



**US Army Corps  
of Engineers®**  
St. Paul District

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## **Appendix I: Architectural**

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Fargo Moorhead Metropolitan Area  
Flood Risk Management Project

### **Diversion Inlet Structure**

Engineering and Design Phase

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# Appendix I: Architectural

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# Appendix I: Architectural

## I.1 GENERAL

Architectural design for this project will include developing Architectural plans and specifications for the Diversion Inlet Control Building. This section summarizes building requirements and provides a narrative description of the proposed building with a proposed schematic floor plan. This section will be used to provide support for preparation of the plans and specifications and cost estimate.

## I.2 BUILDING CODES

The building design will comply with requirements of the most current edition of the International Building Code (IBC), the National Fire Protection Association (NFPA) Life Safety Code 101, and other applicable codes and standards.

## I.3 BUILDING FUNCTIONS

The design description noted in this appendix is based on programming requirements outlined in the Value Based Design Charrette Report, revised 6 February 2015, the preliminary DDR dated 10 February 2015, and subsequent PDT discussions.

The purpose of this building is to provide supervision of operations at the Fargo Diversion Inlet Structure. The building includes four primary functional areas: a space for control equipment, a control office area, a break area with kitchen, and a unisex toilet. Requirements for each space follows.

The control equipment area will provide space for all control equipment panels, MCC's, PLC's for the gates, SCADA system components, and other control related equipment. Per input from MVP Electrical the required size of the control equipment area will be approximately 10' x 5'. The equipment area will be provided heat and ventilation.

The control office area will include a desk, a window with view of the Inlet Structure, and base and wall cabinets for placement of reference manuals, documents, and office supplies. Data ports will be provided at the control area. The approximate size of this space is 10' x 5'. The space will be provided with heat and ventilation.

The break area will accommodate table seating for 4 to 6 employees and will include a small handicap accessible kitchen. The kitchen will have base and wall cabinets, a counter with sink, and will be handicap accessible. The counter will be plastic laminate with a 4 inch backsplash. The sink faucet will provide hot and cold running water. Hot water will be from a tankless point source electric water heater. Open knee space will be provided under the sink for wheelchair accessibility; exposed hot water and drain lines will be provided with an insulated pipe wrap. Kitchen equipment to be accommodated include a wall cabinet mounted microwave and a countertop coffee maker. A small undercounter

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refrigerator will be provided. Convenience receptacles will be provided. The approximate size of the break room / kitchen area is 10' x 13'. The space will be provided heat and ventilation.

The unisex toilet will be handicap accessible, with a sink, water closet, grab bars and appropriate toilet accessories. The sink faucet will provide hot/cold running water. Hot water will be from a tankless point source electric water heater. Exposed hot water and drain lines under the sink will be provided with an insulated pipe wrap. The approximate size of this room is 10' x 5'. The room will be provided with heat and ventilation.

Waste water from the toilet and kitchen will go to a sewage holding tank that will need to be pumped out occasionally.

An exterior power receptacle will be provided to service a rented generator.

An exterior hose bib will be provided near the exterior door.

A parking lot for 8 vehicles will be provided to include a handicap accessible space with paved parking surface and paved accessible route to the building.

#### **I.4 BUILDING CONSTRUCTION**

Exterior wall construction, starting from the exterior, will consist of a 4" masonry veneer (3 courses of split face cmu, with face brick above), cavity air space, 3" rigid insulation, dampproofing/vapor retarder, and 8" normal weight cmu bearing wall grouted solid and steel reinforced. Masonry wall height is 8'-8" above finish floor. Above the masonry is a prefinished metal wall panel on underlayment on 3" rigid insulation on wall sheathing on 2x6 studs at 24" on-center. Continuous thru-wall flashing will be placed along the bottom of the cmu wall to direct cavity moisture to the exterior. Exterior masonry wall thickness is nominal 1'-4". The wall will have a concrete foundation. Perimeter rigid insulation will be provided along the building foundation. Exterior wall system R-value will be minimum R20.

Interior wall construction will be 6" and 8" cmu, carried up to 8'-8" above finish floor. The 6" cmu walls will function as shear walls; a 2x4 stud wall will be placed above the 6" cmu to transfer lateral loads from the roof diaphragm down to the masonry.

Floor construction will be concrete slab on vapor barrier on compacted granular fill.

Roof construction will be a prefinished metal standing seam roof on underlayment on 3" rigid insulation on roof sheathing on 2x10 roof rafters at 24" on-center with batt insulation between rafters. Roof slope will be 1:12. The roof system will have a 20 year warranty. Roof system R-value will be minimum R30.

Exterior door will be 16 gage hollow metal with insulating core. Exterior door frame will be 14 gage hollow metal, mortar filled. All steel will be galvanized. Door and frame will be painted.

Interior doors will be 18 gage hollow metal. Interior door frames will be 16 gage hollow metal. All steel will be galvanized. Doors and frames will be painted.

Windows will be thermally broken aluminum frames with insulating laminated glass panes.

Proposed finishes are as follows:

The exterior cmu veneer will have a plant mixed integral color to approximate the beige color of the Diversion Inlet Structure walls. The brick color and metal wall and roof panel color will be manufacturers' standard colors to complement the color of the cmu.

Interior walls will be painted cmu and gypsum board. The wall base will be a 4" high coved resilient base.

Floor finish will be a slip resistant rubber floor tile over the concrete floor slab.

Ceiling at control room, break room and toilet room will be suspended acoustical ceiling tile set at 8'-0" above finish floor. Tile hold-down clips and hanger rods will be provided for the suspended ceiling at the control / break area for wind resistance when the exterior door is opened. The ceiling at the equipment room will be painted gypsum board.

## I.5 TECHNICAL GUIDELINES AND REFERENCES

1. ***A/E/C CADD Standard***, Release 3.0; U.S. Army Engineer Research and Development Center, Vicksburg, MS; September 2006.
2. ***A/E/C CADD Standard Supplement***, Release 6.2.0; U.S. Army Corps of Engineers, St. Paul District; July 2004.
3. ***United States National CAD Standard***, Version 4.0; National Institute of Building Sciences; July 2009.
4. ***International Building Code***.
5. ***National Fire Protection Association Life Safety Code, NFPA 101, 2012***.

## I.6 REFERENCE DOCUMENTS

<b><i>Final Feasibility Study and Environmental Impact Statement</i></b> , Fargo-Moorhead Metropolitan Area Flood Risk Management, January 5, 2012
<b><i>Project Design Guidelines</i></b> for the overall FMM Project and Reach-Specific Design Guidelines, February 2012
<b><i>Value Based Design Charrette Report</i></b> , Fargo-Moorhead Metropolitan Area Flood Risk Management Project, Diversion Inlet Structure, Cass County, ND, November 2014, Rev. 6 Feb 2015
<b><i>Design Documentation Report, Preliminary Engineering Report</i></b> , Fargo-Moorhead Metropolitan Area Flood Risk Management, 10 February 2015

## I.7 ARCHITECTURAL DRAWINGS

**Figure I-1** shows the proposed schematic floor plan for the Control Building.



**Figure I-1: Control Building Schematic Floor Plan**

