.38	3.81	4.80
60	0.83	1.22	1.48	1.84	2.11	2.38	3.01
120	0.46	0.67	0.81	1.00	1.15	1.30	1.63
180	0.33	0.47	0.57	0.71	0.81	0.91	1.15
360	0.18	0.26	0.32	0.39	0.44	0.50	0.63
720	0.10	0.15	0.17	0.21	0.24	0.28	0.35
1440	0.06	0.08	0.10	0.12	0.13	0.15	0.19

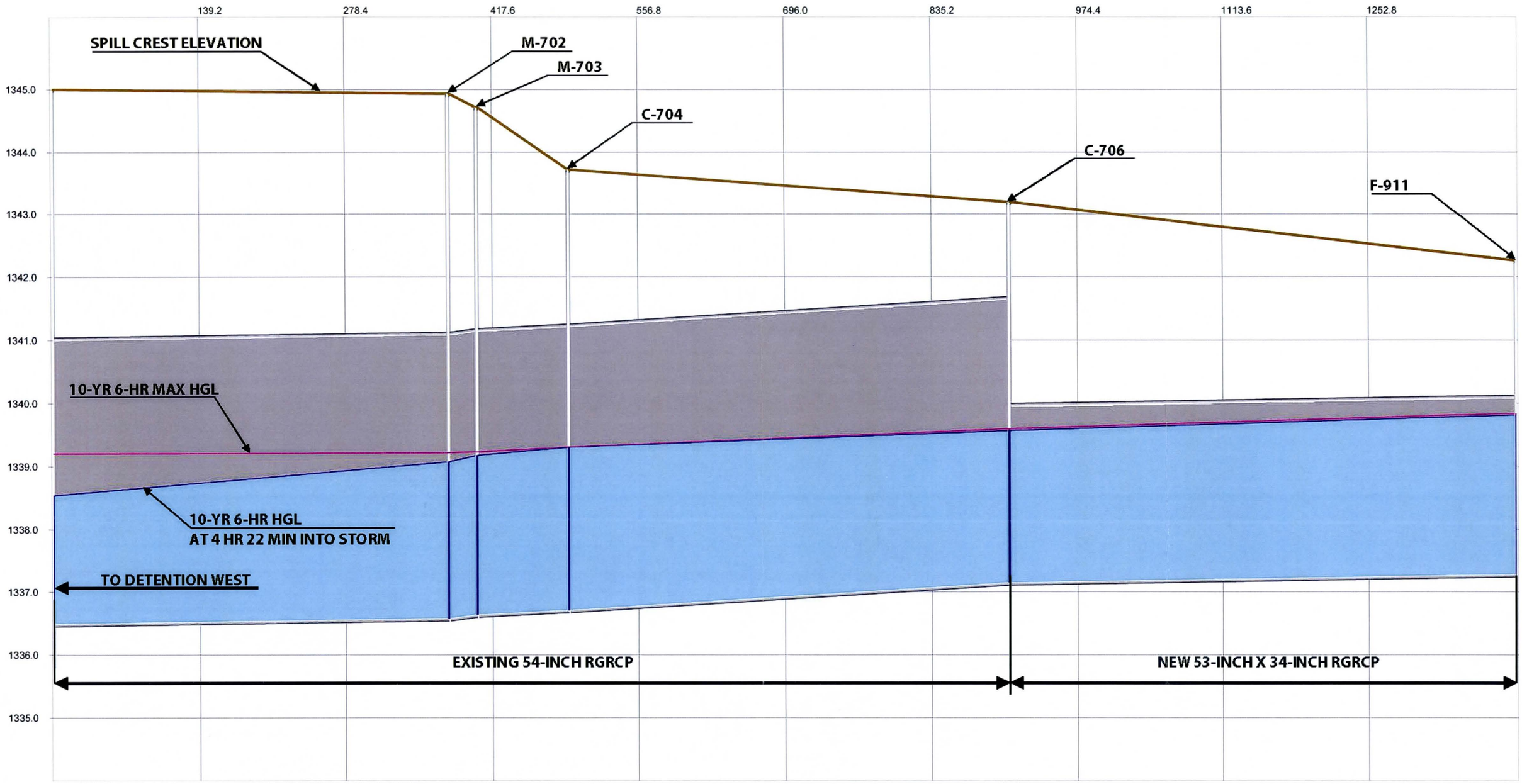
Registered Professional Engineer (Civil)
CERTIFICATE NO.
37878
JOSHUA E.
PAPWORTH
Date Signed 10.7.10
ARIZONA, U.S.A.
Expires 09/30/11

Appendix D:

XP Storm Model (10-yr, 6-hr)

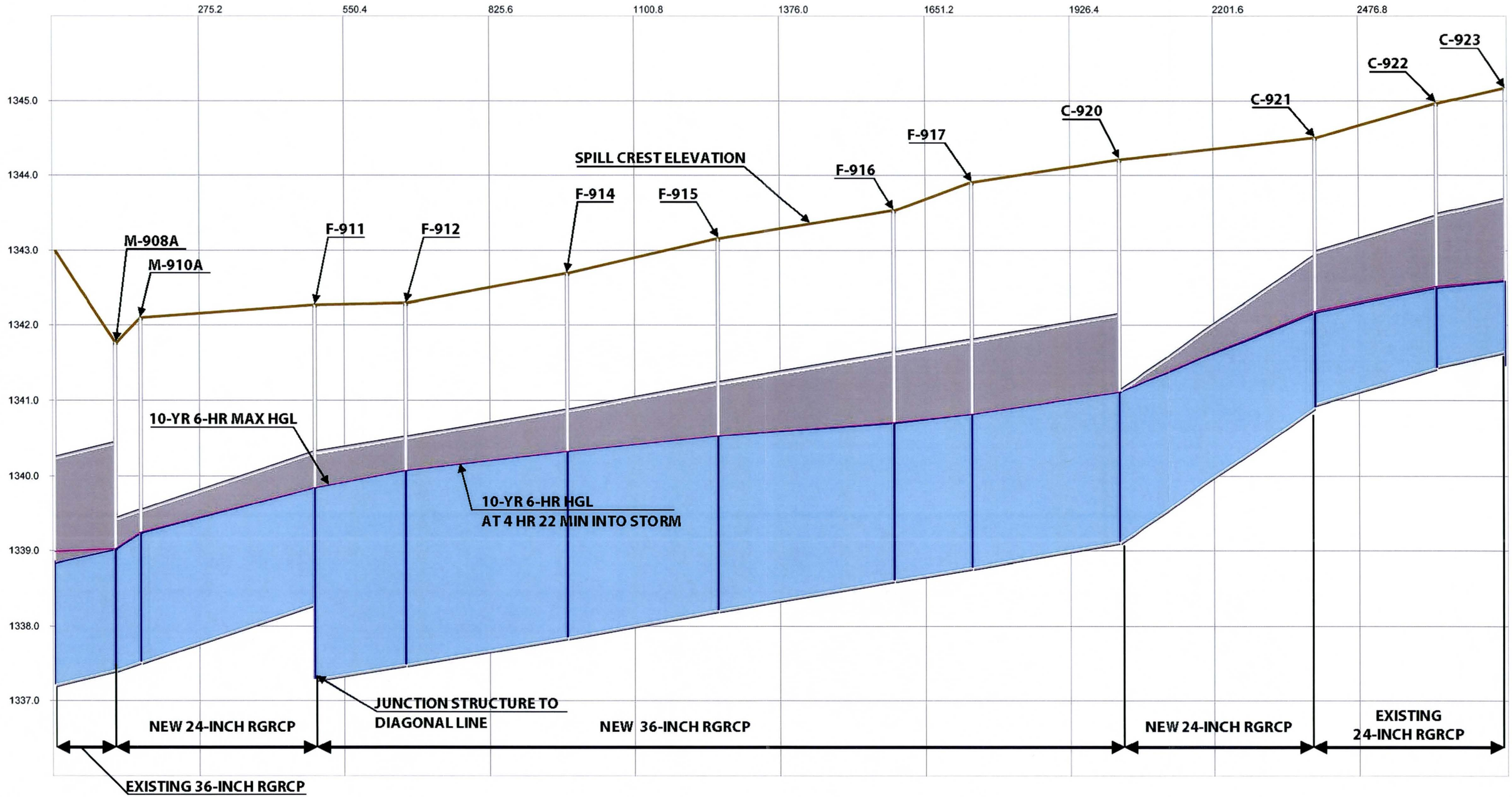


SOUTH AREA DRAINAGE PHASE I
EAST APRON 48 & 42-INCH STORM DRAIN PROFILE



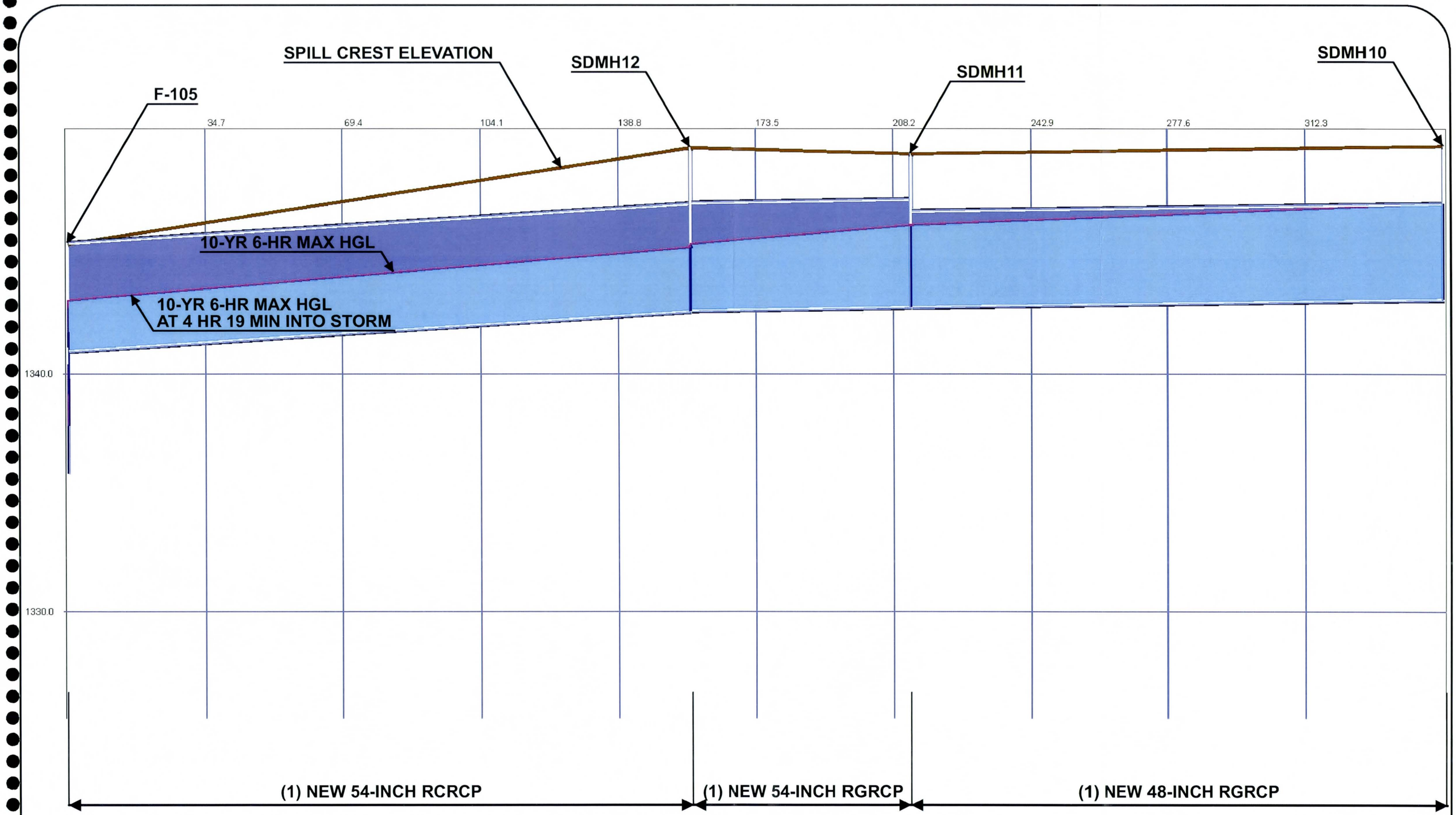
SOUTH AREA DRAINAGE PHASE II

SOUTH APRON DIAGONAL LINE 53-INCH X 34-INCH (42-INCH EQUIVELANT) STORM DRAIN

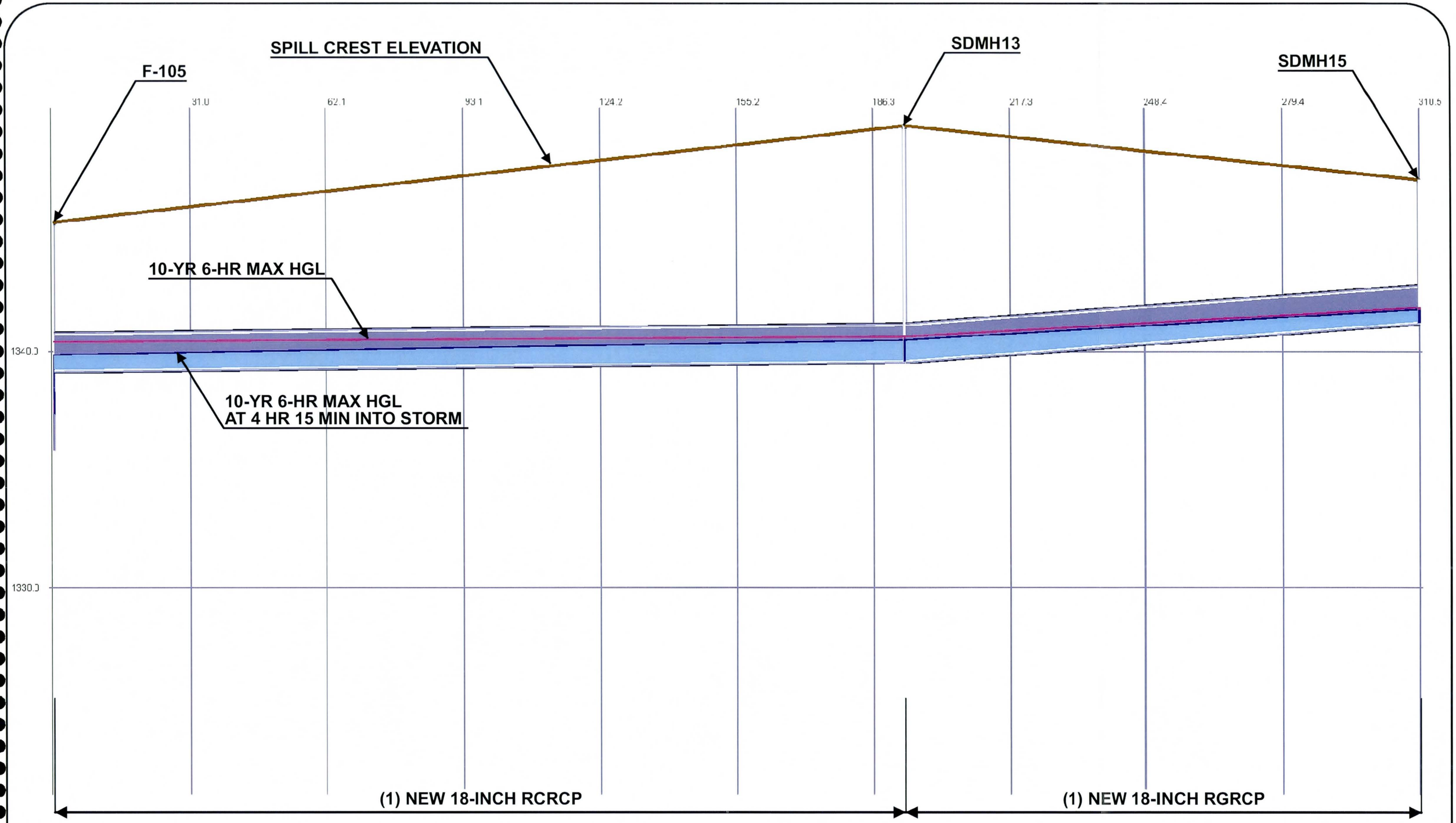


SOUTH AREA DRAINAGE PHASE II

SOUTH APRON WEST LINE DOUBLE 24-INCH & 36-INCH STORM DRAIN PROFILE



SOUTH AREA DRAINAGE PHASE I
SOUTH APRON 54 & 48-INCH STORM DRAIN PROFILE



SOUTH AREA DRAINAGE PHASE I
SOUTHWEST APRON 18-INCH STORM DRAIN PROFILE

Williams Gateway Airport Authority | WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

