

# Better Bonding for Better Building

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# Better Bonding for Better Building

**Bonding:** State raises money for projects with public purpose

Usually to acquire and better public land and buildings,

Also Constitutionally authorized:

- Establish and maintain state highways (Trunk highway bonds)
- Promote forestation and prevent and abate forest fires
- Construct or improve airports
- Develop state's agricultural resources by extending credit on real estate
- Improve public or private railroad rights-of-way and other rail facilities (up to \$200 million)

# Better Bonding for Better Building

**Bonding:** Usually done in year opposite budget year, but not necessarily

Package of projects, bonding bill must originate in House

- Senate Capital Investment Committee (Senator Sandy Pappas)
- House Capital Investment Committee (Rep. Fue Lee)

Requires  $\frac{2}{3}$  vote of the legislature (in both Senate and House)

# Why connect bonding to climate change?

Bonding packages **commit taxpayers of the future** to pay for building projects of today – they shouldn't also commit taxpayers to emissions that worsen climate disruption.

# Why connect bonding to climate change?

Premise: Minnesota should fund projects that reduce our state's greenhouse gas emissions burden rather than increasing it.

Building standards have put us on track for new public buildings that receive state bonding to be **net zero by 2030**.

Can we do more? Can we move faster?

# Why connect bonding to climate change?

## All Bonding Projects Have Climate Impact

Buildings \* Land Acquisition \* Forestation \* Highways

Projects can be designed to help meet our climate goals.

# Building to Net Zero

## The Way it is Built

Embodied carbon in  
building materials

## How it Performs

Building performance:  
energy and efficiency

## Where it is Built

How the project affects and  
interacts with the land



# Westwood Hills Nature Center, City of St. Louis Park



- Fossil-Fuel Free
- Zero Energy Certified
- Net Positive

# Westwood Hills Nature Center, City of St. Louis Park



- Minimize impact on existing habitats
- Use natural windbreak to minimize heat loss
- Use passive and active solar heat and power
- Accommodate a geothermal well field
- Take advantage of natural light

# Westwood Hills Nature Center, City of St. Louis Park

## Westwood Hills Video Tour

To learn more about Westwood Hills Nature Center, view our video.



# Zero Energy Certification



To be Zero Energy Certified, 100% of the building's energy needs on a net annual basis must be supplied by on-site renewable energy. No combustion is allowed

<https://living-future.org/zero-energy/certification/>

# Westwood Hills Nature Center, City of St. Louis Park



Westwood Hills Nature Center, HGA

International Living Future Institute:  
Zero Energy Certification  
[www.living-future.org/zero-energy/certification](http://www.living-future.org/zero-energy/certification)

“The scale of the change we seek is immense.

Unless we can articulate the vision and chart a clear path as a society, we will never experience the type of future that is possible and necessary for our long-term survival.

What is required without delay is a complete reshaping of humanity’s relationship with nature and a realignment of our ecological footprint within the planet’s carrying capacity...



# Westwood Hills Nature Center, City of St. Louis Park



Westwood Hills Nature Center, HGA

International Living Future Institute:  
Zero Energy Certification  
[www.living-future.org/zero-energy/certification](http://www.living-future.org/zero-energy/certification)

“Over the last 30 years, green building has become the most critical and progressive trend in the building industry.

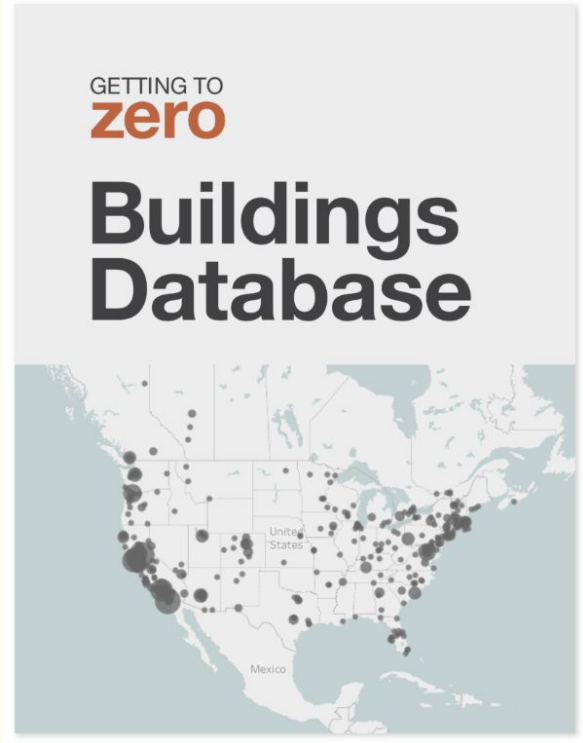
There have been huge steps forward in the design, construction, and operation of buildings.

