ATTACHMENT H

December 2012

TECHNICAL MEMORANDUM

To: Wayne Schuster
Director OPES

From: Ross Gordon
Project Manager

Subject: **Hotel Development Environmental Support - Stormwater Analysis**
Comprehensive Environmental Compliance Services
MAA SV-10-001B– Task Order No. 13
Baltimore/Washington International
Thurgood Marshall Airport

The Maryland Aviation Administration has conceptual plans to redevelop a site behind the existing hourly garage and construct a new hotel. As part of this plan, AECOM is providing guidance on water quality management requirements which will affect this project. This technical memorandum is prepared as agreed upon through the Scope and Fee Proposal under the MAA SV-10-001B contract agreement, Task Order No. 13.

The purpose of this technical memorandum is to conceptually evaluate and quantify strategies for complying with water quality management requirements at the future hotel site. Analysis steps include determination of anticipated stormwater management requirements, development of conceptual compliance alternatives, and development of conceptual cost estimates. It is understood that a proposed site plan does not exist, and therefore this analysis is being performed for a theoretical site plan intended to represent a likely development. The theoretical hotel site is approximately 2.5 acres in size and contains site components similar to those presented in the document titled “Terminal Area Hotel Planning Considerations”, dated May 8, 2012. This technical memorandum addresses the Maryland Department of Environment (MDE) stormwater management requirements for redevelopment activities, which considers only management of the water quality volume. Should this project result in additional impacts to downstream storm drain systems, additional requirements for flood control or channel protection may be applicable. Furthermore, this analysis does not consider erosion and sediment control requirements during construction or other applicable building permit requirements.

Stormwater Management Regulations

The hotel site was analyzed in accordance with the *Stormwater Management Act of 2007*, the *2000 Maryland Stormwater Design Manual (2009 revisions)*, and the *2010 Maryland Stormwater Management Guidelines for State & Federal Projects*. These guidelines require Environmental Site Design (ESD) practices to be implemented to the maximum extent practicable (MEP) to meet stormwater management requirements. Structural practices may be allowable if ESD practices are not practicable. For redevelopment sites, which are defined as any site being constructed on, altered or improved which has greater than 40 percent existing impervious cover, water quality treatment for the first 1 inch of runoff is required for 50 percent of the existing impervious cover. For redevelopment sites with increases in impervious cover, additional impervious cover is treated as new development. For redevelopment sites with decreases in impervious cover, treatment requirements can be met through a combination of stormwater management practices and impervious removal.

Placement of stormwater management is restricted due to wildlife hazard considerations. FAA Advisory Circular 150/5200-33, *Wildlife Hazard Attractants on or Near Airports,* warns against the creation of any open water within 10,000 feet of aircraft movement areas or within five miles of approach or departure surfaces. Due to its location, the proposed hotel site is likely to be subject to wildlife hazard restrictions.

Stormwater Management Compliance

As the proposed hotel site is currently approximately 100% impervious, the project would be classified as redevelopment. To comply with MDE regulations, the proposed redevelopment project must address the water quality volume for 50% of the existing site impervious cover. It is estimated that 2.5 acres of existing impervious cover will be disturbed; therefore water quality treatment must be addressed for 1.25 acres of impervious cover. It is also expected that about 10 percent, or 0.25 acres, of the proposed site will be converted to pervious cover. Therefore, 1 inch of water quality treatment must be provided for 1.00 acre which translates to a total water quality treatment volume of 0.079 acre-ft. The detailed calculations are shown below.

$$WQ_V = P_E \times R_v \times A_{ESD} \div 12$$

$$P_E = Rainfall\ target\ used\ to\ determine\ ESD\ goals$$
$$= 1.0\ inch$$

$$R_V = Dimensionless\ volumetric\ runoff\ coefficient$$
$$= 0.05 + (0.009 \times I); I = 100$$
$$= 0.05 + (0.009 \times 100)$$
$$= 0.95$$

$$A_{ESD} = Drainage\ Area\ to\ be\ treated$$
$$= (50\% \times 2.5\ Acres) - 0.25\ Acres\ Imp.Removed$$
$$= 1.0\ Acres$$

$$WQ_V = 1 \times 0.95 \times 1.0 \div 12$$

$$WQ_V = 0.079\ ac-ft \quad (3{,}450\ ft^3)$$

Conceptual Compliance Alternatives:

Four stormwater management scenarios were analyzed for this site. These include:

- Scenario 1 – Micro-Bioretention
- Scenario 2 – Pervious Pavement
- Scenario 3 – Subsurface Infiltration
- Scenario 4 – Pavement Removal

These four scenarios were evaluated to determine the range of potential compliance costs depending on the ultimate compliance strategy employed. Scenario 1, 2 and 4 would be classified as ESD practices, while Scenario 3 would likely be classified as a structural practice.

Scenario 1: Micro-Bioretention

This scenario proposes the ESD practice of micro-bioretention to manage the WQ_V of 0.079 ac-ft. This scenario assumes placement of micro-bioretention cells in parking lot islands and in available green space (center of parking lot roundabout). Proposed site plans, which call for approximately 0.25 acres of landscaping, could accommodate these micro-bioretention cells inside proposed landscape areas without expanding the site footprint. Underdrains may be necessary depending on the in-situ soil conditions. Should high groundwater be present, micro-bioretention may not be a feasible option.