10-yr 6-hr Conduit Data

Dibble Engineering | 23-Dec-10

Conduit Name	Diameter (ft)	Length (ft)	Conduit Slope (%)	Upstream Node Name	Downstream Node Name	Upstream IE (ft)	Downstream IE (ft)	Maximum Velocity (fps)	Maximum Flow (cfs)	Maximum US Water Elevation (ft)	Maximum DS Water Elevation (ft)
OL-105	8.0	200	1.10	F-301	F-105	1338.00	1335.80	3.31	45.78	1339.14	1339.14
OL-105-1	8.0	200	1.10	F-201	F-105	1338.00	1335.80	3.66	55.73	1339.14	1339.14
OL-214	1.0	10	2.71	M-315	M-214	1350.47	1350.20	0.00	0.00	1346.39	1346.39
OL-304B	0.5	430	0.23	C-305A	C-304B	1346.50	1345.51	0.00	0.00	1343.16	1343.16
P-306D	0.5	160	-0.89	C-306E	C-306D	1345.78	1347.20	1.54	2.20	1344.99	1344.99
P-307D	0.5	166	-0.65	C-307E	C-307D	1346.96	1348.04	2.17	2.52	1344.92	1344.92
P-309D	0.5	166	-0.35	C-309E	F-309D	1347.99	1348.57	2.53	3.41	1344.05	1344.05
P-506	0.5	413	0.11	M-507	M-506	1342.95	1342.50	3.09	25.65	1341.12	1341.12
OL-506-1	0.5	420	0.57	C-502C	M-604	1344.88	1342.48	0.00	0.00	1340.62	1340.62
P-507	0.5	413	0.06	C-709	M-507	1343.20	1342.95	2.88	22.73	1341.54	1341.54
OL-507-1	0.5	885	0.32	C-306E	M-507	1345.78	1342.95	0.00	0.00	1341.54	1341.54
OL-507-2	0.5	550	0.47	C-304B	M-507	1345.51	1342.95	0.00	0.00	1341.54	1341.54
OL-507-3	0.5	415	0.54	C-303D	M-507	1345.20	1342.95	0.00	0.00	1341.54	1341.54
P-508	0.5	305	0.32	M-510	C-709	1344.18	1343.20	2.97	24.16	1341.90	1341.90
P-510	0.5	182	0.31	C-710	M-510	1344.75	1344.19	2.94	24.22	1342.27	1342.27
OL-510-1	0.5	432	0.70	C-307E	M-510	1346.96	1343.93	0.00	0.00	1342.27	1342.27
P-512	0.5	255	0.29	C-513	M-512	1347.00	1346.26	5.37	45.08	1342.91	1342.91
P-513	0.5	258	0.12	C-514	C-513	1347.30	1347.00	5.04	35.69	1343.70	1343.70
P-514	0.5	155	0.43	C-515	C-514	1347.96	1347.30	4.39	22.07	1344.36	1344.36
P-514-1	0.5	416	0.06	C-514A	C-514	1347.55	1347.30	3.97	14.22	1344.36	1344.36
OL-514-2	0.4	695	0.49	M-214	C-514	1350.80	1347.40	0.00	0.00	1344.36	1344.36
P-514A	0.5	419	0.29	C-514B	C-514A	1348.26	1347.05	2.80	5.71	1344.87	1344.87
P-515	0.5	131	0.41	C-516	C-515	1348.50	1347.96	4.14	19.18	1344.71	1344.71
P-516	0.5	276	0.42	C-517	C-516	1349.65	1348.50	4.37	12.58	1345.10	1345.10
P-516-1	0.5	419	0.33	C-516A	C-516	1349.89	1348.50	0.00	0.00	1345.10	1345.10
OL-516-2	0.5	800	0.43	C-215	C-516	1351.94	1348.50	0.00	0.00	1345.10	1345.10
P-517	0.5	325	0.43	C-518	C-517	1351.04	1349.65	3.79	5.17	1345.84	1345.84
OL-710	0.6	580	0.10	C-717A	M-510	1344.40	1343.83	0.00	0.00	1342.27	1342.27
P-710-2	0.5	64	2.36	M-512	C-710	1346.26	1344.75	4.71	44.93	1342.46	1342.46
OL-710-1	0.5	545	0.69	C-309E	C-710	1347.99	1344.21	0.00	0.00	1342.46	1342.46
OL-717A	0.5	147	0.20	C-718A	C-717A	1344.80	1344.50	0.00	0.00	1342.69	1342.69
OL-718A	0.5	258	0.12	C-719A	C-718A	1345.12	1344.80	0.00	0.00	1342.77	1342.77
OL-719A	0.5	243	0.17	C-720A	C-719A	1345.53	1345.12	0.00	0.00	1342.68	1342.68
P-908-1	0.5	50	0.04	C-908A	M-908A	1341.19	1341.17	2.66	9.77	1339.03	1339.03
P-908-3	0.3	188	0.03	C-908B	M-908B	1341.48	1341.43	2.86	8.07	1339.01	1339.01
OL-908A	0.4	550	0.03	C-912A	M-910A	1341.75	1341.60	0.00	0.00	1339.19	1339.19
OL-908A-1	0.5	40	1.02	M-910A	C-908A	1341.60	1341.19	0.00	0.00	1339.06	1339.06
OL-910A	0.5	10	0.00	M-910A	M-910B	1341.60	1341.60	0.00	0.00	1339.22	1339.22
OL-911	0.4	170	-0.07	C-912A	F-911	1341.75	1341.87	0.00	0.00	1340.07	1340.07
OL-913A	0.4	307	0.13	C-914A	C-912A	1342.15	1341.75	0.00	0.00	1340.07	1340.07
OL-914A	0.4	285	0.01	C-915A	C-914A	1342.17	1342.15	0.00	0.00	1340.31	1340.31
OL-915A	0.4	320	0.18	C-916A	C-915A	1342.75	1342.17	0.00	0.00	1340.52	1340.52
OL-916A	0.4	135	0.03	C-917B	C-916A	1342.79	1342.75	0.00	0.00	1340.68	1340.68
OL-917B-2	0.3	272	0.37	C-920	C-917B	1343.91	1342.89	0.00	0.00	1340.81	1340.81
OL-918B-1	0.4	640	0.10	C-921A	C-917B	1343.44	1342.79	0.00	0.00	1340.81	1340.81
OL-921A	0.4	225	0.16	C-922A	C-921A	1343.80	1343.44	0.00	0.00	1342.24	1342.24
OL-922A	0.4	127	0.32	C-923A	C-922A	1344.21	1343.80	0.00	0.00	1342.55	1342.55
P-1	1.5	47	0.00	CB1	SDMH1	1352.08	1351.61	4.18	4.41	1352.95	1352.45
P-10	3.5	282	0.00	SDMH5	SDMH6	1347.11	1346.39	4.04	21.04	1348.96	1348.34
P-100	5.0	42	0.05	F-101	C-100	1335.66	1335.64	3.40	80.29	1338.62	1338.46
P-101	5.0	74	0.04	F-103	F-101	1335.69	1335.66	3.19	78.30	1338.78	1338.62
P-101-1	1.5	8	21.88	C-101A	F-101	1339.30	1337.55	9.05	2.01	1339.61	1338.62
P-102	1.5	8	22.37	C-102A	F-103	1339.34	1337.55	9.81	5.01	1339.91	1338.78
P-103	5.0	54	0.04	F-104	F-103	1335.71	1335.69	2.89	73.30	1338.89	1338.78
P-104	4.5	334	0.13	F-105	F-104	1336.30	1335.85	3.11	33.01	1339.14	1338.89
P-104	4.5	334	0.13	F-105	F-104	1336.30	1335.85	3.11	33.01	1339.14	1338.89
P-11	2.0	47	0.00	CB6	SDMH6	1348.42	1347.95	4.20	4.17	1349.14	1348.53
P-13	2.0	27	0.00	CB9	SDMH8	1347.10	1346.80	3.73	2.83	1347.69	1347.26
P-14	2.0	17	0.00	CB8	SDMH8	1347.10	1346.80	4.09	2.83	1347.66	1347.21
P-2	2.0	282	0.00	SDMH1	SDMH2	1351.51	1350.79	3.13	4.41	1352.45	1351.53
P-201	5.0	334	0.17	M-202	F-201	1338.56	1338.00	5.34	56.11	1341.42	1339.14
P-202	5.0	237	0.20	M-203	M-202	1339.14	1338.66	4.58	53.40	1342.04	1341.42
P-203	5.0	133	0.22	M-204	M-203	1339.43	1339.14	4.26	52.83	1342.47	1342.04
P-203-1	1.5	11	1.09	C-203A	M-203	1342.76	1342.64	2.32	0.50	1343.03	1342.86
P-204	5.0	150	0.19	C-205	M-204	1339.72	1339.43	3.91	49.98	1342.83	1342.47
P-205	5.0	188	0.19	C-206	C-205	1340.08	1339.72	3.87	49.94	1343.20	1342.83
P-206	5.0	161	0.20	C-207	C-206	1340.40	1340.08	3.64	46.70	1343.51	1343.20
P-206-1	1.5	12	0.75	C-206A	C-206	1343.67	1343.58	2.09	0.49	1343.96	1343.82
P-207	5.0	150	0.21	C-208	C-207	1340.71	1340.40	3.48	43.99	1343.78	1343.51
P-208	4.5	161	0.20	C-209	C-208	1341.03	1340.71	3.77	43.92	1344.13	1343.78
P-209	4.5	173	0.20	C-210	C-209	1341.37	1341.03	3.56	41.00	1344.43	1344.13

DETENTION BASIN WEST EVALUATION

10-yr 6-hr Conduit Data

Dibble Engineering 23-Dec-10

Conduit Name	Diameter (ft)	Length (ft)	Conduit Slope (%)	Upstream Node Name	Downstream Node Name	Upstream IE (ft)	Downstream IE (ft)	Maximum Velocity (fps)	Maximum Flow (cfs)	Maximum US Water Elevation (ft)	Maximum DS Water Elevation (ft)
P-210	4.5	365	0.40	F-211	C-210	1342.83	1341.37	5.00	40.64	1345.10	1344.43
P-210-1	1.5	11	0.82	C-210A	C-210	1344.46	1344.37	2.08	0.45	1344.74	1344.59
P-211	4.5	42	0.40	M-212	F-211	1343.00	1342.83	4.16	37.10	1345.50	1345.10
P-211-1	2.0	48	0.79	C-211A	F-211	1344.46	1344.08	2.03	0.34	1345.10	1345.10
P-212	4.0	127	0.23	F-213	M-212	1343.34	1343.05	4.03	35.14	1345.98	1345.50
P-212-1	2.5	43	0.93	C-212A	M-212	1345.40	1345.00	3.25	2.04	1345.87	1345.50
P-212A	2.5	11	0.82	C-212B	C-212A	1345.49	1345.40	2.42	1.73	1346.01	1345.87
P-213	4.0	347	0.08	M-214	F-213	1343.63	1343.34	3.12	28.66	1346.39	1345.98
P-213-1	2.0	129	0.19	C-217	F-213	1345.58	1345.34	3.32	6.53	1346.82	1346.25
P-214	4.0	552	0.13	C-215	M-214	1344.68	1343.97	3.49	26.42	1347.03	1346.39
P-215	2.5	610	0.22	C-216	C-215	1346.00	1344.68	2.97	10.10	1347.64	1347.03
P-217	2.0	275	0.18	C-218	C-217	1346.08	1345.58	2.09	3.36	1347.07	1346.82
P-22	4.0	50	0.00	SDMH8	SDMH9	1344.71	1344.58	4.67	30.75	1346.83	1346.22
P-24	3.5	282	0.00	SDMH6	SDMH7	1346.39	1345.66	4.69	25.16	1348.34	1347.23
P-25	4.0	135	0.00	SDMH7	SDMH8	1345.16	1344.81	3.85	25.15	1347.23	1346.83
P-27	4.0	157	0.00	SDMH9	SDMH10	1344.48	1343.28	5.78	30.74	1346.19	1345.43
P-3	1.5	47	0.00	CB2	SDMH2	1351.35	1350.88	4.28	4.17	1352.18	1351.54
P-30	4.0	134	0.00	SDMH10	SDMH11	1343.18	1342.84	4.26	30.76	1345.43	1344.92
P-301	5.0	371	0.17	M-302	F-301	1338.62	1338.00	4.97	46.21	1341.21	1339.14
P-302	5.0	171	0.20	F-304	M-302	1338.96	1338.62	3.86	40.23	1341.61	1341.21
P-302-1	3.0	60	0.20	M-303	M-302	1340.34	1340.22	2.94	6.27	1341.45	1341.21
P-303	2.0	16	0.94	C-303A	M-303	1340.59	1340.44	2.24	2.99	1341.51	1341.45
P-303-1	2.5	25	1.00	C-303E	M-303	1340.69	1340.44	2.72	3.30	1341.51	1341.45
P-303A	2.0	9	1.00	C-303B	C-303A	1340.68	1340.59	2.02	2.67	1341.59	1341.51
P-303B	2.0	46	0.24	F-303C	C-303B	1340.79	1340.68	2.02	2.65	1341.69	1341.59
P-303C	2.0	249	0.24	C-303D	F-303C	1341.40	1340.79	2.55	2.67	1342.13	1341.69
P-303E	2.5	9	1.00	C-303F	C-303E	1340.78	1340.69	2.45	2.97	1341.59	1341.51
P-304	5.0	79	0.20	M-305	F-304	1339.12	1338.96	3.43	37.95	1341.90	1341.61
P-304-1	2.0	244	0.51	C-304A	F-304	1341.70	1340.46	3.32	2.42	1342.24	1341.61
P-304A	1.5	161	0.50	C-304B	C-304A	1342.50	1341.70	3.34	2.42	1343.16	1342.24
P-305	5.0	275	0.16	M-306	M-305	1339.56	1339.12	3.33	35.92	1342.25	1341.90
P-305-1	2.0	19	0.89	C-305A	M-305	1341.29	1341.12	3.13	2.35	1341.98	1341.90
P-306	5.0	337	0.16	M-307	M-306	1340.10	1339.56	3.04	27.80	1342.51	1342.25
P-306-1	2.0	17	1.00	C-306A	M-306	1342.73	1342.56	4.44	8.67	1343.96	1343.42
P-306A	2.0	9	1.00	C-306B	C-306A	1342.82	1342.73	3.45	8.30	1344.28	1343.96
P-306B	2.0	42	0.19	F-306C	C-306B	1342.90	1342.82	2.50	6.47	1344.45	1344.28
P-306C	2.0	316	0.19	C-306D	F-306C	1343.49	1342.90	2.71	6.46	1344.90	1344.45
P-306D	1.5	160	0.19	C-306E	C-306D	1343.79	1343.49	1.54	2.20	1344.99	1344.90
P-307	4.5	408	0.16	M-308	M-307	1340.75	1340.10	3.16	22.80	1342.89	1342.51
P-307-1	2.0	15	1.00	C-307A	M-307	1342.75	1342.60	3.81	5.10	1343.66	1343.25
P-307A	2.0	18	1.00	M-307B	C-307A	1342.93	1342.75	3.03	4.53	1343.90	1343.66
P-307B	2.0	46	0.20	M-307C	M-307B	1343.02	1342.93	2.58	4.53	1344.13	1343.90
P-307C	2.0	314	0.20	C-307D	M-307C	1343.65	1343.02	2.77	4.53	1344.68	1344.13
P-307D	1.5	166	0.20	C-307E	C-307D	1343.98	1343.65	2.17	2.52	1344.92	1344.68
P-308	4.0	80	0.16	M-310	M-308	1340.88	1340.75	2.46	13.17	1342.95	1342.89
P-308-1	3.0	116	0.52	M-309	M-308	1342.35	1341.75	4.40	11.99	1343.61	1342.89
P-309	2.0	25	0.52	C-309A	M-309	1343.48	1343.35	3.57	5.91	1344.55	1344.18
P-309-1	1.5	16	0.50	C-309C	M-309	1343.93	1343.85	2.95	2.70	1344.72	1344.47
P-309-2	3.0	227	0.21	F-309D	M-309	1342.82	1342.35	1.84	3.40	1343.73	1343.61
P-309A	2.0	12	0.42	C-309B	C-309A	1343.53	1343.48	2.86	5.49	1344.72	1344.55
P-309D	2.0	166	0.20	C-309E	F-309D	1343.15	1342.82	2.53	3.41	1344.05	1343.73
P-31	4.5	56	0.00	SDMH11	SDMH12	1342.84	1342.69	4.62	32.30	1344.92	1344.32
P-310	4.0	313	0.16	F-311	M-310	1341.38	1340.88	2.73	12.67	1343.12	1342.95
P-310-1	2.0	14	1.00	C-310A	M-310	1343.02	1342.88	2.10	0.36	1343.23	1343.05
P-311	4.0	97	0.16	F-312	F-311	1341.54	1341.38	2.63	12.35	1343.24	1343.12
P-311-1	1.5	14	1.00	C-311A	F-311	1342.77	1342.63	1.97	0.24	1343.12	1343.12
P-312	4.0	49	0.20	F-313	F-312	1341.64	1341.54	2.50	12.30	1343.35	1343.24
P-313	4.0	65	0.35	F-314	F-313	1341.87	1341.64	2.54	11.49	1343.47	1343.35
P-313-1	1.5	32	9.06	M-313A	F-313	1345.00	1342.10	6.81	1.29	1345.21	1343.35
P-313A	1.5	24	10.42	C-313B	M-313A	1347.50	1345.00	7.53	1.29	1347.73	1345.21
P-314	4.0	326	0.20	M-315	F-314	1342.52	1341.87	2.97	11.42	1343.88	1343.47
P-315	4.0	579	0.20	M-316	M-315	1343.78	1342.62	3.54	11.39	1344.99	1343.88
P-316	4.0	397	0.20	C-317	M-316	1344.67	1343.88	3.47	11.44	1345.92	1344.99
P-317	3.0	289	0.80	C-318	C-317	1347.08	1344.77	4.77	6.49	1347.78	1345.92
P-317-1	3.0	367	0.20	C-314A	C-317	1345.50	1344.77	2.57	3.26	1346.21	1345.92
P-318	2.0	560	0.34	C-319	C-318	1350.00	1348.08	2.81	1.86	1350.53	1348.55
P-32	2.0	27	0.00	CB11	SDMH11	1345.00	1344.77	2.62	0.84	1345.32	1345.04
P-33	2.0	17	0.00	CB10	SDMH11	1345.00	1344.77	2.94	0.84	1345.30	1345.01
P-34	1.5	27	0.00	CB13	SDMH15	1343.00	1341.25	6.12	0.92	1343.20	1341.53
P-35	1.5	17	0.00	CB12	SDMH15	1343.00	1341.25	0.91	0.01	1343.01	1341.53
P-4	2.5	282	0.00	SDMH2	SDMH3	1350.29	1349.56	3.67	8.58	1351.52	1350.56

