

Contract 000001131  
Salt Lake County  
12323489  
07/19/2016 10:32 AM \$0.00  
Book - 10454 Pg - 159-177  
GARY W. OTT  
RECORDER, SALT LAKE COUNTY, UTAH  
UT ST-DEPT OF TRANSPORTATION  
BOX 148420 ATT: JASON HENLEY  
SLC UT 84114-8420  
BY: MMA, DEPUTY - WI 19 P.

WHEN RECORDED, MAIL TO:  
Utah Department of Transportation  
Right of Way, Fourth Floor  
Box 148420  
Salt Lake City, UT 84114-8240

## UTAH DEPARTMENT OF TRANSPORTATION DRAINAGE AGREEMENT

Salt Lake County

Tax ID No. 87-6000316

This Drainage Agreement made and entered into this 9<sup>th</sup> day of March  
2016 between Utah Department of Transportation ("Department") and  
SALT LAKE COUNTY ("Permittee"), who owns the property described in Exhibit A.

### RECITALS

The Permittee (property owner) desires to construct a drainage system and a drainage connection within the Department Right of Way subject to the requirements and conditions described in the Permit.

Department's Policy 08A-06 requires the Permittee to sign the Drainage Agreement as part of the permitting process for a drainage connection.

The parties agree as follows:

(1) **COMPLIANCE:** Permittee must comply with the conditions in the permit and applicable state and federal statutes, regulations and rules. The Department may perform inspection of Permittee's drainage system to monitor compliance with the Permit and with state and federal statutes, regulations, and rules. Permittee grants the Department access to the Permittee's property for inspection or to perform any repairs to prevent damage to the Department's Right of Way. The Department's inspection does not relieve the Permittee of its responsibilities in meeting the Permit conditions. The Permittee is responsible for the Department's inspection costs. Permittee's responsibilities include:

- a) Permittee is responsible for repairing and restoring any portion of the Department Right of Way and drainage systems located therein that may be damaged as a result of making the drainage connection or as the result of any subsequent drainage originating from the Permittee's property.
- b) Permittee must not increase its drainage discharge into the Department's drainage system without the written permission of the Department.
- c) A bonded contractor must apply for the required permit to install drainage systems in the Department Right of Way prior to the commencement of any such work.
- d) The Permittee is responsible to obtain environmental clearances, permits, or other approvals from any other local, state or federal agency that may have regulatory jurisdiction or oversight.

(2) **MAINTENANCE:** Permittee's drainage system must at all times be maintained, repaired, constructed, and operated by and at the expense of the Permittee. The drainage system will be serviced without access from any interstate highway or ramp. The Department may notify the Permittee of any maintenance requirements if the Permittee fails to maintain the drainage system. The Department reserves the right, without relieving the Permittee of its obligations, to reconstruct or make repairs to the drainage system, as it may consider necessary, and the Permittee must reimburse the Department for its cost if the Permittee fails to comply with the Department's written notification and complete the required maintenance.

(3) **FUTURE IMPACTS:** The Department has the right to change its drainage system for any future transportation project. If the Department's drainage system is reconstructed or modified, the Department reserves the right to hold the Permittee responsible for the cost to reconnect to the Department's drainage system. The Department is not responsible for any costs the Permittee incurs due to the drainage system being reconstructed or modified.

(4) **LIABILITY:** Pursuant to R930-7-6(2)(b), the Permittee is required to guarantee satisfactory performance under this Permit. The Department may proceed against Permittee to recover all expenses incurred by the Department, its employees, or contractors in repairing the sections of roadway damaged by the Permittee or its drainage system, including the failure to restore the Right of Way to Department standards. The Permittee will be liable for all costs the Department incurs under this agreement.

The Permittee will indemnify, defend, and hold harmless the Department, its employees, and the State of Utah from responsibility for any damage or liability arising from Permittee's construction, maintenance, repair, or any other related operation of the drainage system pursuant to the Permit issued under this agreement.

The Permittee will not hold the Department liable for damages resulting from any back-up or flow into the Permittee's drainage system or property. The Permittee accepts all risks associated with the connection to the Department's drainage system. The Permittee is responsible for all liability resulting from the discharge of pollutants into the Department's drainage system from its property or drainage system.

