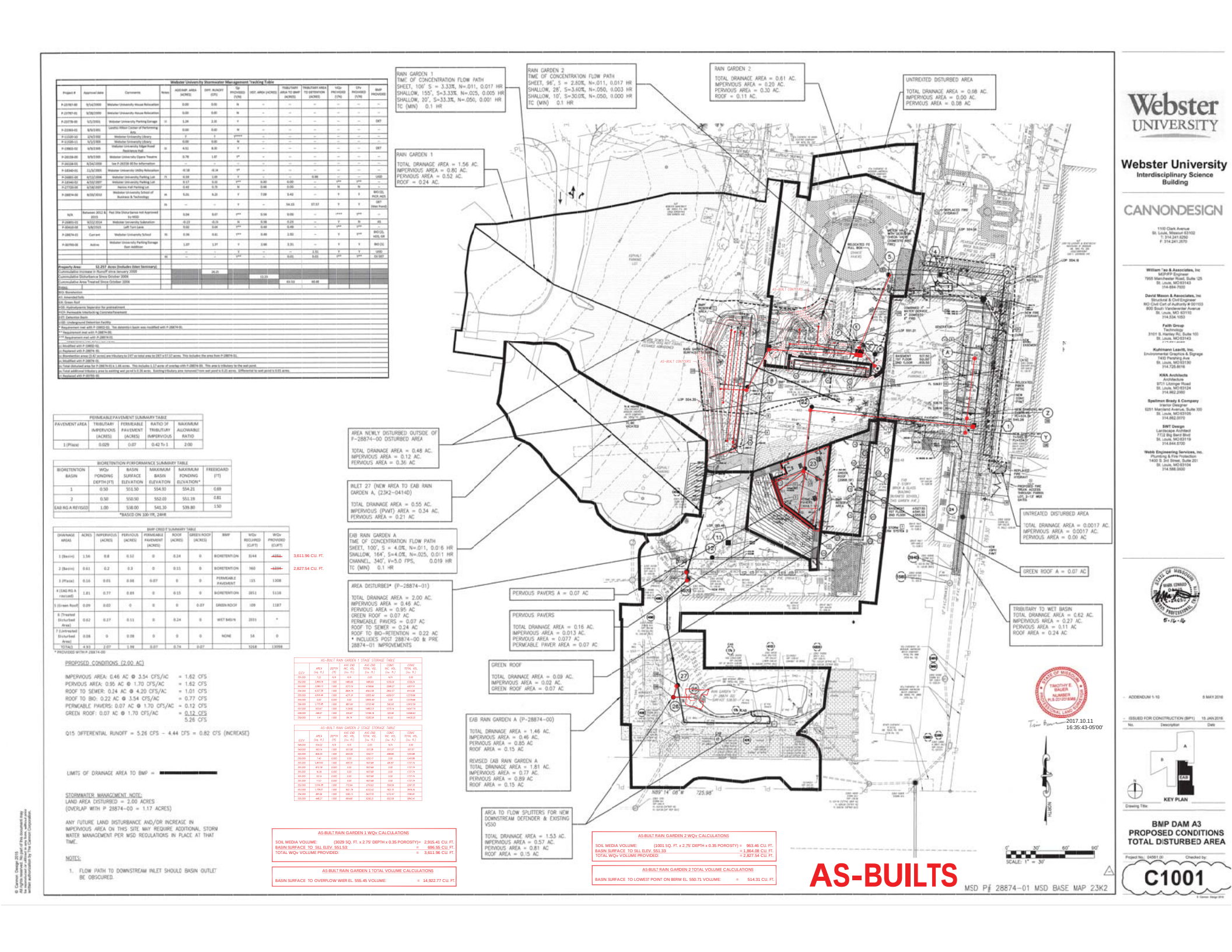

Webster Univerisity Stormwater Management Tracking Table

Project #	Approval date	Comments	Notes	ADD'NAL AREA (ACRES)	DIFF. RUNOFF (CFS)	Q< PROVIDED (Y/N)	DIST. AREA (ACRES)	TRIBUTARY AREA TO BMP (ACRES)	TRIBUTARY AREA TO DETENTION (ACRES)	WQv PROVIDED (Y/N)	CPv PROVIDED (Y/N)	BMP PROVIDED
P-23787-00	9/14/2000	Webster University House Relocation		0.00	0.00	N	–	–	–	–	–	–
P-23787-01	9/28/2000	Webster University House Relocation		0.00	0.00	N	–	–	–	–	–	–
P-23778-00	5/1/2001	Webster University Parking Garage	11	1.26	2.32	Y	–	–	–	–	–	DET
P-23363-01	9/6/2001	Loretto-Hilton Center of Performing Arts		0.00	0.00	N	–	–	–	–	–	–
P-11320-10	2/5/2002	Webster University Library		0	0	*****	–	–	–	–	–	–
P-11320-11	5/1/2003	Webster University Library		0.00	0.00	N	–	–	–	–	–	–
P-19902-02	9/16/2005	Webster University Edgar Road Residence Hall	11	4.51	8.30	Y	–	–	–	–	–	DET
P-26158-00	9/6/2005	Webster University Opera Theatre		0.78	1.67	Y*	–	–	–	–	–	–
P-26158-01	9/26/2009	See P-26158-00 for information		–	–	–	–	–	–	–	–	–
P-18340-01	11/6/2005	Webster University Utility Relocation		-0.18	-0.34	Y*	–	–	–	–	–	–
P-26801-00	4/12/2006	Webster University Parking Lot	15	0.59	1.09	Y	–	–	0.98	–	–	UGD
P-18340-02	4/10/2007	Webster University Parking Lot		0.17	0.33	Y**	0.00	0.00	–	***	***	–
P-27729-00	4/18/2007	Nerinx Hall Parking Lot		0.43	0.79	N	0.48	0.00	–	N	N	–
P-28874-00	8/20/2013	Webster University School of Business & Technology	26	5.01	9.23	Y	7.09	3.42	–	Y	Y	BIO (2), PICP, HCS
			26	–	–	Y	–	54.13	57.57	Y	Y	DET (Inter Pond)
N/A	Between 2012 & 2015	Post Site Disturbance not Approved by MSD		0.04	0.07	Y**	0.54	0.00	–	***	***	–