DETENTION BASIN WEST EVALUATION

10-yr 6-hr Conduit Data

Dibble Engineering 23-Dec-10

Conduit Name	Diameter (ft)	Length (ft)	Conduit Slope (%)	Upstream Node Name	Downstream Node Name	Upstream IE (ft)	Downstream IE (ft)	Maximum Velocity (fps)	Maximum Flow (cfs)	Maximum US Water Elevation (ft)	Maximum DS Water Elevation (ft)
P-43	1.5	117	0.00	SDMH15	SDMH13	1341.25	1339.60	3.68	0.92	1341.53	1340.09
P-5	1.5	47	0.00	CB3	SDMH3	1350.62	1350.15	4.28	4.17	1351.45	1350.81
P-501-1	5.0	376	0.09	M-502	F-105	1336.85	1336.50	4.20	44.10	1339.57	1339.14
P-502-1	2.5	217	0.20	M-502A	M-502	1339.52	1339.09	2.71	3.69	1340.34	1339.72
P-502-2	5.0	50	0.10	F-503	M-502	1336.90	1336.85	3.43	41.08	1339.86	1339.57
P-502A	2.0	11	1.00	C-502B	M-502A	1339.73	1339.62	2.88	3.26	1340.52	1340.34
P-502A-1	2.0	31	1.00	C-502D	M-502A	1339.93	1339.62	1.39	0.44	1340.34	1340.34
P-502B	1.5	109	1.97	C-502C	C-502B	1341.88	1339.73	5.53	2.81	1342.34	1340.52
P-503	5.0	100	0.07	M-504	F-503	1336.97	1336.90	3.17	41.07	1340.12	1339.86
P-504	4.0	494	0.10	M-505	M-504	1337.46	1336.97	3.67	41.09	1340.82	1340.12
P-505	4.0	80	0.07	M-506	M-505	1337.52	1337.46	3.48	41.15	1341.12	1340.82
P-506	3.5	400	0.10	M-507	M-506	1337.92	1337.52	3.09	25.65	1341.54	1341.12
P-506	3.5	400	0.10	M-507	M-506	1337.92	1337.52	3.09	25.65	1341.54	1341.12
P-506	3.5	400	0.11	M-507	M-506	1338.72	1338.29	3.09	25.65	1341.54	1341.12
P-507	3.5	413	0.10	C-709	M-507	1338.34	1337.92	2.88	22.73	1341.90	1341.54
P-507	3.5	413	0.10	C-709	M-507	1338.34	1337.92	2.88	22.73	1341.90	1341.54
P-507	3.5	413	0.12	C-709	M-507	1339.23	1338.72	2.88	22.73	1341.90	1341.54
P-508	3.5	505	0.10	M-510	C-709	1338.84	1338.34	2.97	24.16	1342.27	1341.90
P-508	3.5	505	0.15	M-510	C-709	1340.05	1339.29	2.97	24.16	1342.27	1341.90
P-508	3.5	505	0.10	M-510	C-709	1338.84	1338.34	2.97	24.16	1342.27	1341.90
P-510	3.5	184	0.09	C-710	M-510	1339.00	1338.84	2.94	24.22	1342.46	1342.27
P-510	3.5	184	0.20	C-710	M-510	1340.41	1340.05	2.94	24.22	1342.46	1342.27
P-510	3.5	184	0.09	C-710	M-510	1339.00	1338.84	2.94	24.22	1342.46	1342.27
P-512	3.5	255	0.48	C-513	M-512	1340.53	1339.31	5.37	45.08	1343.70	1342.91
P-513	3.5	258	0.48	C-514	C-513	1341.76	1340.53	5.04	35.69	1344.36	1343.70
P-514	3.0	155	0.48	C-515	C-514	1342.50	1341.76	4.39	22.07	1344.71	1344.36
P-514-1	3.0	416	0.30	C-514A	C-514	1343.23	1342.00	3.97	14.22	1344.87	1344.36
P-514A	3.0	419	0.19	C-514B	C-514A	1344.03	1343.23	2.80	5.71	1345.07	1344.87
P-515	3.0	131	0.48	C-516	C-515	1343.13	1342.50	4.14	19.18	1345.10	1344.71
P-516	2.5	276	0.48	C-517	C-516	1344.45	1343.13	4.37	12.58	1345.84	1345.10
P-517	2.0	325	0.48	C-518	C-517	1346.00	1344.45	3.79	5.17	1346.84	1345.84
P-6	3.0	277	0.00	SDMH3	SDMH4	1349.06	1348.35	3.57	12.75	1350.56	1350.01
P-601	5.0	420	0.09	F-602	F-105	1336.87	1336.50	3.22	47.07	1339.17	1339.14
P-602	5.0	100	0.07	M-603	F-602	1336.94	1336.87	2.87	47.88	1339.23	1339.17
P-603	4.0	503	0.10	M-604	M-603	1337.44	1336.94	4.66	48.21	1340.62	1339.23
P-604	4.0	80	0.10	M-506	M-604	1337.52	1337.44	4.10	48.29	1341.12	1340.62
P-7	1.5	47	0.00	CB4	SDMH4	1349.90	1349.43	4.27	4.11	1350.72	1350.08
P-701	4.5	376	0.02	M-702	F-105	1336.59	1336.50	3.41	27.94	1339.18	1339.14
P-702	4.5	27	0.22	C-703	M-702	1336.65	1336.59	3.08	27.22	1339.18	1339.18
P-702-1	2.5	173	0.20	M-702A	M-702	1337.94	1337.59	1.40	1.07	1339.20	1339.18
P-702A	2.0	16	1.00	C-702B	M-702A	1338.20	1338.04	1.90	0.56	1339.20	1339.20
P-702A-1	2.0	26	1.00	C-702D	M-702A	1338.30	1338.04	2.15	0.60	1339.20	1339.20
P-703	4.5	87	0.08	C-704	C-703	1336.72	1336.65	2.96	27.28	1339.28	1339.18
P-705	4.5	420	0.10	C-706	C-704	1337.15	1336.72	2.67	23.39	1339.57	1339.28
P-706	4.4	482	0.03	F-911	C-706	1337.29	1337.15	2.18	20.89	1339.82	1339.57
P-710-2	3.5	64	0.48	M-512	C-710	1339.31	1339.00	4.71	44.93	1342.91	1342.46
P-710-1	3.0	51	0.20	C-716	C-710	1339.10	1339.00	2.18	20.89	1342.54	1342.46
P-710-3	1.5	213	0.80	C-404	C-710	1342.12	1340.41	3.34	1.70	1342.62	1342.46
P-716	3.0	388	0.20	F-717	C-716	1339.88	1339.10	2.26	12.32	1342.68	1342.54
P-717	3.0	146	0.20	F-718	F-717	1340.17	1339.88	2.47	10.88	1342.75	1342.68
P-718	3.0	256	0.20	F-719	F-718	1340.68	1340.17	2.27	7.36	1342.80	1342.75
P-718-1	2.0	24	3.42	C-718A	F-718	1340.99	1340.17	3.77	3.92	1342.77	1342.75
P-719	2.5	243	0.20	F-720	F-719	1341.17	1340.68	2.10	4.19	1342.84	1342.80
P-719-1	2.0	21	6.90	C-719A	F-719	1342.13	1340.68	5.83	3.70	1342.68	1342.80
P-720	2.0	22	3.78	C-720A	F-720	1342.00	1341.17	4.96	4.43	1342.74	1342.84
P-8	3.0	287	0.00	SDMH4	SDMH5	1348.35	1347.61	4.29	16.84	1350.01	1348.96
P-9	1.5	47	0.00	CB5	SDMH5	1349.15	1348.68	4.30	4.24	1349.99	1349.35
P-902	4.5	137	0.01	M-903	F-104	1335.72	1335.71	1.68	13.50	1338.89	1338.89
P-902	4.5	137	0.01	M-903	F-104	1335.72	1335.71	1.68	13.50	1338.89	1338.89
P-903	4.5	225	0.08	C-904	M-903	1335.90	1335.72	1.83	14.11	1338.90	1338.89
P-903	4.5	225	0.08	C-904	M-903	1335.90	1335.72	1.83	14.11	1338.90	1338.89
P-904	4.5	585	0.12	C-905	C-904	1336.63	1335.90	2.05	11.92	1338.91	1338.90
P-904-1	1.5	42	1.43	C-904A	C-904	1339.60	1339.00	3.60	1.01	1339.93	1339.29
P-904	4.5	585	0.12	C-905	C-904	1336.63	1335.90	2.05	11.92	1338.91	1338.90
P-905-1	1.5	32	1.69	C-905A	C-905	1338.19	1337.65	4.04	1.64	1338.91	1338.91
P-906	3.5	149	0.38	M-907	C-906	1337.22	1336.65	2.69	10.76	1338.92	1338.92
P-906	3.5	149	0.38	M-907	C-906	1337.22	1336.65	2.69	10.76	1338.92	1338.92
P-907-1	3.0	120	-0.04	M-908A	M-907	1337.17	1337.22	2.75	12.04	1339.03	1338.92
P-907-2	3.0	116	0.17	M-908B	M-907	1337.42	1337.22	2.66	9.77	1339.01	1338.92
P-908-3	1.5	171	0.47	C-908B	M-908B	1338.22	1337.42	2.86	8.07	1339.09	1339.01
P-908-1	2.0	43	0.00	C-908A	M-908A	1337.17	1337.17	2.66	9.77	1339.06	1339.03

Williams Gateway Airport Authority | WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

10-yr 6-hr Conduit Data

Dibble Engineering | 23-Dec-10

Conduit Name	Diameter (ft)	Length (ft)	Conduit Slope (%)	Upstream Node Name	Downstream Node Name	Upstream IE (ft)	Downstream IE (ft)	Maximum Velocity (fps)	Maximum Flow (cfs)	Maximum US Water Elevation (ft)	Maximum DS Water Elevation (ft)
P-908-2	2.0	39	0.90	M-910A	M-908A	1337.52	1337.17	2.86	8.07	1339.19	1339.03
P-908-4	2.0	48	0.21	M-910B	M-908B	1337.52	1337.42	2.84	8.03	1339.22	1339.01
P-910-2	2	331	0.24	F-911	M-910A	1338.3	1337.52	3.13	8.07	1339.815	1339.191
P-910-3	2	331	0.24	F-911	M-910B	1338.3	1337.52	3.12	8.04	1339.815	1339.218
P-911-1	3	170	0.12	F-912	F-911	1337.49	1337.29	2.72	17.44	1340.043	1339.815
P-911-1	3	170	0.12	F-912	F-911	1337.49	1337.29	2.72	17.44	1340.043	1339.815
P-912-1	2	45	2.22	C-912A	F-912	1338.49	1337.49	3.43	5.37	1340.067	1340.043
P-913	3	307	0.12	F-914	F-912	1337.85	1337.49	2.49	15.38	1340.295	1340.043
P-913	3	307	0.12	F-914	F-912	1337.85	1337.49	2.49	15.38	1340.295	1340.043
P-914-2	3	285	0.13	F-915	F-914	1338.21	1337.85	2.56	13.63	1340.5	1340.295
P-914-2	3	285	0.13	F-915	F-914	1338.21	1337.85	2.56	13.63	1340.5	1340.295
P-914-1	2	49	2.04	C-914A	F-914	1338.85	1337.85	2.49	15.38	1340.313	1340.295
P-915-2	3	335	0.12	F-916	F-915	1338.61	1338.21	2.36	11.40	1340.691	1340.5
P-915-2	3	335	0.12	F-916	F-915	1338.61	1338.21	2.36	11.40	1340.691	1340.5
P-915-1	2	50	2	C-915A	F-915	1339.21	1338.21	3.23	4.07	1340.517	1340.5
P-916	3	148	0.11	F-917	F-916	1338.78	1338.61	2.17	10.35	1340.803	1340.691
P-916	3	148	0.11	F-917	F-916	1338.78	1338.61	2.17	10.35	1340.803	1340.691
P-916-1	2	51	1.96	C-916A	F-916	1339.61	1338.61	3.63	4.04	1340.684	1340.691
P-918	3	279	0.12	C-920	F-917	1339.12	1338.78	2.96	14.45	1341.128	1340.803
P-920	2	372	0.48	C-921	C-920	1340.91	1339.12	4.23	9.60	1342.239	1341.128
P-921	2	232	0.2	C-922	C-921	1341.43	1340.96	2.54	4.58	1342.553	1342.239
P-922	2	129	0.16	C-923	C-922	1341.66	1341.46	1.69	2.40	1342.638	1342.553
P-Z1	1.5	194	0	SDMH13	F-105	1339.6	1339.23	1.90	0.92	1340.092	1339.588
P-Z2	4.5	157	0	SDMH12	F-105	1342.67	1341	7.06	32.31	1344.183	1342.212
P-Z2	4.5	157	0	SDMH12	F-105	1342.67	1341	7.06	32.31	1343.969	1342.297