The calculation determining the approximate required micro-bioretention filter bed area is shown below.

$$A_{Req'd filter\ bed} = A_{ESD} \times \frac{P_E}{15}$$

$$A_{Req'd filter\ bed} = 1.0\ Ac \times \frac{1.0\ in}{15}$$

$$A_{Req'd filter\ bed} = 0.067\ Ac\ or \sim \mathbf{3,000\ ft^2}$$

The estimated volume captured and treated by 3,000 ft^2 of micro-bioretention filter bed, based on a 6 inch ponding depth and a 2.5 foot filter bed depth is 4,500 ft^3, which is greater than the required WQ_v (3,450 ft^3), and thus is sufficient. This calculation is shown below.

$$Volume = (A_{filter} \times Ponding\ Depth) + (A_{filter} \times Filter\ Depth \times Media\ Porosity, 0.4)$$

$$= (3{,}000 \times 0.5) + (3{,}000 \times 2.5 \times 0.4)$$

$$= \mathbf{4,500\ ft^3}$$

To accommodate a 3,000 ft^2 filter bed, approximately 1.5 times the filter bed area, or 4,500 ft^2 of total space, is required for associated areas on the peripheries of the filter bed such as areas for pretreatment and/or side slopes. An exhibit illustrating conceptual locations for micro-bioretention is included in ***Appendix A***.

Scenario 2: Pervious Pavement

As previously mentioned, water quality requirements can be met through pavement removal. Any existing impervious areas that are replaced with pervious pavement on the proposed site would be considered pervious. Thus, if 1 acre of proposed paved areas, such as parking lots and low-traffic access roads, were paved with pervious pavement, this in conjunction with a proposed 0.25 acres of pervious would result in a site decrease of impervious cover of 50% or 1.25 acres and would satisfy water quality requirements.

As pervious pavement is typically not recommended in higher traffic areas, pervious pavement is likely most feasible in lower traffic areas such as parking areas. Based on the conceptual site layout, it is estimated that proposed parking areas total approximately 0.35 acres. Thus if pervious pavement was maximized on site, treatment of the water quality volume would still need to be provided for a remaining 0.65 acres of impervious or an WQ_V of 0.051 acre-feet. As shown below, this remaining goal could be accomplished with approximately 1,900 ft^2 of micro-bioretention filter bed, or approximately 2,850 ft^2 of total site area.

$$A_{Req'd filter\ bed} = A_{ESD} \times \frac{P_E}{15}$$

$$A_{Req'd filter\ bed} = 0.65\ Ac \times \frac{1.0\ in}{15}$$

$$A_{Req'd filter\ bed} = 0.043\ Ac\ or\ \sim\mathbf{1,900\ ft^2}$$

Note that the use of pervious pavement may be limited by in-situ soil conditions, as a sufficient infiltration rate is required by MDE. If soil conditions are adequate, water quality requirements could be met through a combination of 0.35 acres of pervious pavement and 2,850 ft^2 of micro-bioretention. An exhibit illustrating conceptual locations for pervious pavement and micro-bioretention is included in ***Appendix A***.

Scenario 3: Subsurface Infiltration

This scenario proposes a subsurface infiltration facility to manage the water quality volume. By infiltrating water under proposed pavement, the development footprint does not need to be expanded to account for stormwater management. Two different types of facilities are included in this scenario for cost comparison purposes, both of which are proprietary systems. The first facility type consists of arched open bottom culverts resting on top of a gravel infiltration bed. The second facility type consists of modular plastic rain tanks resting on top of a gravel infiltration bed. These installations are commonly used to manage stormwater under large parking lots. Both types of installations would utilize storage in the gravel layers and structural components and infiltration underneath the facility to meet water quality treatment requirements. Both facilities are sized to provide both storage for the water quality volume and sufficient surface area to infiltrate the water quality volume within approximately 48 hours. Suitable soils capable of achieving an infiltration rate of at least 0.5 inches per hour are typically required. Pretreatment is typically provided, often in the form of a hydrodynamic separator. Should elevated groundwater or soil conditions which do not support infiltration be present, subsurface infiltration may not be a feasible option. Furthermore, structural practices such as subsurface infiltration may not be

allowed if ESD practices such as micro-bioretention can be implemented. The table below summarizes estimated minimum space requirements for installation to provide management of the redevelopment water quality volume of 0.079 ac-ft.

	Estimated Surface Area	Estimated Depth from Top of Grade
Arched Open Bottom Culverts	2,200 ft^2	~5 ft
Rain Tanks	2,200 ft^2	~5 ft

An exhibit illustrating conceptual locations for subsurface infiltration is included in ***Appendix A***. The exhibit shows one potential location for placement of a subsurface infiltration feature of approximately 2,200 ft^2 in size. Either arched open bottom culverts or rain tanks could be used.