Yet given the rate of change required to avoid the worst effects of climate change and other global environmental challenges, our progress can no longer move at a merely incremental pace but must accelerate radically.”

# Interactive Getting to Zero Buildings Database



- Verified
- Emerging



# Minnesota Buildings in the Zero Buildings Database

ZE Status	State or Province	Name	Certifications	City	Building Type
Verified	MN	Science House		St. Paul	Other
Verified	MN	Westwood Hills Nature Center		St. Louis Park	Public Assembly
Emerging	MN	Bagley Classroom University of Minnesota Duluth	LEED, PHI	Duluth	Education
Emerging	MN	Ford Site Net Zero Development		Saint Paul	Multifamily
Emerging	MN	Prairie House		Rochester	Education
Emerging	MN	St. Louis County Government Services Center		Virginia	Office
Emerging	MN	University of Minnesota Itasca Biological Station and La..		Shevlin	
Emerging	MN	West Dorm, Wolf Ridge Environmental Learning Center		Finland	

<https://newbuildings.org/resource/getting-to-zero-database/>



# Better Bonding for Better Building

## State Building Capital Projects:

- State Architect's Office (Dept. of Administration) must review predesign
- Agency that will use project must submit project info to legislature comment (there are exceptions)
- Must comply with sustainable building design guidelines developed by Depts. of Administration and Commerce (so buildings exceed the state energy code by at least 30%)
- Must comply with SB 2030 standards, which includes a net-zero by 2030 standard for new buildings built in 2030 or after.

# State-Funded Net Zero Buildings by 2030

## New / Major Renovation Buildings Receiving Bonding Support:

- By 2030, all new buildings (or those receiving major renovations) receiving bonding support are required to be net-zero ( total energy used  $\approx$  to renewable energy created onsite).
  - **B3** – (Buildings, Benchmarks and Beyond) is a benchmarking program that tracks energy consumption, energy costs, and emissions for all public buildings;
    - A “feedback loop” to the building design, construction and operations industry, from pre-design to 10 years of operation
  - **SB 2030** – (Sustainable Building 2030) is a set of energy standard guidelines enacted by the MN State Legislature in 2001 – went into effect January 15, 2004
    - MN Legislature added net-zero standard to SB 2030 in 2009

# B3 Case Studies Database

MINNESOTA

3

CASE STUDIES DATABASE

Select/search for a project by name

Home Projects Contact

VIEWS

Tile View

Card View

Table View

Table Views:

Project Information

Customize Columns...

FILTER

Organization:

City of Saint Paul

Building Type:

(All Buildings)

Strategies:

Energy & Greenhouse









IEQ

Materials

Process

Site & Water

Transport

Name	Organization	City	Building Type(s)	Construction Type	Building Area (sf)	Design Submission Status	Design Compliance	Operations Submission Status	Operations Compliance	Occupancy Date
 <b>University and Fairview Apartments</b>	City of Saint Paul	Saint Paul	Retail, Housing, Parking	New Construction	306,426	✓	✓	✓	?	1/1/2023
 <b>Highland Bridge by Pulte Homes</b>	City of Saint Paul	Saint Paul	Housing	New Construction	2,512	✓	✓	✓	?	1/1/2021
 <b>Mino Oski Ain Dah Yung Center</b>	City of Saint Paul	Saint Paul	Housing, Community Center, Cultural Center	New Construction	51,760	✓	✓	✓	?	11/7/2019
 <b>Thomas Avenue Flats</b>	City of Saint Paul	Saint Paul	Housing	New Construction	80,061	✓	✓	✗	✗	3/15/2019
 <b>Model Cities Brownstone Building</b>	City of Saint Paul	St. Paul	Housing, Retail, Office	New Construction	70,007	✓	✓	✗	?	11/1/2017
 <b>Wilson Ridge II Apartments</b>	City of Saint Paul	Saint Paul	Housing	New Construction	137,875	✗	✓	✗	?	10/4/2017
 <b>Villa del Sol</b>	City of Saint Paul	Saint Paul	Housing	New Construction	69,704	✓	?	✗	?	9/1/2017
 <b>Richard H. Rowan Public Safety Training Center</b>	City of Saint Paul	Saint Paul	Training Center	New Construction	42,342	✗	?	✗	?	8/1/2017

# State-Funded Net Zero Buildings by 2030

## New / Major Renovation Buildings Receiving Bonding Support:

- **Resiliency guidelines** added by the legislature to B3 Guidelines in 2023
  - For buildings to adapt to and accommodate projected climate-related changes.
- Other statutes and executive orders add specific requirements:
  - On site renewables
  - Pollinator support
  - Bird safety
  - Acoustic requirements

# Climate Action Through Bonding Projects

- But what we build today is still not required to do what we know buildings must:

Operate without fossil fuels.

# Climate Action Through Bonding Projects

- Bonding requests far exceed projects selected.
- Adopting criteria for evaluating bonding projects based on climate impacts would:
  - Start to shift project design
  - Start to expand familiarity with zero emission building practices
  - Provide markets for new material industries like zero carbon steel, zero carbon cement

# Climate Action Through Bonding Projects

## Bonding projects should be designed to:

- 1) Ensure projects do not add to climate disruption pollution when operating:



# Bonding projects should be designed to:

## 1) Ensure buildings do not add to climate disruption pollution when operating:

- Energy Efficiency
- Renewable energy systems

\* Fossil Fuels should not be installed.

**Use materials with lower embodied carbon.**



## Bonding projects should be designed to:

- 1) Ensure they do not add to climate disruption pollution.
- 2) Reduce pollution on most-impacted communities:

# Bonding projects should be designed to:

## 2) Reduce pollution on most-impacted communities:

What projects reduce air pollution on nearby communities while also reducing greenhouse gas emissions?



Photo from:

Green Schools National Network.