Williams Gateway Airport Authority | WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

10-yr 6-hr Junction Data

Dibble Engineering | 07-Oct-10

Structure Name	Ground Elevation Spill Crest (ft)	Invert Elevation (ft)	Max Water Elevation (ft)	Max Water Depth (ft)	Freeboard (ft)
C-100	1343.10	1335.64	1338.46	2.82	4.64
C-101A	1346.00	1339.30	1339.61	0.31	6.39
C-102A	1346.00	1339.34	1339.91	0.57	6.09
C-203A	1346.83	1342.76	1343.03	0.27	3.80
C-205	1346.67	1339.72	1342.83	3.11	3.84
C-206	1347.14	1340.08	1343.20	3.12	3.94
C-206A	1347.46	1343.67	1343.96	0.29	3.50
C-207	1347.47	1340.40	1343.51	3.11	3.96
C-208	1347.76	1340.71	1343.78	3.07	3.98
C-209	1348.29	1341.03	1344.13	3.10	4.16
C-209A	1349.00	1344.12	1344.13	0.01	4.87
C-210	1350.00	1341.37	1344.43	3.06	5.57
C-210A	1350.00	1344.46	1344.74	0.28	5.26
C-211A	1352.00	1344.46	1345.10	0.64	6.90
C-212A	1352.00	1345.40	1345.87	0.47	6.13
C-212B	1351.53	1345.49	1346.01	0.52	5.52
C-212C	1351.00	1345.81	1346.01	0.20	5.00
C-215	1352.44	1344.68	1347.03	2.35	5.41
C-216	1352.51	1346.00	1347.64	1.64	4.87
C-217	1353.20	1345.58	1346.82	1.24	6.38
C-218	1354.00	1346.08	1347.07	0.99	6.93
C-303A	1346.00	1340.59	1341.51	0.92	4.49
C-303B	1345.20	1340.68	1341.58	0.90	3.62
C-303D	1345.71	1341.40	1342.13	0.73	3.58
C-303E	1346.00	1340.69	1341.51	0.82	4.49
C-303F	1345.26	1340.78	1341.59	0.81	3.67
C-304A	1347.00	1341.70	1342.24	0.54	4.76
C-304B	1346.01	1342.50	1343.16	0.66	2.86
C-305A	1347.00	1341.29	1341.98	0.69	5.02
C-306A	1347.14	1342.73	1343.96	1.23	3.17
C-306B	1346.68	1342.82	1344.28	1.46	2.40
C-306D	1347.70	1343.49	1344.90	1.41	2.81
C-306E	1346.29	1343.79	1344.99	1.20	1.30
C-307A	1348.03	1342.75	1343.66	0.91	4.37
C-307D	1348.54	1343.65	1344.68	1.03	3.87
C-307E	1347.47	1343.98	1344.92	0.94	2.55
C-309A	1349.00	1343.48	1344.55	1.07	4.45
C-309B	1349.00	1343.53	1344.72	1.19	4.28
C-309C	1349.00	1343.93	1344.72	0.79	4.28
C-309E	1348.49	1343.15	1344.05	0.90	4.45
C-310A	1349.68	1343.02	1343.23	0.21	6.45
C-311A	1351.00	1342.77	1343.12	0.35	7.88
C-313B	1351.74	1347.50	1347.73	0.23	4.01
C-314A	1351.83	1345.50	1346.21	0.71	5.61
C-317	1351.15	1344.67	1345.92	1.25	5.23
C-318	1353.80	1347.08	1347.78	0.70	6.03
C-319	1355.23	1350.00	1350.53	0.53	4.70
C-404	1347.17	1342.12	1342.62	0.49	4.56
C-502B	1344.79	1339.73	1340.52	0.79	4.28
C-502C	1345.38	1341.88	1342.34	0.46	3.04

Williams Gateway Airport Authority | WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

10-yr 6-hr Junction Data

Dibble Engineering | 07-Oct-10

Structure Name	Ground Elevation Spill Crest (ft)	Invert Elevation (ft)	Max Water Elevation (ft)	Max Water Depth (ft)	Freeboard (ft)
C-502D	1345.00	1339.93	1340.34	0.41	4.65
C-513	1348.00	1340.53	1343.70	3.17	4.30
C-514	1347.80	1341.76	1344.35	2.59	3.45
C-514A	1348.05	1343.23	1344.87	1.64	3.18
C-514B	1348.77	1344.03	1345.07	1.04	3.70
C-515	1348.46	1342.50	1344.71	2.21	3.75
C-516	1349.00	1343.13	1345.10	1.97	3.90
C-516A	1350.40	1346.40	1346.40	0.00	4.00
C-517	1350.15	1344.45	1345.84	1.39	4.31
C-518	1351.54	1346.00	1346.84	0.84	4.70
C-702B	1343.66	1338.20	1339.20	1.00	4.46
C-702C	1343.69	1338.29	1339.20	0.91	4.49
C-702D	1343.60	1338.30	1339.20	0.90	4.41
C-702E	1343.59	1338.39	1339.20	0.81	4.40
C-703	1344.70	1336.65	1339.18	2.53	5.52
C-704	1343.73	1336.72	1339.28	2.56	4.44
C-706	1343.20	1337.15	1339.57	2.42	3.63
C-709	1344.19	1338.34	1341.89	3.56	2.30
C-710	1345.25	1339.00	1342.46	3.46	2.79
C-716	1345.70	1339.10	1342.54	3.44	3.16
C-717A	1345.00	1340.68	1342.69	2.01	2.31
C-718A	1345.30	1340.99	1342.77	1.78	2.53
C-719A	1345.63	1342.13	1342.68	0.55	2.95
C-720A	1346.03	1342.00	1342.74	0.74	3.29
C-904	1344.56	1335.90	1338.89	2.99	5.66
C-904A	1345.00	1339.60	1339.93	0.33	5.07
C-904B	1345.00	1339.80	1339.93	0.13	5.07
C-905	1343.25	1336.63	1338.91	2.28	4.34
C-905.1	1343.63	1336.64	1338.91	2.27	4.72
C-905A	1343.27	1338.19	1338.90	0.71	4.37
C-905B	1344.00	1339.00	1339.00	0.00	5.00
C-906	1344.00	1336.65	1338.92	2.27	5.08
C-906A	1341.16	1336.95	1338.92	1.97	2.24
C-908A	1341.69	1336.79	1339.06	2.27	2.63
C-908B	1342.90	1338.22	1339.09	0.87	3.81
C-912A	1342.15	1338.49	1340.07	1.58	2.08
C-914A	1342.56	1338.85	1340.31	1.46	2.25
C-915A	1342.58	1339.21	1340.52	1.31	2.06
C-916A	1343.15	1339.61	1340.68	1.07	2.47
C-917B	1343.19	1339.78	1340.81	1.03	2.39
C-920	1344.21	1339.12	1341.13	2.01	3.09
C-921	1344.50	1340.91	1342.24	1.33	2.26
C-921A	1343.84	1339.19	1342.24	3.05	1.60
C-922	1344.96	1341.43	1342.55	1.12	2.41
C-922A	1344.20	1342.50	1342.55	0.05	1.65
C-923	1345.16	1341.46	1342.64	1.17	2.53
C-923A	1344.61	1341.61	1342.64	1.03	1.97
CB1	1355.58	1352.08	1352.95	0.87	2.63
CB10	1349.42	1345.00	1345.30	0.30	4.12
CB11	1349.42	1345.00	1345.32	0.32	4.10

Williams Gateway Airport Authority | WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

10-yr 6-hr Junction Data

Dibble Engineering | 07-Oct-10

Structure Name	Ground Elevation Spill Crest (ft)	Invert Elevation (ft)	Max Water Elevation (ft)	Max Water Depth (ft)	Freeboard (ft)
CB12	1346.93	1343.00	1343.01	0.01	3.92
CB13	1346.93	1343.00	1343.20	0.20	3.73
CB2	1354.85	1351.35	1352.18	0.83	2.67
CB3	1354.12	1350.62	1351.45	0.83	2.67
CB4	1353.40	1349.90	1350.72	0.82	2.68
CB5	1352.65	1349.15	1349.99	0.84	2.66
CB6	1351.92	1348.42	1349.14	0.72	2.78
CB8	1351.11	1347.10	1347.66	0.56	3.45
CB9	1351.11	1347.10	1347.69	0.59	3.42
F-101	1346.00	1335.64	1338.62	2.98	7.38
F-103	1345.97	1335.69	1338.78	3.09	7.19
F-104	1341.57	1335.71	1338.89	3.18	2.68
F-105	1345.50	1335.80	1339.14	3.34	6.36
F-201	1346.00	1338.00	1339.14	1.14	6.86
F-211	1351.74	1342.83	1345.10	2.27	6.64
F-213	1353.47	1343.34	1345.98	2.64	7.50
F-301	1346.00	1338.00	1339.14	1.14	6.86
F-303C	1346.00	1340.79	1341.68	0.89	4.32
F-304	1346.94	1338.96	1341.61	2.65	5.33
F-306C	1347.48	1342.90	1344.45	1.55	3.03
F-309D	1349.07	1342.82	1343.73	0.91	5.34
F-311	1351.00	1341.38	1343.12	1.74	7.88
F-312	1351.85	1341.54	1343.24	1.70	8.61
F-313	1351.98	1341.54	1343.35	1.81	8.63
F-314	1353.15	1341.87	1343.47	1.60	9.68
F-503	1344.44	1336.90	1339.86	2.96	4.58
F-602	1344.50	1336.87	1339.17	2.30	5.33
F-717	1345.50	1339.88	1342.68	2.81	2.82
F-718	1345.90	1340.17	1342.75	2.58	3.15
F-719	1346.05	1340.68	1342.80	2.12	3.25
F-720	1346.29	1341.17	1342.84	1.67	3.45
F-911	1342.27	1337.29	1339.82	2.53	2.45
F-912	1342.30	1337.49	1340.04	2.55	2.26
F-914	1342.70	1337.85	1340.30	2.45	2.41
F-915	1343.16	1338.21	1340.50	2.29	2.66
F-916	1343.53	1338.61	1340.69	2.08	2.84
F-917	1343.90	1338.78	1340.80	2.02	3.10
M-202	1346.00	1338.56	1341.42	2.86	4.58
M-203	1346.79	1339.14	1342.03	2.89	4.75
M-204	1346.93	1339.43	1342.47	3.04	4.46
M-212	1351.91	1343.00	1345.50	2.50	6.41
M-214	1351.20	1343.63	1346.39	2.76	4.82
M-302	1346.26	1338.62	1341.21	2.59	5.05
M-303	1346.11	1340.34	1341.45	1.11	4.67
M-305	1347.00	1339.12	1341.90	2.78	5.10
M-306	1347.46	1339.56	1342.25	2.69	5.20
M-307	1348.20	1340.10	1342.51	2.41	5.69
M-307B	1348.00	1342.93	1343.90	0.97	4.10
M-307C	1348.00	1343.02	1344.13	1.11	3.88
M-308	1349.24	1340.75	1342.89	2.14	6.35

Williams Gateway Airport Authority WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

10-yr 6-hr Junction Data

Dibble Engineering 07-Oct-10

Structure Name	Ground Elevation Spill Crest (ft)	Invert Elevation (ft)	Max Water Elevation (ft)	Max Water Depth (ft)	Freeboard (ft)
M-309	1348.94	1342.35	1343.61	1.26	5.33
M-310	1349.91	1340.88	1342.95	2.07	6.96
M-313A	1352.55	1345.00	1345.21	0.21	7.34
M-315	1351.47	1342.52	1343.88	1.36	7.59
M-316	1352.34	1343.78	1344.99	1.21	7.35
M-502	1345.00	1336.85	1339.57	2.72	5.43
M-502A	1344.95	1339.52	1340.34	0.82	4.61
M-504	1345.40	1336.97	1340.12	3.15	5.28
M-505	1343.00	1337.46	1340.82	3.35	2.18
M-506	1343.48	1337.52	1341.12	3.60	2.36
M-507	1343.99	1337.92	1341.54	3.62	2.45

Williams Gateway Airport Authority **WGA Project No. WGAA-3**

Detention Basin West Evaluation
10-Year and 100-Year Peak Discharge Calculations

Dibble Engineering **10/7/2010**

(1) SUB-BASIN ID	(2) DRAINAGE AREA (A) [ac]	(3) PERCENT IMPERVIOUS [%]	(4) 10-YEAR PEAK DISCHARGE (Q_{10}) [ft^3/s]	(5) 100-YEAR PEAK DISCHARGE (Q_{100}) [ft^3/s]	(6) CONNECTION NODE
S1A	1.36	95	2.445	10.029	C-923
S1B	1.35	95	2.241	10.261	C-922
S1C	2.95	95	5.115	21.122	C-921
S2A	2.85	95	4.906	19.856	C-920
S2B	3.59	95	6.314	25.340	F-917
S2C	1.94	95	3.220	14.746	C-916A
S3A	3.13	95	5.551	25.351	C-915A
S3B	2.76	95	4.581	21.306	C-914A
S4A	3.19	95	5.207	25.049	C-912A
S4B	1.47	95	2.677	12.032	F-911
S5	2.68	95	4.435	19.694	C-908A
S6	1.14	40	0.807	3.764	C-906A
S7	0.19	10	0.034	0.125	C-906
S8A	1.75	90	2.900	13.428	C-905.1
S8B	1.19	95	2.073	9.598	C-908B
S9	1.18	80	1.638	6.463	C-905A
S10	0.36	10	0.062	0.233	C-905
S11	0.76	90	0.991	5.011	C-904
S12	0.68	80	1.007	4.096	C-904A
S13	4.33	90	5.652	28.588	C-904
S14	2.56	90	4.431	21.478	C-720A
S15A	2.19	90	3.696	16.982	C-719A
S15B	2.40	90	3.942	18.610	C-718A
S15C	1.19	90	1.824	9.228	C-717A
S16	2.73	90	4.185	21.169	C-716
S17	4.22	95	7.293	28.738	C-514B
S18	7.30	90	11.333	52.565	C-514A
S19	3.10	95	5.172	22.154	C-518
S20A	4.54	90	7.450	35.173	C-517
S20B	3.91	90	6.768	30.242	C-516
S21	1.94	80	3.050	13.372	C-515
S22	6.19	90	10.122	46.729	C-513
S23A	1.20	80	1.713	7.866	C-404
S23B	1.57	80	2.126	10.753	C-710
S24A	0.84	90	1.291	6.160	M-510
S24B	1.07	90	1.619	7.232	C-709
S24C	0.88	90	1.331	5.948	C-709
S25A	2.03	90	3.120	14.885	M-510

