A'22 MN

AIA Minnesota

The Minnesota Conference on Architecture

November 9-11, 2022

Minneapolis Convention Center

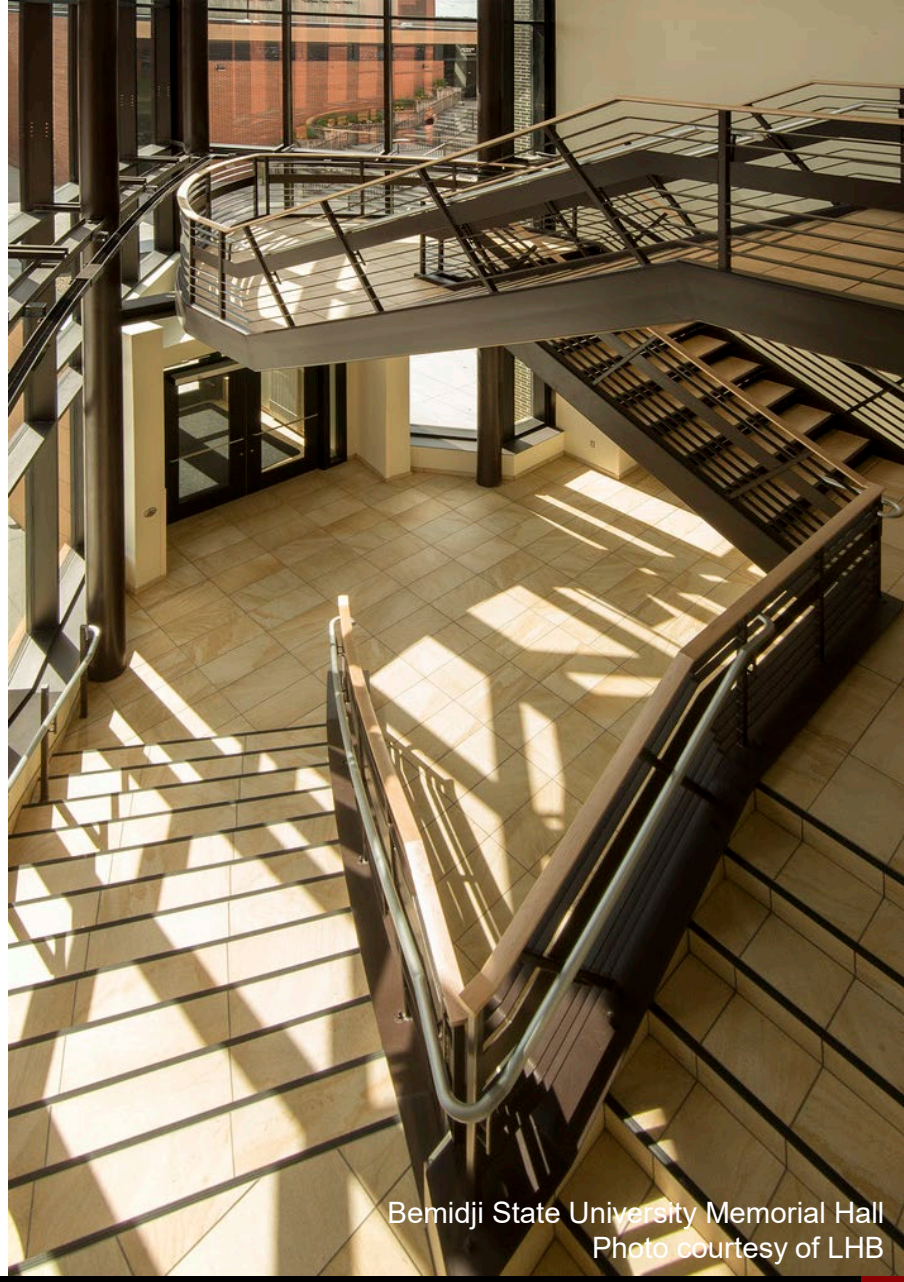
DEMYSTIFYING B3 FOR SMALL PROJECTS

Becky Alexander, AIA – Senior Researcher, LHB
Amber Sausen, AIA – Principal, Alliiance
Patrick Smith – Senior Research Fellow, CSBR
Jennifer Garman, AIA – Architect, Cuningham

November 11, 2022

AGENDA

1. Overview of B3 and SB 2030
2. B3 Testimonial
3. Approaches for Small Projects
4. Case Study | Wakan Tipi Center
5. Panel discussion

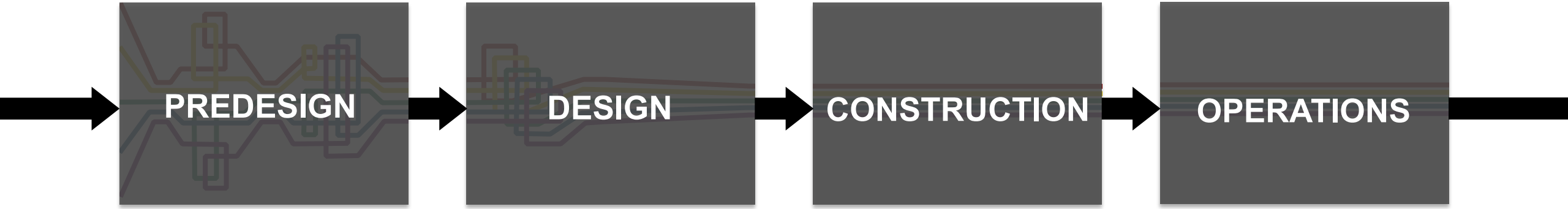


Bemidji State University Memorial Hall
Photo courtesy of LHB

POLLING QUESTIONS

LEARNING OBJECTIVES

1. Understand the intent of the B3 Guidelines and SB 2030 Small Buildings Methods and when they can be used.
2. Explain how the updated B3 Guidelines Site and Water section fits alongside other small project thresholds within the B3 suite of programs and tools.
3. Describe the major changes incorporated in the B3 Guidelines Small Buildings Method compared to the full set of B3 Guidelines.
4. Provide guidance for project design teams to evaluate strategies for small projects and sites during project planning and design.



GUIDELINES

SB 2030 ENERGY STANDARD

Establish project-specific performance requirements.

GUIDELINES

SB 2030 ENERGY STANDARD

Refine project-specific performance requirements.

Optimize use of resources to achieve performance requirements.

Evaluate success of design strategies through early and repeated modeling.

GUIDELINES

Implement construction practices that meet performance requirements.

GUIDELINES

SB 2030 ENERGY STANDARD

BENCHMARKING

ENERGY EFFICIENT OPERATIONS

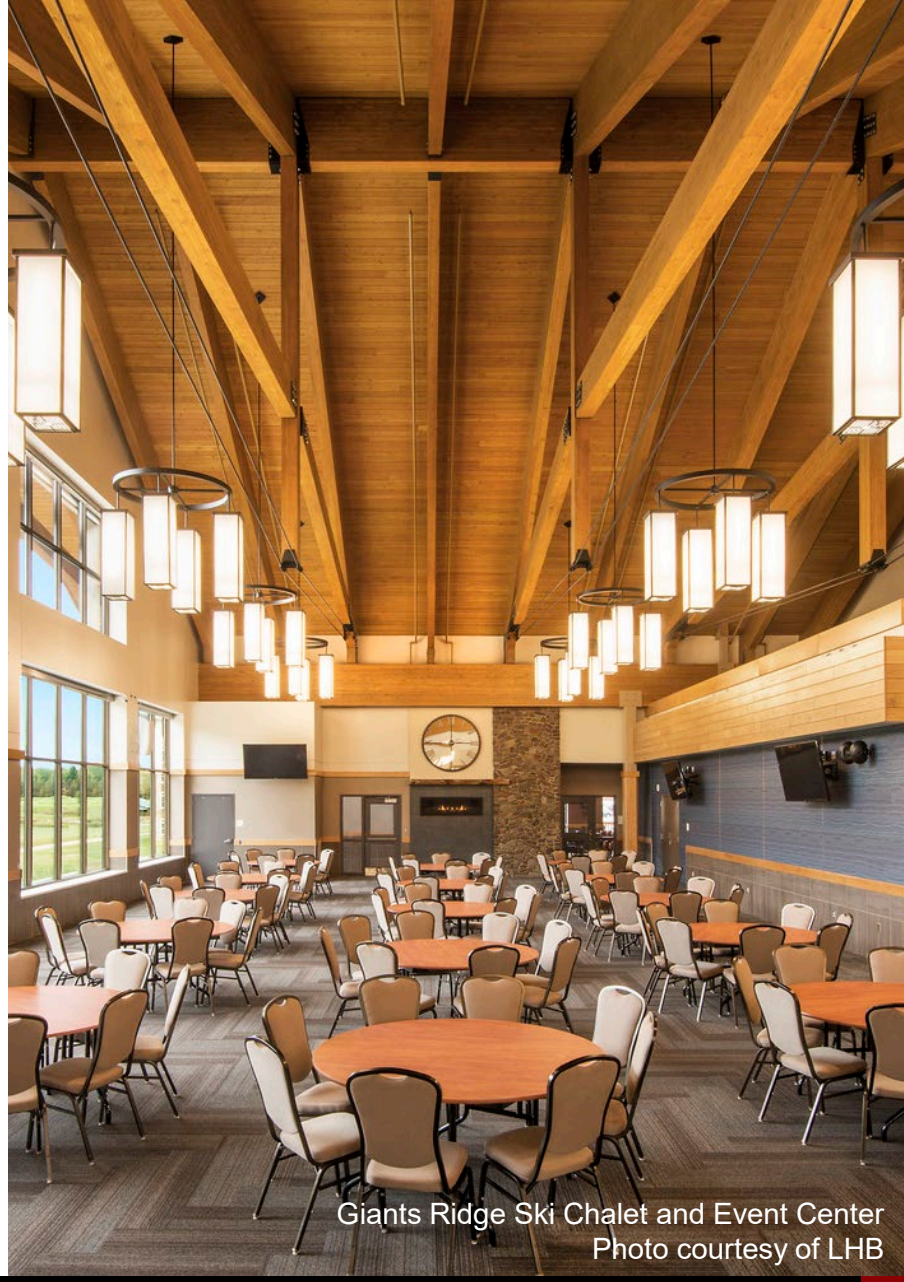
POST-OCCUPANCY EVALUATION

Ensure project is meeting performance requirements.

SB 2030 AND B3 NETWORK OF PROGRAMS

B3 GUIDELINES

- PERFORMANCE MANAGEMENT
- SITE & WATER
- ENERGY & ATMOSPHERE
- INDOOR ENVIRONMENTAL QUALITY
- MATERIALS & WASTE

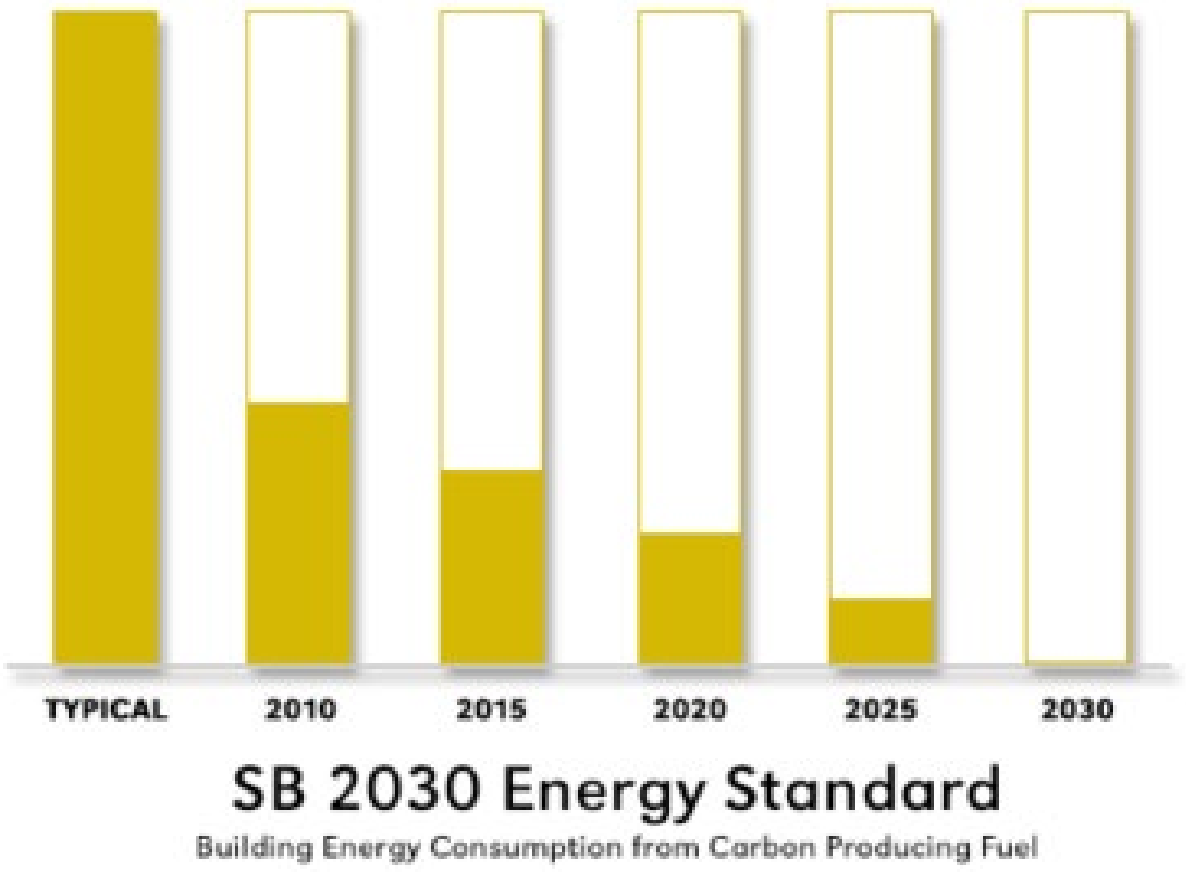


Giants Ridge Ski Chalet and Event Center
Photo courtesy of LHB

SB 2030

SB 2030 is a progressive energy and carbon reduction program

- modeled on the Architecture 2030 program
- customized to better fit Minnesota's buildings, climate, and policies
- expanded to allow the inclusion of more building types.



B3 FOR YOU AND ME

Amber Sausen, AIA, LEED AP BD+C, WELL AP
Alliiance

PRINCIPLES FOR RATING SYSTEMS

SCIENCE-BASED

Results and decisions must be reproducible by others using the same standard.

TRANSPARENT

Standards and process for awarding the certification should be transparent and open for examination.

OBJECTIVE

Certification body should be free of conflict.

PROGRESSIVE

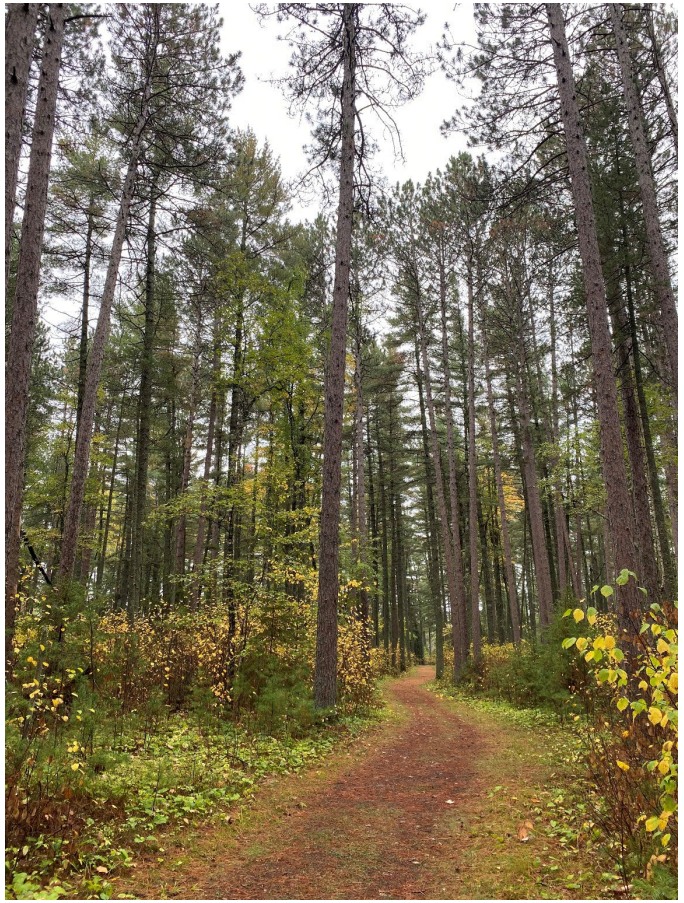
Standards should advance industry practices, not simply reward business as usual.