P-26801-01	9/22/2014	Webster University Substation		-0.13	-0.19	N	0.38	0.23	–	Y	N	AS
P-30410-00	5/6/2015	Left Turn Lane		0.32	0.64	Y**	0.49	0.49	–	***	***	–
P-28874-01	Current	Webster University School	31	0.36	0.61	Y**	0.48	2.02	–	Y	Y**	BIO (2), HDS, GE
P-30793-00	Active	Webster Univesrsity Parking Garage East Addition		1.07	1.97	Y	2.66	3.31	–	Y	Y	BIO (2)
				–	–	Y	–	–	2.31	Y	Y	UGD
			36	–	–	Y**	–	–	0.01	0.03	***	***	EX DET
Property Area:	52.257 Acres (Includes Eden Seminary)											
Cumulative Increase in Runoff since January 2000						26.25						
Cumulative Disturbance Since October 2006							13.19					
Cumulative Area Treated Since October 2006								49.53	60.85			

1) DDS:
BIO: Bioretention
AS: Amended Soils
GR: Green Roof
HDS: Hydrodynamic Separator for pretreatment
PICP: Permeable Interlocking Concrete Pavement
DET: Detention Basin
UGD: Underground Detention Facility
* Requirement met with P-19902-02. The detention basin was modified with P-28874-00.
** Requirement met with P-28874-00.
*** Requirement met with P-28874-01.
2) Modified with P-19902-02.
3) Replaced with P-28874-00.
4) Bioretention areas (3.42 acres) are tributary to DET so total area to DET is 57.57 acres. This includes the area from P-28874-01.
5) Modified with P-28874-00.
6) Total disturbed area for P-28874-01 is 1.46 acres. This includes 1.17 acres of overlap with P-28874-00. This area is tributary to the wet pond.
7) Total additional tributary area to existing wet pond is 0.36 acres. Existing tributary area removed from wet pond is 0.23 acres. Differential to wet pond is 0.01 acres.
8) Replaced with P-30793-00.