Williams Gateway Airport Authority **WGA Project No. WGAA-3**

Detention Basin West Evaluation
10-Year and 100-Year Peak Discharge Calculations

Dibble Engineering **10/7/2010**

(1) SUB-BASIN ID	(2) DRAINAGE AREA (A) [ac]	(3) PERCENT IMPERVIOUS [%]	(4) 10-YEAR PEAK DISCHARGE (Q_{10}) [ft^3/s]	(5) 100-YEAR PEAK DISCHARGE (Q_{100}) [ft^3/s]	(6) CONNECTION NODE
S25B	2.38	80	3.600	16.086	C-709
S25C	1.95	80	2.950	13.180	C-709
S26	1.62	90	2.565	8.810	M-507
S27	3.75	90	5.936	20.393	M-507
S28	1.83	90	11.058	43.864	M-604
S29	4.31	90	10.200	40.461	M-506
S30	1.88	90	3.325	14.578	C-706
S31	3.05	80	4.518	18.129	C-704
S32	0.35	95	0.573	2.572	C-702B
S33	0.37	95	0.619	2.757	C-702D
S34	1.62	90	2.804	13.592	C-502C
S35	0.26	95	0.452	1.835	C-502B
S36	0.26	95	0.438	1.766	C-502D
S37	2.19	80	1.425	5.408	F-105
S38	7.63	85	11.582	43.978	C-314A
S39A	2.74	25	1.867	8.984	C-319
S39B	6.96	25	4.742	17.829	C-318
S40	6.32	25	4.455	17.402	C-317
S41	1.59	90	2.437	12.329	M-214
S42	0.84	90	1.288	6.514	C-313B
S43	0.14	95	0.238	1.146	C-311A
S44	0.20	95	0.360	1.737	C-310A
S45	2.00	100	3.407	17.232	C-309E
S46	3.58	90	5.488	27.760	C-309B
S47	0.26	95	0.422	1.472	C-309A
S48	1.42	90	2.697	11.201	C-309C
S49	0.15	95	2.697	1.183	C-309C
S50	1.43	100	2.520	12.321	C-307E
S51	1.16	90	2.013	8.995	C-307D
S52	0.33	95	0.567	2.204	C-307A
S53	1.29	80	2.197	11.114	C-306E
S54	2.55	90	4.265	19.773	C-306D
S55	1.20	90	1.840	9.305	C-306B
S56	0.21	95	0.373	1.549	C-306A
S57	0.17	95	0.264	1.288	C-305A
S58	1.42	100	2.419	12.234	C-304B
S59	1.35	90	2.093	10.231	C-305A
S60	1.74	90	2.667	13.492	C-303D

Williams Gateway Airport Authority **WGA Project No. WGAA-3**

Detention Basin West Evaluation
10-Year and 100-Year Peak Discharge Calculations

Dibble Engineering **10/7/2010**

(1) SUB-BASIN ID	(2) DRAINAGE AREA (A) [ac]	(3) PERCENT IMPERVIOUS [%]	(4) 10-YEAR PEAK DISCHARGE (Q_{10}) [ft^3/s]	(5) 100-YEAR PEAK DISCHARGE (Q_{100}) [ft^3/s]	(6) CONNECTION NODE
S61	0.20	95	0.332	1.544	C-303A
S62	0.20	95	0.332	1.520	C-303E
S63	2.18	80	2.971	15.026	C-303F
S64	6.26	95	10.013	51.238	C-216
S65	8.98	95	16.451	73.502	C-215
S66	2.19	90	3.357	16.982	C-218
S67	2.07	90	3.173	16.051	C-217
S68	1.13	90	1.732	8.762	C-212B
S69	0.18	95	0.307	1.434	C-212A
S70	0.20	95	0.350	1.620	C-211A
S71	2.51	80	3.420	17.301	F-211
S72	0.28	95	0.453	1.646	C-210A
S73	0.11	95	0.128	0.646	C-210A
S74	2.27	80	3.271	16.547	C-209
S75	2.27	80	3.093	15.646	C-207
S76	0.30	95	0.492	2.037	C-206A
S77	2.28	80	3.107	15.715	C-206
S78	2.40	80	3.270	16.542	M-204
S79	0.29	95	0.496	1.952	C-203A
S80	2.13	80	2.903	14.681	M-202
S81	2.21	80	1.438	5.458	F-105
S82	2.23	80	1.451	5.507	F-105
S84	0.43	95	1.830	8.022	CB12 and CB13
S85	0.55	95	1.830	8.022	CB12 and CB13
S86	0.28	95	1.678	7.164	CB10 and CB11
S87	0.64	95	1.678	7.164	CB10 and CB11
S88	3.69	95	5.666	18.564	CB8 and CB9
S89	2.48	90	4.173	17.070	CB6
S90	2.52	90	4.240	17.345	CB5
S91	2.44	90	4.105	16.795	CB4
S92	2.48	90	4.173	17.070	CB3
S93	2.48	90	4.173	17.070	CB2
S94	2.62	90	4.408	18.034	CB1
DET-W	14.60	5	9.502	36.055	F-105

Registered Professional Engineer (Civil)
CERTIFICATE NO.
37878
JOSHUA E.
PAPWORTH
Date Signed 10.7.10
ARIZONA, U.S.A.
Expires 09/30/11

Appendix E:

XP Storm Model (100-yr, 2-hr)

Williams Gateway Airport Authority | WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

100-yr 2-hr Conduit Data

Dibble Engineering | 23-Dec-10

Conduit Name	Diameter (ft)	Length (ft)	Conduit Slope (%)	Upstream Node Name	Downstream Node Name	Upstream IE (ft)	Downstream IE (ft)	Maximum Velocity (fps)	Maximum Flow (cfs)	Maximum US Water Elevation (ft)	Maximum DS Water Elevation (ft)
OL-105	8.0	200	1.10	F-301	F-105	1338.00	1335.80	5.08	108.82	1340.46	1340.46
OL-105-1	8.0	200	1.10	F-201	F-105	1338.00	1335.80	5.78	134.98	1340.46	1340.46
OL-214	1.0	10	2.71	M-315	M-214	1350.47	1350.20	0.00	0.00	1350.01	1350.01
OL-304B	0.5	430	0.23	C-305A	C-304B	1346.50	1345.51	0.00	0.00	1345.13	1345.13
OL-506-1	0.5	420	0.57	C-502C	M-604	1344.88	1342.48	0.00	0.00	1342.17	1342.17
OL-507-1	0.5	885	0.32	C-306E	M-507	1345.78	1342.95	0.00	0.00	1345.90	1343.62
OL-507-2	0.5	550	0.47	C-304B	M-507	1345.51	1342.95	0.00	0.00	1345.13	1343.62
OL-507-3	0.5	415	0.54	C-303D	M-507	1345.20	1342.95	0.00	0.00	1343.75	1343.62
OL-510-1	0.5	432	0.70	C-307E	M-510	1346.96	1343.93	0.00	0.00	1347.02	1344.60
OL-514-2	0.4	695	0.49	M-214	C-514	1350.80	1347.40	0.00	0.00	1349.51	1347.53
OL-516-2	0.5	800	0.43	C-215	C-516	1351.94	1348.50	0.00	0.00	1350.13	1348.70
OL-710	0.6	580	0.10	C-717A	M-510	1344.40	1343.83	0.00	0.00	1344.94	1344.60
OL-710-1	0.5	545	0.69	C-309E	C-710	1347.99	1344.21	0.00	0.00	1346.74	1344.91
OL-717A	0.5	147	0.20	C-718A	C-717A	1344.80	1344.50	1.81	23.92	1345.22	1344.94
OL-718A	0.5	258	0.12	C-719A	C-718A	1345.12	1344.80	1.26	13.74	1345.50	1345.22
OL-719A	0.5	243	0.17	C-720A	C-719A	1345.53	1345.12	1.29	9.52	1345.84	1345.50
OL-908A	0.4	550	0.03	C-912A	M-910A	1341.75	1341.60	1.29	9.52	1342.05	1341.73
OL-908A-1	0.5	40	1.02	M-910A	C-908A	1341.60	1341.19	1.29	9.52	1341.25	1341.25
OL-910A	0.5	10	0.00	M-910A	M-910B	1341.60	1341.60	1.29	9.52	1340.58	1340.58
OL-911	0.4	170	-0.07	C-912A	F-911	1341.75	1341.87	0.48	1.50	1342.05	1341.90
OL-913A	0.4	307	0.13	C-914A	C-912A	1342.15	1341.75	1.63	26.28	1342.43	1342.05
OL-914A	0.4	285	0.01	C-915A	C-914A	1342.17	1342.15	1.09	25.36	1342.59	1342.43
OL-915A	0.4	320	0.18	C-916A	C-915A	1342.75	1342.17	1.35	16.12	1342.94	1342.59
OL-916A	0.4	135	0.03	C-917B	C-916A	1342.79	1342.75	1.03	14.77	1343.05	1342.94
OL-917B-2	0.3	272	0.37	C-920	C-917B	1343.91	1342.89	0.00	0.00	1343.75	1343.05
OL-918B-1	0.4	640	0.10	C-921A	C-917B	1343.44	1342.79	1.25	15.63	1343.66	1343.05
OL-921A	0.4	225	0.16	C-922A	C-921A	1343.80	1343.44	0.93	6.16	1343.91	1343.66
OL-922A	0.4	127	0.32	C-923A	C-922A	1344.21	1343.80	1.28	6.95	1344.31	1343.91
P-1	1.5	47	0.00	CB1	SDMH1	1352.08	1351.61	7.29	12.97	1355.58	1355.06
P-10	3.5	282	0.00	SDMH5	SDMH6	1347.11	1346.39	5.55	55.44	1351.66	1350.50
P-100	5.0	42	0.05	F-101	C-100	1335.66	1335.64	3.84	124.88	1339.78	1339.58
P-101	5.0	74	0.04	F-103	F-101	1335.69	1335.66	3.63	122.89	1339.97	1339.78
P-101-1	1.5	8	21.88	C-101A	F-101	1339.30	1337.55	9.05	2.01	1339.73	1339.78
P-102	1.5	8	22.37	C-102A	F-103	1339.34	1337.55	9.81	5.00	1340.13	1339.97
P-103	5.0	54	0.04	F-104	F-103	1335.71	1335.69	3.38	117.92	1340.12	1339.97
P-104	4.5	334	0.13	F-105	F-104	1336.30	1335.85	3.47	52.77	1340.46	1340.12
P-104	4.5	334	0.13	F-105	F-104	1336.30	1335.85	3.47	52.77	1340.46	1340.12
P-11	2.0	47	0.00	CB6	SDMH6	1348.42	1347.95	5.71	17.05	1350.81	1350.50
P-13	2.0	27	0.00	CB9	SDMH8	1347.10	1346.80	5.20	9.28	1348.28	1348.30
P-14	2.0	17	0.00	CB8	SDMH8	1347.10	1346.80	5.57	9.28	1348.24	1348.30
P-2	2.0	282	0.00	SDMH1	SDMH2	1351.51	1350.79	4.10	12.33	1355.06	1354.40
P-201	5.0	334	0.17	M-202	F-201	1338.56	1338.00	7.37	136.23	1343.87	1340.46
P-202	5.0	237	0.20	M-203	M-202	1339.14	1338.66	6.24	126.95	1344.93	1343.87
P-203	5.0	133	0.22	M-204	M-203	1339.43	1339.14	6.22	124.89	1345.85	1344.93
P-203-1	1.5	11	1.09	C-203A	M-203	1342.76	1342.64	2.86	2.03	1344.96	1344.93
P-204	5.0	150	0.19	C-205	M-204	1339.72	1339.43	5.64	111.15	1346.52	1345.85
P-205	5.0	188	0.19	C-206	C-205	1340.08	1339.72	5.61	110.33	1347.14	1346.52
P-206	5.0	161	0.20	C-207	C-206	1340.40	1340.08	4.81	94.60	1347.49	1347.14
P-206-1	1.5	12	0.75	C-206A	C-206	1343.67	1343.58	2.55	2.38	1347.30	1347.14
P-207	5.0	150	0.21	C-208	C-207	1340.71	1340.40	4.35	89.42	1347.82	1347.48
P-208	4.5	161	0.20	C-209	C-208	1341.03	1340.71	5.87	93.63	1348.39	1347.82
P-209	4.5	173	0.20	C-210	C-209	1341.37	1341.03	5.03	80.28	1348.83	1348.39
P-210	4.5	365	0.40	F-211	C-210	1342.83	1341.37	5.05	80.15	1349.49	1348.83
P-210-1	1.5	11	0.82	C-210A	C-210	1344.46	1344.37	2.37	2.29	1348.86	1348.83
P-211	4.5	42	0.40	M-212	F-211	1343.00	1342.83	4.62	72.86	1349.74	1349.49
P-211-1	2.0	48	0.79	C-211A	F-211	1344.46	1344.08	2.02	1.64	1349.58	1349.49
P-212	4.0	127	0.23	F-213	M-212	1343.34	1343.05	5.62	71.02	1350.29	1349.74
P-212-1	2.5	43	0.93	C-212A	M-212	1345.40	1345.00	3.50	10.39	1349.92	1349.74
P-212A	2.5	11	0.82	C-212B	C-212A	1345.49	1345.40	2.66	8.93	1349.97	1349.92
P-213	4.0	347	0.08	M-214	F-213	1343.63	1343.34	5.02	63.51	1350.01	1350.29
P-213-1	2.0	129	0.19	C-217	F-213	1345.58	1345.34	8.91	28.43	1353.18	1350.30
P-214	4.0	552	0.13	C-215	M-214	1344.68	1343.97	4.36	56.69	1351.84	1350.01
P-215	2.5	610	0.22	C-216	C-215	1346.00	1344.68	5.89	29.24	1353.17	1351.84
P-217	2.0	275	0.18	C-218	C-217	1346.08	1345.58	5.04	16.06	1354.08	1353.18
P-22	4.0	50	0.00	SDMH8	SDMH9	1344.71	1344.58	7.21	84.94	1348.30	1348.00
P-24	3.5	282	0.00	SDMH6	SDMH7	1346.39	1345.66	7.01	69.67	1350.50	1348.86
P-25	4.0	135	0.00	SDMH7	SDMH8	1345.16	1344.81	5.77	69.35	1348.86	1348.30
P-26	2.0	47	0.00	CB7	SDMH7	1347.68	1347.21	5.77	69.35	1349.18	1348.86
P-27	4.0	157	0.00	SDMH9	SDMH10	1344.48	1343.28	8.11	84.94	1348.00	1347.19
P-3	1.5	47	0.00	CB2	SDMH2	1351.35	1350.88	7.17	12.78	1354.85	1354.40
P-30	4.0	157	0.00	SDMH10	SDMH11	1343.18	1342.84	6.82	85.01	1347.19	1346.17

