



AMENDMENT NO. 2 to
ENGINEERING SERVICES AGREEMENT
Greenmeadow Sanitary Infrastructure Improvements (Project)
Original Agreement Executed December 21, 2016

This Amendment is by and between:

City of Waukesha
130 Delafield Street
Waukesha, WI 53188

and

Donohue & Associates, Inc. (Donohue)
3311 Weeden Creek Road
Sheboygan, WI 53081

Who agree to amend the original Agreement, as follows:

PART I – B. SCOPE OF SERVICES

Donohue and sub-consultant, Brierley Associates, provided design services for the Greenmeadow Interceptor project. Brierley was involved with the design of trenchless construction segments of the project and preparation of the Geotechnical Baseline Report (GBR). The GBR included a geological profile, to which all parties will turn to gain a basic understanding of what to expect underground, including a list of soil and rock properties that will impact ground behavior during construction.

The City has retained a different consultant to provide construction management and construction observation services for the Greenmeadow Interceptor. Donohue and Brierley will be involved during the construction phase to provide support as the project designers. Brierley will also be involved with observation during shaft, tunnel, and portal construction and Horizontal Direction Drilling (HDD) to confirm the GBR information.

Construction Phase Engineering Services to be provided under this agreement are as follows:

1. *Pre-Construction Conference.* Attend a Pre-Construction Conference for the project prior to commencement of Work at the project site.
2. *RFI Responses and Submittal Review.* Provide a technical review and approve or take other appropriate action in respect to Shop Drawings and other data which the Contractor is required to submit, for conformance with the information given in the Contract Documents and compatibility with the design concept of the project as a functioning whole as indicated in the Contract Documents. Such reviews and approvals or other action will not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto.

- a. Design Submittal and Work Plan Submittal Review of the following aspects of the project, assuming 1 revision for each of the following 8 submittals:
 - i. Watertight Shafts,
 - ii. Initial Rock Support Design (Tunnel and Shafts)
 - iii. Deep Excavation Design,
 - iv. Tunneling,
 - v. Horizontal Directional Drilling,
 - vi. Carrier Pipe Installation,
 - vii. Groundwater Control Grouting,
 - viii. Dewatering
 - b. RFI Responses related to shaft construction, tunnel construction, horizontal directional drilling, and open cut sanitary sewer and storm sewer construction. Assume 4 RFI's related to shaft construction, tunnel construction or horizontal directional drilling and 3 RFI's related to open cut sanitary sewer or storm sewer construction.
3. *Progress Meetings.* Attend monthly Progress Meetings. Assume 7 meetings attended in person and 8 meetings attended via teleconference.
 4. *Construction Monitoring.* Brierley will perform the following services in connection with observations of Contractor's work in progress for the project. The City's construction management consultant will be available to assist with monitoring activities. Up to approximately 450 hours of the construction management consultant's time may be required for this task.
 - a. Provide construction observation services to document and monitor construction activities associated with shaft construction, tunnel construction, and horizontal directional drilling. Make visits to the site at intervals appropriate to the various stages of construction.
 - i. Shaft Construction (2 shafts- estimated 16 week duration)
 - This includes watertight shaft construction in the overburden and interface between the bedrock and overburden.
 - Assess magnitude of groundwater and associated impact,
 - Support of Excavation process and conformance to contractors design and assumptions based on GBR.
 - Verify groundwater cutoff and implementation of mitigation.

If a third shaft is needed based on the contractor's construction method, additional fees would be required as listed in the compensation section of this contract amendment.
 - ii. Bedrock Mapping in Shafts (2 shafts)
 - This includes bedrock excavation and initial support in the shafts to the tunnel invert.
 - Verify groundwater and bedrock conditions and implementation of contractors initial rock support,
 - Mapping includes joint set identification, zones of instability, groundwater inflow, overbreak documentation to verify GBR and anticipated conditions,

- Drill and probing logging for groundwater cutoff.

If a third shaft is needed based on the contractor’s construction method, additional fees would be required as listed in the compensation section of this contract amendment.