PERMEABLE PAVEMENT SUMMARY TABLE

PAVEMENT AREA	TRIBUTARY IMPERVIOUS (ACRES)	PERMEABLE PAVEMENT (ACRES)	RATIO OF TRIBUTARY IMPERVIOUS	MAXIMUM ALLOWABLE RATIO
1 (Plaza)	0.029	0.07	0.42 To 1	2:00

BIORETENTION PERFORMANCE SUMMARY TABLE

BIORETENTION BASIN	WQv PONDING DEPTH (FT)	BASIN SURFACE ELEVATION	MAXIMUM BASIN ELEVATION	MAXIMUM PONDING ELEVATION*	FREEBOARD (FT)
1	0.50	551.50	554.93	554.21	0.69
2	0.50	550.50	552.00	551.19	0.81
EAB RG A REVISED	1.00	538.00	541.30	539.80	1.50
		*BASED ON 100-YR, 24HR			

BMP CREDIT SUMMARY TABLE

DRAINAGE AREAS	ACRES	IMPERVIOUS (ACRES)	PERVIOUS (ACRES)	PERMEABLE PAVEMENT (ACRES)	ROOF (ACRES)	GREEN ROOF (ACRES)	BMP	WQv REQUIRED (CUFT)	WQv PROVIDED (CUFT)	
1 (Basin)	1.56	0.8	0.52	0	0.24	0	BIORETENTION	3144	~~4351~~	3,611.96 CU. FT.
2 (Basin)	0.61	0.2	0.3	0	0.11	0	BIORETENTION	960	~~1334~~	2,827.54 CU. FT.
3 (Plaza)	0.16	0.01	0.08	0.07	0	0	PERMEABLE PAVEMENT	135	1308	
4 (EAG RG A revised)	1.81	0.77	0.89	0	0.15	0	BIORETENTION	2851	5116	
5 (Green Roof)	0.09	0.02	0	0	0	0.07	GREEN ROOF	109	1187	
6 (Treated Disturbed Area)	0.62	0.27	0.11	0	0.24	0	WET BASIN	2031	*	
7 (Untreated Disturbed Area)	0.08	0	0.08	0	0	0	NONE	58	0	
TOTALS	4.93	2.07	1.98	0.07	0.74	0.07		5268	13098	

* PROVIDED WITH P-28874-00

PROPOSED CONDITIONS (2.00 AC)

IMPERVIOUS AREA: 0.46 AC @ 3.54 CFS/AC = 1.62 CFS
PERVIOUS AREA: 0.95 AC @ 1.70 CFS/AC = 1.62 CFS
ROOF TO SEWER: 0.24 AC @ 4.20 CFS/AC = 1.01 CFS
ROOF TO BIO: 0.22 AC @ 3.54 CFS/AC = 0.77 CFS
PERMEABLE PAVERS: 0.07 AC @ 1.70 CFS/AC = 0.12 CFS
GREEN ROOF: 0.07 AC @ 1.70 CFS/AC = 0.12 CFS
5.26 CFS

Q15 DIFFERENTIAL RUNOFF = 5.26 CFS – 4.44 CFS = 0.82 CFS (INCREASE)

LIMITS OF DRAINAGE AREA TO BMP =

STORMWATER MANAGEMENT NOTE:
LAND AREA DISTURBED = 2.00 ACRES
(OVERLAP WITH P 28874–00 = 1.17 ACRES)

ANY FUTURE LAND DISTURBANCE AND/OR INCREASE IN IMPERVIOUS AREA ON THIS SITE MAY REQUIRE ADDITIONAL STORM WATER MANAGEMENT PER MSD REGULATIONS IN PLACE AT THAT TIME.

