

# Task Order No. 3, Amendment ~~1~~2

In accordance with Paragraph 1.01 of the Agreement Between Fargo-Moorhead Flood Diversion Authority (“Owner”) and Houston-Moore Group, LLC (HMG) (“Engineer”) for Professional Services – Task Order Edition, dated March 8, 2012 (“Agreement”), Owner and Engineer agree as follows:

The parties agree that in the event of a conflict between Task Order No. 3 and this Amendment, the terms and conditions in this Amendment shall prevail, provided however, nothing herein shall preclude ENGINEER from invoicing for work authorized under prior versions of this Task Order and performed prior to effective date of this Amendment, even to the extent such prior work was revised by this Amendment. All other terms and conditions shall remain the same and are hereby ratified and affirmed by the parties.

## 1. Specific Project Data

- A. Title: Design of Work Package 4 (Reach 3)
- B. Description: As part of the Authority’s Lands, Easements, Rights of Way, Relocations, and Disposal (LERRDs) work, design and prepare contract documents for the construction of the new County Road 81 (CR-81) bridge and the two (2) Interstate Highway 29 (I-29) north and south bound bridges, which will cross the diversion channel, road alignment and grade changes, local drainage facilities and structures, and ~~2,500,000~~-feet of diversion channel.
- C. Background: I-29 is a concrete surfaced divided highway with separate roadways carrying northbound and southbound traffic. The project location is approximately one mile south of the Argusville Interchange. County Road 81 is a paved 2 lane road approximately 300-ft east of the I-29 bridges. The diversion channel will cross these bridges approximately five miles upstream of the outlet to the Red River. The segment of I-29 in Section 17 of Harwood Township will be impacted by construction of the diversion channel, necessitating construction of new bridges in this location to accommodate traffic over the diversion channel. United States Army Corps of Engineers (USACE) will provide some design criteria for the bridges, to include length, waterway geometry, pier configuration, and clearance line elevation. In addition to bridge construction, approach roadways will need to be reconstructed to accommodate the raised elevation of the new structure and provide appropriate approach roadway grades and cross section. Design and construction must be coordinated and comply with standards of the North Dakota Department of Transportation (NDDOT), and Cass County, as applicable.
- D. BNSF Railway bridge is being designed by others under contract to USACE. This design will need to be coordinated with the railroad bridge design.

## 2. Services of Engineer

- A. Design of Work Package 4 Contract Documents: Prepare contract documents (Plans and Specifications) for the construction of the new I-29 and CR-81 bridges, associated road raises, local drainage facilities, and diversion channel.
  - i. Design items include but are not limited to:
    1. I-29 north and south bound bridges, approximately 520 feet long and per NDDOT roadway bridge design requirements and USACE design criteria. Include temporary by-pass requirements in the design.
    2. CR-81 bridge, approximately 520 feet long and per Cass County roadway bridge design requirements and USACE design criteria. Include temporary by-pass requirements in the design.

3. Local drainage and road raises as required.
  4. Approximately ~~2,5005,000~~ feet of diversion channel per USACE design requirements. Coordinate with BNSF bridge design team.
  5. Include a list and forms of permits required for construction of these facilities.
- ii. Roadway and bridge design services will be prepared in accordance with applicable Cass County Standards, NDDOT Design Manual, NDDOT Cadd Standards, and AASHTO bridge and roadway design specifications, modified as required for this project. Plan drawings will be generated using MicroStation V8i. Survey will follow USACE standards and will be translated to NDDOT or Cass County standards, as appropriate, under a future Task Order.
- B. Scope of Work

## **100 Project Management and Coordination**

### **101 Project Schedule.**

Develop and maintain a project schedule. The schedule will include the establishment of milestone dates for the major work items. Review and adjust the schedule as necessary to incorporate changes in the work concept and progress to date.

### **102 Progress Reports (Monthly).**

Provide written progress reports describing the work performed on each task. Provide progress reports concurrently with the monthly invoice.

### **103 Bridge Design Team Meetings.**

Participate in weekly team meetings (conference calls) to discuss design progress, technical issues, and other topics developed as the project progresses.