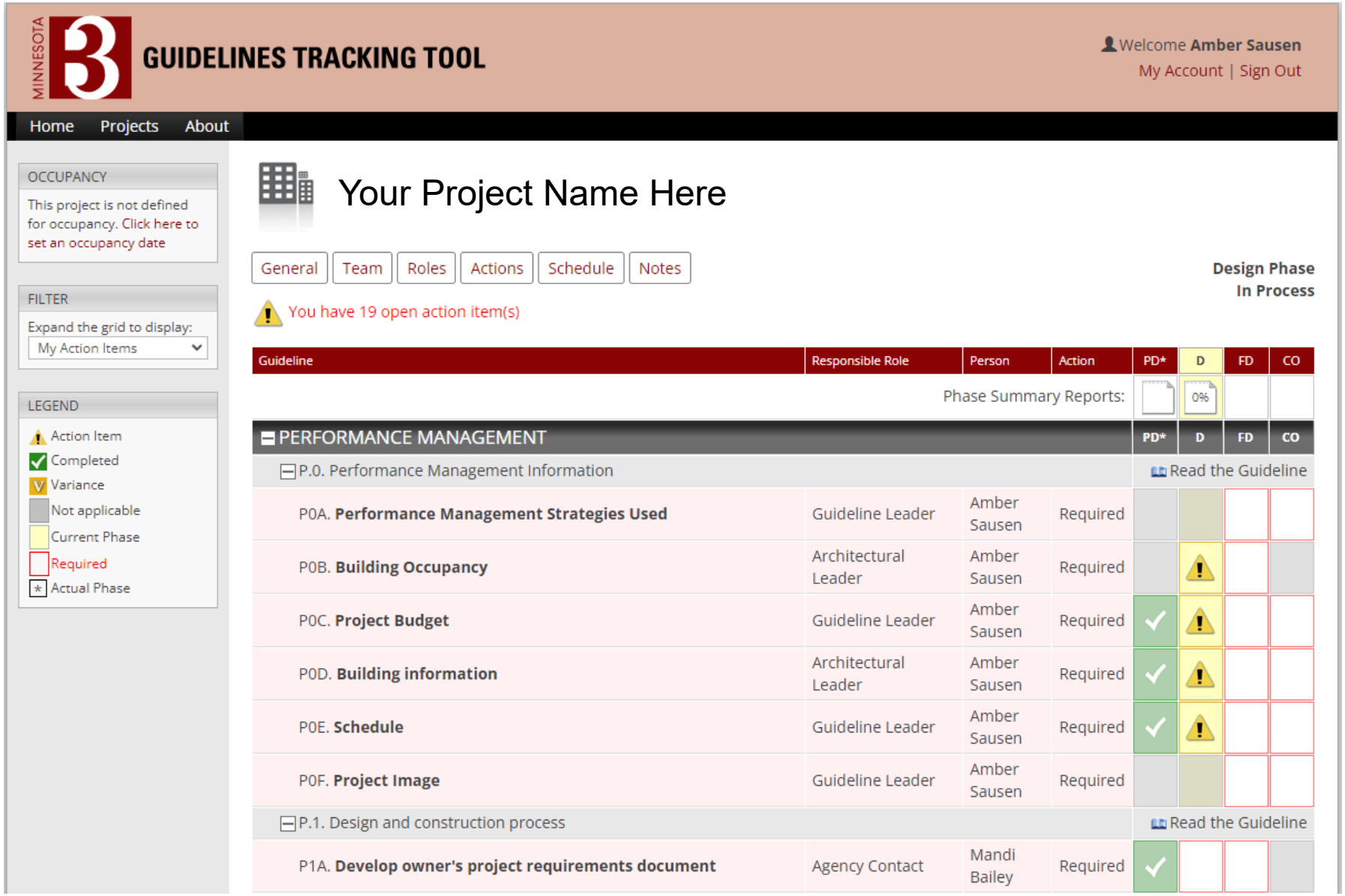
www.wbdg.org/resources/green-building-standards-and-certification-systems

PRINCIPLES FOR RATING SYSTEMS

REGIONAL

Addresses environmental priorities specific to the project site and ecological context




MINNESOTA 3
GUIDELINES TRACKING TOOL
Welcome Amber Sausen
My Account | Sign Out
Home
Projects
About
OCCUPANCY
This project is not defined for occupancy. Click here to set an occupancy date
FILTER
Expand the grid to display:
My Action Items
LEGEND
Action Item
Completed
Variance
Not applicable
Current Phase
Required
Actual Phase
Your Project Name Here
General
Team
Roles
Actions
Schedule
Notes
Design Phase
In Process
You have 19 open action item(s)
Guideline
Responsible Role
Person
Action
PD*
D
FD
CO
Phase Summary Reports:
0%
PERFORMANCE MANAGEMENT
P.0. Performance Management Information
Read the Guideline
P0A. Performance Management Strategies Used
Guideline Leader
Amber Sausen
Required
P0B. Building Occupancy
Architectural Leader
Amber Sausen
Required
P0C. Project Budget
Guideline Leader
Amber Sausen
Required
P0D. Building information
Architectural Leader
Amber Sausen
Required
P0E. Schedule
Guideline Leader
Amber Sausen
Required
P0F. Project Image
Guideline Leader
Amber Sausen
Required
P.1. Design and construction process
Read the Guideline
P1A. Develop owner's project requirements document
Agency Contact
Mandi Bailey
Required

GOOD FOR PEOPLE

UMN Bee Lab

73% reduction from baseline

EUI 164 kBTU/sf/yr

GOOD FOR PEOPLE

GOOD FOR NON-PEOPLE

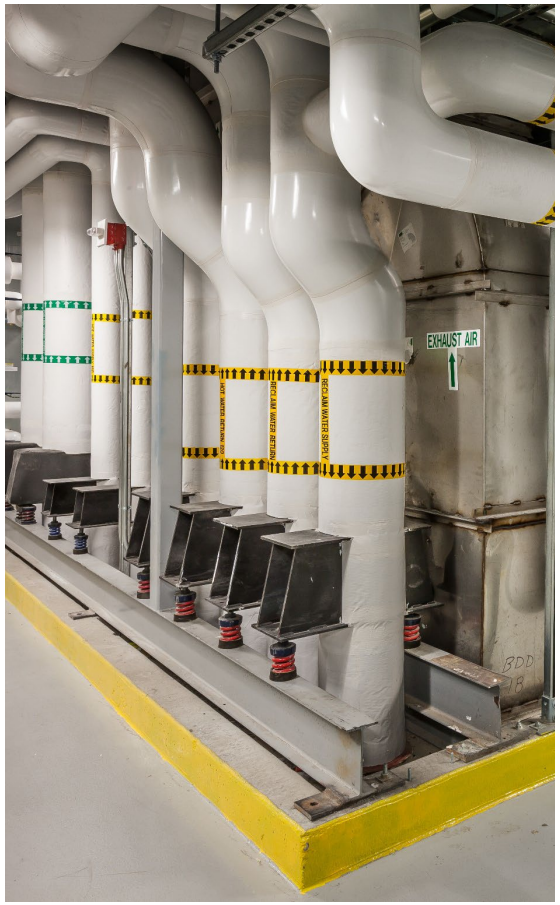
UMN Bee Lab

73% reduction from baseline

EUI 164 kBTU/sf/yr

GOOD FOR NON-PEOPLE

GOOD FOR OPERATIONS



ASPIRATIONAL

MnDOT Jackson Safety Rest Areas
Voluntary SB 2030
70% reduction from baseline
EUI 89 kBTU/sf/yr

ACCESSIBLE

B3 Assistance
msbghelp@umn.edu

SMALL IS BEAUTIFUL

B3 & SB 2030 SMALL BUILDINGS METHODS

Pat Smith – Senior Research Fellow, CSBR

OUTLINE

1. Introduction to approaches for small projects
    - Purpose
    - Timeline
    - Applicability
2. B3 Guidelines Small Buildings Method and small sites updates
3. SB 2030 Small Buildings Method

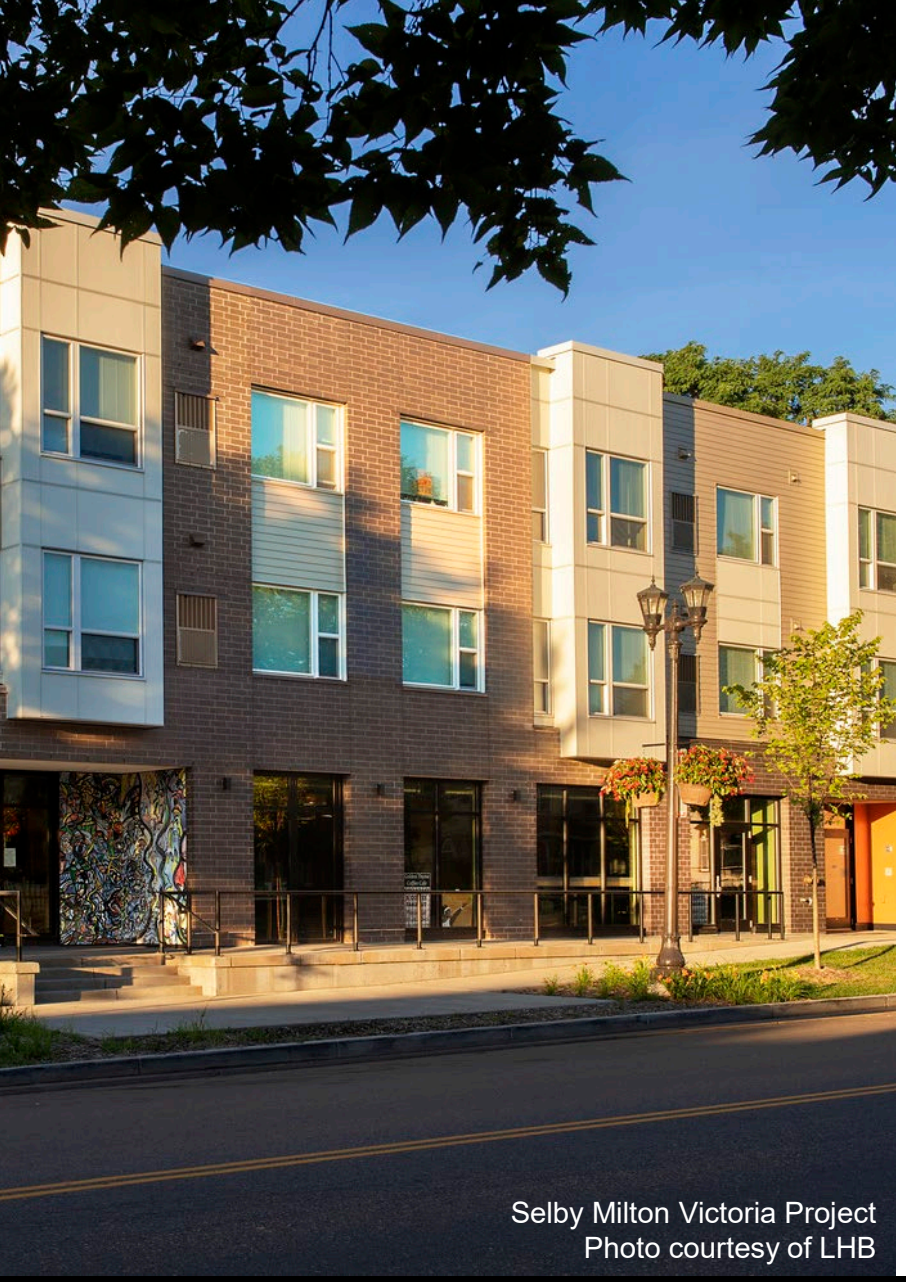
Eastman Nature Center
Photo courtesy of MSR Design. Photo credit: Paul Crosby

WHY A DIFFERENT APPROACH?

Small project characteristics:

- Lower budgets
- Smaller project teams
- Faster design and construction schedule
- Scale of impact

Springbrook Nature Center
Photo courtesy of HKGi



Selby Milton Victoria Project
Photo courtesy of LHB

TIMELINE

SB 2030 SMALL BUILDINGS METHOD

- Addresses energy efficiency and renewables
- Developed in 2011, most recently updated in 2020

B3 GUIDELINES SMALL SITES APPROACH

- Addresses site and water
- Size-specific approach implemented in 2019 within v3.1, updates planned for Early 2023 as v3.2r02

B3 GUIDELINES SMALL BUILDINGS METHOD

- Addresses performance management, bird safety, energy and atmosphere, indoor environmental quality, and materials and waste
- Implemented May 2021 – v3.2r01

APPLICABILITY

SMALL BUILDINGS

- Applies to buildings ≤ 20,000 gross conditioned sf
- Size threshold generally aligns with EDA programs and ASHRAE small building design guides
- There are nuances for the size threshold for the B3 Guidelines versus SB 2030

Eastman Nature Center
Photo courtesy of MSR Design. Photo credit: Paul Crosby

SMALL BUILDINGS METHODS APPLICABILITY

	Regularly occupied	Not regularly occupied	Not regularly occupied and primarily inactive storage/industrial process
Conditioned space	Include	Include	Include for SB 2030, potentially exclude for B3*
Indirectly conditioned	Include	Include for SB 2030, potentially exclude for B3*	Include for SB 2030, potentially exclude for B3*
Semiheated space	Include	Include for SB 2030, potentially exclude for B3*	Include for SB 2030, potentially exclude for B3*
Unconditioned space	Do not include	Do not include	Do not include

*Spaces noted as “potentially excluded” must be approved by the B3 Guidelines Administrators.


NCTC Aviation Maintenance Facility | Foss Architecture

Red Wing Armory Renovation | Wold AE

PTCC Pine Innovation Center | Cuningham


Southwest Regional Crisis Center | LHB


Itasca Community College Liberal Arts Building | Foss Architecture & Interiors


Selby Milton Victoria Project | Cermak Rhoades


Bear Head Lake Trail Center | Partners & Sirny

Ramsey County Library, White Bear Lake | BTR

SMALL BUILDINGS

APPLICABILITY

SMALL SITES

- Based on land disturbance (sf) and cut and fill (cy)
- Exclude ADA improvements and utility connections

	Includes Building Footprint	Excludes Building Footprint
≤5,000 sf ≤50 cy	Stormwater (S.2)	Soils (S.3)
≤1,000sf ≤10 cy	--	All others

Rolling Hills Apartments
Photo courtesy of Cermak Rhoades Architects

B3 & SB 2030 SMALL BUILDINGS METHODS

B3 Guidelines

Bear Head Lake State Park Trail Center
Photo courtesy of Minnesota DNR

GOALS FOR SMALL PROJECTS

Goals:

- Significantly decrease cost and administration for small projects
- Prioritize topics with a high impact-to-burden ratio
- Retain as many environmental and health benefits as possible