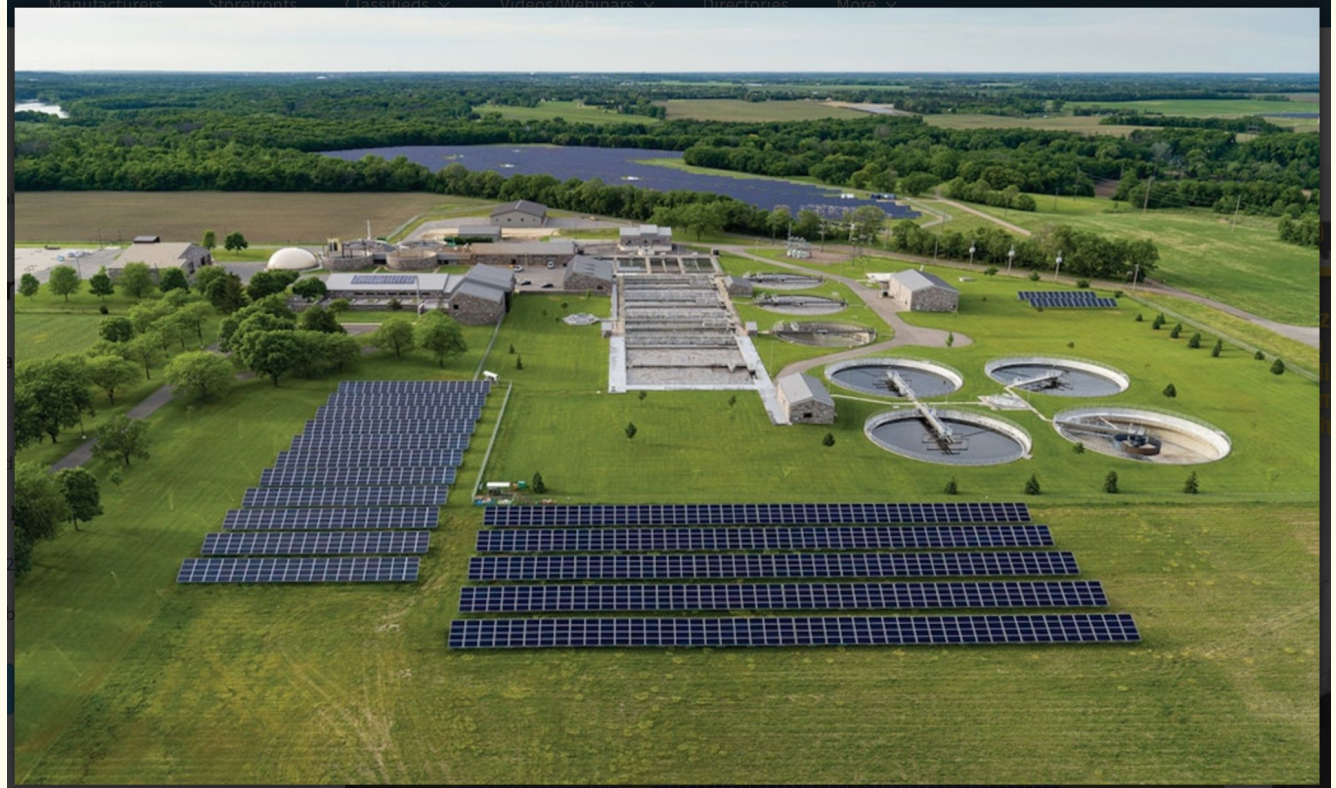
## Bonding projects should be designed to:

- 1) Ensure they do not add to climate disruption pollution.
- 2) Reduce pollution on most-impacted communities.
- 3) Respond to needs of communities while reducing energy burdens:

# Bonding projects should be designed to:

Respond to needs of communities while reducing energy burden.

- Solar on Wastewater Treatment Facilities



# Bonding projects should be designed to:

## Part 4. Renewable Energy Opportunities

Consideration should be given for the implementation of renewable energy opportunities:

1. Utilization of biogas recovered from anaerobic biosolids treatment processes.
2. Recovering heat from biosolids treatment processes or other heat production processes.
3. Installation of a combined heat and power system for biosolids treatment.
4. Solar and wind power generation at the facility

## Bonding projects should be designed to:

- 1) Ensure they do not add to climate disruption pollution.
- 2) Reduce pollution on most-impacted communities.
- 3) Respond to needs of communities while reducing energy burdens.
- 4) Use land in ways that draws heat-trapping carbon out of the atmosphere:



# Bonding projects should be designed to:

Restore blighted areas  
in ways that brings  
carbon out of the  
atmosphere.





## Bonding projects should be designed to:

- 1) Ensure they do not add to climate disruption pollution.
- 2) Reduce pollution on most-impacted communities.
- 3) Respond to needs of communities while reducing energy burdens.
- 4) Use land in ways that draws carbon out of the atmosphere.
- 5) **Transition transportation away from fossil fueled vehicles:**

# Bonding projects should be designed to:

## Transition transportation away from fossil fueled vehicles:

- Consider approach to transit lines
- Incorporate EV charging
- Connections to walking options