### **104 Coordination Meetings.**

Participate in coordination meetings with the PMC, USACE, BNSF Railway, contractors or other organizations relevant to the project.

## **200 Field Survey**

### **201 Survey Criteria and Standards Development.**

Participate in the development of project survey criteria and standards with the design team to establish consistency across the team and to meet deliverable requirements of the project stakeholders including the NDDOT, Cass County, and USACE.

### **202 Landowner Notification.**

Notify landowners prior to accessing property to conduct the field survey in accordance with Right-of-Entry agreements. Coordinate access with PMC and Owner.

### **203 Field Survey.**

Collect survey data in accordance with the criteria developed in Task 201. Field survey will include establishing control, collecting topographic data of the existing ground and roadways, utilities, drainage features, and existing right of way.

### **204 Compile Data and Generate Base Map.**

Download the survey data collected and generate a base map for development of project plan drawings.

### **205 Geotechnical Location Survey.**

Stake the location of the planned soil borings and record the coordinates and elevation of the borings for inclusion in the geotechnical report and the project plans.

### **206 Pickup Survey.**

After the final bridge alignment and elevation has been established, collect additional data from the site if needed.

### **207 Survey Control Report.**

Develop a report documenting the survey control established for the bridge site and the standards used.

## **300 Roadway Design**

### **301 Preliminary Roadway Design.**

Perform preliminary roadway design functions and prepare preliminary roadway plans for review NDDOT, Cass County, and the PMC. The preliminary design will include the following:

- Traffic Operations
- Preliminary alignment and profile
- Settlement countermeasure concepts
- Existing and proposed typical sections
- Establish subgrade criteria
- Preliminary pavement/section design
- Roadway design report

### **302 Final Roadway Design and Plan Preparation.**

Develop the final roadway design and final plans and conduct a Plans, Specifications and Estimate (PS&E) review meeting with NDDOT, Cass County, the local sponsors, and other interested parties and agencies. Develop a construction staging plan for the four bridges in Reach 3 and provide analysis and budgetary cost estimates. Conduct a realignment analysis of I-29 to evaluate construction staging issues and costs.

Preparation of final roadway plans will consist of the following:

- Final alignment and grade
- Final typical section
- Traffic control/construction staging
- Utility relocations
- Drainage design
- Signing and pavement marking
- Guardrail design and plans
- Settlement countermeasures
- Roadway plan drawings
- Roadway plan notes and special provisions

Assemble and distribute plans for review.

Attend PS&E Review Meeting and provide written response to comments.

## **400 Bridge Aesthetics Concept Development and Coordination**

### **401 Project Background Review and Initial Site Visit.**

Review relevant preliminary bridge design documents and relevant base mapping available.

Review relevant planning studies and agency guidelines.

Review Draft Diversion Recreation and Use Plan. Identify aspects of the Recreation and Use Plan that could affect the design of bridges.

Prepare project area visit and existing conditions documentation. Assess the visual character of the proposed bridge sites and nearby surrounding community context through select photographs and sketches to serve as a basis for developing aesthetic design themes appropriate to the setting.

#### **402 Bridge Aesthetics Concept Development and Coordination.**

Develop three alternative aesthetic design themes for bridges and associated wing walls and retaining walls. Prepare appropriate graphics to communicate each theme for preliminary consideration by project stakeholders with the goal of selecting a preferred alternative(s) that can be applied to the entirety of the project to establish a distinct recognizable identity. The scale of the project may potentially warrant multiple complementary aesthetic treatments rather than just one uniform theme dependent upon further review.

Prepare comparative cost estimates for each alternative and compare to a “conventional” bridge theme.

Prepare bridge aesthetics design drawings. Coordinate with bridge engineering team members on technical aspects of the bridge designs. Prepare conceptual plan, elevation, and section drawings that illustrate different bridge types using the selected preferred alternative theme(s).

Prepare prototypical bridge aesthetics design models. Prepare conceptual 3D computer models using the Sketchup Program that illustrate prototypical conditions and select design details utilizing the selected preferred alternative theme(s).