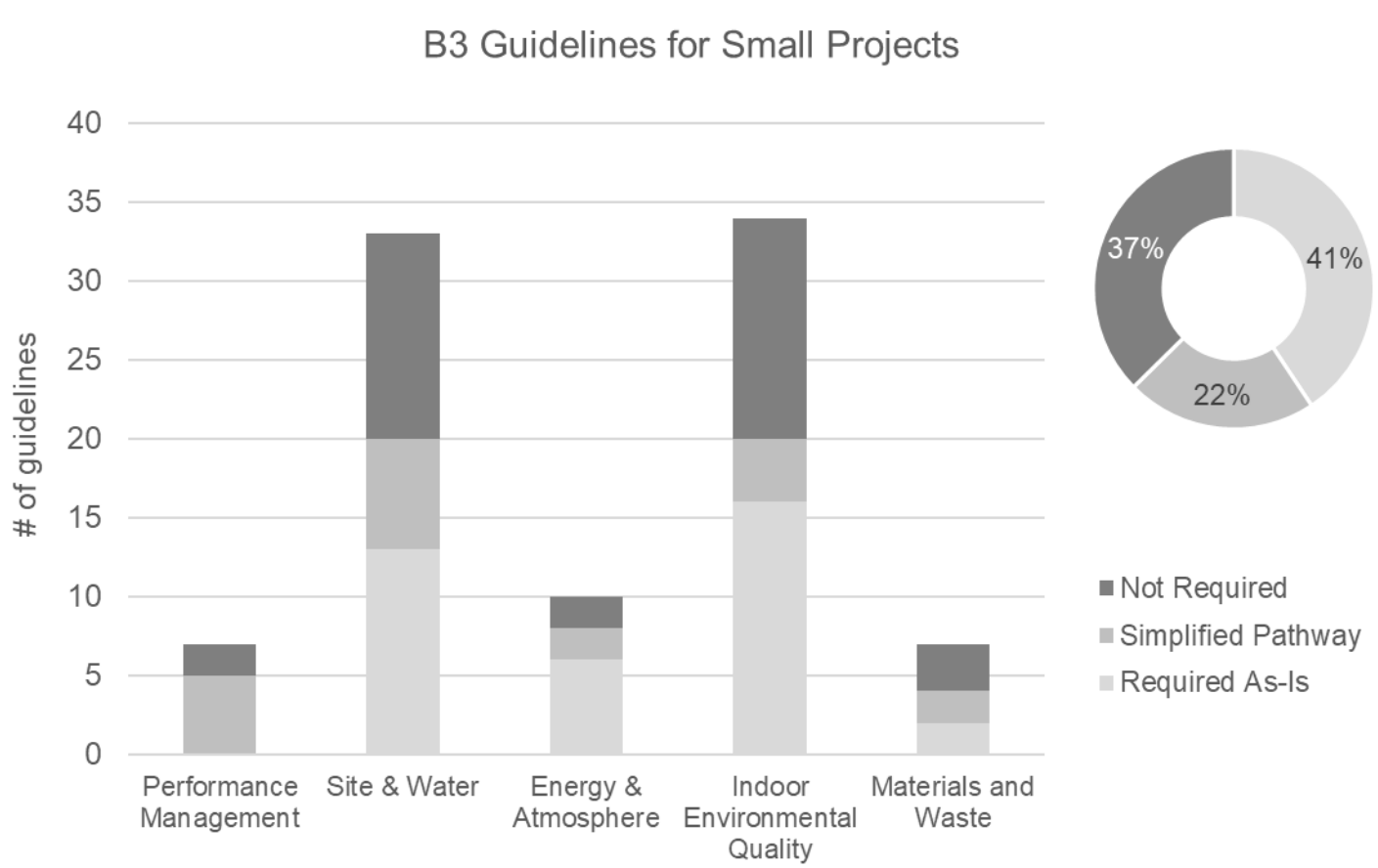
Rubric for evaluating requirements:

- Does it result in meaningful changes to design and construction compared to business as usual?
- How much effort is required for compliance?
- How expensive is it to achieve compliance?
- Is it appropriate for small projects?

ADJUSTMENTS FOR SMALL PROJECTS

CHANGES

1. Required as-is
2. Simplified pathway
3. Not required



REQUIRED FOR SMALL PROJECTS

PERFORMANCE MANAGEMENT

- Owner's project requirements (OPR), basis of design (BOD), and safety risk assessment
- Commissioning for HVAC systems and lighting controls
- Indoor air quality (IAQ) management plan for construction, IAQ test post-occupancy
- Post-occupancy evaluation (if more than 25 occupants)

Pine City Armory
Photo courtesy of Military Affairs

REQUIRED FOR SMALL PROJECTS

SITE & WATER

- Site and water connections for humans, plants, and animals*
- 50% reduction in building water use
- Vegetation – no critical sites, tree conditions, vegetation requirements, pollinator support, biomass target, site albedo minimum*
- Animal habitat support* and bird safety

* For sites with 1,000-5,000sf of land disturbance or 10-50cy of cut and fill. Sites below these thresholds are not required to meet this guideline.

Itasca Community College Liberal Arts Building
Photo courtesy of Itasca Community College (Foss Architecture)

DNR Area Office, Glenwood
Photo courtesy of Minnesota DNR

REQUIRED FOR SMALL PROJECTS

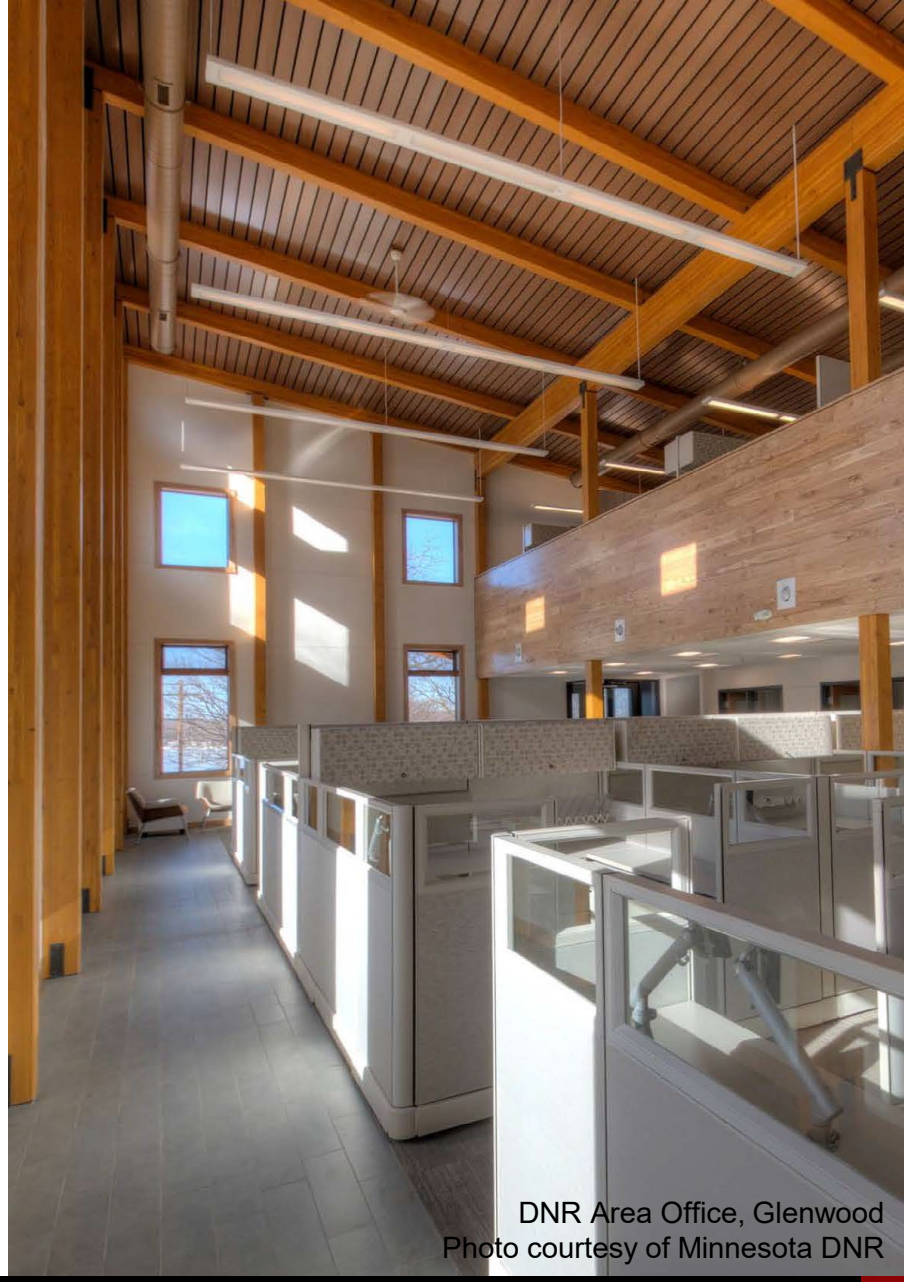
ENERGY & ATMOSPHERE

- Meet SB 2030 Energy & Carbon Standards
- Document energy consumption by energy type
- On-site renewables (≥2% of energy use)
- Renewable energy-ready roof or site
- Energy Star equipment & appliances
- Refrigerant selection and leakage detection for large equipment
- Electric vehicle infrastructure

REQUIRED FOR SMALL PROJECTS

INDOOR ENVIRONMENTAL QUALITY

- Green certifications for top 5 interior materials
- VOC limits and chemical restrictions for wet applied materials
- Bulk water management and moisture-safe construction (blower door test/building enclosure consultant)
- Ventilation rates, filtration, outdoor air intake separation
- Soil gas control (e.g. radon)
- Passive thermal comfort (window properties and shading) and occupant controls for thermal comfort



DNR Area Office, Glenwood
Photo courtesy of Minnesota DNR

REQUIRED FOR SMALL PROJECTS

INDOOR ENVIRONMENTAL QUALITY (CONTINUED)

- Window-to-wall ratio of at least 35% (or use daylight modeling to achieve daylight level targets), plus glare control devices
- Acoustic requirements, especially for classrooms and other learning spaces
- Access to vision glazing
- Adjustable workstations and chairs
- Universal design principles (equitable and flexible use)
- Quiet use/lactation room

Itasca Community College Liberal Arts Building
Photo courtesy of Itasca Community College (Foss Architecture)

Itasca Community College Liberal Arts Building
Photo courtesy of Itasca Community College (Foss Architecture)

REQUIRED FOR SMALL PROJECTS

MATERIALS AND WASTE

- Embodied carbon reduction
- Salvaged, recycled, bio-based, regional, and/or responsibly-sourced materials for top 5 materials
- Construction waste reduction
- Mercury limits in compact fluorescent lamps

ADJUSTMENTS FOR SMALL PROJECTS

Performance Management:

- Commissioning scaled back to HVAC and lighting systems
- No energy efficiency operations manual required

Site and Water:

- Most site and water guidelines not required for sites ≤1,000sf
- No stormwater requirements for sites ≤ 5,000sf
- No soil requirements for sites ≤ 5,000sf
- No water feature required for sites ≤ 1 acre
- Bird safety guidelines calculation simplified for buildings without see-through conditions

Max Carter Commons
Photo courtesy of Minnesota State Academies

ADJUSTMENTS FOR SMALL PROJECTS

Energy and Atmosphere:

- Prescriptive option for SB 2030, no energy modeling required
- No submetering requirements beyond code—apart from separately metering the project from larger campus

Indoor Environmental Quality

- Green certifications only required for the top 5 interior materials
- No enclosure moisture analysis (e.g. WUFI, Glaser)
- No IES light level thresholds and contrast ratio calculations
- Daylight simulations can be replaced by WWR requirements
- Acoustic calculations significantly simplified

Itasca Community College Liberal Arts Building
Photo courtesy of Itasca Community College (Foss Architecture)

ADJUSTMENTS FOR SMALL PROJECTS

Materials and Waste Guidelines

- No whole building LCA model
- No EPDs or product chemical inventories
- Environmentally preferable materials tracking only required for top 5 materials
- No material conservation and waste management plan

Bemidji State University Decker Hall
Photo courtesy of LHB

B3 & SB 2030 SMALL BUILDINGS METHODS

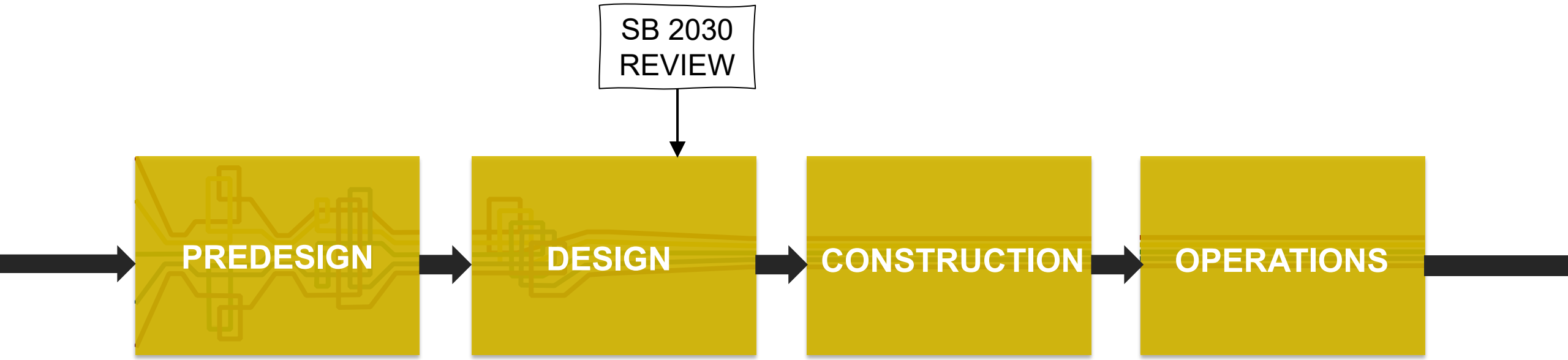
SB 2030 Energy Standard

Selby Milton Victoria Project
Photo courtesy of LHB

SB 2030 SMALL BUILDINGS METHOD

Goals:

- Decrease cost and administration for small projects
- Provide projects with prescriptive options
- Establish minimum efficiency and renewable energy requirements more quickly



Calculate the SB 2030 Standard.

Establish appropriate project budget.

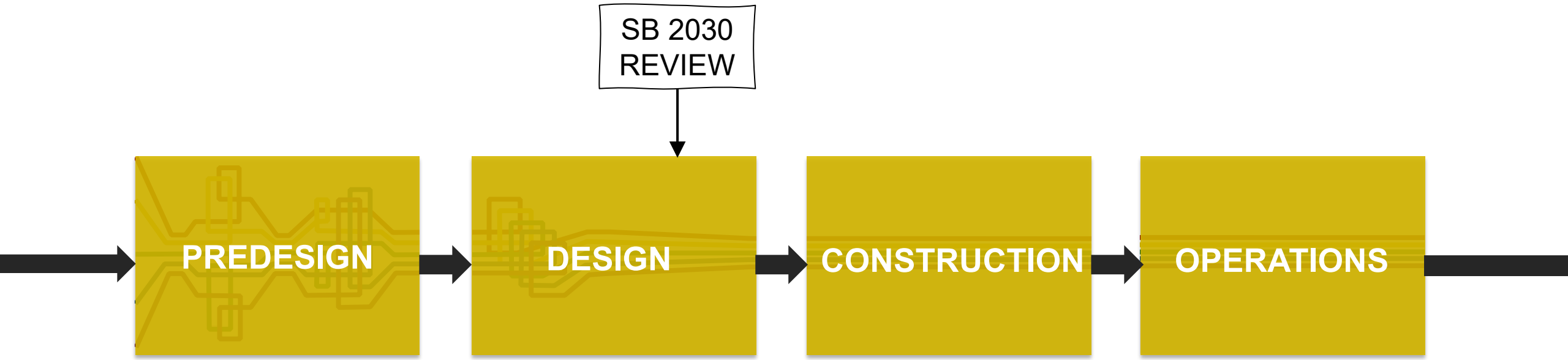
Integrate energy efficiency and renewable energy strategies.

Conduct energy modeling to ensure project meets the Standard.

Implement construction practices that meet performance requirements.

Track and report annual energy use through B3 Benchmarking

SB 2030 PROCESS



Calculate the SB 2030 Standard.

Establish appropriate project budget.

Meet an approved building performance standard and include mandatory efficiency requirements.