Scenario 4: Pavement Removal

Mitigation through pavement reduction would require that 50% of the existing site impervious cover be converted to pervious cover. On an existing site of approximately 2.5 acres, this would require that 1.25 acres be converted to pervious cover. Due to vehicular circulation requirements, the impervious areas that seem most feasible to remove would be on-site parking. These parking spaces could conceivably be provided inside the existing hourly garage. Based on the conceptual site layout, these areas total approximately 0.35 acres. Thus, similar to Scenario 2, treatment of the water quality volume would still need to be provided for a remaining 0.65 acres of impervious or a WQ_V of 0.051 acre-feet. As described in Scenario 2, this remaining goal could be accomplished with approximately 1,900 ft^2 of micro-bioretention filter bed, or approximately 2,850 ft^2 of total site area. An exhibit illustrating conceptual locations for pavement removal and micro-bioretention is included in ***Appendix A***.

SUMMARY OF PROPOSED ALTERNATIVES AND COSTS

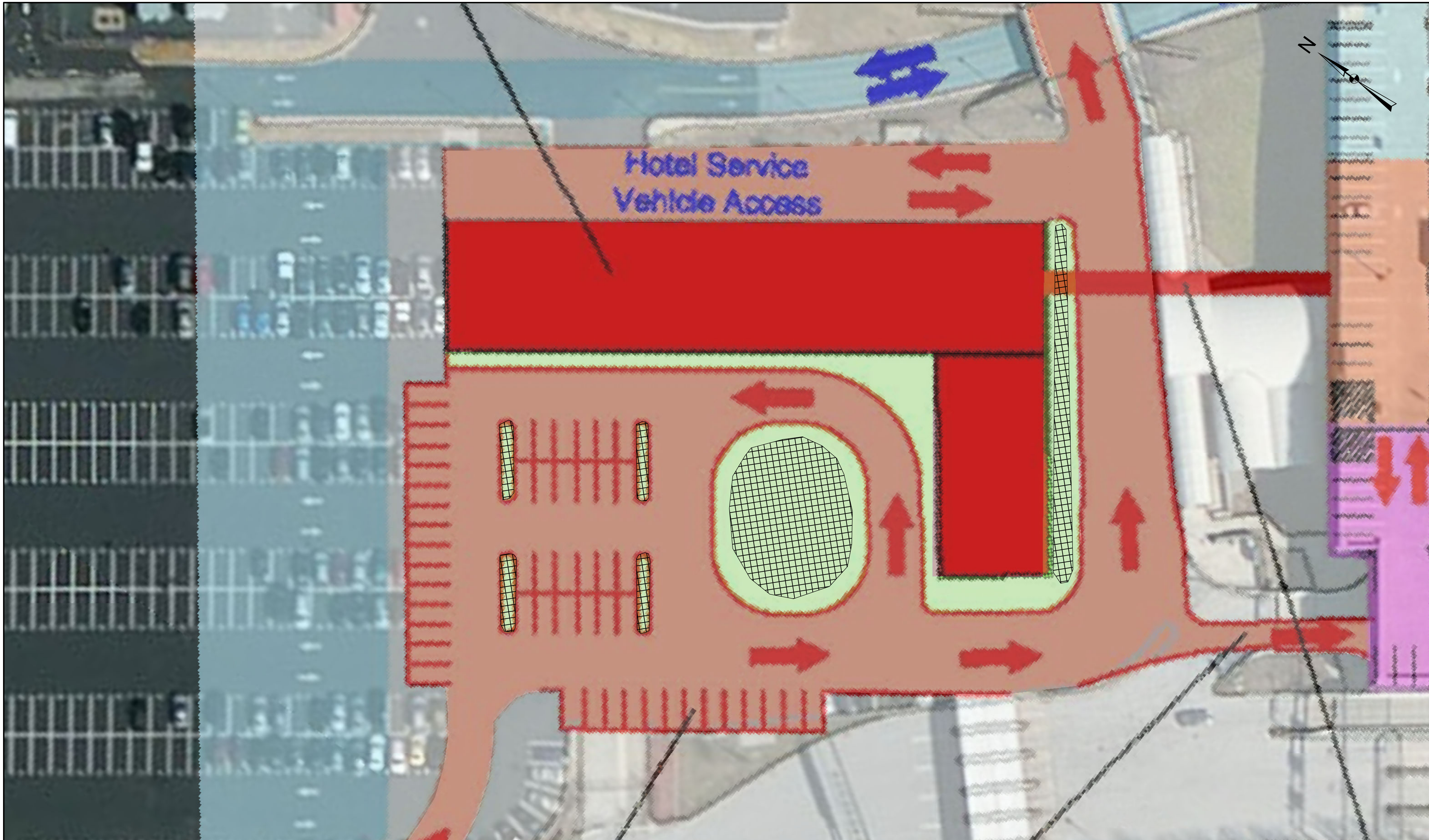
AECOM developed conceptual level cost estimates for the four scenarios described above. Each estimate reflects only the costs unique to the stormwater quality management solutions. Estimates do not include general site development costs, including stormwater collection and conveyance. Additional information on cost estimates for the presented scenarios is provided in **Appendix B**.