Photo-realistic 3D bridge visualization. Develop one (1) photo-realistic 3D visualization graphic illustrating the incorporation of the preferred alternative design at a specific project location.

#### **403 Bridge Aesthetics Technical Memorandum.**

Develop a Bridge Aesthetics Technical Memorandum to serve as a guide for final design and as a record of the process by which aesthetic design decisions were made. Include an executive summary, narrative, design guidelines, meeting records, and a summary record of decisions matrix.

Bridge aesthetics narrative. Prepare a narrative that summarizes the basis for the selected preferred alternative theme(s) and intended application including (but not limited to: project background, site and community context, associated studies, alternative themes considered, bridge types, retaining wall types, and other design features.

Prepare bridge aesthetics design guidelines. Refine and format the graphic illustrations of the prototypical and bridge-specific studies prepared in task above that will serve as guidelines for the final design phase of each bridge.

Summary Record of Decisions Matrix. In simple matrix table format, list the selected bridge aesthetic options as a quick summary reference.

## **500 Preliminary Bridge Design**

### **501 Develop Design Criteria.**

Develop a Bridge Design Criteria Document detailing the governing design and construction specifications, the hydraulic and geometric criteria used to determine the bridge lengths and elevations, material strengths and properties, and specific design methodologies to be used for the major components of the bridges. Deliver the Bridge Design Criteria Document to PMC for distribution to project stakeholders for review. Incorporate comments and produce a final document.

### **502 Bridge Length Determination.**

Determine the final bridge length in accordance with the design criteria established for the bridge.

### **503 Conceptual Superstructure Design.**

Perform preliminary design calculations to establish the preliminary designs for the girders, bridge deck, and traffic barriers. Evaluate two girder types for cost effectiveness comparison: prestressed concrete I-girders, and steel plate girders.

### **504 Conceptual Substructure Design.**

Perform preliminary design calculations to establish the preliminary designs for the piers and abutments. Evaluate two foundation types for cost effectiveness comparison: driven piles and drilled reinforced concrete shafts.

### **505 Evaluate Use of Alternate Designs.**

Prepare cost estimates for the various structure concepts developed in Tasks 403 and 404 to determine if there is potential for overall construction cost savings by bidding competing superstructure and/or substructure types.

### **506 Type, Size & Location Inspection (TS&L).**

Conduct a TS&L Inspection with the bridge owners and other interested parties to confirm the site conditions and the suitability of the bridge concept. Complete and distribute TS&L report following the meeting.

### **507 Bridge Preliminary Design Report.**

Prepare Bridge Preliminary Design Report(s) to document the conceptual designs studied, the structure site data, hydraulic and geotechnical criteria used as a basis for the design, a discussion of the span optimization process used, and a recommendation for bridge substructure and superstructure, along with a recommendation regarding the use of alternate designs.

### **510 Preliminary Channel Design.**

Prepare a draft Preliminary Design Report (PDR) on the Diversion Channel design for 2,500 feet of channel, consistent with USACE Design Criteria and Engineer's analysis of specific project requirements. The PDR will be submitted to USACE for review. Respond to USACE and Owner comments and issue a final PDR.

## **600 Final Bridge Design Calculations**

### **601 Design Kickoff Meeting.**

Participate in a design kickoff meeting with the bridge owner and other interested parties to discuss the final design criteria, the submittal schedule, and agency review requirements.

### **602 Foundation/Substructure Design.**

The substructure design will be either driven piles or drilled shafts. If alternate designs are to be bid, both types will be designed. The following elements are included in the substructure design:

- Finalize geotechnical criteria
- Foundation design (piling or drilled shafts)
- Pier column and cap design
- Abutment design
- Bearing design
- Scour countermeasures

### **603 Superstructure Design.**

The superstructure design is based on designing prestressed concrete I-girders or steel plate girders as the structural system. If the preliminary design results in recommending alternate designs, both types will be designed. The following elements are included in the superstructure design:

- Deck design
- Girder design
- Camber and deflection calculations
- Pier and abutment diaphragms
- Traffic barriers
- Drainage system
- Expansion joints
- Utility supports (if applicable)

### **610 Final Channel Design.**

Based on the final PDR, prepare final design drawings and specifications of the Diversion Channel, including a 90% cost estimate. Submit design to Owner and USACE for review. Respond to Owner and USACE comments and issue 90% design.