NOTES:

1. FLOW PATH TO DOWNSTREAM INLET SHOULD BASIN OUTLET BE OBSCURED.

AS-BUILT RAIN GARDEN 1 STAGE STORAGE TABLE

ELEV.	AREA (sq. ft.)	DEPTH (ft)	AVE END AC. VOL. (cu. ft.)	AVE END TOTAL VOL. (cu. ft.)	CONIC AC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
550.00	7.22	0.0	0.0	0.00	N/A	0.00
552.00	2,841.9	2.00	5,483.83	5,483.83	5,520.24	5,520.24
553.00	3,260.13	1.00	3,051.01	8,534.84	3,044.25	8,564.50
554.00	4,327.28	1.00	3,804.70	12,339.53	3,862.57	12,427.08
555.00	4,595.48	1.00	4,471.38	16,810.92	4,459.57	16,886.65
555.05	0.00	0.05	114.89	16,925.81	0.00	16,976.48
556.00	1,775.09	1.00	887.69	17,813.49	566.83	17,543.31
557.00	10.67	1.00	1,138.92	18,952.41	1,125.14	18,667.74
558.00	34.67	1.00	22.67	18,998.78	20.00	18,688.62
559.00	1.41	1.00	24.74	19,023.19	15.02	19,703.21

AS-BUILT RAIN GARDEN 2 STAGE STORAGE TABLE

ELEV.	AREA (sq. ft.)	DEPTH (ft)	AVE END AC. VOL. (cu. ft.)	AVE END TOTAL VOL. (cu. ft.)	CONIC AC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
545.00	554.02	N/A	N/A	0.00	N/A	0.00
546.00	967.16	1.00	817.09	817.09	817.07	817.07
547.00	804.09	1.00	883.09	1700.17	888.80	1705.88
548.00	1.40	1.00	402.75	2102.91	0.00	1705.88
551.00	1,787.62	3.00	4803.3	6907.68	4805.87	7511.74
551.05	813.28	0.05	61.01	6968.69	0.00	7511.74
551.33	6.28	0.33	0.00	6968.69	0.00	7511.74
551.33	35.16	0.000	0.00	6968.69	0.00	7511.74
551.33	11.67	0.000	0.00	6968.69	0.00	7511.74
552.00	1,014.78	1.00	772.44	7741.12	559.59	8071.33
553.00	1,709.23	1.00	1362.79	9103.92	1425.31	9496.64
554.00	891.08	1.00	1286.15	10390.07	1210.47	10707.11
555.00	440.27	1.00	654.65	11044.72	612.59	11319.71

AS-BUILT RAIN GARDEN 1 WQv CALCULATIONS

SOIL MEDIA VOLUME: (3029 SQ. FT. x 2.75' DEPTH x 0.35 POROSITY)= 2,915.41 CU. FT.
BASIN SURFACE TO SILL ELEV. 551.53 = 696.55 CU. FT.
TOTAL WQv VOLUME PROVIDED: = 3,611.96 CU. FT.

AS-BUILT RAIN GARDEN 1 TOTAL VOLUME CALCULATIONS

BASIN SURFACE TO OVERFLOW WIER EL. 555.45 VOLUME: = 14,922.77 CU. FT.

AS-BUILT RAIN GARDEN 2 WQv CALCULATIONS

SOIL MEDIA VOLUME: (1001 SQ. FT. x 2.75' DEPTH x 0.35 POROSITY) = 963.46 CU. FT.
BASIN SURFACE TO SILL ELEV. 551.33 = 1,864.08 CU. FT.
TOTAL WQv VOLUME PROVIDED: = 2,827.54 CU. FT.

AS-BUILT RAIN GARDEN 2 TOTAL VOLUME CALCULATIONS

BASIN SURFACE TO LOWEST POINT ON BERM EL. 550.71 VOLUME: = 514.31 CU. FT.

AS-BUILTS

MSD P# 28874–01 MSD BASE MAP 23K2

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Webster University
Interdisciplinary Science Building

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6-16-16

TIMOTHY B. BAUER
NUMBER PLS-2012088
PROFESSIONAL LAND SURVEYOR

Tim Bauer 2017.10.11 16:35:43-05'00'

No.	Description	Date
–	ADDENDUM 1-10	5 MAY 2016
–	ISSUED FOR CONSTRUCTION (BP1)	15 JAN 2016

KEY PLAN

Drawing Title:

BMP DAM A3
PROPOSED CONDITIONS
TOTAL DISTURBED AREA

Project No.: 94561.00 Checked by:

C1001

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