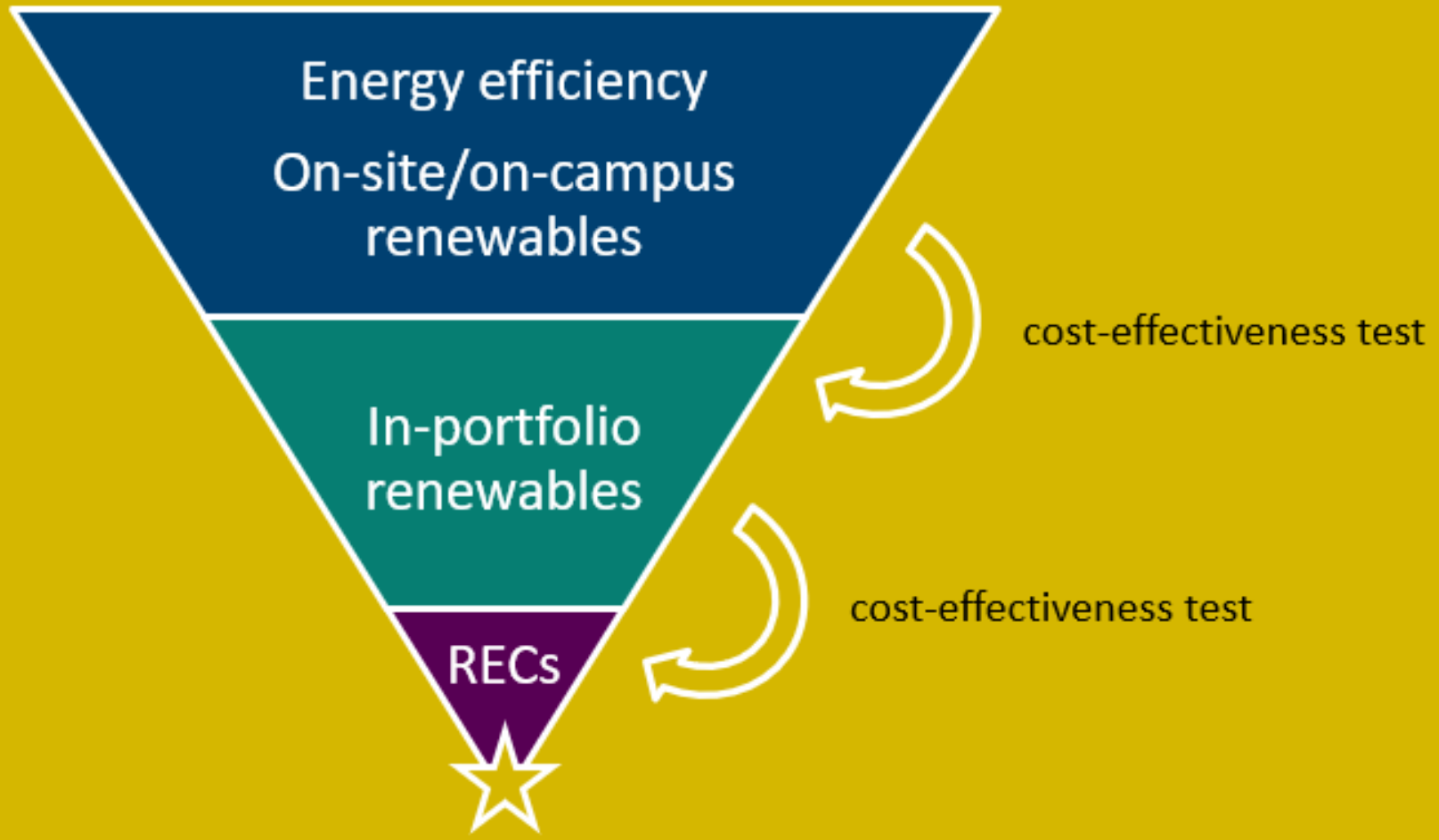
Estimate energy use.

Incorporate renewables to meet SB 2030 Standard.

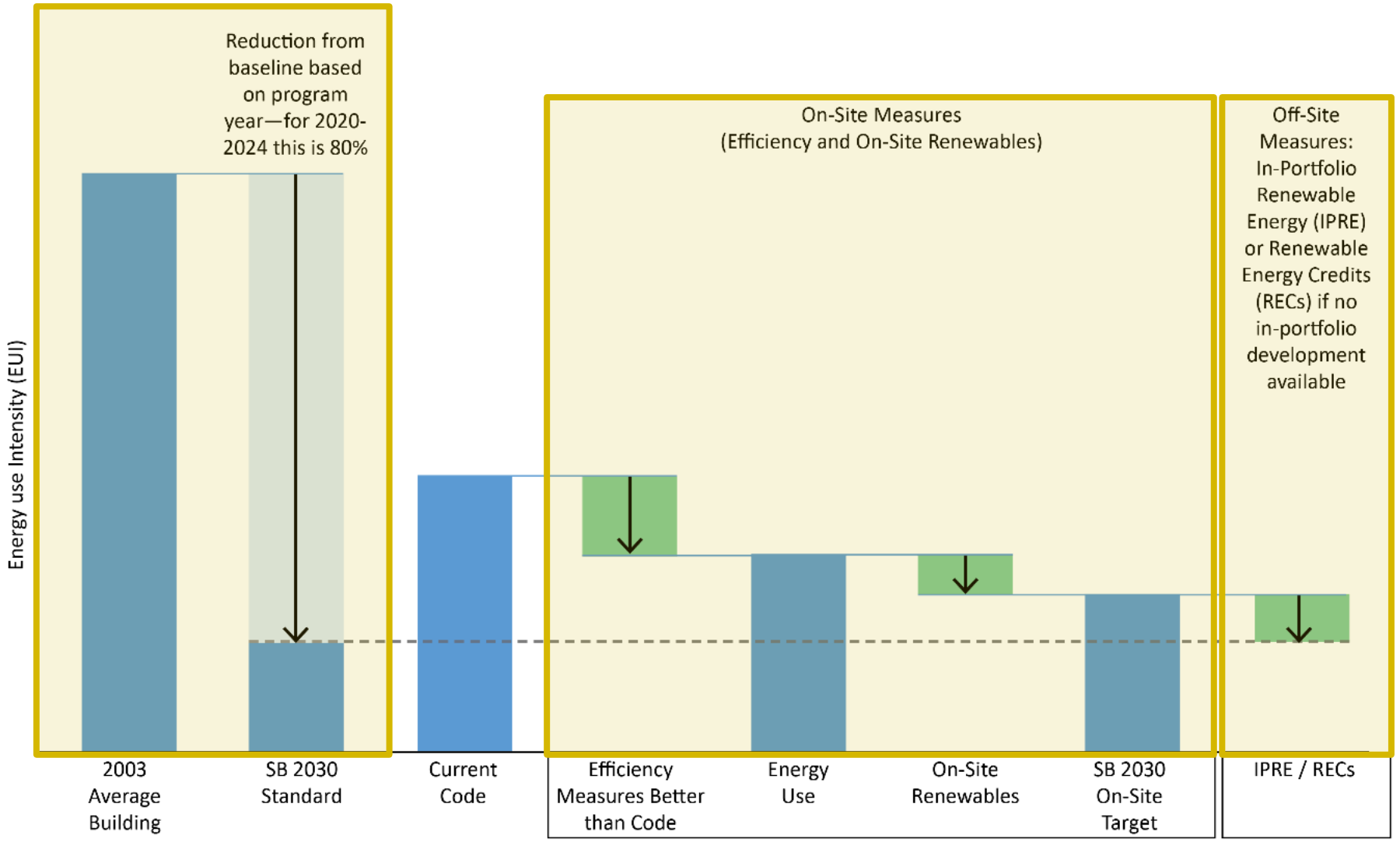
Implement construction practices that meet performance requirements.

Track and report annual energy use through B3 Benchmarking

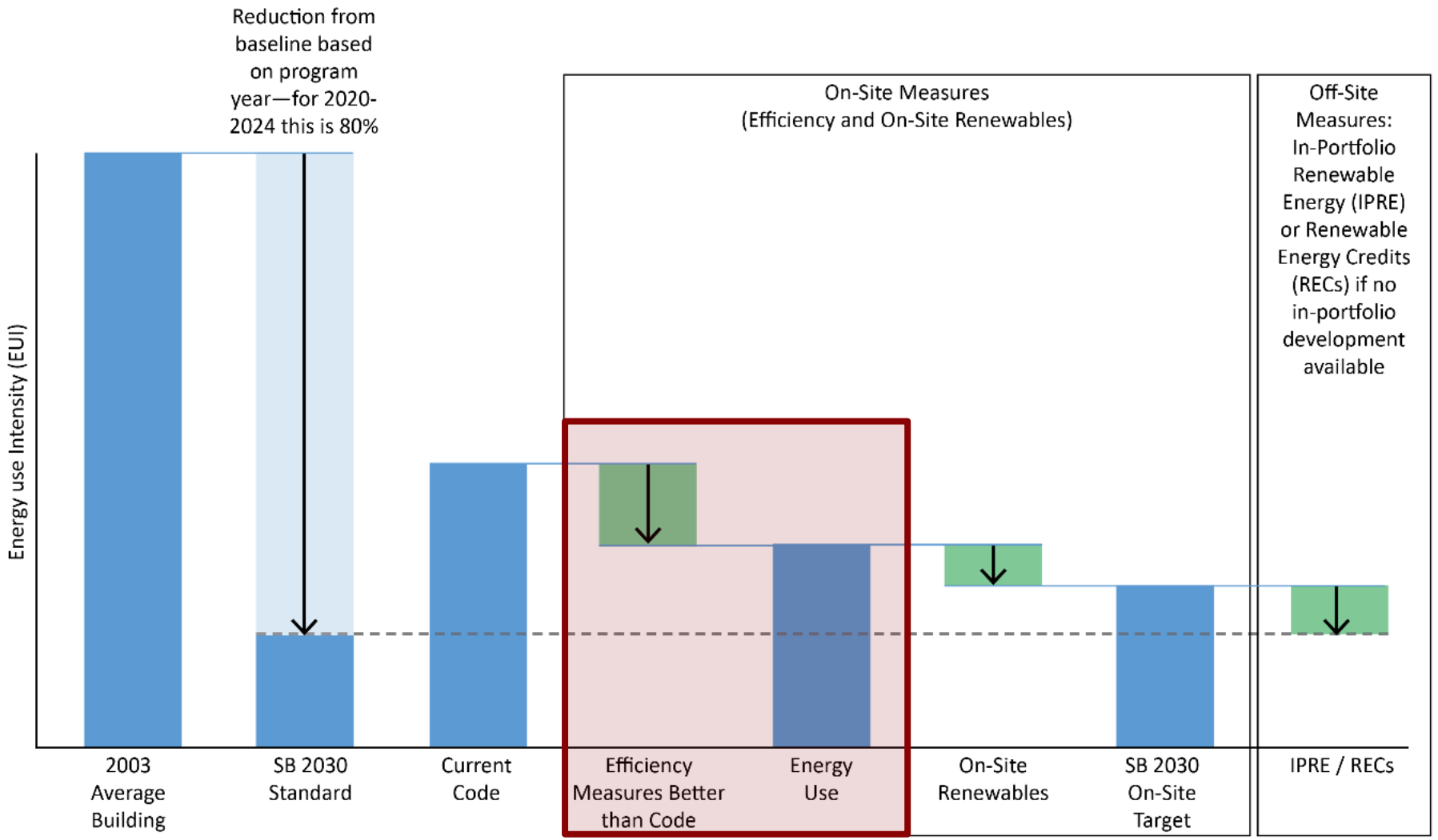
SB 2030 PROCESS – SMALL BUILDINGS METHOD



ENERGY HIERARCHY



MEETING SB 2030



MEETING SB 2030

BUILDING PERFORMANCE STANDARDS

COMMERCIAL

- ASHRAE 90.1-2019 prescriptive path
- New Buildings Institute 40% Stretch Energy Standard: Path B Stretch Prescriptive Measures + ASHRAE 90.1-2019
- International Green Construction Code (IgCC) + ASHRAE 90.1 2019
- ASHRAE Advanced Energy Design Guides – Achieving Zero Energy Ready Series

RESIDENTIAL

- Department of Energy Zero Energy Ready Homes Certification (DOE ZERH)
- Passive House Certification (either PHIUS or PHI)

ZERO ENERGY READY HOME U.S. DEPARTMENT OF ENERGY

nbi new buildings institute

ZERO ENERGY

ASHRAE®

IgCC

MANDATORY EFFICIENCY REQUIREMENTS

ENERGY STAR APPLICABLE EQUIPMENT

Energy Star rated equipment for all relevant equipment types. This includes, but is not limited to the following:

- Appliances that have Energy Star product categories
- Computers
- Other office equipment
- Light fixtures
- Light bulbs
- Small HVAC equipment
- Televisions

WATER FIXTURES

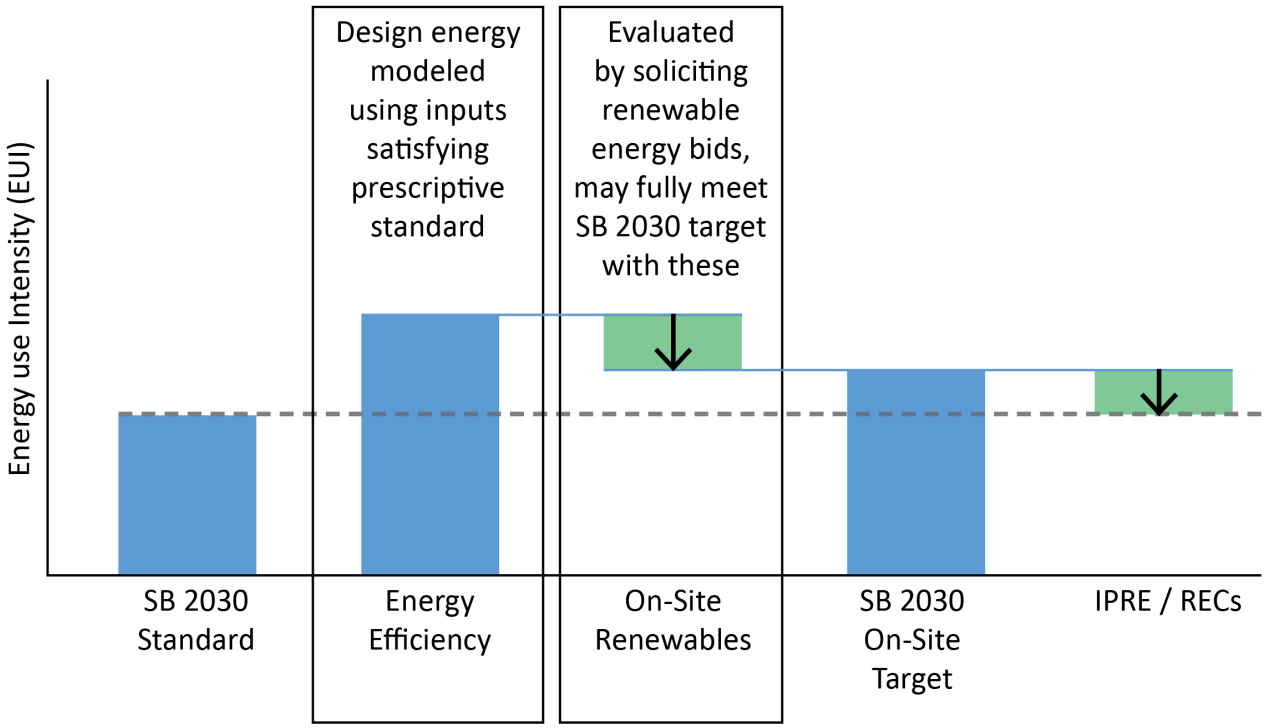
The following types of plumbing fixtures must have design flow rates specified and installed at or below the flow rates listed below.

- Lavatory faucets ≤ 1.75 gallons per minutes
- Kitchen faucets ≤ 2.0 gallons per minute
- Showerheads ≤ 1.8 gallons per minute

More stringent standards may be needed to meet the B3 Guidelines requirement for water efficiency.