## **700 Bridge Plan Preparation**

### **701 30% Plan Submittal.**

- Bridge Layout
- Construction Staging
- Preliminary Foundation/Substructure
- Preliminary Superstructure
- Miscellaneous Sheets (Soil borings, framing plan, etc.)

Assemble and distribute plans.

Attend plan review meeting and provide written response to comments.

### **702 90% Plans.**

- Bridge layout
- Construction staging
- Foundation/substructure
- Superstructure
- Miscellaneous sheets
- Aesthetic details
- Details
- Plan notes

- Quantity calculations
- Special Provisions

Assemble and distribute plans.

Attend PS&E Review Meeting and provide written response to comments.

**710 Channel Plan Preparation.**

Prepare plans and specifications for inclusion in construction documents.

**800 Quality Assurance/Quality Control**

**801 Internal Design Review (IDR).**

This review will consist of internal quality control checks and quality assurance reviews of the design calculations and the 30%, 90%, and final plan submittals.

**802 Discipline Design Review (DDR).**

This review will consist of cross review of the bridge plans, roadway plans, diversion channel plans, and the geotechnical report by the various disciplines involved in the project.

**803 Rotational Team Review (RTR).**

The design calculations and bridge plans for each bridge will be reviewed by designers from a team other than the team that designed the bridge to ensure consistency in design approach and compliance with NDDOT and Cass County standards across the overall team.

**Deliverables**

1. Project Schedule with milestone dates for key activities and monthly updates
2. Monthly Progress Reports
3. Survey Control Report
4. Roadway Design Report
5. Bridge Aesthetics Memorandum
6. Preliminary Bridge Design Report(s)
7. Final Roadway Plans
8. Channel Preliminary Design Report
9. 90% Channel Design
10. Final Channel Plan Submittal
11. 30% Bridge Plan Submittal
12. 90% Bridge Plan Submittal
13. Final Bridge Plan Submittal
14. 30% cost estimate
15. 90% cost estimate
16. Contract Documents (final plans and specifications)

**Work not included in this Scope of Services**

1. Environmental documentation and permitting
2. Utility Relocation Agreements
3. ROW Acquisition including Appraisals, Title Searches, Title Opinions, Deeds
4. Bid documents and bidding services

3. Owner's Responsibilities

Owner shall have those responsibilities set forth in Article 2 of the Agreement and in Exhibit B.

4. Times for Rendering Services

<u>Phase</u>	<u>Start Time</u>	<u>Completion Time</u>
Design of Work Package 4 Contract Documents (100% Plans and Specifications)	March 8, 2012	<del>June-September</del> 30, 2013

5. Payments to Engineer

A. Owner shall pay Engineer for services rendered as follows:

- i. Compensation for services identified under Subtasks 100 through 800 shall be on a Time and Material basis in accordance with the Standard Hourly Rates shown in Appendix 2 of Exhibit C of the Agreement.
- ii. The total compensation for services identified under the Task Order for Subtasks 100 through 800 is not-to-exceed ~~\$2,333,300~~ total amount as defined in the table below.

<b>Subtask</b>	<b>Assumed Distribution Current Budget (\$)</b>	<b>Change (\$)</b>	<b>Revised Budget (\$)</b>
100 Project Management and Coordination	112,700		<u>112,700</u>
200 Field Survey	91,800		<u>91,800</u>
300 Roadway Design	346,900	<u>79,000</u>	<u>425,900</u>
400 Bridge Aesthetics Concept Development and Coordination	48,300		<u>48,300</u>
500-509 Preliminary Bridge Design	258,300		<u>258,300</u>
510 Preliminary Channel Design	112,900		<u>112,900</u>
600-609 Final Bridge Design Calculations	315,000		<u>315,000</u>
610 Final Channel Design	63,000		<u>63,000</u>
700-709 Bridge Plan Preparation	574,400		<u>574,400</u>
710 Channel Plan Preparation	126,000	<u>36,000</u>	<u>162,000</u>
800 Quality Assurance/Quality Control	284,000		<u>284,000</u>

<b>TOTAL</b>	<b>2,333,300</b>	<b><u>115,000</u></b>	<b><u>2,448,300</u></b>
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B. The terms of payment are set forth in Article 4 of the Agreement and in Exhibit C.