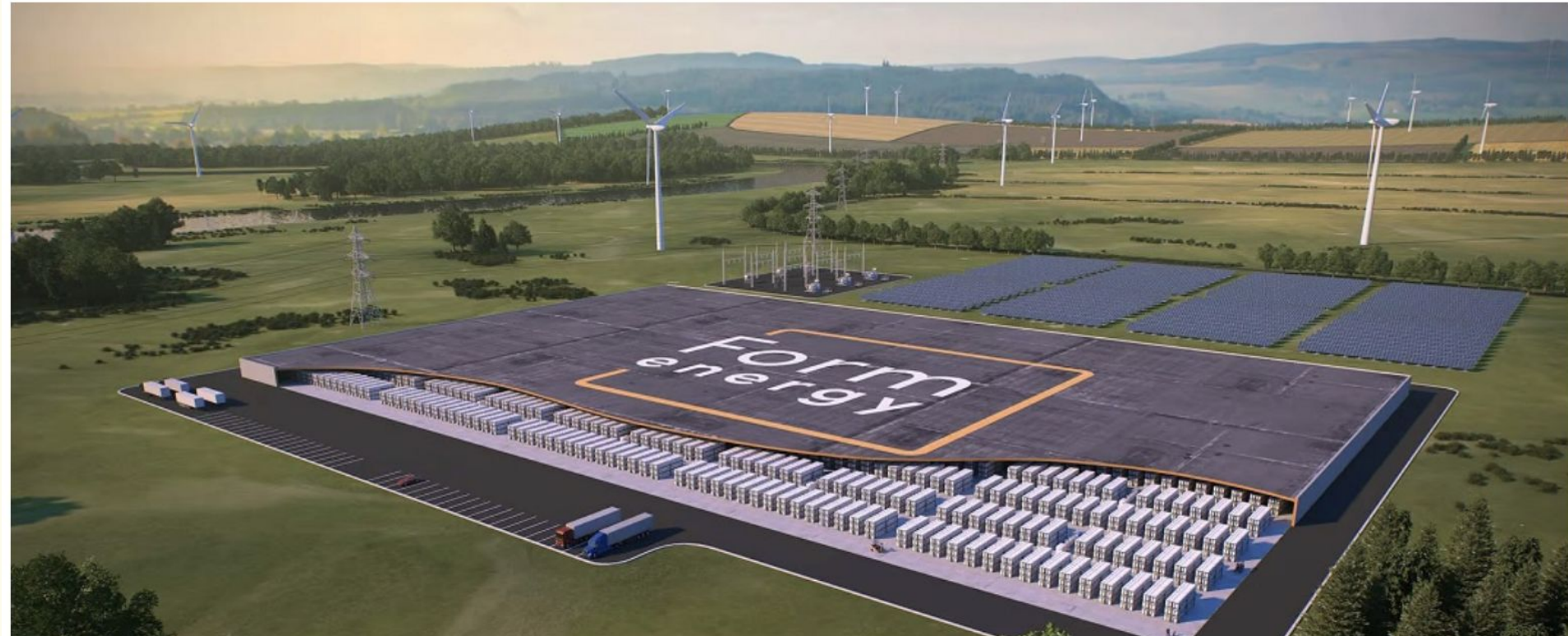
## Bonding projects should be designed to:

- 1) Ensure they do not add to climate disruption pollution.
- 2) Reduce pollution on most-impacted communities.
- 3) Respond to needs of communities while reducing energy burdens.
- 4) Use land in ways that draws carbon out of the atmosphere.
- 5) Transition transportation away from fossil fueled vehicles.
- 6) Pilots emerging technologies to model success/identify refinements:

# Bonding projects should be designed to:

Pilot emerging technologies, like battery storage.

Photo: Form Energy.



# Emerging Technologies: Zero Carbon Steel

The logo for Boston Metal, featuring the words "BOSTON" and "METAL" in a bold, green, sans-serif font, stacked vertically.

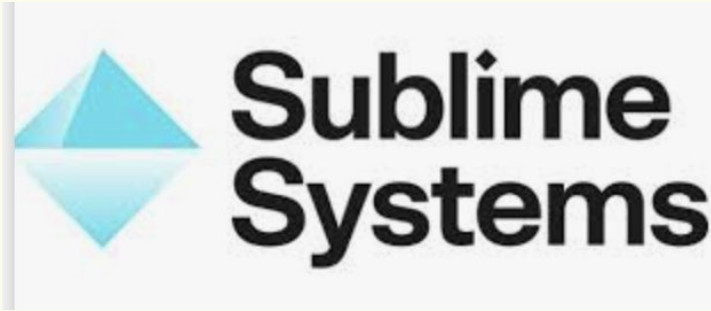
Producing liquid iron with high temperatures  
from consistent electricity.