(5) **CANCELLATION OF PERMIT:** Any failure on the part of Permittee to comply with the terms and conditions set forth in the Permit or this Agreement may result in cancellation of the Permit. Failure of the Permittee to pay any sum of money for costs incurred by the Department in association with inspection, reconstruction, repair, or maintenance of the drainage system may also result in cancellation of the Permit. Non-compliance with either the Permit or Agreement may result in the Department removing the drainage system and restoring the highway and Right of Way at the sole expense of the Permittee. The Department will notify the Permittee in writing prior to any cancellation, setting forth the violations, and will provide the Permittee a reasonable time to correct the violations to the satisfaction of the Department. The Department may order the Permittee to remove its drainage system if the violations are not corrected.

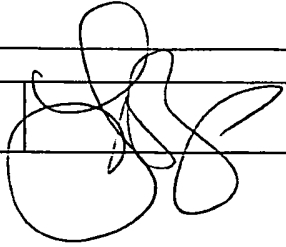
(6) **SUCCESSORS AND ASSIGNS:** All covenants, obligations and agreements will be binding upon the parties, their successors and assigns and run with the land as described in Exhibit A until the drainage connection is removed from the Department's Right of Way.

(7) **MISCELLANEOUS:**

- a) Each party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of the Agreement at the request of the other party.
- b) This Agreement does not create any type of agency relationship, joint venture, or partnership between the Department and Permittee.
- c) The failure of either party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either party to exercise any rights or remedies provided in this Agreement, or by law, will not release either party from any obligations arising under this Agreement.

- d) This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective party and to bind such party.
- e) If any portion of this Agreement is held to be invalid or unenforceable for any reason by a court of competent jurisdiction, such invalidity or unenforceability shall not affect any other provision, and this Agreement shall be construed as if such invalid or unenforceable provision had never been included.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written.

CURRENT PROPERTY OWNER/PERMITTEE	
Name Printed: <u>Lori Bays</u>	Signature: 

Deputy Mayor & Chief Administrative Officer

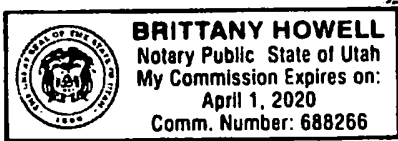
State of Utah  
County of Salt Lake

On this 18 day of April, in the year 2016,

Lori Bays personally appeared before me and duly acknowledged to me that he/she executed this agreement as the current property owner of said property or was authorized to sign the agreement on behalf of the property owner. Witness my hand and official seal.

(NOTARY SEAL)

Brittany Howell  
Notary Public



APPROVED AS TO FORM  
District Attorney's Office  
By: Ryan W. Lambert  
Attorney  
RYAN W. LAMBERT  
Date: 4 27 16

UTAH DEPARTMENT OF TRANSPORTATION – Region Permits Officer	
Name Printed: <u>Lynne Fidler</u>	Signature: <u>Lynne Fidler</u>

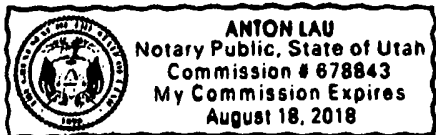
State of Utah)  
County of SALT LAKE

On this 23 day of May, in the year 2016,

Lynne Fidler personally appeared before me, who duly acknowledged to me that he/she executed this agreement pursuant to the authority delegated to him/her for the Utah Department of Transportation. Witness my hand and official seal.

(NOTARY SEAL)

Anton Lau  
Notary Public



(EXHIBIT A)

Legal Description of Real Property

**Parcel No. 9 (Tax Parcel No. 16-06-306-014):**

Commencing at the Northwest corner of Lot 2, Block 39, Plat A, Salt Lake City Survey; and running thence South 5 rods; thence East 154 feet; thence South 5 rods; thence East 55 feet, more or less, to a point 70.97 feet, more or less, West of the Southeast corner of said Lot 2; thence North 165 feet to the North line of said Lot 2; thence West along the North line of said Lot 2; a distance of 209 feet, more or less, to the place of beginning.

ALSO: Beginning at the Southwest corner of Lot 2, Block 39, Plat A, Salt Lake City Survey; and running thence East 154 feet; thence North 82.5 feet; thence West 154 feet; thence South 82.5 feet to beginning.

