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# FM Area Diversion Resilience

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## Agenda

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03 Resilience:

Social – Economic – Environmental

04 Envision Overview

05 Example - P3 Envision Credits

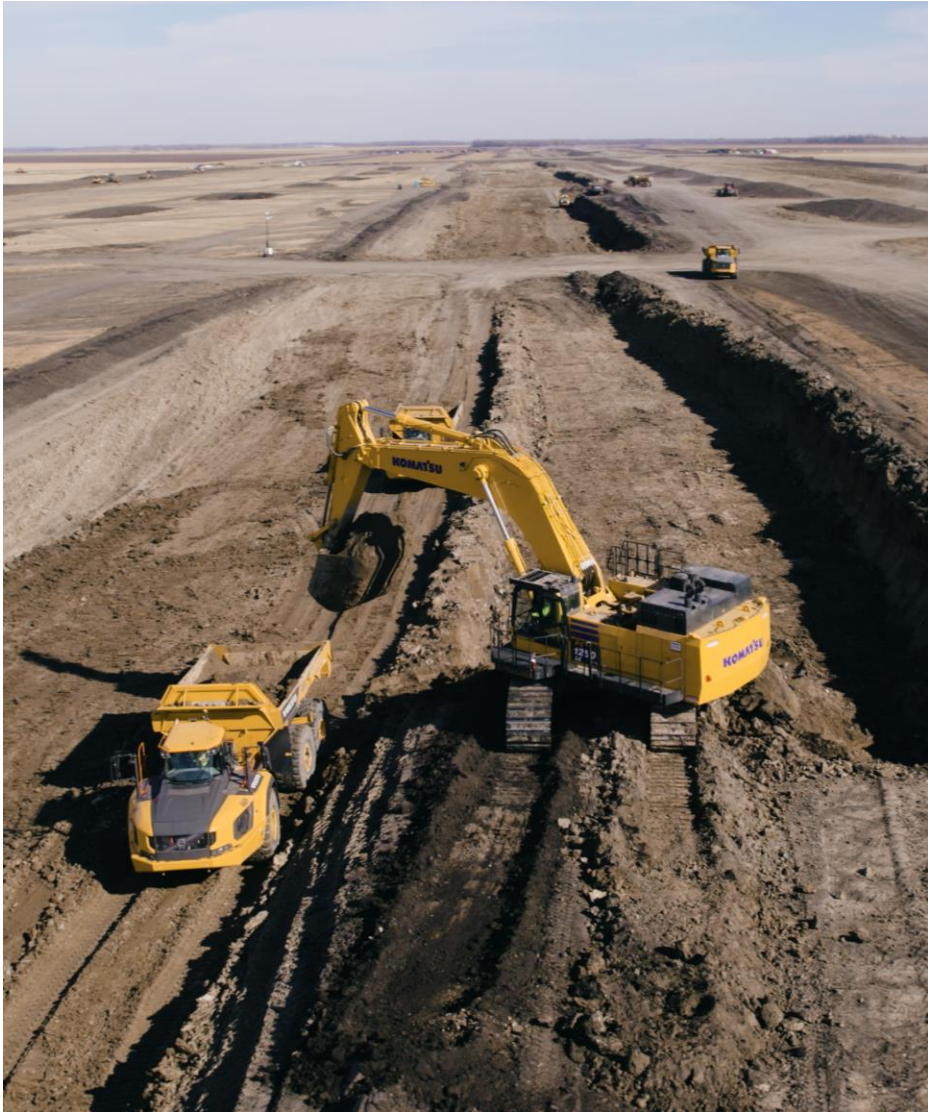


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# Katey Levihn

Environmental Manager  
Jacobs (PMC for MFDA)

# Project Firsts



- First-ever public-private partnership (P3) done in conjunction with the U.S. Army Corps of Engineers
- First-ever water management P3 implemented in North America
- First green finance initiative in the U.S. specifically designed for climate change adaptation
- Pilot project for using renewable biofuels to power heavy machinery

# Resilience Awards for Project



## **Environmental Finance Green Social and Sustainability Loan of the Year (2022)**

Environmental Finance's Sustainable Debt Awards recognize the best green, social, sustainable, and sustainability-linked (GSSS) bond and loan deals of the year.

## **IJ Global's ESG Climate Adaptation Award (2022)**

The IJGlobal ESG Awards demonstrate how organizations within the international infrastructure and energy community have turned the dial on the Environmental, Social and Governance front via their project.