ESTIMATE ENERGY USE

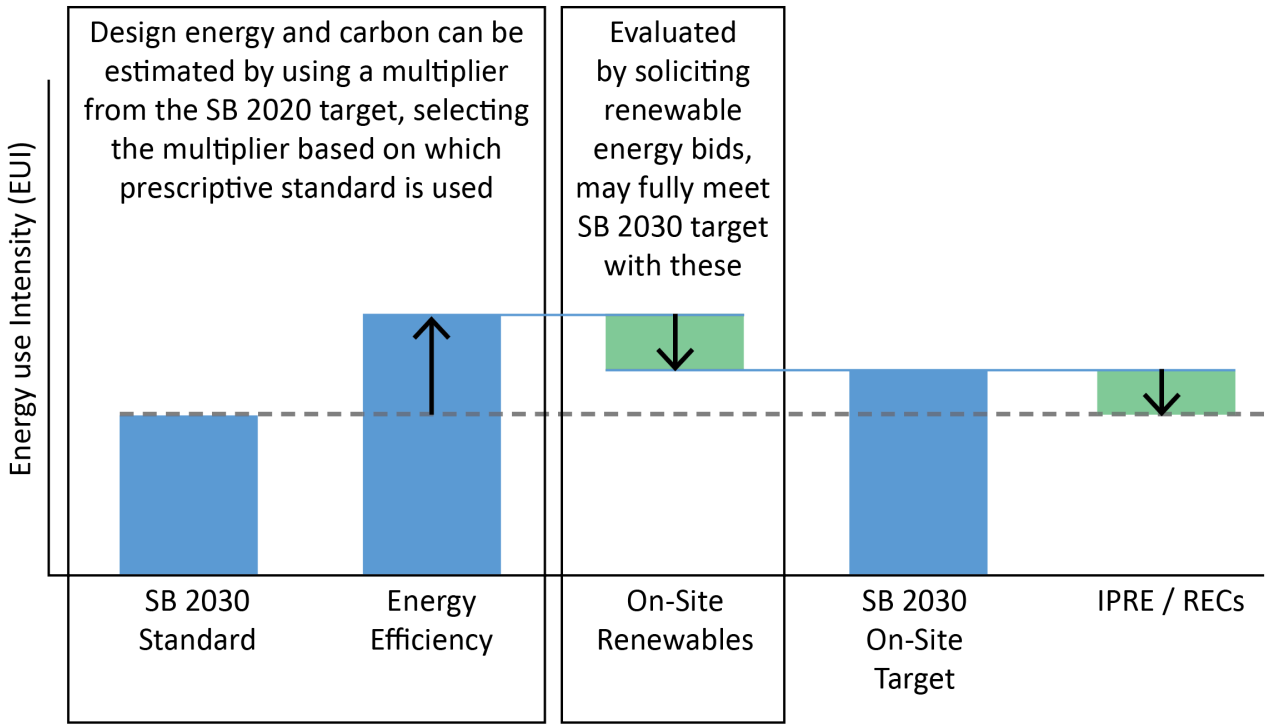
OPTION 1 – ENERGY SIMULATION



Use an energy model to simulate predicted energy use, which accounts for where the project exceeds minimum prescriptive requirements.

ESTIMATE ENERGY USE

OPTION 2 – PERFORMANCE MULTIPLIER



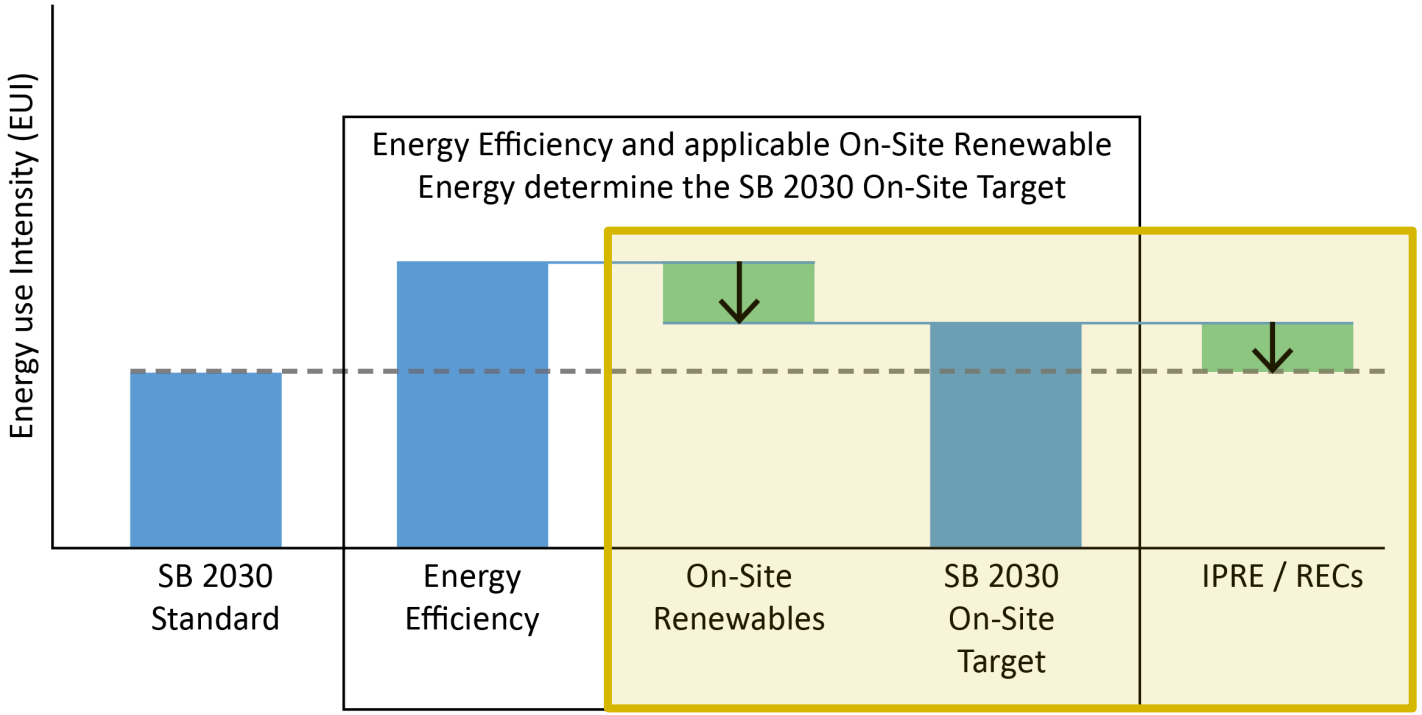
Apply a preset multiplier to the SB 2030 Energy Standard based on the building performance standard used.

PERFORMANCE MULTIPLIERS

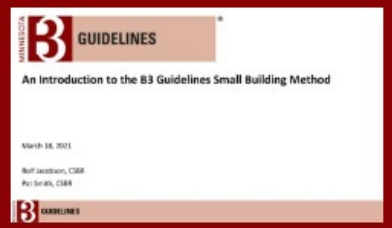
Building Type	NBI 40%	ASHRAE 90.1	IgCC	AEDG
Office	1.6	1.6	1.6	1.3
Hotel	1.7	1.8	1.8	--
Warehouse	2.4	3.3	3.0	--
Secondary School	1.1	1.1	1.0	0.6
Primary School	1.2	1.3	1.2	0.6

RENEWABLE ENERGY IMPLEMENTATION

The remaining energy needed to meet the SB 2030 Standard must be met through renewable energy.

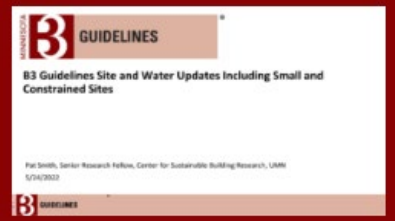


ADDITIONAL RESOURCES (B3MN.ORG)

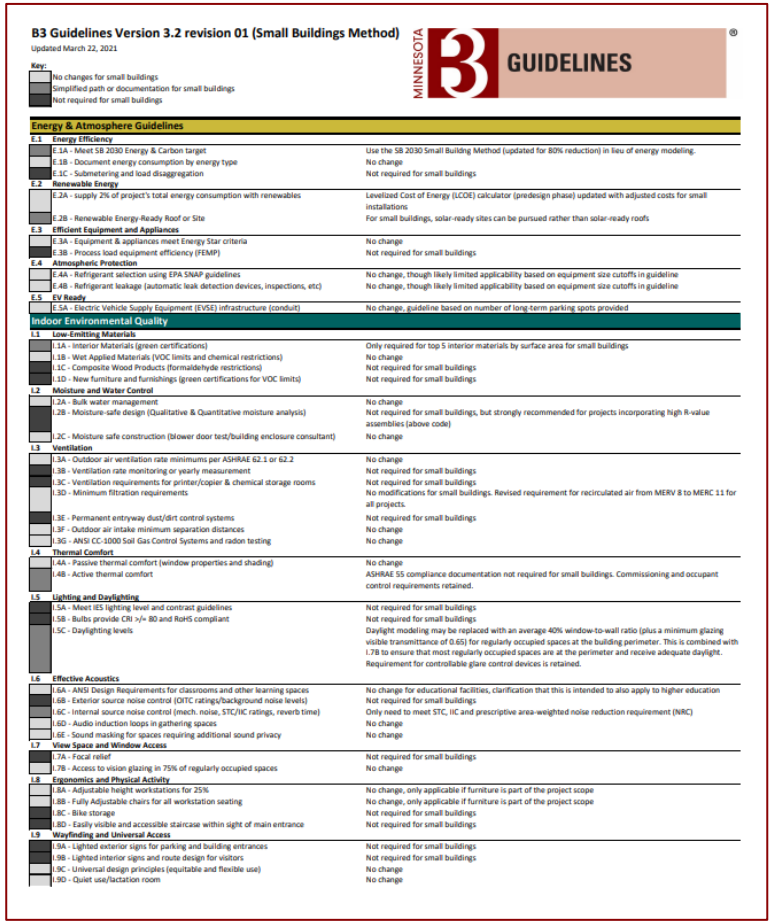


An Introduction to the B3 Guidelines Small Building Method

An Introduction to the SB 2030 Small Buildings Method



Site and Water Updates Including Small and Constrained Sites



B3 Guidelines Version 3.2 revision 01 (Small Buildings Method)

Updated March 22, 2021

Key:
- No changes for small buildings
- Simplified path or documentation for small buildings
- Not required for small buildings

MINNESOTA B3 GUIDELINES®

Energy & Atmosphere Guidelines		
E.1	**Energy Efficiency**	
	E.1A - Meet SB 2030 Energy & Carbon target	Use the SB 2030 Small Building Method (updated for 80% reduction) in lieu of energy modeling.
	E.1B - Document energy consumption by energy type	No change
	E.1C - Submetering and load disaggregation	Not required for small buildings
E.2	**Renewable Energy**	
	E.2A - supply 2% of project's total energy consumption with renewables	Levelized Cost of Energy (LCOE) calculator (predesign phase) updated with adjusted costs for small installations
	E.2B - Renewable Energy-Ready Roof or Site	For small buildings, solar-ready sites can be pursued rather than solar-ready roofs
E.3	**Efficient Equipment and Appliances**	
	E.3A - Equipment & appliances meet Energy Star criteria	No change
	E.3B - Process load equipment efficiency (FEMP)	Not required for small buildings
E.4	**Atmospheric Protection**	
	E.4A - Refrigerant selection using EPA SNAP guidelines	No change, though likely limited applicability based on equipment size cutoffs in guideline
	E.4B - Refrigerant leakage (automatic leak detection devices, inspections, etc)	No change, though likely limited applicability based on equipment size cutoffs in guideline
E.5	**EV Ready**	
	E.5A - Electric Vehicle Supply Equipment (EVSE) infrastructure (conduit)	No change, guideline based on number of long-term parking spots provided
Indoor Environmental Quality		
I.1	**Low-Emitting Materials**	
	I.1A - Interior Materials (green certifications)	Only required for top 5 interior materials by surface area for small buildings
	I.1B - Wet Applied Materials (VOC limits and chemical restrictions)	No change
	I.1C - Composite Wood Products (formaldehyde restrictions)	Not required for small buildings
	I.1D - New furniture and furnishings (green certifications for VOC limits)	Not required for small buildings
I.2	**Moisture and Water Control**	
	I.2A - Bulk water management	No change
	I.2B - Moisture-safe design (Qualitative & Quantitative moisture analysis)	Not required for small buildings, but strongly recommended for projects incorporating high R-value assemblies (above code)
	I.2C - Moisture safe construction (blower door test/building enclosure consultant)	No change
I.3	**Ventilation**	
	I.3A - Outdoor air ventilation rate minimums per ASHRAE 62.1 or 62.2	No change
	I.3B - Ventilation rate monitoring or yearly measurement	Not required for small buildings
	I.3C - Ventilation requirements for printer/copier & chemical storage rooms	Not required for small buildings
	I.3D - Minimum filtration requirements	No modifications for small buildings. Revised requirement for recirculated air from MERV 8 to MERC 11 for all projects.
	I.3E - Permanent entryway dust/dirt control systems	Not required for small buildings
	I.3F - Outdoor air intake minimum separation distances	No change
	I.3G - ANSI CC-1000 Soil Gas Control Systems and radon testing	No change
I.4	**Thermal Comfort**	
	I.4A - Passive thermal comfort (window properties and shading)	No change
	I.4B - Active thermal comfort	ASHRAE 55 compliance documentation not required for small buildings. Commissioning and occupant control requirements retained.
I.5	**Lighting and Daylighting**	
	I.5A - Meet IES lighting level and contrast guidelines	Not required for small buildings
	I.5B - Bulbs provide CRI >/= 80 and RoHS compliant	Not required for small buildings
	I.5C - Daylighting levels	Daylight modeling may be replaced with an average 40% window-to-wall ratio (plus a minimum glazing visible transmittance of 0.65) for regularly occupied spaces at the building perimeter. This is combined with I.7B to ensure that most regularly occupied spaces are at the perimeter and receive adequate daylight. Requirement for controllable glare control devices is retained.
I.6	**Effective Acoustics**	
	I.6A - ANSI Design Requirements for classrooms and other learning spaces	No change for educational facilities, clarification that this is intended to also apply to higher education
	I.6B - Exterior source noise control (OITC rating/background noise levels)	Not required for small buildings
	I.6C - Internal source noise control (mech. noise, STC/IIC ratings, reverb time)	Only need to meet STC, IIC and prescriptive area-weighted noise reduction requirement (NRC)
	I.6D - Audio induction loops in gathering spaces	No change
	I.6E - Sound masking for spaces requiring additional sound privacy	No change
I.7	**View Space and Window Access**	
	I.7A - Focal relief	Not required for small buildings
	I.7B - Access to vision glazing in 75% of regularly occupied spaces	No change
I.8	**Ergonomics and Physical Activity**	
	I.8A - Adjustable height workstations for 25%	No change, only applicable if furniture is part of the project scope
	I.8B - Fully Adjustable chairs for all workstation seating	No change, only applicable if furniture is part of the project scope
	I.8C - Bike storage	Not required for small buildings
	I.8D - Easily visible and accessible staircase within sight of main entrance	Not required for small buildings
I.9	**Wayfinding and Universal Access**	
	I.9A - Lighted exterior signs for parking and building entrances	Not required for small buildings
	I.9B - Lighted interior signs and route design for visitors	Not required for small buildings
	I.9C - Universal design principles (equitable and flexible use)	No change
	I.9D - Quiet use/lactation room	No change

B3 CASE STUDIES DATABASE

Name	City	Building Type(s)	Construction Type	Building Area (sf)	Design Submission Status	Design Compliance	Occupancy Date	Architect
 **Minnesota Zoo Crossroads Park – Carousel/Play Area**	Apple Valley	Recreation Center, Nature Center	New Construction	3,736	✓	✓	7/15/2015	U + B architecture & design, inc.
 **St. Paul Rolling Hills Apartments - Community Building**	Saint Paul	Community Center	New Construction	3,963	✓	?	12/1/2013	Cermak Rhoades Architects
 **Max Carter Commons**	Faribault	Housing	New Construction	4,086	✓	✓	4/1/2011	ISG
 **Como Park Aquatic Center**	Saint Paul	Recreation Center, Athletic Facility	New Construction	5,431	✓	?	5/1/2012	292 Design Group
 **Lake Waconia Regional Park Waterfront Service Center**	Waconia	Classroom, Park/Campground Building	New Construction	6,056	✓	✓		HGA

www.casestudies.b3mn.org

WAKAN TIPI CENTER

Jennifer Garman, AIA, LFA
Cuningham

Cuningham

Full Circle
Indigenous Planning + Design

PROJECT INFORMATION

LOCATION

Saint Paul, MN

B3 ELIGIBILITY

$3M appropriation from the State of MN (2018)

BUDGET

$7.8M for Phase 1

PROGRAM

9,500 sf cultural center sharing the Dakota history, language and values near the sacred site of the Wakan Tipi Cave