---

**Grantor hereby consolidates parcel 16-06-306-014 into Parcel A described as:**

A parcel of land being two tracts in Lot 2 Block 39, Plat "A", Salt Lake City Survey and located in the Southwest Quarter of Section 6, Township 1 South, Range 1 East, Salt Lake Meridian; said parcel was conveyed to Salt Lake County as Parcel 9 per that Special Warranty Deed recorded May 15, 2014, as Entry No. 11849863 in Book 10230, at Page 9590 and that Quit Claim Deed recorded May 15, 2014 as Entry No. 11849864 in Book 10230, at Page 9594 in the Office of the Salt Lake County Recorder and also shown on that certain A.L.T.A Survey plat filed as No. S2015-05-0195 in the Office of the Salt Lake County Surveyor; the boundary of said parcel of land is described as follows:

**Beginning** at the southwesterly Corner of said Lot 2 of Block 39 which point is 68.72 feet S. 89°47'38" E. along the centerline of 500 South Street and 63.78 feet N. 00°12'34" E. from a brass monument marking the intersection of Main Street and 500 South Street; thence N. 00°12'47" E. (Record = North) 165.00 feet along the westerly line to the northwesterly corner of said Lot 2; thence S. 89°47'29" E. (Record = East) 209.00 feet along the northerly line of said Lot 2; thence departing said northerly line S. 00°12'47" W. (Record = South) 165.00 feet to the southerly line of said Lot 2 of Block 39; thence N. 89°47'29" W. (Record = West) 209.00 feet along said southerly line to the **Point of Beginning**.

The above described parcel of land contains 34,485 square feet in area or 0.792 acres, more or less.

**EXHIBIT "B":** By this reference, made a part hereof.

**BASIS OF BEARINGS:** The Basis of Bearings is S. 89°47'38" E. between the Salt Lake City brass cap monument at the intersection of 500 South Street and Main Street and the Salt Lake City brass cap monument at the intersection of 500 South Street and State Street.

(EXHIBIT A)

Legal Description of Real Property

**Parcel No. 1 (Tax Parcel No 16-06-306-006):**

Beginning 84.5 feet South of the Northwest corner of Lot 4, Block 39, Plat A, Salt Lake City Survey, and running then South 40.5 feet, to a Point which is 40 feet North of the Southwest corner of said Lot 4; thence East 165 feet; thence North 40.5 feet; thence West 165 feet to the beginning.

**Parcel No. 2 (Tax Parcel No. 16-06-306-007):**

Beginning 25 feet North of the Southwest corner of Lot 4, Block 39, Plat A, Salt Lake City Survey, thence North 15 feet; thence East 82.5 feet; thence 15 feet; thence West 82.5 feet to beginning.

**Parcel No. 3 (Tax Parcel No. 16-06-306-008):**

Commencing at the Northwest corner of Lot 3, Block 39, Plat A, Salt Lake City Survey; and running thence South 5 rods; thence East 10 rods; thence North 122.50 feet; thence West 5 rods; thence South 15 feet; thence West 5 rods; thence South 25 feet to the place of beginning.

**Parcel No. 4 (Tax Parcel No. 16-06-306-009):**

Beginning 41.25 feet North of the Southwest corner of Lot 4, Block 39, Plat A, Salt Lake City Survey, thence North 41.25 feet, to a point which is 5 rods (82.50 feet) South of the Northeast corner of said Lot 4; thence West 165 feet; thence South 41.25 feet; thence East 165 feet to the place of beginning.

**Parcel No. 5 (Tax Parcel No. 16-06-306-010):**

Beginning at the Southeast corner of Lot 4, Block 39, Plat A, Salt Lake City Survey and running thence North 2 and 1/2 rods; thence West 10 rods; thence South 2 and 1/2 rods; thence East 10 rods to the point of beginning.

**Parcel No. 6 (Tax Parcel No. 16-06-306-011):**

Beginning at the Northeast corner of Lot 3, Block 39, Plat A, Salt Lake City Survey and running thence South 24 feet; thence West 165 feet; thence North 24 feet; thence East 165 feet to the point of beginning

**Parcel No. 7 (Tax Parcel No. 16-06-306-012):**

Commencing 24 feet South of the Northeast corner of Lot 3, Block 39; Plat A, Salt Lake City Survey, and running thence South 58.5 feet; thence West 165; thence North 58.5 feet; thence East 165 feet to the beginning.

**Parcel No. 8 (Tax Parcel No. 16-06-306-013):**

The South one-half of Lot 3, Block 39, Plat A, Salt Lake City Survey. Also, being described as follows: Commencing 82.5 feet South of the Northwest corner of Lot 3, Block 39, Plat A, Salt Lake City Survey, and running thence East 330 feet; thence South 82.5 feet; thence West 330 feet; thence North 82.5 feet to beginning.

**Parcel No. 10 (Tax Parcel No. 16-06-306-015):**

Beginning at a point 209 feet East of the Southwest corner of Lot 2, Block 39, Plat A, Salt Lake City Survey, and running thence East 50.03 feet; thence North 10 rods; thence West 50.03 feet; thence South 10 rods to the point of beginning.

