

# Task Order No. 4, Amendment ~~1~~2

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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. 4 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 7 (CR-32 and CR-22)
- 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 32 (CR-32) and County Road 22 (CR-22) bridges which cross the diversion channel, road alignment and grade changes, local drainage facilities and structures, and 1000-foot of diversion channel (nominally 500-feet on either side of the centerline of the bridge).
- C. Background:
  - i. Cass County Road 32 (CR-32), also known as 28th St. SE, is an aggregate surfaced county road serving commuter, farm to market, and rural residential needs. In the project location, the route of CR-32 is in an east–west direction, one and one-half miles west of a crossing of Interstate Highway 29, and three miles northwest of the City of Harwood. The diversion channel crosses CR-32 approximately seven miles upstream of the outlet to the Red River. In this location, the crossing is a high priority for design and construction in the early phases of the project. The segment of CR 32 between Sections 19 and 30 of Harwood Township will be impacted by construction of the diversion channel, necessitating construction of a new bridge in this location to accommodate traffic over the diversion channel.
  - ii. Cass County Road 22 (CR-22), also known as 31st Street SE, is an aggregate surfaced county road serving commuter, farm to market, and rural residential needs. In the project location, the route of CR-22 is in an east-west direction approximately one mile south and two and one-half miles west of the City of Harwood. The diversion channel crosses CR-22 approximately eleven miles upstream of the outlet to the Red River. The segment of CR-22 between Sections 2 and 11 of Raymond Township will be impacted by construction of the diversion channel, necessitating construction of a new bridge in this location to accommodate traffic over the diversion channel.
  - iii. The 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.

## 2. Services of Engineer

- A. General

- i. CR-32 Bridge. Prepare contract documents (Plans and Specifications) for the construction of the new CR-32 bridge, associated roads, local drainage facilities, and diversion channel. Design items include but are not limited to:
  - 1. CR-32 bridge, approximately 520 feet long and per Cass County roadway bridge design requirements and USACE design criteria. Include any by-pass requirements in the design. Provide design improvements to upgrade 3.6 miles of Township roadway, to Cass County roadway standards, for use as by-pass route.
  - 2. Local drainage and road raises as required.
  - 3. 1000-feet of diversion channel per USACE design requirements.
  - 4. Include a list and forms of permits required for construction of these facilities.
- ii. CR-22 Bridge. Prepare contract documents (Plans and Specifications) for the construction of the new CR-22 bridge, associated roads, local drainage facilities, and diversion channel. Design items include but are not limited to:
  - 1. CR-22 bridge, approximately 520 feet long and per Cass County roadway bridge design requirements and USACE design criteria. Include any by-pass requirements in the design. Provide design improvements to upgrade 1.4 miles of Township roadway, to Cass County roadway standards, for use as by-pass route.
  - 2. Local drainage and road raises as required.
  - 3. Coordinate design with the Lower Rush River inlet.
  - 4. 1000-feet of diversion channel per USACE design requirements.
  - 5. Include a list and forms of all permits required for construction of these facilities.
- iii. 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 Cass County standards 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, [by-pass routes](#) 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 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 Cass County, the local sponsors, and other interested parties and agencies. 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 Preliminary Bridge Design**

##### **401 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.

##### **402 Bridge Length Determination.**

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

##### **403 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.

##### **404 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.

##### **405 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.

##### **406 Bridge Aesthetic Design Concepts.**

Incorporate selected bridge aesthetic concepts and features developed in Task Order No. 3.

##### **407 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.

##### **408 Bridge Preliminary Design Report.**

Prepare a Bridge Preliminary Design Reports 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.

#### **410 Channel Preliminary Design.**

Prepare a draft Preliminary Design Report (PDR) on the Diversion Channel design for 2,000 feet of channel, nominally 500 feet each side of each bridge centerline, 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.

### **500 Final Bridge Design Calculations**

#### **501 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.

#### **502 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

#### **503 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)

#### **510 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.

### **600 Bridge Plan Preparation**

#### **601 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.

#### **602 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.

#### **610 Channel Plan Preparation.**

Prepare plans and specifications for inclusion in construction documents. [Provide hydraulic analysis and designs for by-pass crossings of the Rush and Lower Rush Rivers. Coordinate design of Excavated Material Berms \(EMB\) with adjacent USACE diversion channel reach EMBs. Revise EMB layouts as needed to match USACE final EMB layouts](#)

### **700 Quality Assurance/Quality Control**

#### **701 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.

#### **702 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.

#### **703 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. Preliminary Bridge Design Report(s)

6. Final Roadway Plans
7. Preliminary Channel Design Report
8. 90% Channel Design
9. Final Channel Plan Submittal
10. 30% Bridge Plan Submittal
11. 90% Bridge Plan Submittal
12. Final Bridge Plan Submittal
13. 30% cost estimate
14. 90% cost estimate
15. 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 7 (100% Plans and Specifications)	March 8, 2012	<del>June 30, 2012</del> <u>September 30, 2013</u>

5. Payments to Engineer

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

- i. Compensation for services identified under Subtasks 100 through 700 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 700 is not-to-exceed ~~\$1,421,000~~ total amount as defined in the table below.

<u>Subtask</u>	<u>Assumed Distribution Current Budget (\$)</u>	<u>Change (\$)</u>	<u>Revised Budget (\$)</u>
100 Project Management and Coordination	106,000		<u>106,000</u>
200 Field Survey	43,000	<u>47,000</u>	<u>90,000</u>
300 Roadway Design	94,000	<u>50,000</u>	<u>144,000</u>
400-409 Preliminary Bridge Design	245,000		<u>245,000</u>
410 Preliminary Channel Design	128,000		<u>128,000</u>
500-509 Final Bridge Design Calculations	184,000		<u>184,000</u>

<b>Subtask</b>	<b>Assumed Distribution Current Budget (\$)</b>	<b>Change (\$)</b>	<b>Revised Budget (\$)</b>
510 Final Channel Design	66,000		<u>66,000</u>
600-609 Bridge Plan Preparation	247,000		<u>247,000</u>
610 Channel Plan Preparation	108,000	<u>48,000</u>	<u>156,000</u>
700 Quality Assurance/Quality Control	200,000		<u>200,000</u>
<b>TOTAL</b>	<b>1,421,000</b>	<b><u>145,000</u></b>	<b><u>1,566,000</u></b>

B. The terms of payment are set forth in Article 4 of the Agreement and in Exhibit C.

6. Consultants:

- a. Barr Engineering Company
- b. Braun Intertec Corporation
- c. HDR, Inc.
- d. Kadrmas, Lee & Jackson
- e. Northern Technologies, Inc.
- f. 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

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Sr. Project Manager

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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

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