- iii. Bedrock Mapping at Portal Site to confirm geotechnical conditions, similar to shaft mapping.
- iv. Bedrock Mapping in Tunnels (Assume 6 months for tunnel construction)
 - This includes bedrock excavation and initial support in the tunnel
 - Verify groundwater and bedrock conditions and implementation of contractors initial rock support,
 - Mapping includes joint set identification, zones of instability, groundwater inflow, overbreak documentation to verify GBR and anticipated conditions,
 - Drill and probing logging for groundwater cutoff.
- v. Construction Monitoring of Tunnel Break-in.
Includes the time when the TBM/MTBM/Drill and Blast Tunnel approaches the shafts for retrieval or arrival. Also, includes time for launch of TBM/MTBM.
- vi. Construction monitoring of the Horizontal Directionally Drilled (HDD) crossing of the Fox River (Assume one month for base bid HDD construction).
 - Monitor downhole pressures and guidance data real-time,
 - Monitor drilling fluid properties to assess subsurface conditions,
 - Work with contractor to facilitate effective decision making related to construction issues.
 - Ensure contractor is performing work with the intention of industry’s best practices as it relates to redirection and drill hole stability.

Assume that the shorter alignment (base bid) will be performed. If the longer alternate alignment is selected, additional fees would be required as listed in the compensation section of this contract amendment.

PART III – A. COMPENSATION

Compensation for these services shall be a lump sum of \$213,990.

Should the following services be required, compensation shall be as listed below:

Additional meetings (attended in person by Donohue & Brierley)	\$ 1,146
Additional shaft, tunneling, or HDD RFI’s (per RFI)	\$ 1,420
Construction Monitoring and Bedrock Mapping at Optional Shaft	\$11,985
Construction Monitoring for HDD Alternate	\$19,372

**Construction Related Services (CRS)
Fee Estimate Summary (CA No 2)
Donohue & Associates, Inc.**

Task	Holzart \$ 140	CRS CM \$ -	Kimmler \$ 155	Brierley \$ 160	Total Hours	Total Labor	BA Expense	DA Expenses	Total Cost
Eng. Services During Constructiton									
Management (15 months @ 3 hrs/month)	45				45	\$ 6,300			\$ 6,300
Preconstruction Conference	4			3	7	\$ 1,040	\$ 30	\$ 76	\$ 1,146
Submittal Reviews - Assume 8 @ 12 hrs/submittal	8		8	96	112	\$ 17,720			\$ 17,720
Clarification Requests & Field Questions (RFIs) - Assume 4 trenchless construction and 3 other	16		4	32	52	\$ 7,980			\$ 7,980
Progress Meetings (7 in-person, 8 teleconference)	40			33	73	\$ 10,880	\$ 210	\$ 532	\$ 11,622
Eng. Services During Construction Subtotal	113	-	12	164	289	\$ 43,920	\$ 240	\$ 608	\$ 44,768
Construction Monitoring									
Shaft Construction (2 shafts - 16 wk duration	20	160	2	160	342	\$ 28,710	\$ 3,250		\$ 31,960
Bedrock Mapping in Shafts (2 shafts @ 80 hrs/shaft)		40		120	160	\$ 19,200	\$ 2,800		\$ 22,000
Bedrock Mapping at Portal Site	2	20		60	82	\$ 9,880	\$ 300		\$ 10,180
Bedrock Mapping in Tunnels -	10	200		400	610	\$ 65,400	\$ 4,250		\$ 69,650
Construction Monitoring of Tunnel Break-in	4	20	2	40	66	\$ 7,270	\$ 300		\$ 7,570
Horizontal Directional Drilling	12	20	2	104	138	\$ 18,630	\$ 1,800		\$ 20,430
Siphons, Vortex units	12				12	\$ 1,680		\$ 152	\$ 1,832
Coordination with Brierley & Construction Manager	40				40	\$ 5,600			\$ 5,600
					-	\$ -			\$ -
					-	\$ -			\$ -
					-	\$ -			\$ -
					-	\$ -			\$ -
Construction Monitoring Subtotal	100	460	6	884	1,450	\$ 156,370	\$ 12,700	\$ 152	\$ 169,222
Total	213	460	18	1,048	1,739	\$ 200,290	\$ 12,940	\$ 760	\$ 213,990
Total Labor Dollars by Labor Class	\$ 29,820	\$ -	\$ 2,790	\$ 167,680					

Additional Meetings (Per Meeting)	4			3	7	\$ 1,040	\$ 30	\$ 76	\$ 1,146
Additional RFI's (Per RFI)	1			8	9	\$ 1,420			\$ 1,420
Construction Monitoring at Optional Shaft				60	60	\$ 9,600	\$ 1,625	\$ 760	\$ 11,985
Construction Monitoring for Alternative HDD (extra)	12			104	116	\$ 18,320	\$ 900	\$ 152	\$ 19,372

Brierley	\$ 180,620
Donohue	\$ 33,370
	<u>\$ 213,990</u>