	Scenario 1	Scenario 2	Scenario 3		Scenario 4
Description	Micro-Bioretention	Pervious Pavement & Micro-Bioretention	Subsurface Infiltration		Pavement Removal & Micro-Bioretention
			Open Bottom Arch	Rain Tank	
Approximate Space Required	4,500 ft^2	15,250 ft^2 Pervious Pavement; 2,850 ft^2 Micro-Bioretention	2,200 ft^2	2,200 ft^2	15,250 ft^2 Pavement Removal; 2,850 ft^2 Micro-Bioretention
Estimated Stormwater Costs	$320,000	$520,000[a]	$210,000	$180,000	$200,000

Note [a]: Cost of pervious pavement calculated as the difference in cost/SF between asphalt pavement and pervious pavement.

As demonstrated in the sections above, there are multiple feasible means of providing required stormwater management for the hotel development. Assuming there is sufficient space available in the site plan for above ground practices, MDE is likely to prefer a solution similar to Scenario 1, 2 or 4 as environmental site design is required to the maximum extent practicable. Depending on the ultimate layout of the hotel site, the distribution of stormwater management practices across the site may shift, resulting in a potential increase or decrease in cost. AECOM recommends that this stormwater analysis be updated when a more definitive site plan is available.

Appendix A
Exhibits



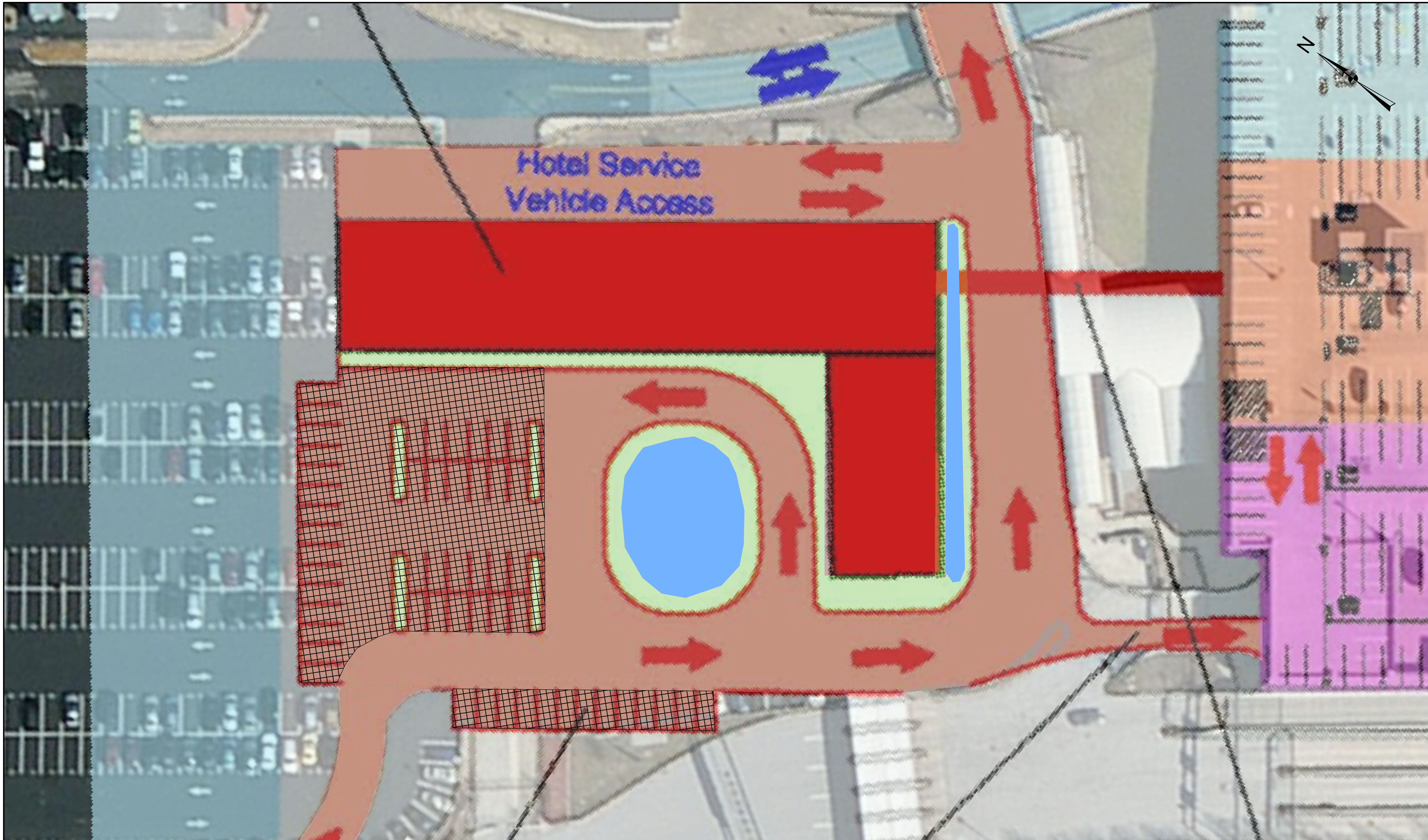
Potential Micro-Bioretention Location

0 25 50 100 Feet

BWI BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

DRAFT

Proposed Hotel - Stormwater Analysis
Scenario 1 SWM Conceptual Layout
Date: Dec 2012 — AECOM