TIMELINE

Predesign – Dec 2019

Design – Feb 2021

Final Design – April 2022

Construction – April 2023

PROJECT INFORMATION

OWNER AGENCY

Lower Phalen Creek Project

City of St. Paul Parks + Recreation

TEAM

Architect

- Full Circle Indigenous Planning

- Cuningham

Landscape Architect - City of Saint Paul

MEP Engineer - Salas Obrien

Civil Engineer – BKBM Engineers

Structural Engineer – Reigstad Engineers

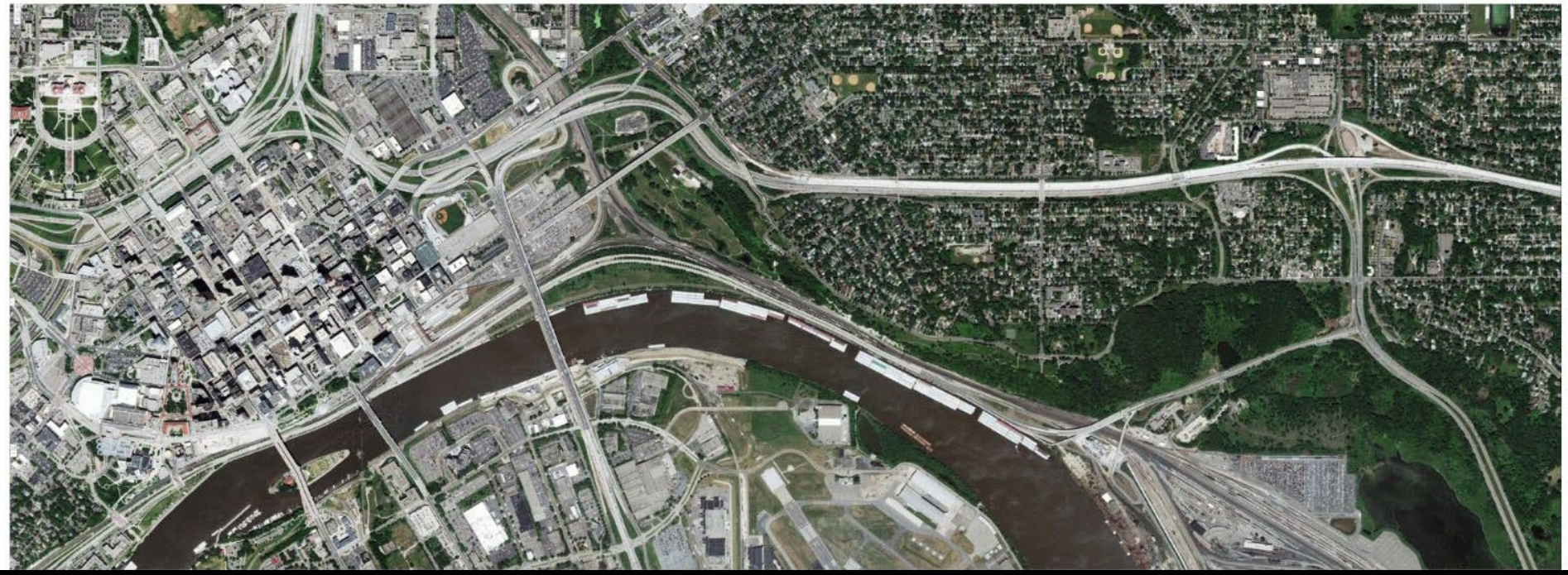
Enclosure Consultant – Intertek

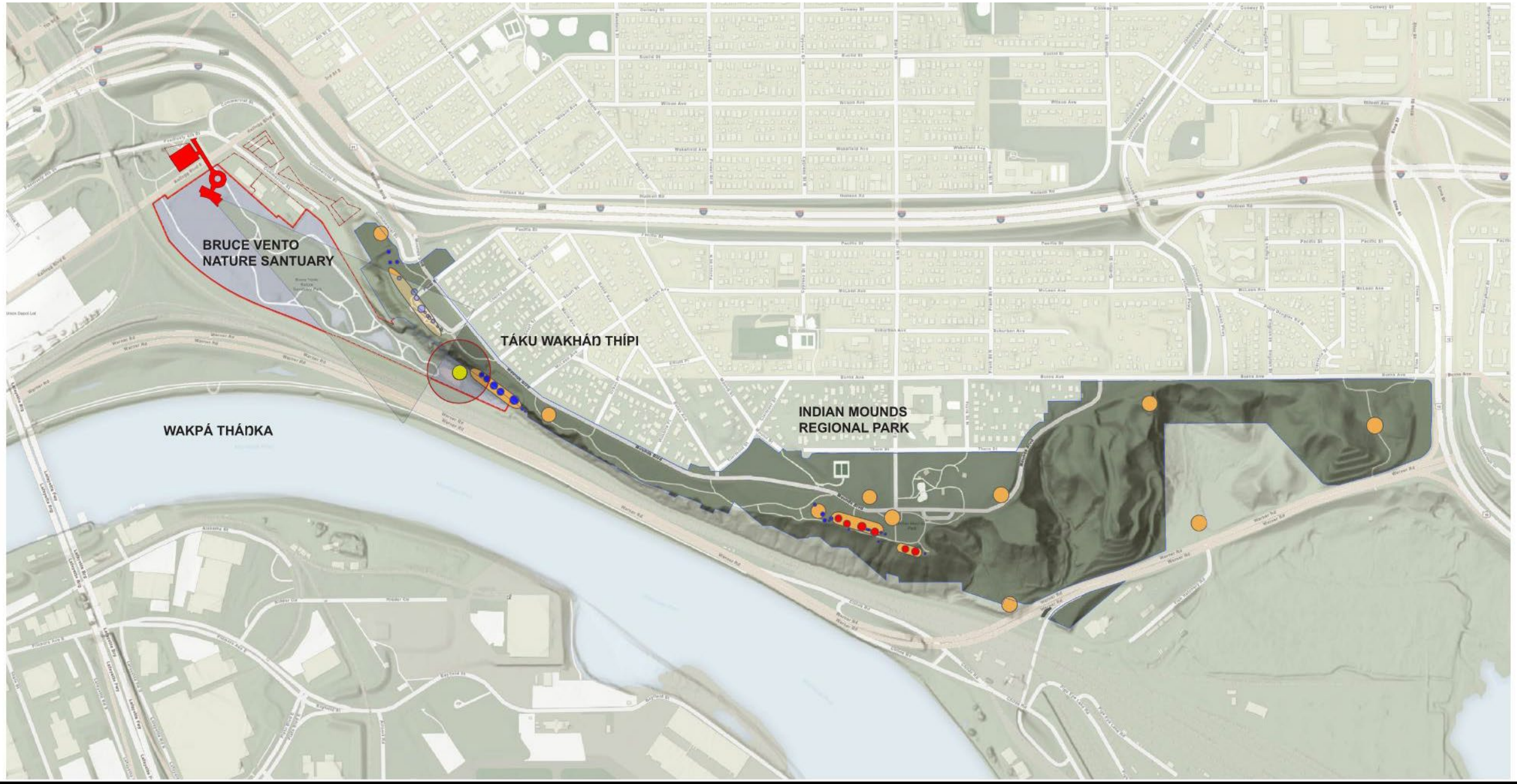
Acoustics Consultant – Kverstoen, Ronnholm & Associates

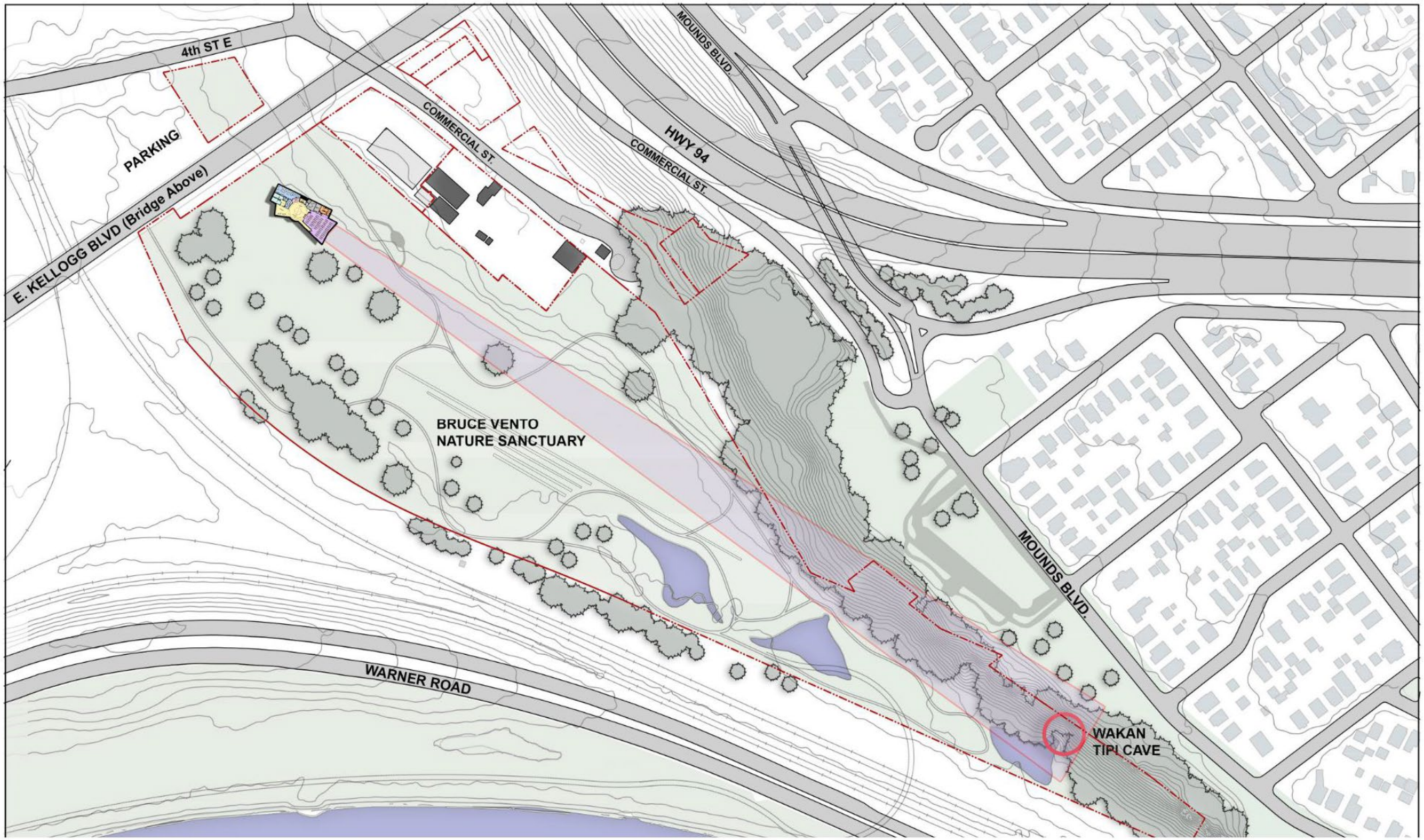
Soil Consultant – Landmark Environmental

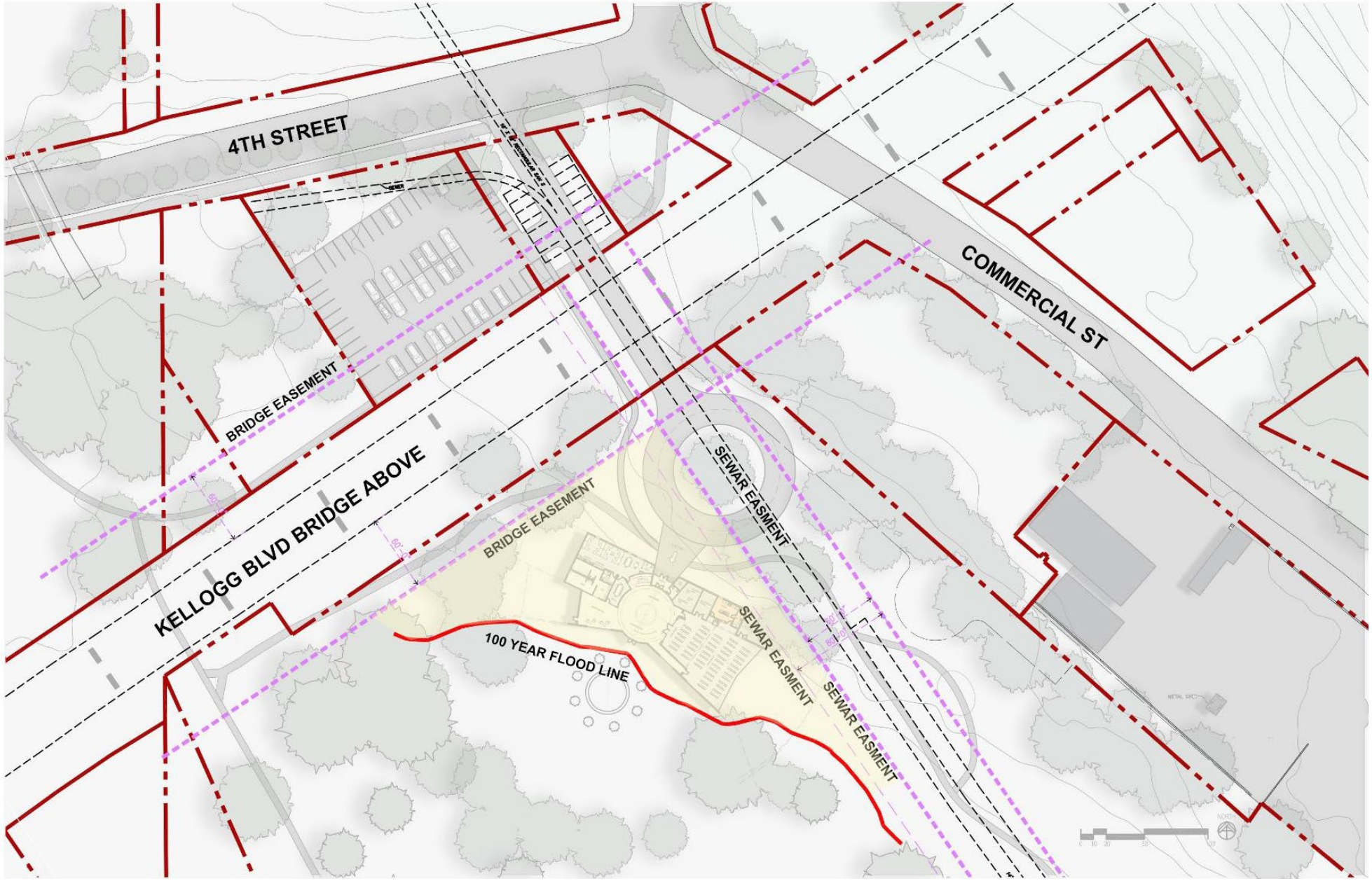
Construction Manager – Loeffler

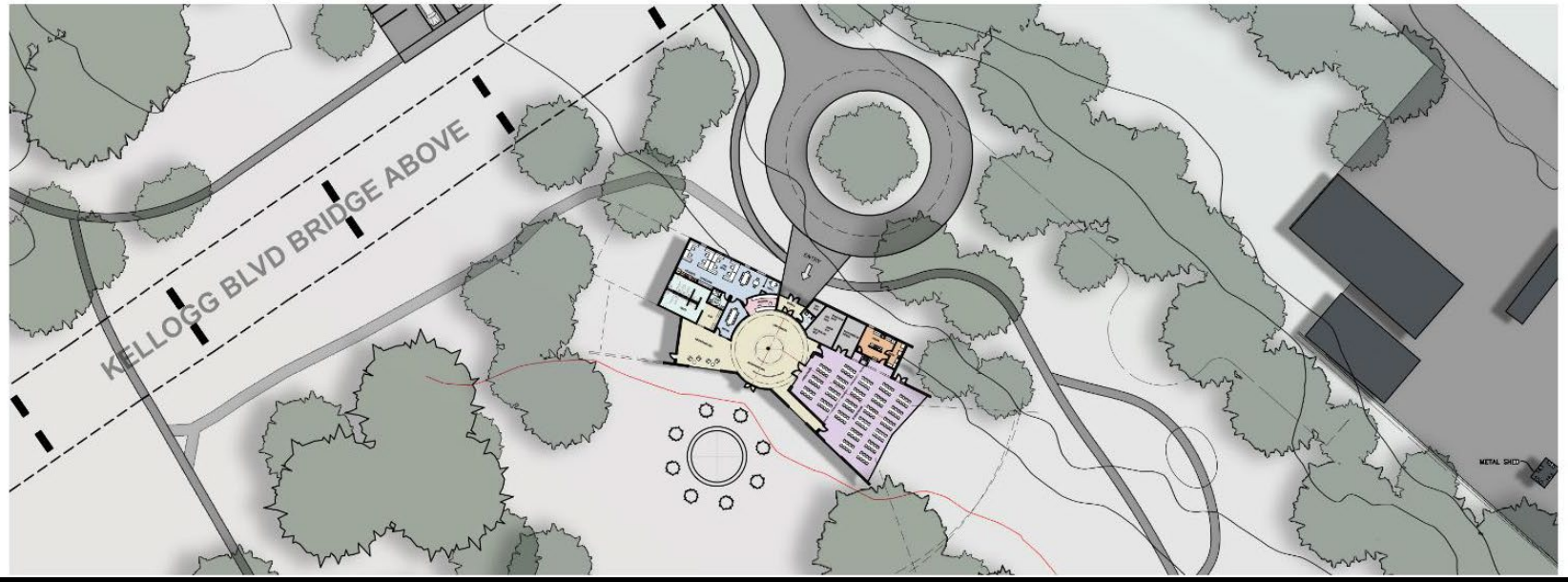
HVAC Commissioning Agent – Efficiency Commissioning LLC