6. Consultants:

Barr Engineering Company  
Braun Intertec Corporation  
HDR, Inc.  
Kadmas, Lee & Jackson  
Northern Technologies, Inc.  
SRF Consulting Group, Inc.

7. Other Modifications to Agreement: None

8. Attachments:

None

9. Documents Incorporated By Reference: None

10. Terms and Conditions: Execution of this Task Order by Owner and Engineer shall make it subject to the terms and conditions of the Agreement (as modified above), which Agreement is incorporated by this reference. Engineer is authorized to begin performance upon its receipt of a copy of this Task Order signed by Owner.

The Effective Date of this Task Order is March 8, 2012.

ENGINEER:

**Houston-Moore Group, LLC**

Signature \_\_\_\_\_ Date \_\_\_\_\_

**Jeffry J. Volk**

Name \_\_\_\_\_

**President**

Title \_\_\_\_\_

DESIGNATED REPRESENTATIVE FOR  
TASK ORDER:

**C. Gregg Thielman**

Name \_\_\_\_\_

**Sr. Project Manager**

Title \_\_\_\_\_

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\_\_\_\_\_

Fax

OWNER:

**Fargo-Moorhead Metro Diversion Authority**

Signature \_\_\_\_\_ Date \_\_\_\_\_

**Darrell Vanyo**

Name \_\_\_\_\_

**Chairman, Flood Diversion Board of Authority**

Title \_\_\_\_\_

DESIGNATED REPRESENTATIVE FOR  
TASK ORDER:

**Keith Berndt**

Name \_\_\_\_\_

**Cass County Administrator**

Title \_\_\_\_\_

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**COST JUSTIFICATION AND RECOMMENDATION**

PREPARED FOR: Technical Advisory Team (TAC)  
 COPIES: United States Army Corps of Engineers (USACE)  
 PREPARED BY: Program Management Consultant (PMC)  
 DATE: 7/3/2013  
 SUBJECT: **Task Order No. 3, Amendment 2:  
 Work Package 4 - CR-81 Bridge, I-29 N & S Bridges**  
 ATTACHMENT(S): HMG Cost Proposal

**Purpose:** The purpose of this document is to present an independent estimate of the engineering fees required to accomplish the above listed Task Order No. 3, Amendment 2 as well as a recommendation to the TAC on the total cost for this action.

**Scope:**

1. Provide channel design for additional 2,500-ft of channel (5,000 ft total).
2. Develop a comprehensive construction staging plan for all four bridges in Reach 3 and provide analysis and budgetary cost estimates. Conduct a realignment analysis of I-29 to evaluate construction staging issues and costs.

**Background**

The additional channel length is needed to provide adequate fill for bridge approach raises. The construction staging plan and realignment analysis are needed to determine the preferred bride configuration and determine construction schedule. The work is creditable work-in-kind assistance.

**PMC Cost Estimate**

The PMC used the attached level of effort (LoE) estimate to determine a baseline of cost for this amendment. This LoE estimate is used to compare to the estimate received from the consultant.