DETENTION BASIN WEST EVALUATION
100-yr 2-hr Conduit Data

Dibble Engineering 23-Dec-10

Conduit Name	Diameter (ft)	Length (ft)	Conduit Slope (%)	Upstream Node Name	Downstream Node Name	Upstream IE (ft)	Downstream IE (ft)	Maximum Velocity (fps)	Maximum Flow (cfs)	Maximum US Water Elevation (ft)	Maximum DS Water Elevation (ft)
P-301	5.0	371	0.17	M-302	F-301	1338.62	1338.00	6.94	110.38	1342.86	1340.46
P-302	5.0	171	0.20	F-304	M-302	1338.96	1338.62	5.11	93.80	1343.50	1342.86
P-302-1	3.0	60	0.20	M-303	M-302	1340.34	1340.22	4.07	25.39	1343.08	1342.86
P-303	2.0	16	0.94	C-303A	M-303	1340.59	1340.44	3.59	10.07	1343.22	1343.08
P-303-1	2.5	25	1.00	C-303E	M-303	1340.69	1340.44	3.34	16.20	1343.21	1343.08
P-303A	2.0	9	1.00	C-303B	C-303A	1340.68	1340.59	3.29	9.85	1343.32	1343.22
P-303B	2.0	46	0.24	F-303C	C-303B	1340.79	1340.68	3.10	9.84	1343.44	1343.32
P-303C	2.0	249	0.24	C-303D	F-303C	1341.40	1340.79	3.15	9.80	1343.75	1343.44
P-303E	2.5	9	1.00	C-303F	C-303E	1340.78	1340.69	3.05	14.92	1343.31	1343.21
P-304	5.0	79	0.20	M-305	F-304	1339.12	1338.96	4.44	85.69	1343.95	1343.50
P-304-1	2.0	244	0.51	C-304A	F-304	1341.70	1340.46	4.32	9.54	1343.89	1343.50
P-304A	1.5	161	0.50	C-304B	C-304A	1342.50	1341.70	5.75	10.19	1345.13	1343.89
P-305	5.0	275	0.16	M-306	M-305	1339.56	1339.12	4.14	80.56	1344.51	1343.95
P-305-1	2.0	19	0.89	C-305A	M-305	1341.29	1341.12	3.49	11.38	1344.02	1343.95
P-306	5.0	337	0.16	M-307	M-306	1340.10	1339.56	3.57	66.72	1344.89	1344.51
P-306-1	2.0	17	1.00	C-306A	M-306	1342.73	1342.56	5.96	18.34	1344.89	1344.51
P-306A	2.0	9	1.00	C-306B	C-306A	1342.82	1342.73	5.38	16.94	1345.35	1344.89
P-306B	2.0	42	0.19	F-306C	C-306B	1342.90	1342.82	3.11	10.14	1345.53	1345.35
P-306C	2.0	316	0.19	C-306D	F-306C	1343.49	1342.90	3.03	9.98	1346.09	1345.53
P-306D	0.5	160	-0.89	C-306E	C-306D	1345.78	1347.20	3.67	6.48	1345.90	1346.09
P-306D	1.5	160	0.19	C-306E	C-306D	1343.79	1343.49	3.67	6.48	1345.90	1346.09
P-307	4.5	408	0.16	M-308	M-307	1340.75	1340.10	3.47	55.18	1345.41	1344.89
P-307-1	2.0	15	1.00	C-307A	M-307	1342.75	1342.60	5.19	14.67	1345.11	1344.89
P-307A	2.0	18	1.00	M-307B	C-307A	1342.93	1342.75	4.11	12.82	1345.33	1345.11
P-307B	2.0	46	0.20	M-307C	M-307B	1343.02	1342.93	3.96	12.92	1345.61	1345.33
P-307C	2.0	314	0.20	C-307D	M-307C	1343.65	1343.02	4.12	13.04	1346.70	1345.61
P-307D	0.5	166	-0.65	C-307E	C-307D	1346.96	1348.04	4.66	8.32	1347.02	1347.02
P-307D	1.5	166	0.20	C-307E	C-307D	1343.98	1343.65	4.66	8.32	1347.02	1346.70
P-308	4.0	80	0.16	M-310	M-308	1340.88	1340.75	2.92	28.60	1345.48	1345.41
P-308-1	3.0	116	0.52	M-309	M-308	1342.35	1341.75	7.12	51.46	1346.08	1345.41
P-309	2.0	25	0.52	C-309A	M-309	1343.48	1343.35	9.01	28.49	1347.66	1346.08
P-309-1	1.5	16	0.50	C-309C	M-309	1343.93	1343.85	6.95	12.37	1347.00	1346.08
P-309-2	3.0	227	0.21	F-309D	M-309	1342.82	1342.35	3.33	16.91	1346.17	1346.08
P-309A	2.0	12	0.42	C-309B	C-309A	1343.53	1343.48	8.66	27.48	1349.00	1347.66
P-309D	0.5	166	-0.35	C-309E	F-309D	1347.99	1348.57	5.28	16.67	1346.74	1346.74
P-309D	2.0	166	0.20	C-309E	F-309D	1343.15	1342.82	5.28	16.67	1346.74	1346.17
P-31	4.5	56	0.00	SDMH11	SDMH12	1342.84	1342.69	7.09	90.69	1346.17	1345.88
P-310	4.0	313	0.16	F-311	M-310	1341.38	1340.88	3.03	27.94	1345.61	1345.48
P-310-1	2.0	14	1.00	C-310A	M-310	1343.02	1342.88	2.57	1.63	1345.48	1345.48
P-311	4.0	97	0.16	F-312	F-311	1341.54	1341.38	2.84	27.34	1345.69	1345.61
P-311-1	1.5	14	1.00	C-311A	F-311	1342.77	1342.63	2.15	1.01	1345.61	1345.61
P-312	4.0	49	0.20	F-313	F-312	1341.64	1341.54	2.67	27.10	1345.75	1345.69
P-313	4.0	65	0.35	F-314	F-313	1341.87	1341.64	2.71	26.15	1345.81	1345.75
P-313-1	1.5	32	9.06	M-313A	F-313	1345.00	1342.10	8.22	6.38	1345.72	1345.75
P-313A	1.5	24	10.42	C-313B	M-313A	1347.50	1345.00	10.19	6.49	1348.08	1345.72
P-314	4.0	326	0.20	M-315	F-314	1342.52	1341.87	3.09	25.52	1345.94	1345.81
P-315	4.0	579	0.20	M-316	M-315	1343.78	1342.62	3.61	23.82	1346.22	1345.94
P-316	4.0	397	0.20	C-317	M-316	1344.67	1343.88	3.88	22.47	1346.68	1346.22
P-317	3.0	289	0.80	C-318	C-317	1347.08	1344.77	6.66	24.28	1348.59	1346.68
P-317-1	3.0	367	0.20	C-314A	C-317	1345.50	1344.77	3.25	8.63	1346.80	1346.68
P-318	2.0	560	0.34	C-319	C-318	1350.00	1348.08	4.08	8.00	1351.23	1349.09
P-32	2.0	27	0.00	CB11	SDMH11	1345.00	1344.77	3.64	3.44	1346.16	1346.17
P-33	2.0	17	0.00	CB10	SDMH11	1345.00	1344.77	4.03	3.48	1346.16	1346.17
P-34	1.5	27	0.00	CB13	SDMH15	1343.00	1342.00	6.98	3.97	1343.45	1342.45
P-35	1.5	17	0.00	CB12	SDMH15	1343.00	1342.00	2.28	0.04	1343.04	1342.03
P-4	2.5	282	0.00	SDMH2	SDMH3	1350.29	1349.56	4.50	21.79	1354.40	1353.81
P-43	1.5	117	0.00	SDMH15	SDMH13	1341.25	1339.60	5.37	3.91	1341.85	1340.58
P-5	1.5	47	0.00	CB3	SDMH3	1350.62	1350.15	7.81	13.90	1354.12	1353.81
P-501-1	5.0	376	0.09	M-502	F-105	1336.85	1336.50	4.96	72.30	1340.77	1340.46
P-502-1	2.5	217	0.20	M-502A	M-502	1339.52	1339.09	4.25	16.53	1341.44	1340.77
P-502-2	5.0	50	0.10	F-503	M-502	1336.90	1336.85	3.90	62.65	1340.99	1340.77
P-502A	2.0	11	1.00	C-502B	M-502A	1339.73	1339.62	4.74	15.24	1341.87	1341.44
P-502A-1	2.0	31	1.00	C-502D	M-502A	1339.93	1339.62	1.40	1.80	1341.45	1341.44
P-502B	1.5	109	1.97	C-502C	C-502B	1341.88	1339.73	7.62	13.53	1344.58	1341.87
P-503	5.0	100	0.07	M-504	F-503	1336.97	1336.90	3.66	62.68	1341.24	1340.99
P-504	4.0	494	0.10	M-505	M-504	1337.46	1336.97	4.97	62.71	1342.47	1341.24
P-505	4.0	80	0.07	M-506	M-505	1337.52	1337.46	4.98	62.72	1343.08	1342.47
P-506	0.5	413	0.11	M-507	M-506	1342.95	1342.50	3.71	36.53	1343.62	1343.08
P-506	3.5	400	0.10	M-507	M-506	1337.92	1337.52	3.71	36.53	1343.62	1343.08
P-506	3.5	400	0.10	M-507	M-506	1337.92	1337.52	3.71	36.53	1343.62	1343.08
P-506	3.5	400	0.11	M-507	M-506	1338.72	1338.29	3.71	36.53	1343.62	1343.08

DETENTION BASIN WEST EVALUATION
100-yr 2-hr Conduit Data

Dibble Engineering 23-Dec-10

Conduit Name	Diameter (ft)	Length (ft)	Conduit Slope (%)	Upstream Node Name	Downstream Node Name	Upstream IE (ft)	Downstream IE (ft)	Maximum Velocity (fps)	Maximum Flow (cfs)	Maximum US Water Elevation (ft)	Maximum DS Water Elevation (ft)
P-507	0.5	413	0.06	C-709	M-507	1343.20	1342.95	3.17	31.88	1344.08	1343.62
P-507	3.5	413	0.10	C-709	M-507	1338.34	1337.92	3.17	31.88	1344.08	1343.62
P-507	3.5	413	0.10	C-709	M-507	1338.34	1337.92	3.17	31.88	1344.08	1343.62
P-507	3.5	413	0.12	C-709	M-507	1339.23	1338.72	3.17	31.88	1344.08	1343.62
P-508	0.5	305	0.32	M-510	C-709	1344.18	1343.20	3.22	31.08	1344.60	1344.08
P-508	3.5	505	0.10	M-510	C-709	1338.84	1338.34	3.22	31.08	1344.60	1344.08
P-508	3.5	505	0.15	M-510	C-709	1340.05	1339.29	3.22	31.08	1344.60	1344.08
P-508	3.5	505	0.10	M-510	C-709	1338.84	1338.34	3.22	31.08	1344.60	1344.08
P-510	0.5	182	0.31	C-710	M-510	1344.75	1344.19	3.52	34.01	1344.91	1344.60
P-510	3.5	184	0.09	C-710	M-510	1339.00	1338.84	3.52	34.01	1344.91	1344.60
P-510	3.5	184	0.20	C-710	M-510	1340.41	1340.05	3.52	34.01	1344.91	1344.60
P-510	3.5	184	0.09	C-710	M-510	1339.00	1338.84	3.52	34.01	1344.91	1344.60
P-512	0.5	255	0.29	C-513	M-512	1347.00	1346.26	7.56	73.09	1347.22	1346.39
P-512	3.5	255	0.48	C-513	M-512	1340.53	1339.31	7.56	73.09	1347.22	1346.07
P-513	0.5	258	0.12	C-514	C-513	1347.30	1347.00	5.08	49.10	1347.53	1347.22
P-513	3.5	258	0.48	C-514	C-513	1341.76	1340.53	5.08	49.10	1347.53	1347.22
P-514	0.5	155	0.43	C-515	C-514	1347.96	1347.30	5.34	37.94	1348.17	1347.53
P-514	3.0	155	0.48	C-515	C-514	1342.50	1341.76	5.34	37.94	1348.17	1347.53
P-514-1	0.5	416	0.06	C-514A	C-514	1347.55	1347.30	4.84	30.41	1347.57	1347.53
P-514-1	3.0	416	0.30	C-514A	C-514	1343.23	1342.00	4.84	30.41	1347.57	1347.53
P-514A	0.5	419	0.29	C-514B	C-514A	1348.26	1347.05	4.05	27.30	1347.55	1347.57
P-514A	3.0	419	0.19	C-514B	C-514A	1344.03	1343.23	4.05	27.30	1347.55	1347.57
P-515	0.5	131	0.41	C-516	C-515	1348.50	1347.96	4.57	32.48	1348.70	1348.17
P-515	3.0	131	0.48	C-516	C-515	1343.13	1342.50	4.57	32.48	1348.70	1348.17
P-516	0.5	276	0.42	C-517	C-516	1349.65	1348.50	4.61	22.80	1349.81	1348.70
P-516	2.5	276	0.48	C-517	C-516	1344.45	1343.13	4.61	22.80	1349.81	1348.70
P-517	0.5	325	0.43	C-518	C-517	1351.04	1349.65	4.23	13.41	1351.12	1349.81
P-517	2.0	325	0.48	C-518	C-517	1346.00	1344.45	4.23	13.41	1351.12	1349.81
P-6	3.0	277	0.00	SDMH3	SDMH4	1349.06	1348.35	4.43	31.38	1353.81	1353.18
P-601	5.0	420	0.09	F-602	F-105	1336.87	1336.50	3.84	72.58	1340.54	1340.46
P-602	5.0	100	0.07	M-603	F-602	1336.94	1336.87	3.45	74.83	1340.61	1340.54
P-603	4.0	503	0.10	M-604	M-603	1337.44	1336.94	5.89	75.61	1342.17	1340.61
P-604	4.0	80	0.10	M-506	M-604	1337.52	1337.44	5.98	75.69	1343.08	1342.17
P-7	1.5	47	0.00	CB4	SDMH4	1349.90	1349.43	7.71	13.72	1353.40	1353.18
P-701	4.5	376	0.02	M-702	F-105	1336.59	1336.50	4.65	61.64	1340.50	1340.46
P-702	4.5	27	0.22	C-703	M-702	1336.65	1336.59	4.19	57.09	1340.53	1340.50
P-702-1	2.5	173	0.20	M-702A	M-702	1337.94	1337.59	1.63	5.11	1340.50	1340.50
P-702A	2.0	16	1.00	C-702B	M-702A	1338.20	1338.04	2.00	2.53	1340.50	1340.50
P-702A-1	2.0	26	1.00	C-702D	M-702A	1338.30	1338.04	2.24	2.71	1340.50	1340.50
P-703	4.5	87	0.08	C-704	C-703	1336.72	1336.65	4.05	57.45	1340.70	1340.53
P-705	4.5	420	0.10	C-706	C-704	1337.15	1336.72	3.13	43.18	1340.96	1340.70
P-706	4.4	482	0.03	F-911	C-706	1337.29	1337.15	3.60	36.80	1341.49	1340.96
P-710-1	3.0	51	0.20	C-716	C-710	1339.10	1339.00	3.60	36.80	1345.00	1344.91
P-710-2	0.5	64	2.36	M-512	C-710	1346.26	1344.75	7.49	72.57	1346.07	1344.91
P-710-2	3.5	64	0.48	M-512	C-710	1339.31	1339.00	7.49	72.57	1346.07	1344.91
P-710-3	1.5	213	0.80	C-404	C-710	1342.12	1340.41	4.39	7.83	1345.95	1344.91
P-716	3.0	388	0.20	F-717	C-716	1339.88	1339.10	3.60	25.51	1345.04	1345.00
P-717	3.0	146	0.20	F-718	F-717	1340.17	1339.88	3.35	23.77	1345.22	1345.04
P-718	3.0	256	0.20	F-719	F-718	1340.68	1340.17	2.54	18.00	1345.43	1345.22
P-718-1	2.0	24	3.42	C-718A	F-718	1340.99	1340.17	4.07	8.69	1345.22	1345.22
P-719	2.5	243	0.20	F-720	F-719	1341.17	1340.68	2.25	11.11	1345.63	1345.43
P-719-1	2.0	21	6.90	C-719A	F-719	1342.13	1340.68	5.62	8.22	1345.50	1345.43
P-720	2.0	22	3.78	C-720A	F-720	1342.00	1341.17	4.92	11.12	1345.84	1345.63
P-8	3.0	287	0.00	SDMH4	SDMH5	1348.35	1347.61	5.85	41.56	1353.18	1351.66
P-9	1.5	47	0.00	CB5	SDMH5	1349.15	1348.68	7.96	14.18	1352.65	1351.66
P-902	4.5	137	0.01	M-903	F-104	1335.72	1335.71	3.96	40.64	1340.13	1340.12
P-902	4.5	137	0.01	M-903	F-104	1335.72	1335.71	3.96	40.64	1340.13	1340.12
P-903	4.5	225	0.08	C-904	M-903	1335.90	1335.72	3.66	41.29	1340.13	1340.13
P-903	4.5	225	0.08	C-904	M-903	1335.90	1335.72	3.66	41.29	1340.13	1340.13
P-904	4.5	585	0.12	C-905	C-904	1336.63	1335.90	3.04	31.49	1340.14	1340.13
P-904	4.5	585	0.12	C-905	C-904	1336.63	1335.90	3.04	31.49	1340.14	1340.13
P-904-1	1.5	42	1.43	C-904A	C-904	1339.60	1339.00	4.80	4.05	1340.34	1340.13
P-905.1	3.5	136	0.01	C-906	C-905.1	1336.65	1336.64	2.60	24.19	1340.16	1340.15
P-905.1	3.5	136	0.01	C-906	C-905.1	1336.65	1336.64	2.60	24.19	1340.16	1340.15
P-905-1	1.5	32	1.69	C-905A	C-905	1338.19	1337.65	4.73	6.32	1340.14	1340.14
P-906	3.5	149	0.38	M-907	C-906	1337.22	1336.65	3.18	23.65	1340.17	1340.16
P-906	3.5	149	0.38	M-907	C-906	1337.22	1336.65	3.18	23.65	1340.17	1340.16
P-907-1	3.0	120	-0.04	M-908A	M-907	1337.17	1337.22	4.05	28.89	1340.54	1340.17
P-907-2	3.0	116	0.17	M-908B	M-907	1337.42	1337.22	3.18	19.69	1340.28	1340.17
P-908-1	0.5	50	0.04	C-908A	M-908A	1341.19	1341.17	3.18	19.69	1341.25	1341.19
P-908-1	2.0	43	0.00	C-908A	M-908A	1337.17	1337.17	3.18	19.69	1341.25	1340.54