Potential Micro-Bioretention Location

Pervious Pavement

0 25 50 100 Feet

BWI BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

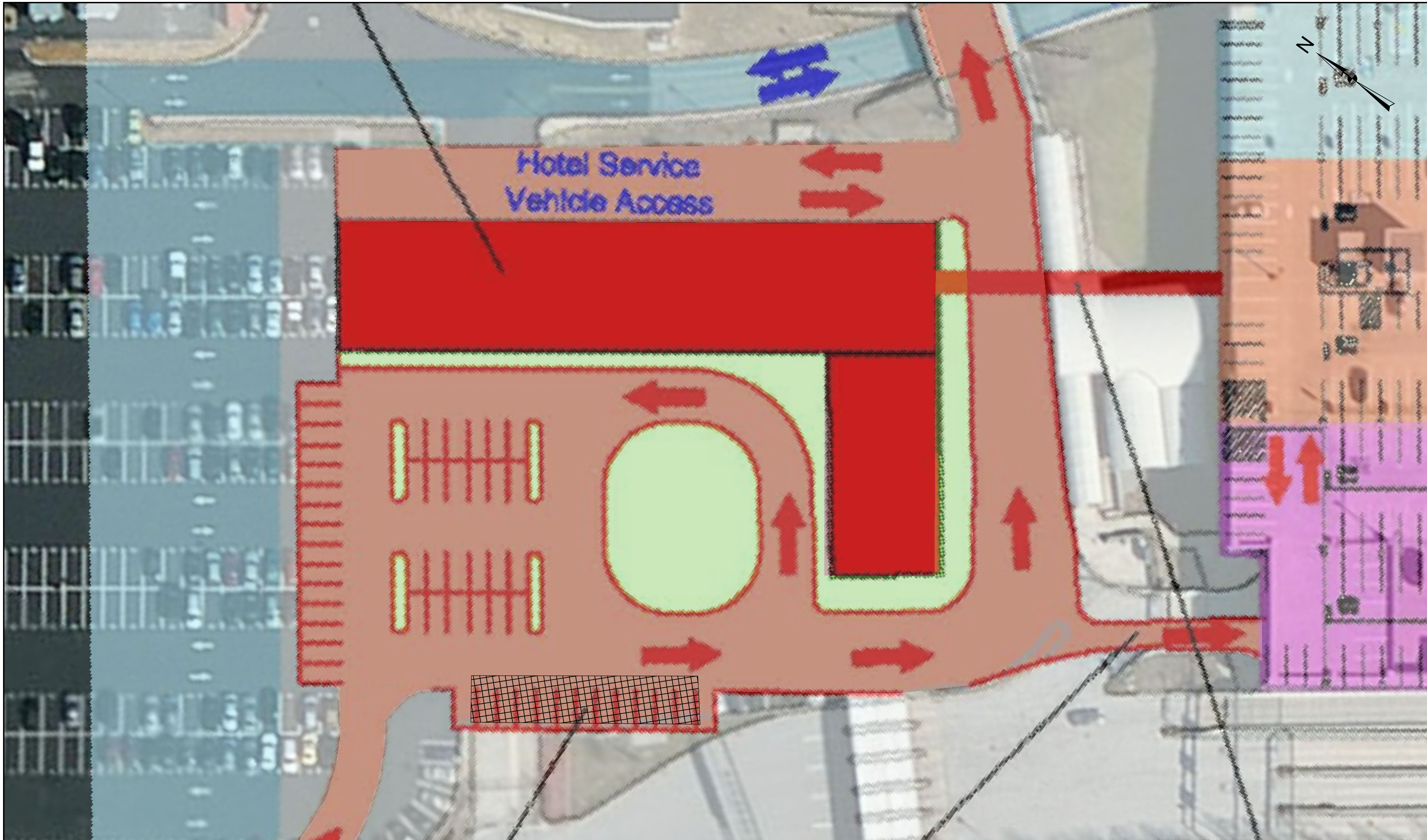
DRAFT

Proposed Hotel - Stormwater Analysis

Scenario 2 SWM Conceptual Layout

Date: Dec 2012

AECOM



Underground Infiltration Structure

0 25 50 100 Feet

BWI BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

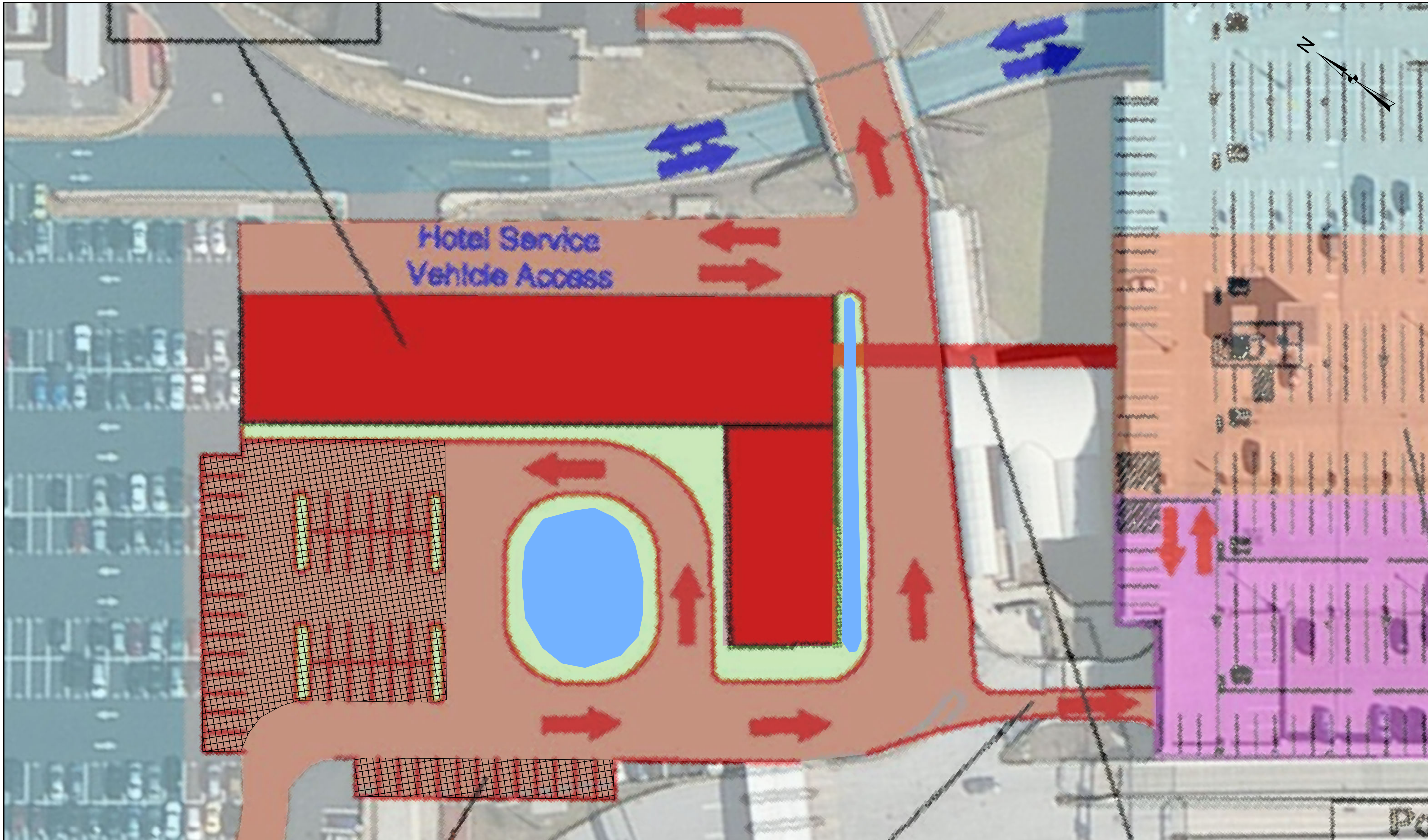
DRAFT

Proposed Hotel - Stormwater Analysis

Scenario 3 SWM Conceptual Layout

Date: Dec 2012

AECOM



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Pavement Removal Area

Potential Micro-Bioretention Area

0 25 50 100 Feet

Proposed Hotel - Stormwater Analysis

Scenario 4 SWM Conceptual Layout

Date: Dec 2012

AECOM

Appendix B
Cost Estimates

MAA-SV-10-001B Task 013

STORMWATER MANAGEMENT ANALYSIS

Hotel Site, Scenario 1 - Engineer's Estimate

12/10/2012 DRAFT

ESTIMATING LEVEL: ☐ Budget ☑ Concept ☐ 30% ☐ 60% ☐ 100% ☐ Bid

ITEM	DESCRIPTION		UNIT	UNIT COST	QUANTITY	TOTAL	COMMENT
	CONSTRUCTION COST ESTIMATE						
	Micro-Bioretention (installed)		SF	$ 27.78	4,500	$ 125,028.00	
	Miscellaneous Utilities		LS	$ 30,000.00	1	$ 30,000.00	
Special Systems		BAS (Metasys)					
		FAS (Honeywell)					