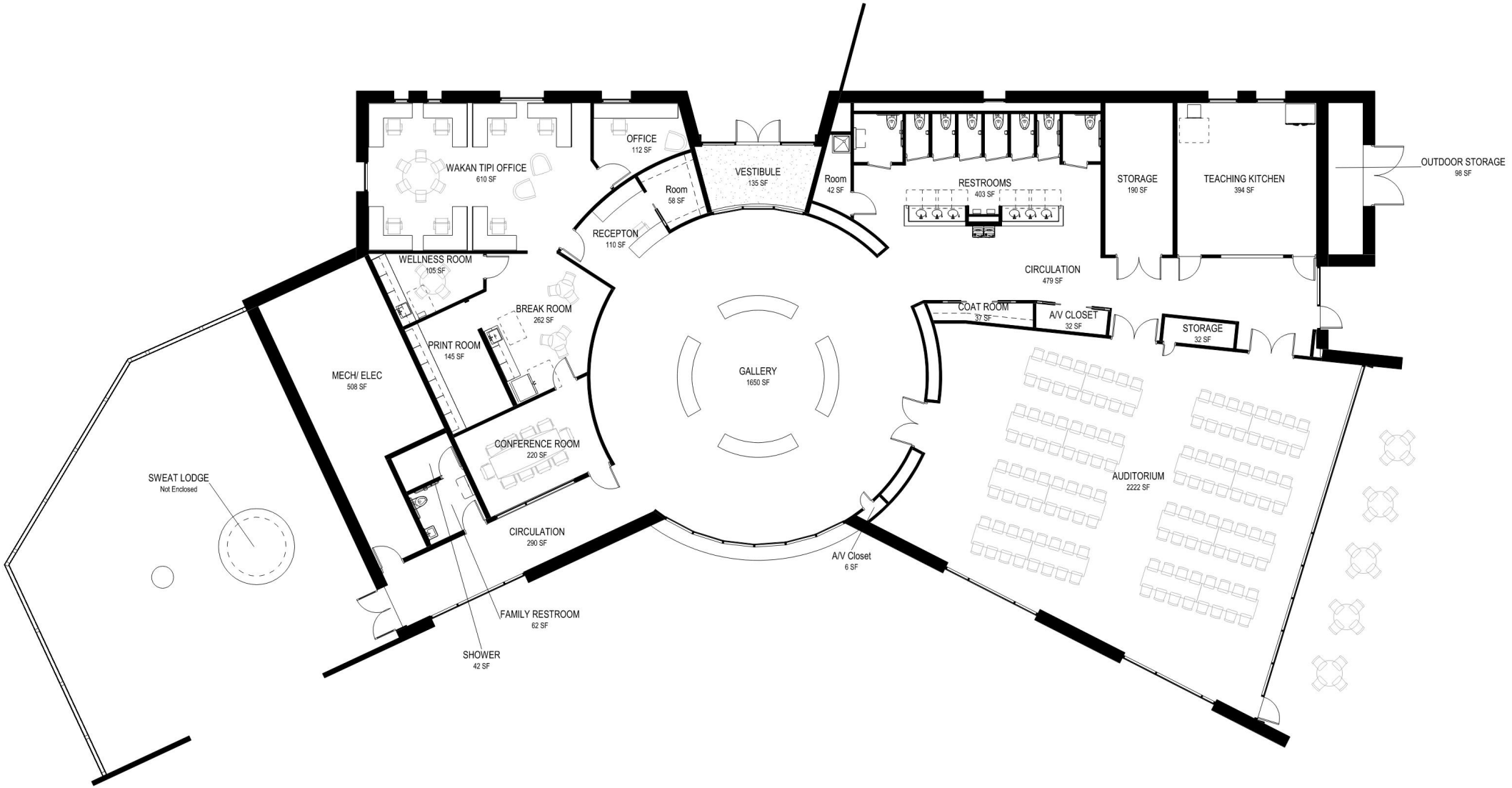


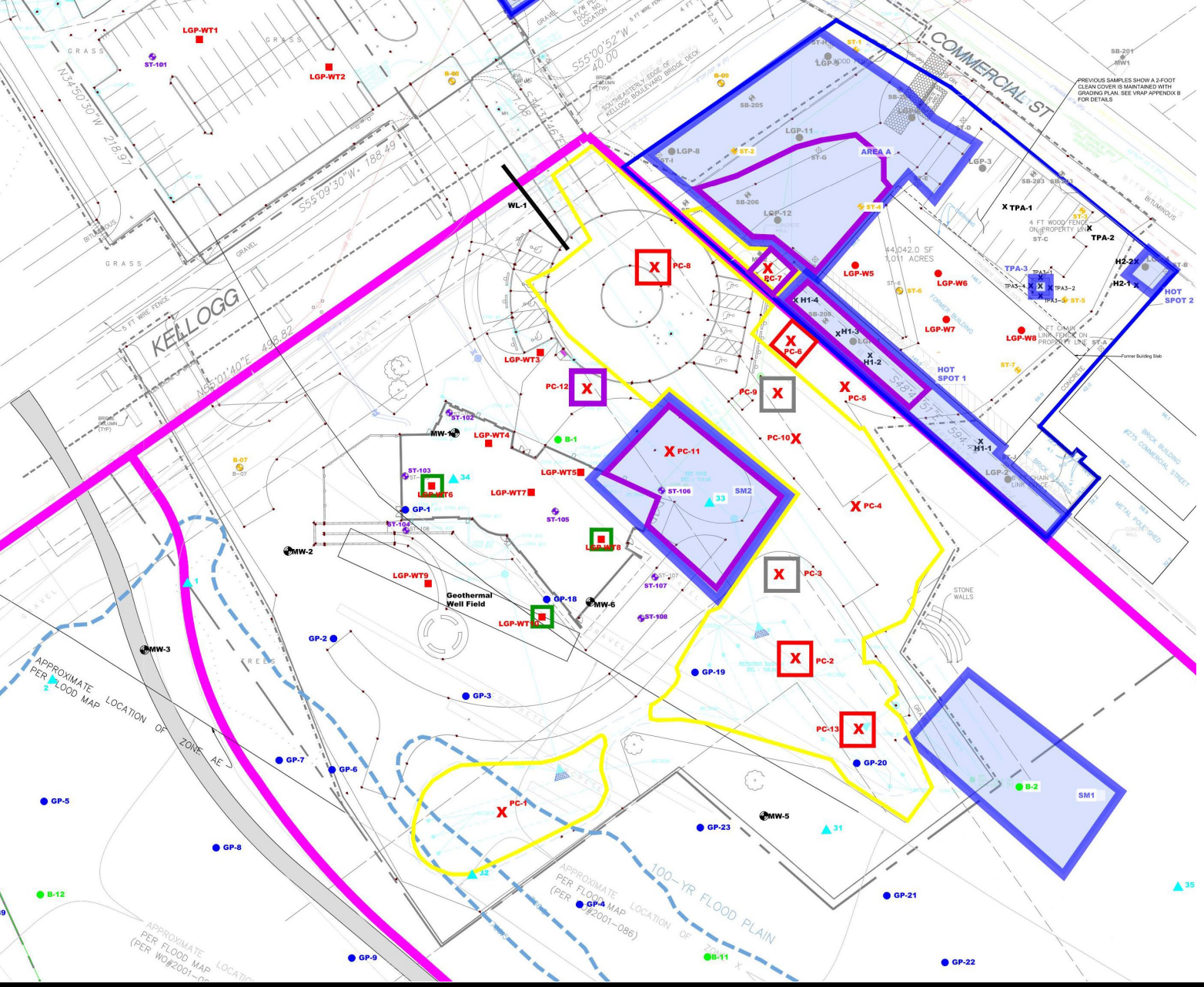

BRUCE VENTO
NATURE SANTUARY
TÁKU WAKHÁŋ THÍPI
WAKPÁ THÁŋKA
INDIAN MOUNDS
REGIONAL PARK


4th ST E
PARKING
E. KELLOGG BLVD (Bridge Above)
COMMERCIAL ST.
COMMERCIAL ST.
MOUNDS BLVD.
HWY 94
BRUCE VENTO
NATURE SANCTUARY
MOUNDS BLVD.
WARNER ROAD
WAKAN
TIPI CAVE


4TH STREET
COMMERCIAL ST
BRIDGE EASEMENT
KELLOGG BLVD BRIDGE ABOVE
BRIDGE EASEMENT
SEWAR EASEMENT
100 YEAR FLOOD LINE
SEWAR EASEMENT
SEWAR EASEMENT


KELLOGG BLVD BRIDGE ABOVE
METAL SHED


WAKAN TIPI OFFICE
610 SF
OFFICE
112 SF
Room
58 SF
RECEPTON
110 SF
VESTIBULE
135 SF
Room
42 SF
RESTROOMS
403 SF
STORAGE
190 SF
TEACHING KITCHEN
394 SF
OUTDOOR STORAGE
98 SF
WELLNESS ROOM
105 SF
BREAK ROOM
262 SF
PRINT ROOM
145 SF
MECH/ ELEC
508 SF
GALLERY
1650 SF
CIRCULATION
479 SF
COAT ROOM
37 SF
A/V CLOSET
32 SF
STORAGE
32 SF
CONFERENCE ROOM
220 SF
SWEAT LODGE
Not Enclosed
AUDITORIUM
2222 SF
CIRCULATION
290 SF
A/V Closet
6 SF
FAMILY RESTROOM
62 SF
SHOWER
42 SF



SOIL

- Railroad industry contaminated soils
  - lead, mercury, arsenic, petroleum, and polycyclic aromatic hydrocarbons (PAHs) as well as construction fill materials (ie. brick, concrete, coal fines, etc)
- Contaminated soil must be removed and clean fill added

FORMER INTERPRETIVE CENTER ENVIRONMENTAL COVENANT AREA

NATURE SANCTUARY ENVIRONMENTAL COVENANT AREA

RESPONSE ACTIONS FOR SOIL

PREVIOUS REMEDIATION AREA - includes 4 feet of clean fill over contaminated soil

Remove 4 feet of clean soil to reuse on Property, remove contaminated soil below to maintain 2 foot clean cover on Former Interpretive Center; 4 feet clean cover on Nature Sanctuary; 2 feet clean soil under building, lined pond, and impervious pavement; and, 2 feet clean soil above stormwater tunnel.

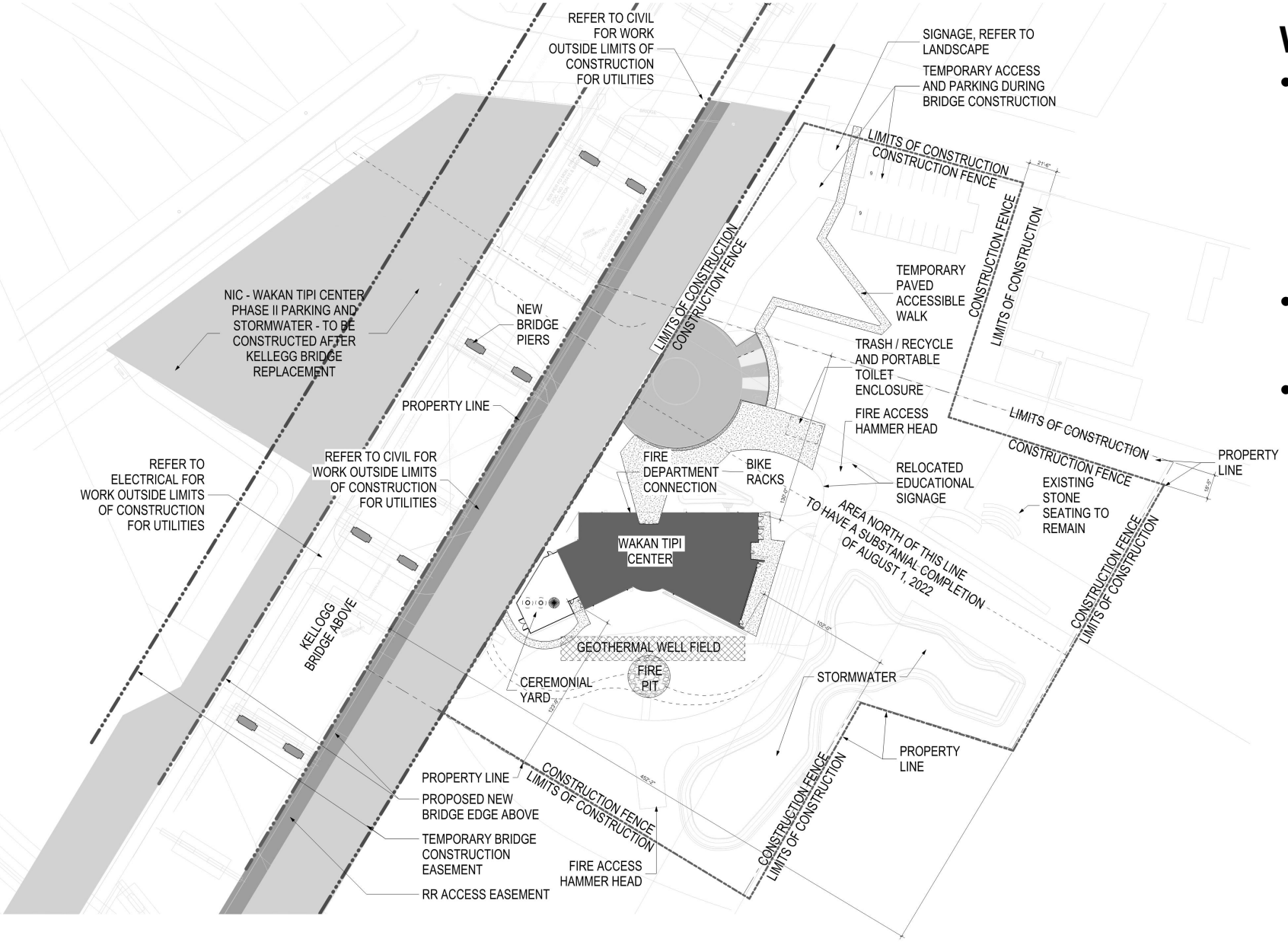
HOT SPOT AREA - remove contaminated soil to depth specified.

UNKNOWN GREEN SPACE CUT AREA - conducted sampling to determine if soil is contaminated and to determine whether clean soil cover requirement is met.

SOIL MANAGEMENT AREA - covered with 4 feet of soil, impervious pavement, pond liner, or building. Maintain 2 feet of clean soil under pavement, building and pond liner, and 2 feet of clean soil above stormwater tunnel.