Williams Gateway Airport Authority | WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

100-yr 2-hr Conduit Data

Dibble Engineering | 23-Dec-10

Conduit Name	Diameter (ft)	Length (ft)	Conduit Slope (%)	Upstream Node Name	Downstream Node Name	Upstream IE (ft)	Downstream IE (ft)	Maximum Velocity (fps)	Maximum Flow (cfs)	Maximum US Water Elevation (ft)	Maximum DS Water Elevation (ft)
P-908-2	2.0	39	0.90	M-910A	M-908A	1337.52	1337.17	6.28	19.81	1341.18	1340.54
P-908-3	0.3	188	0.03	C-908B	M-908B	1341.48	1341.43	6.28	19.81	1341.52	1341.44
P-908-3	1.5	171	0.47	C-908B	M-908B	1338.22	1337.42	6.28	19.81	1341.52	1340.28
P-908-4	2	48	0.21	M-910B	M-908B	1337.52	1337.42	3.70	11.66	1340.583	1340.283
P-910-2	2	331	0.24	F-911	M-910A	1338.3	1337.52	3.35	10.57	1341.488	1341.175
P-910-3	2	331	0.24	F-911	M-910B	1338.3	1337.52	3.70	11.66	1341.488	1340.583
P-911-1	3	170	0.12	F-912	F-911	1337.49	1337.29	3.60	25.54	1341.874	1341.488
P-911-1	3	170	0.12	F-912	F-911	1337.49	1337.29	3.60	25.54	1341.874	1341.488
P-912-1	2	45	2.22	C-912A	F-912	1338.49	1337.49	4.46	14.06	1342.051	1341.874
P-913	3	307	0.12	F-914	F-912	1337.85	1337.49	2.94	20.88	1342.305	1341.874
P-913	3	307	0.12	F-914	F-912	1337.85	1337.49	2.94	20.88	1342.305	1341.874
P-914-1	2	49	2.04	C-914A	F-914	1338.85	1337.85	2.94	20.88	1342.433	1342.305
P-914-2	3	285	0.13	F-915	F-914	1338.21	1337.85	2.83	20.89	1342.584	1342.305
P-914-2	3	285	0.13	F-915	F-914	1338.21	1337.85	2.83	20.89	1342.584	1342.305
P-915-1	2	50	2	C-915A	F-915	1339.21	1338.21	4.23	13.35	1342.587	1342.584
P-915-2	3	335	0.12	F-916	F-915	1338.61	1338.21	2.50	17.73	1343.004	1342.584
P-915-2	3	335	0.12	F-916	F-915	1338.61	1338.21	2.50	17.73	1343.004	1342.584
P-916	3	148	0.11	F-917	F-916	1338.78	1338.61	3.17	22.47	1343.059	1343.004
P-916	3	148	0.11	F-917	F-916	1338.78	1338.61	3.17	22.47	1343.059	1343.004
P-916-1	2	51	1.96	C-916A	F-916	1339.61	1338.61	3.46	10.90	1342.943	1343.004
P-918	3	279	0.12	C-920	F-917	1339.12	1338.78	3.86	27.37	1343.755	1343.059
P-920	2	372	0.48	C-921	C-920	1340.91	1339.12	4.32	13.65	1344.272	1343.755
P-921	2	232	0.2	C-922	C-921	1341.43	1340.96	2.55	6.96	1344.44	1344.272
P-922	2	129	0.16	C-923	C-922	1341.66	1341.46	2.19	6.37	1344.45	1344.44
P-Z1	1.5	194	0	SDMH13	F-105	1339.6	1339.23	2.93	3.67	1340.582	1340.464
P-Z2	4.5	157	0	SDMH12	F-105	1342.67	1341	9.45	90.64	1345.143	1343.462

Williams Gateway Airport Authority WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

100-yr 2-hr Junction Data

Dibble Engineering 07-Oct-10

Structure Name	Ground Elevation Spill Crest (ft)	Invert Elevation (ft)	Max Water Elevation (ft)	Max Water Depth (ft)	Freeboard (ft)
C-100	1343.10	1335.64	1339.58	3.94	3.52
C-101A	1346.00	1339.30	1339.73	0.43	6.27
C-102A	1346.00	1339.34	1340.13	0.79	5.88
C-203A	1346.83	1342.76	1344.88	2.12	1.95
C-205	1346.67	1339.72	1346.28	6.56	0.40
C-206	1347.14	1340.08	1347.01	6.93	0.13
C-206A	1347.46	1343.67	1347.03	3.36	0.43
C-207	1347.47	1340.40	1347.47	7.07	0.00
C-208	1347.76	1340.71	1347.81	7.10	-0.05
C-209	1348.29	1341.03	1348.38	7.35	-0.10
C-209A	1349.00	1344.12	1348.38	4.26	0.62
C-210	1350.00	1341.37	1348.83	7.46	1.17
C-210A	1350.00	1344.46	1348.86	4.40	1.14
C-211A	1352.00	1344.46	1349.48	5.02	2.51
C-212A	1352.00	1345.40	1349.90	4.50	2.10
C-212B	1351.53	1345.49	1349.95	4.46	1.57
C-212C	1351.00	1345.81	1350.00	4.19	1.00
C-215	1352.44	1344.68	1351.51	6.83	0.93
C-216	1352.51	1346.00	1353.17	7.17	-0.66
C-217	1353.20	1345.58	1353.14	7.56	0.06
C-218	1354.00	1346.08	1354.08	8.00	-0.07
C-303A	1346.00	1340.59	1343.21	2.62	2.79
C-303B	1345.20	1340.68	1343.31	2.63	1.89
C-303D	1345.71	1341.40	1343.75	2.35	1.96
C-303E	1346.00	1340.69	1343.21	2.52	2.79
C-303F	1345.26	1340.78	1343.31	2.53	1.95
C-304A	1347.00	1341.70	1343.89	2.19	3.11
C-304B	1346.01	1342.50	1345.13	2.63	0.89
C-305A	1347.00	1341.29	1344.02	2.73	2.98
C-306A	1347.14	1342.73	1344.89	2.16	2.24
C-306B	1346.68	1342.82	1345.35	2.53	1.33
C-306D	1347.70	1343.49	1346.09	2.60	1.62
C-306E	1346.29	1343.79	1345.90	2.11	0.39
C-307A	1348.03	1342.75	1345.11	2.36	2.92
C-307D	1348.54	1343.65	1346.70	3.05	1.84
C-307E	1347.47	1343.98	1347.02	3.04	0.45
C-309A	1349.00	1343.48	1347.61	4.13	1.39
C-309B	1349.00	1343.53	1348.96	5.43	0.04
C-309C	1349.00	1343.93	1347.00	3.07	2.00
C-309E	1348.49	1343.15	1346.74	3.59	1.75
C-310A	1349.68	1343.02	1345.48	2.46	4.19
C-311A	1351.00	1342.77	1345.61	2.84	5.39
C-313B	1351.74	1347.50	1348.08	0.58	3.66
C-314A	1351.83	1345.50	1346.80	1.30	5.03
C-317	1351.15	1344.67	1346.68	2.01	4.47
C-318	1353.80	1347.08	1348.59	1.51	5.21
C-319	1355.23	1350.00	1351.23	1.23	4.01
C-404	1347.17	1342.12	1345.95	3.83	1.22
C-502B	1344.79	1339.73	1341.86	2.13	2.93
C-502C	1345.38	1341.88	1344.57	2.69	0.81

Williams Gateway Airport Authority | WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

100-yr 2-hr Junction Data

Dibble Engineering | 07-Oct-10

Structure Name	Ground Elevation Spill Crest (ft)	Invert Elevation (ft)	Max Water Elevation (ft)	Max Water Depth (ft)	Freeboard (ft)
C-502D	1345.00	1339.93	1341.44	1.51	3.56
C-513	1348.00	1340.53	1347.22	6.69	0.78
C-514	1347.80	1341.76	1347.53	5.77	0.27
C-514A	1348.05	1343.23	1347.57	4.34	0.48
C-514B	1348.77	1344.03	1347.55	3.52	1.22
C-515	1348.46	1342.50	1348.17	5.67	0.29
C-516	1349.00	1343.13	1348.70	5.57	0.30
C-516A	1350.40	1346.40	1348.71	2.31	1.69
C-517	1350.15	1344.45	1349.81	5.36	0.35
C-518	1351.54	1346.00	1351.12	5.12	0.42
C-702B	1343.66	1338.20	1340.50	2.30	3.16
C-702C	1343.69	1338.29	1340.50	2.21	3.19
C-702D	1343.60	1338.30	1340.50	2.20	3.11
C-702E	1343.59	1338.39	1340.50	2.11	3.10
C-703	1344.70	1336.65	1340.53	3.88	4.18
C-704	1343.73	1336.72	1340.69	3.97	3.03
C-706	1343.20	1337.15	1340.96	3.81	2.25
C-709	1344.19	1338.34	1344.08	5.75	0.11
C-710	1345.25	1339.00	1344.90	5.90	0.35
C-716	1345.70	1339.10	1345.00	5.90	0.70
C-717A	1345.00	1340.68	1344.94	4.26	0.06
C-718A	1345.30	1340.99	1345.22	4.23	0.08
C-719A	1345.63	1342.13	1345.50	3.37	0.13
C-720A	1346.03	1342.00	1345.84	3.84	0.19
C-904	1344.56	1335.90	1340.13	4.23	4.43
C-904A	1345.00	1339.60	1340.34	0.74	4.66
C-904B	1345.00	1339.80	1340.34	0.54	4.66
C-905	1343.25	1336.63	1340.14	3.51	3.11
C-905.1	1343.63	1336.64	1340.15	3.51	3.48
C-905A	1343.27	1338.19	1340.14	1.95	3.13
C-905B	1344.00	1339.00	1340.14	1.14	3.86
C-906	1344.00	1336.65	1340.16	3.51	3.85
C-906A	1341.16	1336.95	1340.16	3.21	1.00
C-908A	1341.69	1336.79	1341.25	4.46	0.44
C-908B	1342.90	1338.22	1341.52	3.30	1.38
C-912A	1342.15	1338.49	1342.05	3.56	0.10
C-914A	1342.56	1338.85	1342.43	3.58	0.13
C-915A	1342.58	1339.21	1342.59	3.38	-0.01
C-916A	1343.15	1339.61	1342.94	3.33	0.21
C-917B	1343.19	1339.78	1343.05	3.27	0.14
C-920	1344.21	1339.12	1343.76	4.64	0.46
C-921	1344.50	1340.91	1344.27	3.36	0.23
C-921A	1343.84	1339.19	1343.66	4.47	0.18
C-922	1344.96	1341.43	1344.44	3.01	0.52
C-922A	1344.20	1342.50	1343.91	1.41	0.29
C-923	1345.16	1341.46	1344.45	2.99	0.71
C-923A	1344.61	1341.61	1344.31	2.71	0.29
CB1	1355.58	1352.08	1355.58	3.50	0.00
CB10	1349.42	1345.00	1346.16	1.16	3.26
CB11	1349.42	1345.00	1346.16	1.16	3.26

Williams Gateway Airport Authority WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

100-yr 2-hr Junction Data

Dibble Engineering 07-Oct-10

Structure Name	Ground Elevation Spill Crest (ft)	Invert Elevation (ft)	Max Water Elevation (ft)	Max Water Depth (ft)	Freeboard (ft)
CB12	1346.93	1343.00	1343.04	0.04	3.89
CB13	1346.93	1343.00	1343.45	0.45	3.48
CB2	1354.85	1351.35	1354.85	3.50	0.00
CB3	1354.12	1350.62	1354.12	3.50	0.00
CB4	1353.40	1349.90	1353.40	3.50	0.00
CB5	1352.65	1349.15	1352.65	3.50	0.00
CB6	1351.92	1348.42	1350.75	2.33	1.17
CB7	1351.18	1347.68	1349.18	1.50	2.00
CB8	1351.11	1347.10	1348.24	1.14	2.87
CB9	1351.11	1347.10	1348.28	1.18	2.83
F-101	1346.00	1335.64	1339.78	4.14	6.22
F-103	1345.97	1335.69	1339.97	4.28	6.00
F-104	1341.57	1335.71	1340.12	4.41	1.45
F-105	1345.50	1335.80	1340.46	4.66	5.04
F-201	1346.00	1338.00	1340.46	2.46	5.54
F-211	1351.74	1342.83	1349.47	6.64	2.27
F-213	1353.47	1343.34	1350.27	6.93	3.21
F-301	1346.00	1338.00	1340.46	2.46	5.54
F-303C	1346.00	1340.79	1343.44	2.65	2.56
F-304	1346.94	1338.96	1343.50	4.54	3.44
F-306C	1347.48	1342.90	1345.53	2.63	1.95
F-309D	1349.07	1342.82	1346.15	3.33	2.93
F-311	1351.00	1341.38	1345.61	4.23	5.39
F-312	1351.85	1341.54	1345.68	4.14	6.16
F-313	1351.98	1341.54	1345.75	4.21	6.23
F-314	1353.15	1341.87	1345.81	3.94	7.34
F-503	1344.44	1336.90	1340.99	4.09	3.45
F-602	1344.50	1336.87	1340.53	3.66	3.97
F-717	1345.50	1339.88	1345.04	5.16	0.46
F-718	1345.90	1340.17	1345.22	5.05	0.68
F-719	1346.05	1340.68	1345.43	4.75	0.62
F-720	1346.29	1341.17	1345.63	4.46	0.66
F-911	1342.27	1337.29	1341.49	4.20	0.78
F-912	1342.30	1337.49	1341.87	4.38	0.43
F-914	1342.70	1337.85	1342.30	4.45	0.40
F-915	1343.16	1338.21	1342.58	4.37	0.58
F-916	1343.53	1338.61	1342.89	4.28	0.64
F-917	1343.90	1338.78	1343.06	4.28	0.84
M-202	1346.00	1338.56	1343.85	5.29	2.15
M-203	1346.79	1339.14	1344.86	5.72	1.93
M-204	1346.93	1339.43	1345.65	6.22	1.28
M-212	1351.91	1343.00	1349.74	6.74	2.17
M-214	1351.20	1343.63	1349.92	6.29	1.28
M-302	1346.26	1338.62	1342.86	4.24	3.41
M-303	1346.11	1340.34	1343.08	2.74	3.03
M-305	1347.00	1339.12	1343.95	4.83	3.05
M-306	1347.46	1339.56	1344.51	4.95	2.95
M-307	1348.20	1340.10	1344.89	4.79	3.31
M-307B	1348.00	1342.93	1345.33	2.40	2.67
M-307C	1348.00	1343.02	1345.61	2.59	2.39