**Parcel No. 11 (Tax Parcel No. 16-06-306-016):**

Beginning at the Southeast corner of Lot 2, Block 39, Plat A, Salt Lake City Survey and running thence North 165 feet; thence West 70.97 feet; thence South 165 feet; thence East 70.97 feet to the point of beginning.

Grantor hereby consolidates said parcels 16-06-306-006, 16-06-306-007, 16-06-306-008, 16-06-306-09, 16-06-306-010, 16-06-306-011, 16-06-306-012, 16-06-306-013, 16-06-306-015, 16-06-306-016 into Parcel B described as:

A parcel of land being ten entire tracts in Lots 2, 3, and 4 of Block 39, Plat "A", Salt Lake City Survey and located in the Southwest Quarter of Section 6, Township 1 South, Range 1 East, Salt Lake Base and Meridian; said parcels were conveyed to Salt Lake County per that Special Warranty Deed recorded May 15, 2014 as Entry No. 11849863 in Book 10230 at Page 9590 and that Quit Claim Deed recorded May 15, 2014 as Entry No. 11849864 in Book 10230, at Page 9594 in the Office of the Salt Lake County Recorder also shown on that certain A.L.T.A Survey plat filed as No. S2015-05-0195 in the Office of the Salt Lake County Surveyor; the boundary of said parcel of land is described as follows:

**Beginning** at the northwesterly Corner of said Lot 2 of Block 39 which point is 68.72 feet S. 89°47'38" E. along the centerline of 500 South Street and 63.78 feet N. 00°12'34" E. and 165.00 feet N. 00°12'47" E. (Record = North) along the westerly line of said Lot 2 of Block 39 from a brass monument marking the intersection of Main Street and 500 South Street; thence N. 00°12'47" E. (Record = North) 245.52 feet along the westerly line of said Lots 3 and Lot 4 to a northwesterly corner of said parcel; thence along the northerly and westerly lines of said parcel the following three (3) courses: 1) S. 89°47'29" E. (Record = East) 165.00 feet; 2) N. 00°58'10" E. (Record = North) 1.98 feet; 3) S. 89°47'29" E. (Record = East) 165.00 feet to the easterly line of said Lot 4; thence S. 00°13'04" W. (Record = South) 412.50 feet along the easterly lines of said Lots 4, 3, and 2 to the southeasterly corner of said Lot 2; thence N. 89°47'29" W. (Record = West) 121.00 feet along the southerly line of said Lot 2 and Block 39 to a southwesterly corner of said parcel; thence departing said southerly Lot and Block line N. 00°12'47" E. (Record = North) 165.00 feet along a westerly boundary line of said parcel to the northerly line of said Lot 2; thence N. 89°47'29" W. 209.00 feet along the northerly line of said Lot 2 to the **Point of Beginning**.

The above described parcel of land contains 101,319 square feet in area or 2.326 acres, more or less.

**EXHIBIT "B":** By this reference, made a part hereof.

**BASIS OF BEARINGS:** The Basis of Bearing is S. 89°47'38" E. between the Salt Lake City brass cap monument at the intersection of 500 South Street and Main Street and the Salt Lake City brass cap monument at the intersection of 500 South Street and State Street.



**EXHIBIT B**

(include drainage plan showing state route, mile post and location of all drainage systems and drainage calculations)

"EXHIBIT B"—Department Drainage Agreement (per UDOT Policy 08A-06)

Exhibit B

**PEPG CONSULTING**  
L.L.C.

**Salt Lake County  
SLC District Attorney Building  
Drainage Report**

Located at  
500 South Main Street  
Salt Lake City, Utah

**April 18, 2016**

Prepared by  
Ryan Kitchen, P.E.

Prepared for  
Salt Lake City

{P:\1187.1510\hd\drainage\_report.docx}

---

8805 South Sandy Parkway • Sandy, UT 84070 • (801) 562-2521 • Fax (801) 562-2551 • [www.pepg.net](http://www.pepg.net)

---

### **Introduction**

The Salt Lake County District Attorney Building project is located at 500 South Main Street in Salt Lake City, Utah. The development consists of constructing a new building and parking garage on roughly 1.5 acres. This development replaces the existing parking lot and building south of the Garff property. The footprint of the new building is roughly 17,000 square feet and the footprint of the parking garage is roughly 22,600 square feet. This report addresses the storm drainage design for the project. Maps of the drainage system schematic and drainage construction drawing are included in the appendix. The labels on the schematic map are referenced in this report.