# Resilience and Sustainability

## Resilience

The ability to thrive in the face of change and successfully adapt and/or recover readily from a significant disruption

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- Multiple energy sources
- Multiple water sources
- Disaster fortitude design
- Emphasis on passive systems
- Reduced environmental effects
- Floodplain evaluation of building site

- ✓ **Energy independence**
- ✓ **Water independence**
- ✓ **Renewable resources**
- ✓ **Resource storage**
- ✓ **Environmental effects**
- ✓ **Community support**

## Sustainability

The ability to continue important functions indefinitely without a decline in quality

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- Energy reduction
- Renewable energy production
- Locally sourced material
- Community responsibility
- Access to transportation
- Indoor environmental quality
- Brownfield restoration

# Resilience Actions

## P3

P3 required to submit reports demonstrating resilience performance during design, construction, operations, and maintenance

- Reduction of design conflicts (value engineering)
- Community and stakeholder engagement
- Construction safety and impacts
- Water, energy, waste, and materials management
- Noise and lighting
- Local workforce development

## USACE

The Corps of Engineers' Adaptive Management & Mitigation Plan addresses the updated NEPA analysis, which requires mitigation to offset any potential adverse effects to:

- Aquatic habitat
- Riparian forest
- Wetland resources
- Biological connectivity

The Corps will also monitor river geomorphology, water quality and fish stranding

# Climate Resilience

## Leading the Way

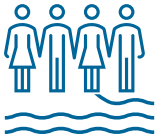
First green finance initiative in the U.S. for climate change adaptation (Green Bond and Green Loan)

One of the first flood protection and resiliency P3s in the United States





# Social Sustainability & Resiliency



Protects all ~260,000 residents in Fargo and Moorhead metropolitan areas from flooding



Provides apprenticeship opportunities to learn construction work



With federal \$\$\$, requires equal opportunity for all workers

- Targets 6.9% female and 0.7% minority participation by trade



Provides continuing recreation and outdoor experiences via the trail system

# Environmental Resilience & Sustainability



Creates ~3,500-4,000 direct jobs & ~7,500-8,500 indirect jobs



By providing flood protection, saves individual landowners \$\$\$ from having to purchase flood insurance



Farmers are reimbursed for crop loss due to UMA flooding



Saves \$1-2 billion community dollars in flood protection and restoration costs



Flood protection encourages future economic growth and development, as demonstrated by similar project in Winnipeg

# Environmental Resilience & Sustainability



## **Environmental Stewardship** of Habitat & Wetlands

- Fauna: Exclusion periods for Northern Long-Eared Bat, migratory bird species, working in the rivers to protect fish
- Flora: Vegetative zones of native species restores prairie
- Aquatic: Provision of aqueducts at the Maple and Sheyenne Rivers for fish passage; arched weirs for outlets

**Pollution Prevention:** NPDES Permit, SWPPP, Clean Air Act and Clean Water Act Requirements, noise and vibration monitoring

**Cultural Resources:** Protects and preserves historical buildings and archaeological artifacts

# Wetland Restoration Effects



## Wetlands

- Long-term benefits from restoring about 84 acres of wet meadow and 66 acres of marsh
- Wildlife habitat and increases diversity
- Improved water quality due to filtering sediments, nutrients and pollutants



## Agriculture

- About 1 mile of Drain 27 abandoned
- About 300 acres of currently farmed land taken out of production
- Farmland and crops outside of project parcels won't be inundated more than 24 hours after a large summer rainfall



## Vegetation

- Changes from row crops to about 150 acres of native wetland and 170 acres of prairie vegetation



# Kristen Almen

Operations Environmental  
Coordinator and Resilience  
Program Coordinator

RRVA/ASN Constructors

# ASN Constructors



**ASN Constructors is a design and construction company established in 2021 to deliver the Stormwater Diversion Channel and Associated Infrastructure portion of the Fargo-Moorhead Area Diversion project**

- Partnership of three large and experienced contractors
- Companies also comprise the Red River Valley Alliance, which was chosen by the MFDA for the development, design, and construction of the FM Area Diversion channel, as well as operation and maintenance of the diversion channel for a period of 30 years after completion
- Together, they are building a world-class project to protect the Fargo-Moorhead area from catastrophic flooding from the Red River.

# ASN Resilience Plan

ASN is comprised of:

- 19 departments
- 517 employees
- 356 pieces of equipment
- ~7,800 acres of project ROW

How can resilience be measured?