Williams Gateway Airport Authority | WGA Project No. WGAA-3

DETENTION BASIN WEST EVALUATION

100-yr 2-hr Junction Data

Dibble Engineering | 07-Oct-10

Structure Name	Ground Elevation Spill Crest (ft)	Invert Elevation (ft)	Max Water Elevation (ft)	Max Water Depth (ft)	Freeboard (ft)
M-308	1349.24	1340.75	1345.41	4.66	3.82
M-309	1348.94	1342.35	1346.06	3.71	2.88
M-310	1349.91	1340.88	1345.48	4.60	4.43
M-313A	1352.55	1345.00	1345.71	0.71	6.84
M-315	1351.47	1342.52	1345.94	3.42	5.54
M-316	1352.34	1343.78	1346.22	2.44	6.12
M-502	1345.00	1336.85	1340.76	3.91	4.24
M-502A	1344.95	1339.52	1341.43	1.91	3.53
M-504	1345.40	1336.97	1341.24	4.27	4.16
M-505	1343.00	1337.46	1342.47	5.01	0.53
M-506	1343.48	1337.52	1343.08	5.55	0.40

Williams Gateway Airport Authority **WGA Project No. WGAA-3**

Detention Basin West Evaluation
10-Year and 100-Year Peak Discharge Calculations

Dibble Engineering **10/7/2010**

(1) SUB-BASIN ID	(2) DRAINAGE AREA (A) [ac]	(3) PERCENT IMPERVIOUS [%]	(4) 10-YEAR PEAK DISCHARGE (Q_{10}) [ft^3/s]	(5) 100-YEAR PEAK DISCHARGE (Q_{100}) [ft^3/s]	(6) CONNECTION NODE
S1A	1.36	95	2.445	10.029	C-923
S1B	1.35	95	2.241	10.261	C-922
S1C	2.95	95	5.115	21.122	C-921
S2A	2.85	95	4.906	19.856	C-920
S2B	3.59	95	6.314	25.340	F-917
S2C	1.94	95	3.220	14.746	C-916A
S3A	3.13	95	5.551	25.351	C-915A
S3B	2.76	95	4.581	21.306	C-914A
S4A	3.19	95	5.207	25.049	C-912A
S4B	1.47	95	2.677	12.032	F-911
S5	2.68	95	4.435	19.694	C-908A
S6	1.14	40	0.807	3.764	C-906A
S7	0.19	10	0.034	0.125	C-906
S8A	1.75	90	2.900	13.428	C-905.1
S8B	1.19	95	2.073	9.598	C-908B
S9	1.18	80	1.638	6.463	C-905A
S10	0.36	10	0.062	0.233	C-905
S11	0.76	90	0.991	5.011	C-904
S12	0.68	80	1.007	4.096	C-904A
S13	4.33	90	5.652	28.588	C-904
S14	2.56	90	4.431	21.478	C-720A
S15A	2.19	90	3.696	16.982	C-719A
S15B	2.40	90	3.942	18.610	C-718A
S15C	1.19	90	1.824	9.228	C-717A
S16	2.73	90	4.185	21.169	C-716
S17	4.22	95	7.293	28.738	C-514B
S18	7.30	90	11.333	52.565	C-514A
S19	3.10	95	5.172	22.154	C-518
S20A	4.54	90	7.450	35.173	C-517
S20B	3.91	90	6.768	30.242	C-516
S21	1.94	80	3.050	13.372	C-515
S22	6.19	90	10.122	46.729	C-513
S23A	1.20	80	1.713	7.866	C-404
S23B	1.57	80	2.126	10.753	C-710
S24A	0.84	90	1.291	6.160	M-510
S24B	1.07	90	1.619	7.232	C-709
S24C	0.88	90	1.331	5.948	C-709
S25A	2.03	90	3.120	14.885	M-510

Williams Gateway Airport Authority **WGA Project No. WGAA-3**

Detention Basin West Evaluation
10-Year and 100-Year Peak Discharge Calculations

Dibble Engineering **10/7/2010**

(1) SUB-BASIN ID	(2) DRAINAGE AREA *(A)* *[ac]*	(3) PERCENT IMPERVIOUS *[%]*	(4) 10-YEAR PEAK DISCHARGE *(Q_{10})* *[ft^3/s]*	(5) 100-YEAR PEAK DISCHARGE *(Q_{100})* *[ft^3/s]*	(6) CONNECTION NODE
S25B	2.38	80	3.600	16.086	C-709
S25C	1.95	80	2.950	13.180	C-709
S26	1.62	90	2.565	8.810	M-507
S27	3.75	90	5.936	20.393	M-507
S28	1.83	90	11.058	43.864	M-604
S29	4.31	90	10.200	40.461	M-506
S30	1.88	90	3.325	14.578	C-706
S31	3.05	80	4.518	18.129	C-704
S32	0.35	95	0.573	2.572	C-702B
S33	0.37	95	0.619	2.757	C-702D
S34	1.62	90	2.804	13.592	C-502C
S35	0.26	95	0.452	1.835	C-502B
S36	0.26	95	0.438	1.766	C-502D
S37	2.19	80	1.425	5.408	F-105
S38	7.63	85	11.582	43.978	C-314A
S39A	2.74	25	1.867	8.984	C-319
S39B	6.96	25	4.742	17.829	C-318
S40	6.32	25	4.455	17.402	C-317
S41	1.59	90	2.437	12.329	M-214
S42	0.84	90	1.288	6.514	C-313B
S43	0.14	95	0.238	1.146	C-311A
S44	0.20	95	0.360	1.737	C-310A
S45	2.00	100	3.407	17.232	C-309E
S46	3.58	90	5.488	27.760	C-309B
S47	0.26	95	0.422	1.472	C-309A
S48	1.42	90	2.697	11.201	C-309C
S49	0.15	95	2.697	1.183	C-309C
S50	1.43	100	2.520	12.321	C-307E
S51	1.16	90	2.013	8.995	C-307D
S52	0.33	95	0.567	2.204	C-307A
S53	1.29	80	2.197	11.114	C-306E
S54	2.55	90	4.265	19.773	C-306D
S55	1.20	90	1.840	9.305	C-306B
S56	0.21	95	0.373	1.549	C-306A
S57	0.17	95	0.264	1.288	C-305A
S58	1.42	100	2.419	12.234	C-304B
S59	1.35	90	2.093	10.231	C-305A
S60	1.74	90	2.667	13.492	C-303D

Williams Gateway Airport Authority **WGA Project No. WGAA-3**

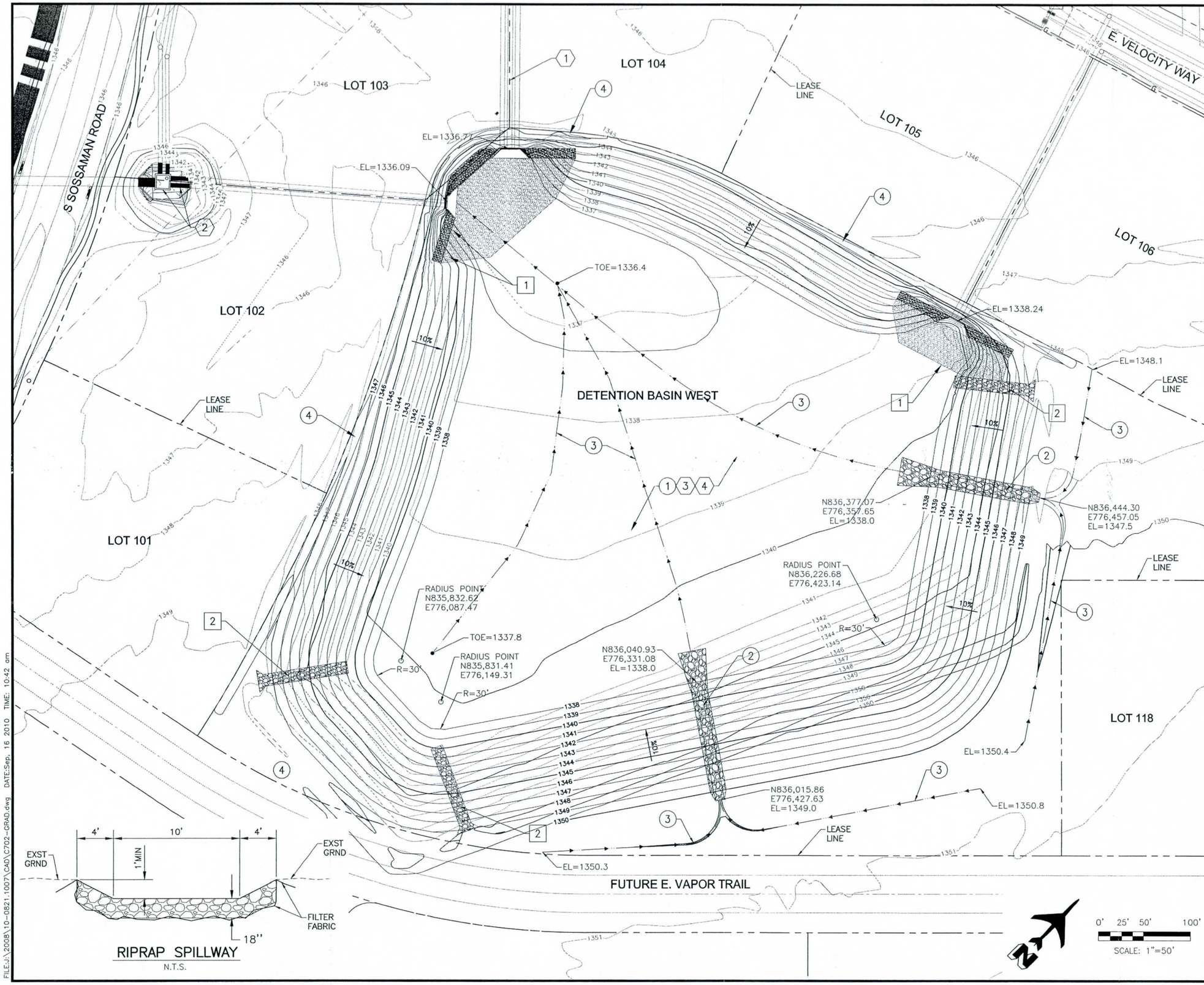
Detention Basin West Evaluation
10-Year and 100-Year Peak Discharge Calculations

Dibble Engineering **10/7/2010**

(1) SUB-BASIN ID	(2) DRAINAGE AREA *(A)* *[ac]*	(3) PERCENT IMPERVIOUS *[%]*	(4) 10-YEAR PEAK DISCHARGE *(Q_{10})* *[ft^3/s]*	(5) 100-YEAR PEAK DISCHARGE *(Q_{100})* *[ft^3/s]*	(6) CONNECTION NODE
S61	0.20	95	0.332	1.544	C-303A
S62	0.20	95	0.332	1.520	C-303E
S63	2.18	80	2.971	15.026	C-303F
S64	6.26	95	10.013	51.238	C-216
S65	8.98	95	16.451	73.502	C-215
S66	2.19	90	3.357	16.982	C-218
S67	2.07	90	3.173	16.051	C-217
S68	1.13	90	1.732	8.762	C-212B
S69	0.18	95	0.307	1.434	C-212A
S70	0.20	95	0.350	1.620	C-211A
S71	2.51	80	3.420	17.301	F-211
S72	0.28	95	0.453	1.646	C-210A
S73	0.11	95	0.128	0.646	C-210A
S74	2.27	80	3.271	16.547	C-209
S75	2.27	80	3.093	15.646	C-207
S76	0.30	95	0.492	2.037	C-206A
S77	2.28	80	3.107	15.715	C-206
S78	2.40	80	3.270	16.542	M-204
S79	0.29	95	0.496	1.952	C-203A
S80	2.13	80	2.903	14.681	M-202
S81	2.21	80	1.438	5.458	F-105
S82	2.23	80	1.451	5.507	F-105
S84	0.43	95	1.830	8.022	CB12 and CB13
S85	0.55	95	1.830	8.022	CB12 and CB13
S86	0.28	95	1.678	7.164	CB10 and CB11
S87	0.64	95	1.678	7.164	CB10 and CB11
S88	3.69	95	5.666	18.564	CB8 and CB9
S89	2.48	90	4.173	17.070	CB6
S90	2.52	90	4.240	17.345	CB5
S91	2.44	90	4.105	16.795	CB4
S92	2.48	90	4.173	17.070	CB3
S93	2.48	90	4.173	17.070	CB2
S94	2.62	90	4.408	18.034	CB1
DET-W	14.60	5	9.502	36.055	F-105

Appendix F:

Detention West Grading Plan Addendum



RIPRAP SPILLWAY
N.T.S.

DEMOLITION NOTES

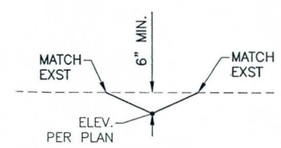
1. SALVAGE EXST RIPRAP DURING GRADING AND REPLACE UPON COMPLETION
2. REMOVE 3 EA EXST CONCRETE SPILLWAY AND REGRADE AREA

CONSTRUCTION NOTES

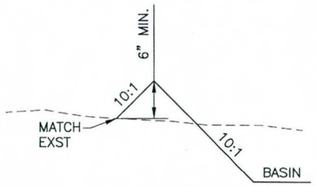
1. EXCAVATE 14,350 CY & GRADE BOTTOM OF BASIN PER PLAN
2. 158 CY RIPRAP SPILLWAY WITH FILTER FABRIC D_{50}=8", DEPTH 18" SEE DETAIL THIS SHEET
3. EXCAVATE 970 LF OF DRAINAGE SWALE (NPI), SEE DETAIL (A) THIS SHEET
4. CONSTRUCT BERM SEE DETAIL (B) THIS SHEET, BELOW (TYP) AROUND BASIN WHERE NOTED

REFERENCE NOTES

1. SEE SHEET C4.01 FOR STORM DRAIN PLAN & PROFILE
2. SEE SHEETS C4.08 AND C9.02 FOR DETENTION WEST JUNCTION STRUCTURE AND STORM DRAIN PLAN & PROFILE
3. 100-YR, 2-HR W.S.E. = 1340.5'
4. CLEAR & GRUB ALL CREOSOTE BUSHES & WEEDS WITHIN DETENTION BASIN WEST



(A) DRAINAGE SWALE
N.T.S.



(B) BERM
N.T.S.

CALL TWO WORKING DAYS BEFORE YOU DIG
(602) 263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

REV	DATE	DESCRIPTION

Dibble Engineering
7500 N. Dreamy Draw Drive
Suite 200
Phoenix, AZ 85020
P 602.957.1155

Registered Professional Engineer (Civil)
CERTIFICATE NO. 39520
DEREK S. ROGERS
Date Signed 3/16/10
ARIZONA, U.S.A.
Expires 09/30/12

DATE:	MAR 2010	
DESIGNED BY:	DSR	
DRAWN BY:	DSO	
REVIEWED BY:	KLS	
FILE NAME:	C702-GRAD	

PhxMesa Gateway Airport
PHOENIX-MESA GATEWAY AIRPORT AUTHORITY
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MESA, ARIZONA 85212
(480) 988-7600
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SOUTH AREA DRAINAGE - PHASE I & II
PMGAA PROJECT NO. 3

DETENTION WEST GRADING PLAN ADDENDUM

C7.02

SHEET #: 33A OF 43

FILE:J:\2008\10-0821.1007\CAD\C702-GRAD.dwg DATE:Sep. 16 2010 TIME: 10:42 am