### **Hydrology**

The rational method was used to calculate storm water runoffs and volumes. Five areas were subdivided based on the drainage to each catch basin inlet or roof drain. We calculated the peak flows for the 10-year and 100-year design storms using the Farmer Fletcher distribution for each drainage area. We also calculated the peak flow for 0.5 inches of precipitation in 10 minutes to obtain the LEED point for water quality. Rational coefficients were weighted based on the percentage of impervious area. Precipitation data and distribution are included in the appendix. Hydrology calculations are also attached in the appendix. A summary of our calculations is shown in Table 1. The peak water quality flow for the site is 3.58 cfs.

*Table 1: Summary of Peak Flows*

ID	Peak Flows	
	10-Yr	100-Yr
DA1	0.16	0.28
DA2	0.16	0.29
DA3	0.87	1.54
DA4	0.61	1.08
DA5	1.16	2.05

### **Hydraulic Design**

We used Manning's equation to size each pipe based on the results of our hydrologic analysis. Each pipe was designed to convey the 100-year design flow without overtopping. Our hydraulic calculations are attached in the appendix. A summary of our calculations is shown in Table 2.

**Table 2: Pipe Sizing Summary**

ID	Pipe Size (in)	Slope (%)	Capacity (cfs)	10-Year		100-Year	
				Peak Flow (cfs)	% Full	Peak Flow (cfs)	% Full
P1	12	0.40%	2.45	0.16	6.4%	0.28	11.3%
P2	12	0.40%	2.45	0.32	13.0%	0.56	23.1%
P3	10	2.00%	3.37	0.87	25.8%	1.54	45.8%
P4	15	0.40%	4.44	1.80	40.5%	3.18	71.8%
P5	10	2.00%	3.37	1.16	34.4%	2.05	60.9%
P6	18	0.40%	7.22	2.96	41.0%	5.24	72.5%
O1	8	0.20%	0.59	0.29	50.0%	0.29	50.0%

**Detention Design**

We designed an underground detention basin with 42" pipes to control the outlet flow to 0.2 cfs per acre for the 100-year storm as required by Salt Lake City. Our detention basin calculations are attached in the appendix. We designed a 2-3/8" orifice to limit the offsite discharge to 0.29 cfs. A summary of our calculations is shown in Table 3. In the case of overflow, water will exit the two southern-most catch basins and drain into 500 South. The buildings were also designed at raised elevations to direct storm water away in the case of a pipe clog or extreme rainfall event.

**Table 3: Detention Basin Design Summary**

<b>Proposed 100-Yr Peak Inflow</b>	5.24 cfs
<b>Orifice Size</b>	2-3/8"
<b>Peak Offsite Discharge</b>	0.29 cfs
<b>Detention Volume Required</b>	6,006 cubic feet
<b>Underground Pipes Capacity</b>	6,465 cubic feet