**Task 1. Additional Channel Design**

Position/Grade	Rate / Hr.	Additional Channel Design	Total	Cost
Principal Engineer	\$ 163		0	\$ -
Senior Project Manager	\$ 158	40	40	\$ 6,320
Senior Project Engineer	\$ 147	40	40	\$ 5,880
Project Manager	\$ 142		0	\$ -
Professional Engineer	\$ 132	160	160	\$ 21,120
Project Engineer	\$ 116	120	120	\$ 13,920
Engineer/GIS Manager	\$ 132	20	20	\$ 2,640
H&H Modeler	\$ 115		0	\$ -
Geotechnical Engineer	\$ 132		0	\$ -

Environmental Scientist	\$ 119		0	\$ -
Construction Engineer	\$ 109		0	\$ -
Project Controls Mgr	\$ 142		0	\$ -
Engineering Technician	\$ 93		0	\$ -
GIS Technician	\$ 111	80	80	\$ 8,880
Land Surveyor	\$ 116		0	\$ -
CADD Technician	\$ 105	120	120	\$ 12,600
Administrative Assistant	\$ 65	80	80	\$ 5,200
Expenses				
<b>TOTALS</b>			660	\$ 76,560

**Task 2. Construction Staging Plan**

<b>Position/Grade</b>	<b>Rate / Hr.</b>	<b>Construction Staging Plan</b>	<b>Total</b>	<b>Cost</b>
Principal Engineer	\$ 163		0	\$ -
Senior Project Manager	\$ 158	20	20	\$ 3,160
Senior Project Engineer	\$ 147	20	20	\$ 2,940
Project Manager	\$ 142		0	\$ -
Professional Engineer	\$ 132	120	120	\$ 15,840
Project Engineer	\$ 116		0	\$ -
Engineer/GIS Manager	\$ 132		0	\$ -
H&H Modeler	\$ 115		0	\$ -
Geotechnical Engineer	\$ 132		0	\$ -
Environmental Scientist	\$ 119		0	\$ -
Construction Engineer	\$ 109		0	\$ -
Project Controls Mgr	\$ 142		0	\$ -
Engineering Technician	\$ 93		0	\$ -
GIS Technician	\$ 111		0	\$ -
Land Surveyor	\$ 116		0	\$ -
CADD Technician	\$ 105	120	120	\$ 12,600
Administrative Assistant	\$ 65		0	\$ -
Expenses				
<b>TOTALS</b>			280	\$ 34,540

The PMC independently estimated the cost for this task order amendment to be approximately \$111,100. The local consultant estimated the work to be \$115,895.

## **HMG proposal**

HMG's proposal is included as an attachment.

## **Recommendation and Justification**

The PMC independently estimated the cost for this task order amendment and reviewed the HMG proposal and believes a \$115,000 budget is reasonable. The PMC recommends the Authority execute Task Order No. 3, Amendment 2 to increase the contract amount by \$115,000.



**FM Metro Flood Risk Management Project**

**Scope and Fee for Task Order 3 - Reach 3 Bridges**

Task	Activity Description	Personnel Costs																				
		Project Manager		Senior Project Engineer		Lead Surveyor		Project Engineer		Graduate Engineer		GIS Technician II		CADD Technician III		Administrative Assistant		GPS Survey Crew Chief		Survey Tech III		Cost Per Task
		Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost			
<b>Task 300 - Roadway Design</b>																						
	Comprehensive staging analysis and plan development for the construction of all 4 bridges, embankment and channel.		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	\$ -
	Realignment study of options to shift I-29 corridor west of existing alignment to avoid construction staging issues.																					
	Change in bridge length related to updated		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	\$ 79,275
	<b>Total</b>	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	\$ 79,275
<b>Task 710 - Channel Plan Preparation</b>																						
	Extension of reach from 2,500 to 5,000 ft - Additional channel, EMB and ditch design	40	\$ 5,630		\$ -		\$ -	140	\$ 16,240		\$ -		\$ -	140	\$ 14,700		\$ -		\$ -		\$ -	\$ 36,620
	<b>Total</b>	40	\$ 5,630	0	\$ -	0	\$ -	140	\$ 16,240	0	\$ -	0	\$ -	140	\$ 14,700	0	\$ -	0	\$ -	0	\$ -	\$ 36,620
	<b>Grand Totals</b>	40	\$ 5,630	0	\$ -	0	\$ -	140	\$ 16,240	0	\$ -	0	\$ -	140	\$ 14,700	0	\$ -	0	\$ -	0	\$ -	\$ 115,895