<b>Water Management</b>	<b>Energy Management</b>	<b>Waste &amp; Materials Management</b>	<b>Soils Management</b>	<b>Public and Stakeholder Engagement Management</b>	<b>Minimize Light Pollution</b>
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# Envision®



ENVISION™



Envision provides a consistent, consensus-based framework for assessing sustainability, resiliency, and equity in civil infrastructure.

- Designed by the Institute for Sustainable Infrastructure
- Envision Sustainability Professional
- Project Verification

344

Projects registered, under review and completed

\$237B

Cumulative value of those projects

9,000

Envision Sustainability Professionals (ENV SPs)



# Envision<sup>®</sup> Standards



[www.SustainableInfrastructure.org](http://www.SustainableInfrastructure.org)

“Envision<sup>®</sup> provides a holistic framework for planning, evaluating and rating the community, environmental, and economic benefits of all types and sizes of infrastructure projects ...”

*Institute for Sustainable Infrastructure*

## 64 Envision credits across 5 categories

	<b>Quality of Life</b> 14 Credits Wellbeing, Mobility, Community
	<b>Leadership</b> 12 Credits Wellbeing, Mobility, Community
	<b>Resource Allocation</b> 14 Credits Wellbeing, Mobility, Community
	<b>Natural World</b> 14 Credits Wellbeing, Mobility, Community
	<b>Climate &amp; Resilience</b> 10 Credits Wellbeing, Mobility, Community

# Envision<sup>®</sup> Framework



## WELLBEING

- QL1.1** Improve Community Quality of Life
- QL1.2** Enhance Public Health & Safety
- QL1.3** Improve Construction Safety
- QL1.4** Minimize Noise & Vibration
- QL1.5** Minimize Light Pollution
- QL1.6** Minimize Construction Impacts

## MOBILITY

- QL2.1** Improve Community Mobility & Access
- QL2.2** Encourage Sustainable Transportation
- QL2.3** Improve Access & Wayfinding

## COMMUNITY

- QL2.1** Advance Equity & Social Justice
- QL2.2** Preserve Historic & Cultural Resources
- QL2.3** Enhance Views & Local Character
- QL2.4** Enhance Public Space & Amenities

**QL0.0** Innovate or Exceed Credit Requirements



## COLLABORATION

- LD1.1** Provide Effective Leadership & Commitment
- LD1.2** Foster Collaboration & Teamwork
- LD1.3** Provide for Stakeholder Involvement
- LD1.4** Pursue Byproduct Synergies

## PLANNING

- LD2.1** Establish a Sustainability Management Plan
- LD2.2** Plan for Sustainable Communities
- LD2.3** Plan for Long-Term Monitoring & Maintenance
- LD2.4** Plan for End-of-Life

## ECONOMY

- LD3.1** Stimulate Economic Prosperity & Development
  - LD3.2** Develop Local Skills & Capabilities
  - LD3.3** Conduct a Life-Cycle Economic Evaluation
- LD0.0** Innovate or Exceed Credit Requirements



## MATERIALS

- RA1.1** Support Sustainable Procurement Practices
- RA1.2** Use Recycled Materials
- RA1.3** Reduce Operational Waste
- RA1.4** Reduce Construction Waste
- RA1.5** Balance Earthwork On Site

## ENERGY

- RA2.1** Reduce Operational Energy Consumption
- RA2.2** Reduce Construction Energy Consumption
- RA2.3** Use Renewable Energy
- RA2.4** Commission & Monitor Energy Systems

## WATER

- RA3.1** Preserve Water Resources
- RA3.2** Reduce Operational Water Consumption
- RA3.3** Reduce Construction Water Consumption
- RA3.4** Monitor Water Systems

**RA0.0** Innovate or Exceed Credit Requirements



## SITING

- NW1.1** Preserve Sites of High Ecological Value
- NW1.2** Provide Wetland & Surface Water Buffers
- NW1.3** Preserve Prime Farmland
- NW1.4** Preserve Undeveloped Land

## CONSERVATION

- NW2.1** Maintain Brownfields
- NW2.2** Manage Stormwater
- NW2.3** Reduce Pesticide & Fertilizer Impacts
- NW2.4** Protect Surface & Groundwater Quality

## ECOLOGY

- NW3.1** Enhance Functional Habitats
- NW3.2** Enhance Wetland & Surface Water Functions
- NW3.3** Maintain Floodplain Functions
- NW3.4** Control Invasive Species
- NW3.5** Protect Soil Health