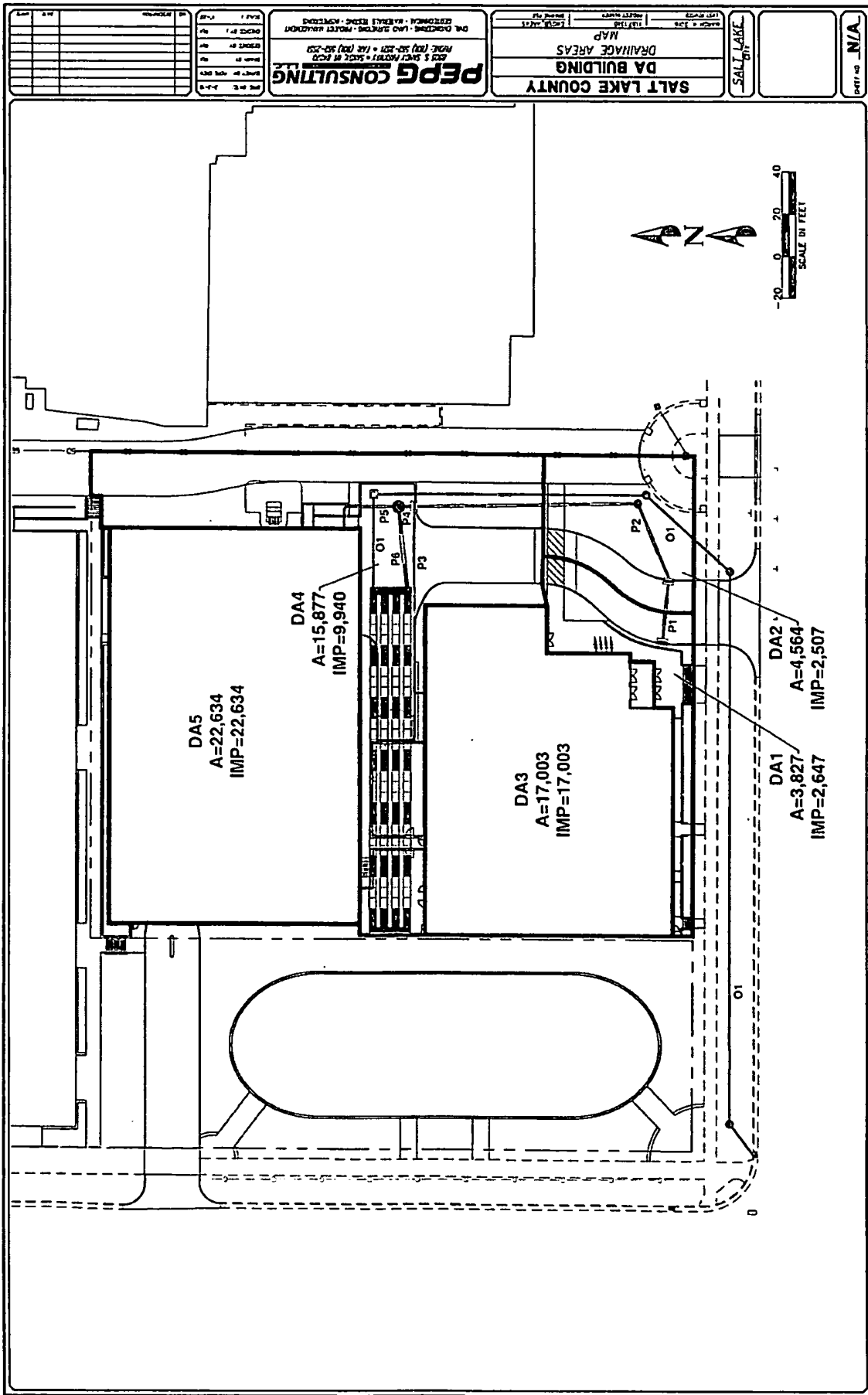
**Water Quality**

We designed a water treatment device that can treat the 0.5" storm with 80% TSS removal. We chose a Contech CDS 3035 unit to provide this treatment. The contractor may also select an equal product as approved by PEPG Consulting and Salt Lake City Public Utilities.

**Conclusion**

This report addresses the storm water drainage for the proposed Salt Lake County SLC DA Building project. We have evaluated the 10-year and 100-year storms. The proposed pipes and underground detention basin were designed to handle the 100-year peak flow with 0.2 cfs/acre runoff as required by Salt Lake City. Water quality treatment was designed for the 0.5" storm as required by LEED. This drainage design is compliant with Salt Lake City, Utah, and US guidelines and requirements.

**Appendix**



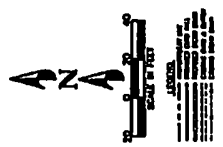
**HTN**  
 ARCHITECTS  
 1000 EAST 1000 SOUTH  
 SALT LAKE CITY, UT 84143  
 TEL: 313.222.2222  
 FAX: 313.222.2222  
 WWW: HTNARCHITECTS.COM

