

**AMENDMENT NO. 6
TO THE CONTRACT FOR PURCHASE OF
SERVICES
(DESIGN PROFESSIONALS)
CONTRACT 8411**

WEST WINGRA WATERSHED STUDY

RECITALS

This amendment is for additional work beyond the scope of the existing agreement and consists of conducting the Phase 1 green infrastructure analysis to corroborate the work done in-house for the Pheasant Branch Watershed Study.

1. On May 2, 2019, the City of Madison, hereinafter called the "City", and Brown and Caldwell, hereinafter called the "Consultant" entered into a contract for a flood and stormwater modeling of the West Wingra Watershed, Legislative File No.54800.
2. Article 9 and Article 10, of the contract, provided for amendment of the contract for additional services.
3. The City has authority to execute an amendment to this contract as provided by Council Legislative File No. 55946.

NOW THEREFORE, The City and the Consultant hereby agree to amend the contract as follows:

A. PROJECT DESCRIPTION

Amend project Scope of Work per the attached file, entitled "West Wingra Watershed Study – Amendment No. 6, Contract 8411".

B. COMPENSATION

Amend Paragraph 24 of purchase of services contract to increase the contract by \$15,755.00 for a new contract amount of \$432,567.00.

C. SCHEDULE

Extend the term of the contract in Section 4 to December 31, 2021.

IN WITNESS WHEREOF, the parties hereto have set their hands at Madison, Wisconsin.

CONTRACTOR:

Brown and Caldwell
(Type or Print Name of Contracting Entity)

By: _____
(Signature)

(Print Name and Title of Person Signing)

Date: _____

**CITY OF MADISON, WISCONSIN
a municipal corporation:**

By: _____
Satya Rhodes-Conway, Mayor

Date: _____

Approved:

By: _____
David P. Schmiedicke, Finance Director

Date: _____

By: _____
Maribeth Witzel-Behl, City Clerk

Date: _____

Approved as to Form:

By: _____
Eric T. Veum, Risk Manager

Date: _____

By: _____
Michael Haas, City Attorney

Date: _____

Task 6.1 – Phase I Volume Control Analysis

The following budget and assumptions were developed by Brown and Caldwell (BC) based on the scope of work for Phase I Volume Control Analysis (dated October 8, 2020) provided by the City of Madison.

Budget

A total budget increase for the scope described above (Amendment #6) is \$15,755.00 as detailed in the following table.

Task 6.1	Description	Adjusted Total Hours	Adjusted Total Effort
Step 1	Create the Models	48	\$8,907
Step 2	Meet with City	7	\$1,113
Step 3	Finalize analysis based on Meeting / Prepare Technical Memo	41	\$5,735
	Total	114	\$15,755

Original contract amount:	\$ 225,000.00
Amendment #1	\$ 12,539.00
Amendment #2	\$ 87,229.00
Amendment #3	\$ 38,025.00
Amendment #4	\$ 22,245.00
Amendment #5	\$ 31,774.00
Amendment #6	\$ 15,755.00
Amended Contract Amount:	\$ 432,567.00

Assumptions

This list of assumptions is specific to Task 6.1 and does not supersede assumptions contained in the original contract and/or other assumptions.

1. The analysis will modify the amount of directly connected impervious area and indirectly connected impervious area. Other model parameters will not be modified.
2. Documentation associated with Step 3 of the scope of work will include a brief technical memorandum referencing the scope of work, assumptions made within the analysis, and include tables and figures identified within the scope of work.
3. Up to 16 hours is budgeted for revisions to the analysis under Step 3 of the scope of work. Revisions to the analysis are anticipated to include finalization of the modeling and/or revision of results reporting. Additional model scenarios are not included.

Watershed Studies – Phase I Volume Control Proposed Tasks

v10/08/2020

The City has conducted an initial analysis of the effect of distributed green infrastructure (volume control practices) in the Pheasant Branch Watershed. The intent of the analysis is to understand if sizing distributed green infrastructure in the traditional manner (generally the smaller, more frequent events) has an effect on the peak flows for the large storm events (> 10-yr recurrence interval).

The City requests this analysis be repeated in two more watersheds in the City to understand if the results are similar. The two watersheds chosen are Wingra West and Willow Creek.

- a. Wingra West was chosen because it's fully urbanized (unlike Pheasant Branch) and it has a large storage area (Odana Hills Golf Course Ponds) in the middle.
- b. Willow Creek was chosen because it's a fully urbanized watershed with little to no storage and is being done with rain-on-grid. If The City goes forward with more rain-on-grid, we want to see how the distributed GI analysis would be done with that approach.

The scope below describes Phase 1 of the distributed green infrastructure (volume control) analysis. There may be additional Phases depending upon the results of this analysis and the extended analysis the City is conducting in-house.

The City has also created a working spreadsheet that the Consultant may utilize for this effort if they deem appropriate.

Task 6.1 – Phase I Volume Control Analysis (VC)

Step 1 – Create the models

Determine the effect on peak flows for the 10-year and 100-year, 24-hour events if 1) 10% of the DCIA (Directly Connected Impervious Area) is routed to green infrastructure and 2) 25% of the DCIA is routed to green infrastructure.

To do this, move the %DCIA removed to NDCIA (Non-Directly Connected Impervious Area) for each subcatchment. Then, adjust the pervious area storage based on the assumed sizing of the distributed green infrastructure (DGI). For purposes of this exercise, when adjusting the pervious area storage assume: 1) the DGI has a depth of 1 foot of open air storage, 2) no engineered media, and 3) the porosity of the underlying native soil is not taken into account.

Create one model for the 10% DCIA removed and a second model for the 25% DCIA removed.

Run both models for the 1-yr, 10-yr, and 100-yr events and tabulate results.

Initial deliverable includes:

- 1) Table noting the flooding depth (ft) and peak flow (cfs) for the 25 locations identified during Task 4.

Step 2 – Meet with the City to go over the results.

Following Step 1, the Consultant will meet with the City to go over the results.

Deliverable includes:

1. Meeting minutes from meeting

Step 3 – Finalize analysis based on meeting with City

Revise the analysis based on feedback from the City.

Deliverables for this step shall include:

- 1) Color figures showing the maximum extent of flooding during each storm event. The figures shall be color coded to show depth of flooding (typical ranges utilized are: 0.01'-0.25', 0.25'-0.5', 0.5'-1.0', and greater than 1').
- 2) Table noting the flooding depth (ft) and peak flow (cfs) for the 25 locations identified during Task 4.
- 3) Model files and documentation.
- 4) GIS files generated for model development. All files shall be delivered to the City on an external hard drive.

Task 6.1 – Phase II Volume Control Analysis (VC) - TBD