		CASS					
		CCTV					
		BGE					
		Verizon					
		BHS (Baggage Handling Sys					
		Other Systems (Specify)					
SUBTOTAL A						**$ 155,028.00**	
Design Contingency (15% to 25% of A)					25%	$ 38,757.00	
SUBTOTAL B						**$ 193,785.00**	
General Conditions 15% of B					15%	$ 29,067.75	
Contractor O&P X% of B (if not included in Unit Costs)						$ -	included above
Construction Security Plan X% of B (if not included in Unit Costs)						$ -	included above
SUBTOTAL C						**$ 222,852.75**	
Construction Quality Control Plan (3% of C)					3%	$ 6,685.58	
Miscellaneous Construction Allowance (5% to 10% of C)					10%	$ 22,285.28	
TOTAL CONSTRUCTION COST ESTIMATE (BASE BID)						**$ 251,823.61**	
ADDITIONAL PROGRAM COSTS							
Estimated Design Fee (8% to 12% of Construction Cost)					12%	$ 30,218.83	
Estimated CMI Fee (8% to 12% of Construction Cost)					12%	$ 30,218.83	
Estimated PM Fee (2% of Construction Cost)					2%	$ 5,036.47	
TOTAL CAPITAL PROGRAM COST ESTIMATE						**$ 65,474.14**	
Escalation Factor (if applicable)						$ -	
GRAND TOTAL						**$ 320,000**	
Level of Accuracy		☑ Conceptual	☐			☐	
List of Sole Source Items		1					
Included in this Contract		2					
List of Assumptions		2012 Dollar Value					