**SALT LAKE CITY**  
**DISTRICT ATTORNEY**  
**OFFICE BUILDING**  
 25 EAST 500 SOUTH  
 SALT LAKE CITY, UTAH

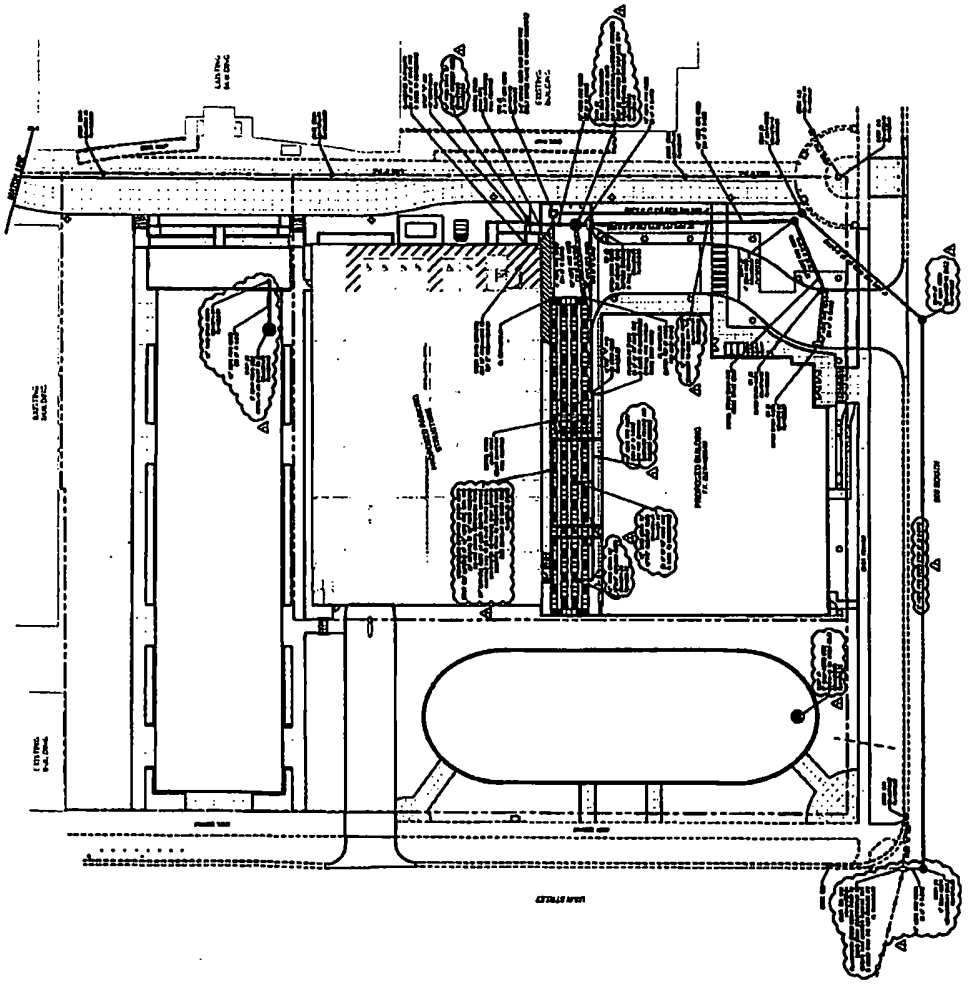
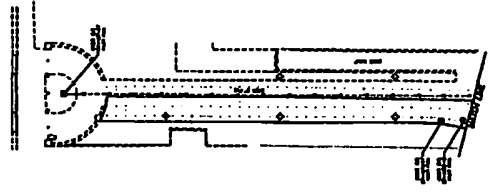


DATE: 10/15/2013
PROJECT: DISTRICT ATTORNEY OFFICE BUILDING
DRWG: OVERALL DRAINAGE PLAN
SCALE: AS SHOWN
DESIGNED BY: [Name]
CHECKED BY: [Name]
IN CHARGE: [Name]

**OVERALL**  
**DRAINAGE PLAN**  
**C4.0**



1. ALL NEW DRAINAGE SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE UTAH DRAINAGE CODE AND THE UTAH CONSTRUCTION CODE. THE DESIGNER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE DESIGNER SHALL ALSO BE RESPONSIBLE FOR OBTAINING ALL NECESSARY INFORMATION FROM THE CLIENT AND OTHER AGENCIES. THE DESIGNER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY INFORMATION FROM THE CLIENT AND OTHER AGENCIES. THE DESIGNER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY INFORMATION FROM THE CLIENT AND OTHER AGENCIES.



## Precipitation

10-Year Precipitation= 1.09

100-Year Precipitation= 1.93

Time (min)	Precipitation (%)	10-Year Precip (in)	100-Year Precip (in)
0-15	1.9%	0.021	0.037
15-30	3.7%	0.040	0.071
30-45	60.5%	0.659	1.168
45-60	78.0%	0.850	1.505
60-75	84.8%	0.924	1.637
75-90	88.8%	0.968	1.714
90-105	90.7%	0.989	1.751
105-120	92.6%	1.009	1.787
120-135	94.4%	1.029	1.822
135-150	96.3%	1.050	1.859
150-165	98.1%	1.069	1.893
165-180	100.0%	1.090	1.930

10-Year Peak Intensity= 2.476

100-Year Peak Intensity= 4.385

Peak Intensity was found by taking 2/3 of the peak 15 min to get the precipitation in 10 min, then multiplying by 6 to get its intensity in in/hr.