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The logo for Electra, featuring the word "electra" in a blue, lowercase, sans-serif font, with a small green leaf icon above the letter 't'.

Producing clean iron (with low temperatures  
from intermittent electricity) for green steel.

# Emerging Technologies: Zero Carbon Cement



# Pushing for more from our bonding, sooner

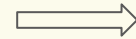
Aren't we on the right track?

Does starting to build zero emission buildings five years sooner than 2030 really make a difference?

# Pushing for more from our bonding, sooner

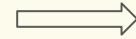
## Fundamental difference between:

Improving existing technology  
to make something 30% less harmful.



Dead End Pathway

Adopting new technology  
that takes us where we need  
to go.



Zero Emissions



# Pushing for more from our bonding, sooner

**We need to stop digging the climate hole now.**

# Pushing for more from our bonding, sooner

We need to leapfrog over the final incremental improvements to the new technologies that get us where we need to go: zero emissions.



# Pushing for more from our bonding, sooner

## AIA Minnesota Roundtable with Designers of SB 2030

*By Mary-Margaret Zindren*

***With:***

**Janet Streff, formerly of the State Energy Office at the Department of Commerce**

**Richard Graves, AIA, Director of the University of Minnesota's Center for Sustainable Building Research**

**Rick Carter, FAIA, Integrative Design Team Leader at LHB**

**Tom McDougall, Associate AIA, formerly of the Weidt Group**

**Zindren:** By 2030, do you expect there will be zero carbon emissions for all public buildings in Minnesota?

**Streff:** Well, to be clear, while it's encouraged for all buildings in Minnesota, SB 2030 is only required for new public buildings or big renovations of public buildings. So it's not going nearly as fast as we think it should in order to meet the goals for reducing greenhouse-gas emissions set out by the Legislature in 2007.



# Pushing for more from our bonding, sooner

## AIA Minnesota Roundtable with Designers of SB 2030

*By Mary-Margaret Zindren*

**McDougal:** To reduce the amount of energy needed to build a building, it's going to take all of our related industries working together. It will take architects, engineers, and building owners. It will take the trades – electrical, mechanical, and carpentry.

It's going to take all of us to build better buildings that conserve energy.

And if B3 were accepted as a performance-based code – an alternative to the... building codes we're dealing with today for private-sector buildings – then we could really make a difference.

# Pushing for more from our bonding, sooner

## AIA Minnesota Roundtable with Designers of SB 2030

*By Mary-Margaret Zindren*

**Carter:** If the B3 program were instituted as a statewide building code today, we'd have a pretty good chance of getting to our goal of net-zero carbon emissions by 2030.



# Pushing for more from our bonding, sooner

## AIA Minnesota Roundtable with Designers of SB 2030

*By Mary-Margaret Zindren*

- Graves:** A study conducted on the cost of carbon-reduction efforts looked at making B3 code for all buildings. It found that the cost of implementation is far outweighed by the dollars and societal benefits gained.
- Carter:** It actually saves money.
- Graves:** Yes – taxpayers and the public of Minnesota.
- It also gives Minnesota architects a competitive advantage in knowing how to build better buildings.

# Pushing for more from our bonding, sooner

## AIA Minnesota Roundtable with Designers of SB 2030

*By Mary-Margaret Zindren*

**Graves:** It also gives Minnesota architects a competitive advantage in knowing how to build better buildings. I don't think anyone has quantified it, but in my conversations with the firms that are doing work to the B3 benchmarks, I understand they're exporting those services to other parts of the country and the world. That's real economic value our architecture community is creating.

Unfortunately, as things stand, Minnesota cities aren't allowed to create a code that's stricter than the current state building code. Their hands are tied.



# Pushing for more from our bonding, sooner

We have what we need to build better now.



# THANK YOU!



Please make a  
gift to MNIPPL  
today!