MAA-SV-10-001B Task 013

STORMWATER MANAGEMENT ANALYSIS

Hotel Site, Scenario 2 - Engineer's Estimate

12/10/2012 DRAFT

ESTIMATING LEVEL: ☐ **Budget** ☑ **Concept** ☐ **30%** ☐ **60%** ☐ **100%** ☐ **Bid**

ITEM	DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL	COMMENT
	CONSTRUCTION COST ESTIMATE					
	Micro-Bioretention (installed)	SF	$ 27.78	2,850	$ 79,184.40	
	Miscellaneous Utilities	LS	$ 30,000.00	1	$ 30,000.00	
	Pervious Pavement (increase over asphalt)	SF	$ 9.43	15,250	$ 143,807.50	
Special Systems	BAS (Metasys)					
	FAS (Honeywell)					
	CASS					
	CCTV					
	BGE					
	Verizon					
	BHS (Baggage Handling Sys					
	Other Systems (Specify)					
SUBTOTAL A					**$ 252,991.90**	
Design Contingency (15% to 25% of A)				25%	$ 63,247.98	
SUBTOTAL B					**$ 316,239.88**	
General Conditions 15% of B				15%	$ 47,435.98	
Contractor O&P X% of B (if not included in Unit Costs)					$ -	included above
Construction Security Plan X% of B (if not included in Unit Costs)					$ -	included above
SUBTOTAL C					**$ 363,675.86**	
Construction Quality Control Plan (3% of C)				3%	$ 10,910.28	
Miscellaneous Construction Allowance (5% to 10% of C)				10%	$ 36,367.59	
TOTAL CONSTRUCTION COST ESTIMATE (BASE BID)					**$ 410,953.72**	
ADDITIONAL PROGRAM COSTS						
Estimated Design Fee (8% to 12% of Construction Cost)				12%	$ 49,314.45	
Estimated CMI Fee (8% to 12% of Construction Cost)				12%	$ 49,314.45	
Estimated PM Fee (2% of Construction Cost)				2%	$ 8,219.07	
TOTAL CAPITAL PROGRAM COST ESTIMATE					**$ 106,847.97**	
Escalation Factor (if applicable)					$ -	
GRAND TOTAL					**$ 520,000**	

Level of Accuracy	☑ Conceptual	☐	☐
List of Sole Source Items	1		
Included in this Contract	2		
List of Assumptions	2012 Dollar Value		

MAA-SV-10-001B Task 013

STORMWATER MANAGEMENT ANALYSIS

Hotel Site, Scenario 3a - Engineer's Estimate

12/10/2012 DRAFT

ESTIMATING LEVEL: ☐ **Budget** ☑ **Concept** ☐ **30%** ☐ **60%** ☐ **100%** ☐ **Bid**

ITEM	DESCRIPTION		UNIT	UNIT COST	QUANTITY	TOTAL	COMMENT
CONSTRUCTION COST ESTIMATE							
	Subsurface Detention (Open arch installed)		CF	$ 15.76	4,500	$ 70,897.50	
	StormCeptor Pretreatment		EA	$ 15,000.00	1	$ 15,000.00	
	Miscellaneous Utilities		LS	$ 15,000.00	1	$ 15,000.00	
Special Systems		BAS (Metasys)					
		FAS (Honeywell)					
		CASS					
		CCTV					
		BGE					
		Verizon					
		BHS (Baggage Handling Sys					
		Other Systems (Specify)					
SUBTOTAL A						**$ 100,897.50**	
Design Contingency (15% to 25% of A)					25%	$ 25,224.38	
SUBTOTAL B						**$ 126,121.88**	
General Conditions 15% of B					15%	$ 18,918.28	
Contractor O&P X% of B (if not included in Unit Costs)						$ -	included above
Construction Security Plan X% of B (if not included in Unit Costs)						$ -	included above
SUBTOTAL C						**$ 145,040.16**	
Construction Quality Control Plan (3% of C)					3%	$ 4,351.20	
Miscellaneous Construction Allowance (5% to 10% of C)					10%	$ 14,504.02	
TOTAL CONSTRUCTION COST ESTIMATE (BASE BID)						**$ 163,895.38**	
ADDITIONAL PROGRAM COSTS							
Estimated Design Fee (8% to 12% of Construction Cost)					12%	$ 19,667.45	
Estimated CMI Fee (8% to 12% of Construction Cost)					12%	$ 19,667.45	
Estimated PM Fee (2% of Construction Cost)					2%	$ 3,277.91	
TOTAL CAPITAL PROGRAM COST ESTIMATE						**$ 42,612.80**	
Escalation Factor (if applicable)						$ -	
GRAND TOTAL						**$ 210,000**	