**NW0.0** Innovate or Exceed Credit Requirements



## EMISSIONS

- CR1.1** Reduce Net Embodied Carbon
- CR1.2** Reduce Greenhouse Gas Emissions
- CR1.3** Reduce Air Pollutant Emissions

## RESILIENCE

- CR2.1** Avoid Unsuitable Development
- CR2.2** Assess Climate Change Vulnerability
- CR2.3** Evaluate Risk & Resilience
- CR2.4** Establish Resilience Goals and Strategies
- CR2.5** Maximize Resilience
- CR2.6** Improve Infrastructure Integration

**CR0.0** Innovate or Exceed Credit Requirements

# ASN's Construction Resilience Goals



**Water Management:** Reduce construction potable water use consumption



**Energy Management:** Reduce construction energy consumption



**Waste and Materials Management:** Reduce construction waste and the use of virgin materials



**Soils Management:** Balance earthwork on site



**Public and Stakeholder Engagement Management:** Reduce impacts from construction noise and vibrations and ensure a transparent and meaningful engagement process

# Activities & Related Resilience Goals



## Dust Control

- Water is pumped from excavations on site to use for dust control - *Reduce Construction Water Consumption*
- Dust control is applied if and when local residents share concerns - *Provide for Stakeholder Involvement*
- Efforts are made to return roads to their original condition - *Minimize Construction Impacts*



## Tree Chipping

- Trees are chipped instead of burned, which creates smoke - *Minimize Construction Impacts*
- Woodchips are used at construction entrances to prevent track-out - *Minimize Construction Impacts*



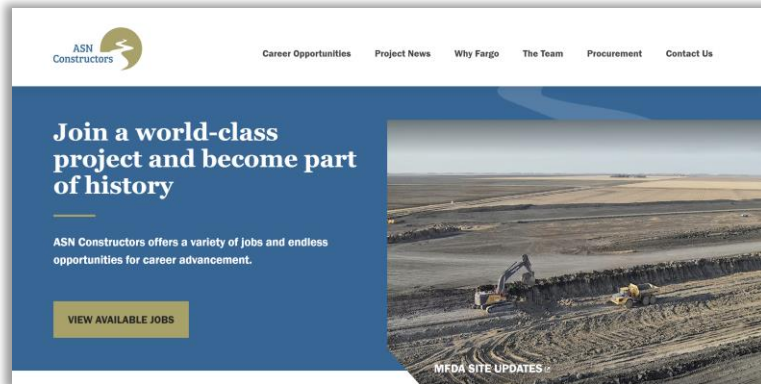
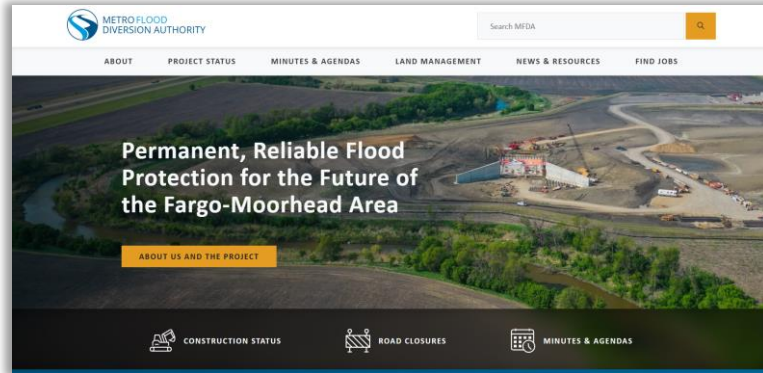
## Equipment Washing

- Water used for equipment washing is collected in a lined basin - *Preserve Water Resources*
- Water is reused from the basin - *Reduce Construction Water Consumption*

# Challenges & Data Tracked

- Recycling services not available outside of city limits
- Tracking data across all departments
  - Earthwork volumes
  - Water volumes
    - Trailers/offices
    - Dust suppression
    - Concrete curing
    - Equipment cleaning
- Waste management volumes
- Cubic yards of concrete
- Tons of aggregates
- Pounds of steel
- Gallons of diesel used
- Number of pieces of equipment
- Phone calls received by the PIO

# Stay Connected



## Websites

[www.FMDiversion.gov](http://www.FMDiversion.gov)

[www.ASNConstructors.com](http://www.ASNConstructors.com)



## Monthly E-Newsletter

<https://fmdiversion.gov/subscribe/>

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