## Proposed Site

LEED Water Quality (WQ) Precipitation (in) 0.5  
 LEED Water Quality (WQ) Precipitation (in/hr) 3 (10 minute minimum duration)

DA1	DA2	DA3	DA4
Area (sq. ft.) 3827	Area (sq. ft.) 4564	Area (sq. ft.) 17003	Area (sq. ft.) 15877
Area (ac.) 0.09	Area (ac.) 0.10	Area (ac.) 0.39	Area (ac.) 0.36
TOC (min.) 10	TOC (min.) 10	TOC (min.) 10	TOC (min.) 10
10 Yr Peak I (in/hr) 2.476	10 Yr Peak I (in/hr) 2.476	10 Yr Peak I (in/hr) 2.476	10 Yr Peak I (in/hr) 2.476
100 Yr Peak I (in/hr) 4.385	100 Yr Peak I (in/hr) 4.385	100 Yr Peak I (in/hr) 4.385	100 Yr Peak I (in/hr) 4.385
Perv. Area (sq. ft.) 1180	Perv. Area (sq. ft.) 2057	Perv. Area (sq. ft.) 0	Perv. Area (sq. ft.) 5937
Prop. Weighted C 0.71	Prop. Weighted C 0.63	Prop. Weighted C 0.90	Prop. Weighted C 0.68
Prop. WQ Flow (cfs) 0.19	Prop. WQ Flow (cfs) 0.20	Prop. WQ Flow (cfs) 1.05	Prop. WQ Flow (cfs) 0.74
Prop. Qp10 (cfs) 0.16	Prop. Qp10 (cfs) 0.16	Prop. Qp10 (cfs) 0.87	Prop. Qp10 (cfs) 0.61
Prop. Qp100 (cfs) 0.28	Prop. Qp100 (cfs) 0.29	Prop. Qp100 (cfs) 1.54	Prop. Qp100 (cfs) 1.08
<b>DA5</b>		<b>Total Site</b>	
Area (sq. ft.) 22634		Area (sf) 63905	
Area (ac.) 0.52		Area (ac) 1.47	
TOC (min.) 10		PA (sf) 9174	
10 Yr Peak I (in/hr) 2.476		Wtd. C 0.814	
100 Yr Peak I (in/hr) 4.385		.2 cfs/ac 0.293	
Perv. Area (sq. ft.) 0		Total WQ Flow (cfs) 3.58	
Prop. Weighted C 0.90		Total Qp10 (cfs) 2.96	
Prop. WQ Flow (cfs) 1.40		Total Qp100 (cfs) 5.24	
Prop. Qp10 (cfs) 1.16			
Prop. Qp100 (cfs) 2.05			

NOTE: We used a minimum time of concentration of 10 minutes because of the relatively short drainage paths.

## Pipe Sizing

ID	Dia. (in.)	Min. Slope (%)	N	Capacity	10-Year		100-Year	
					Actual	% Full	Actual	% Full
P1	12	0.40%	0.012	2.45	0.16	6.4%	0.28	11.3%
P2	12	0.40%	0.012	2.45	0.32	13.0%	0.56	23.1%
P3	10	2.00%	0.012	3.37	0.87	25.8%	1.54	45.8%
P4	15	0.40%	0.012	4.44	1.80	40.5%	3.18	71.8%
P5	10	2.00%	0.012	3.37	1.16	34.4%	2.05	60.9%
P6	18	0.40%	0.012	7.22	2.96	41.0%	5.24	72.5%
O1	8	0.20%	0.012	0.59	0.29	50.0%	0.29	50.0%

**100 Year Detention Volume**

Rational C=	0.814
Area (sq. ft.)=	63905
Area (ac.)=	1.47
Orifice (in)=	2.375
Head (ft)=	3.45
Outlet (cfs)=	0.293

Storm (min)	Precipitation (in)	Intensity (in/hr)	Peak Inflow (cfs)	Peak Outflow (cfs)	Volume (cu. ft.)
0-15	0.037	0.15	0.18	0.18	0
15-30	0.071	0.14	0.17	0.17	0
30-45	1.168	4.38	5.24	0.293	4449
45-60	1.505	1.35	1.61	0.293	5637
60-75	1.637	0.52	0.63	0.293	5938
75-90	1.714	0.31	0.37	0.293	6006
90-105	1.751	0.15	0.18	0.293	5900
105-120	1.787	0.15	0.18	0.293	5794
120-135	1.822	0.14	0.17	0.293	5680
135-150	1.859	0.15	0.18	0.293	5574
150-165	1.893	0.14	0.17	0.293	5459
165-180	1.930	0.15	0.18	0.293	5353

15 Min. Peak Flow (cfs)=	5.24
Detention Req'd (cu. ft.)=	8006