Level of Accuracy	☑ Conceptual	☐	☐
List of Sole Source Items	1		
Included in this Contract	2		
List of Assumptions	2012 Dollar Value		

MAA-SV-10-001B Task 013
STORMWATER MANAGEMENT ANALYSIS
Hotel Site, Scenario 3b - Engineer's Estimate
12/10/2012 DRAFT

ESTIMATING LEVEL: ☐ **Budget** ☑ **Concept** ☐ **30%** ☐ **60%** ☐ **100%** ☐ **Bid**

ITEM	DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL	COMMENT
CONSTRUCTION COST ESTIMATE						
	Subsurface Detention (Rain tank installed)	CF	$ 12.65	4,500	$ 56,925.00	
	StormCeptor Pretreatment	EA	$ 15,000.00	1	$ 15,000.00	
	Miscellaneous Utilities	LS	$ 15,000.00	1	$ 15,000.00	
Special Systems	BAS (Metasys)					
	FAS (Honeywell)					
	CASS					
	CCTV					
	BGE					
	Verizon					
	BHS (Baggage Handling Sys					
	Other Systems (Specify)					
SUBTOTAL A					**$ 86,925.00**	
Design Contingency (15% to 25% of A)				25%	$ 21,731.25	
SUBTOTAL B					**$ 108,656.25**	
General Conditions 15% of B				15%	$ 16,298.44	
Contractor O&P X% of B (if not included in Unit Costs)					$ -	included above
Construction Security Plan X% of B (if not included in Unit Costs)					$ -	included above
SUBTOTAL C					**$ 124,954.69**	
Construction Quality Control Plan (3% of C)				3%	$ 3,748.64	
Miscellaneous Construction Allowance (5% to 10% of C)				10%	$ 12,495.47	
TOTAL CONSTRUCTION COST ESTIMATE (BASE BID)					**$ 141,198.80**	
ADDITIONAL PROGRAM COSTS						
Estimated Design Fee (8% to 12% of Construction Cost)				12%	$ 16,943.86	
Estimated CMI Fee (8% to 12% of Construction Cost)				12%	$ 16,943.86	
Estimated PM Fee (2% of Construction Cost)				2%	$ 2,823.98	
TOTAL CAPITAL PROGRAM COST ESTIMATE					**$ 36,711.69**	
Escalation Factor (if applicable)					$ -	
GRAND TOTAL					**$ 180,000**	

Level of Accuracy	☑ Conceptual	☐	☐
List of Sole Source Items	1		
Included in this Contract	2		
List of Assumptions	2012 Dollar Value		

MAA-SV-10-001B Task 013
STORMWATER MANAGEMENT ANALYSIS
Hotel Site, Scenario 4 - Engineer's Estimate
12/10/2012 DRAFT

ESTIMATING LEVEL: ☐ **Budget** ☑ **Concept** ☐ **30%** ☐ **60%** ☐ **100%** ☐ **Bid**

ITEM	DESCRIPTION		UNIT	UNIT COST	QUANTITY	TOTAL	COMMENT
	CONSTRUCTION COST ESTIMATE						
	Micro-Bioretention (installed)		SF	$ 27.78	2,850	$ 79,184.40	
	Miscellaneous Utilities		LS	$ 15,000.00	1	$ 15,000.00	
Special Systems		BAS (Metasys)					
		FAS (Honeywell)					
		CASS					
		CCTV					
		BGE					
		Verizon					
		BHS (Baggage Handling Sys					
		Other Systems (Specify)					
SUBTOTAL A						**$ 94,184.40**	
Design Contingency (15% to 25% of A)					25%	$ 23,546.10	
SUBTOTAL B						**$ 117,730.50**	
General Conditions 15% of B					15%	$ 17,659.58	
Contractor O&P X% of B (if not included in Unit Costs)						$ -	included above
Construction Security Plan X% of B (if not included in Unit Costs)						$ -	included above
SUBTOTAL C						**$ 135,390.08**	
Construction Quality Control Plan (3% of C)					3%	$ 4,061.70	
Miscellaneous Construction Allowance (5% to 10% of C)					10%	$ 13,539.01	
TOTAL CONSTRUCTION COST ESTIMATE (BASE BID)						**$ 152,990.78**	
ADDITIONAL PROGRAM COSTS							
Estimated Design Fee (8% to 12% of Construction Cost)					12%	$ 18,358.89	
Estimated CMI Fee (8% to 12% of Construction Cost)					12%	$ 18,358.89	
Estimated PM Fee (2% of Construction Cost)					2%	$ 3,059.82	
TOTAL CAPITAL PROGRAM COST ESTIMATE						**$ 39,777.60**	
Escalation Factor (if applicable)						$ -	
GRAND TOTAL						**$ 200,000**	

Level of Accuracy	☑ Conceptual	☐	☐
List of Sole Source Items	1		
Included in this Contract	2		
List of Assumptions	2012 Dollar Value		