Meets on-site cleanup goals but does not meet off-site reuse cleanup goals

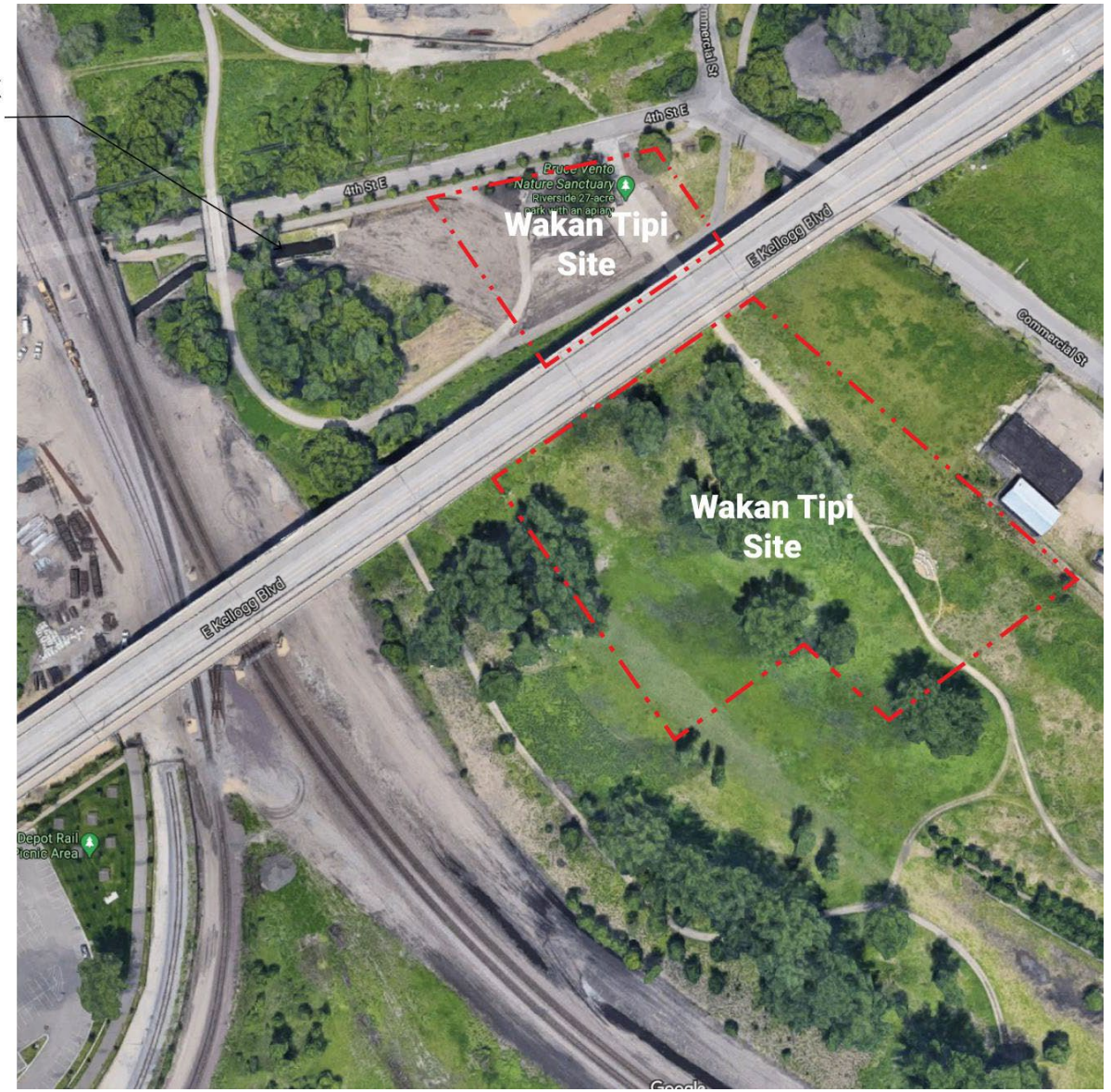
PC-13 X PRE-CONSTRUCTION INVESTIGATION LOCATIONS (LANDMARK MAY & JUNE 2021)



WATER

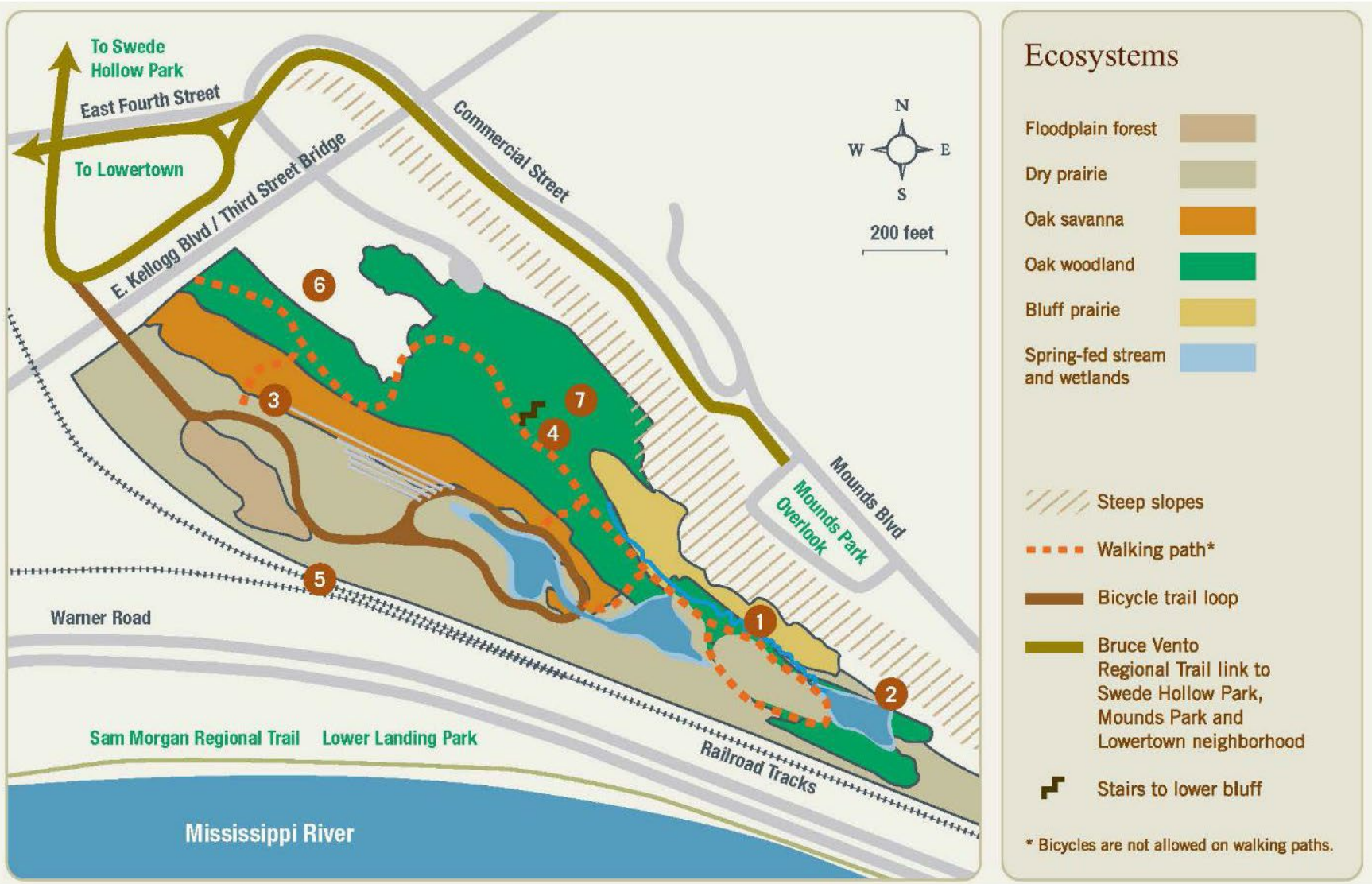
- Groundwater at about 4 to 10’ deep is contaminated with petroleum, PAHs, and petroleum volatile organic compounds (PVOCs)
  - No infiltration
- Infiltration basin planted with native species
- Drought-resistant native plantings

SITE + WATER



HABITAT

- Critical bird habitat site
  - Birdsafe glazing
- Located within 3 miles of rare | endangered species
- Culturally significant plantings to Dakota community
  - Support pollinator habitat
  - Native dry and mesic prairie plantings
- Fell tree materials distributed on-site to support habitat
- Infiltration basin
- Water Feature (S5H)
  - Not required for sites within 500’ of existing stream at least 10’ wide

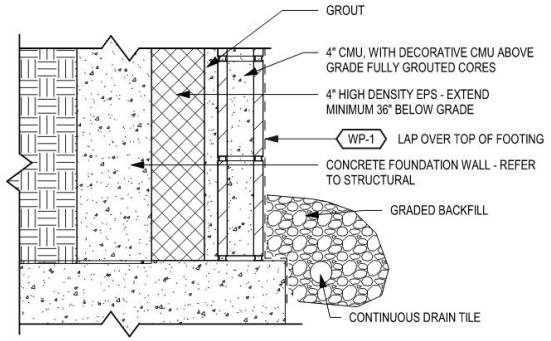


INDIGENOUS PLANTINGS

CULTURALLY IMPORTANT PLANTINGS

SITE + WATER

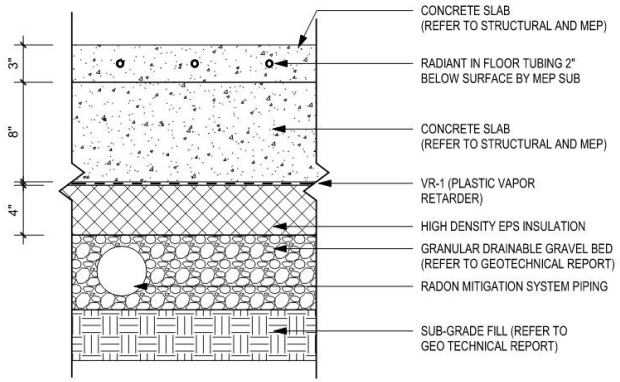
Sub Grade Systems



SG FDTN Foundation Drainage System

Zone 6a, 18-0720 R-Value = 15 MIN

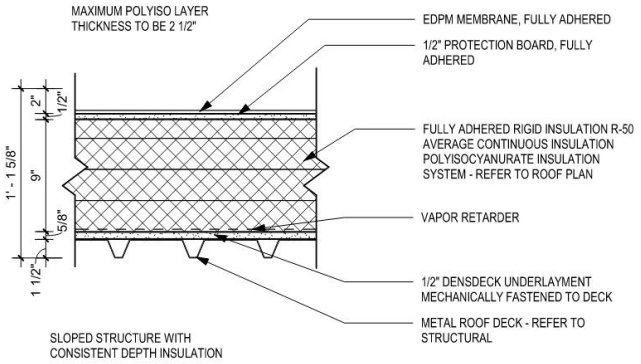
Floor Systems



F SOG Concrete Structural Slab

Zone 6a, 18-0720 R-Value = 15 MIN

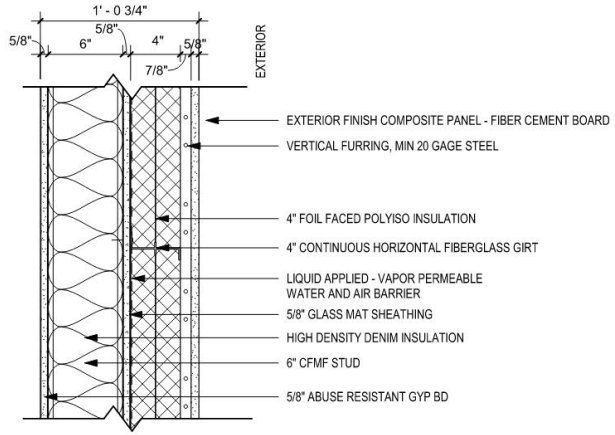
Roof Systems



R EPDM-A EPDM on Metal Deck System

Zone 6a, 18-0720 R-Value = 50 MIN

Wall Systems



W FC Fiber Cement Boards on Metal Studs - Insulated

Zone 6a, 18-0720 R-Value = 30 MIN

NET ZERO DESIGN

- EUI: 27 kBtu/sf/yr
- Geo-exchange field
- Energy Recovery
- High-performing envelope
  - R-40 exterior walls
  - R-50 roof
  - Infiltration: 0.05 cfm/sf
- 60 kW solar array

ENERGY

Carbon Emissions: 14 lb CO2/sf/yr

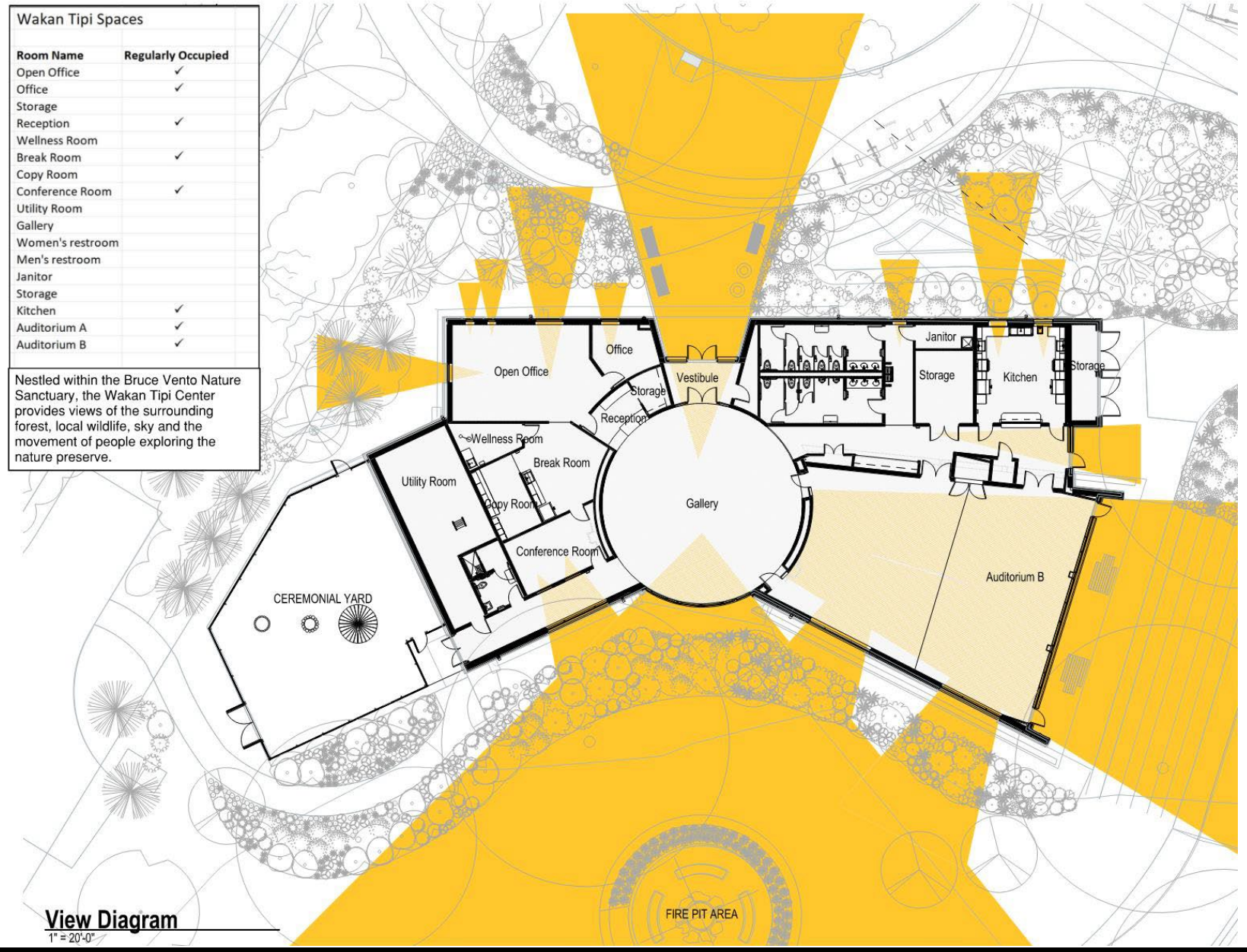
CONCRETE

- Reduced embodied carbon and water
- In-situ CO_2 mineralization
- 40% Fly Ash content in footings and foundations; 25% maximum Fly Ash content in slab on grade
- Ground Granulated Blast-Furnace Slag
- Recycled aggregate at concealed concrete (footings and foundations)
- Recycled / reclaimed water
- Water-reducing admixtures

FOUNDATION INSULATION

- High density EPS instead of XPS for carbon reduction

MATERIALS



DAYLIGHT + VIEWS

- All regularly occupied spaces have daylight and views

HEALTHY INTERIORS

- Low-emitting materials
- Radon mitigation system

ACOUSTIC COMFORT

- STC55 +
- Interior partitions extend to deck
- Gathering spaces meet ANSI S12:60 for max. background noise and reverberation times

INDOOR ENVIRONMENTAL QUALITY

TODAY

UPDATE

Project is being redesigne to meet current market cost and site conditions

Design team reducing building footprint and massing to realign with budget.

TIMELINE

Final Design – March 2023

Construction Complete – Dec 2023

PROGRAM

~~9,500 sf~~ **7,200 sf** cultural center

Kitchen now fully electric (meaning entire building electrification!)

Simplify geometry and wall systems

Further reduce soil export and clean fill

DISCUSSION

Becky Alexander | becky.alexander@lhbcorp.com
Amber Sausen | asausen@alliiance.us
Pat Smith | guidelines@b3mn.org
Jennifer Garman | jgarman@cuningham.com