

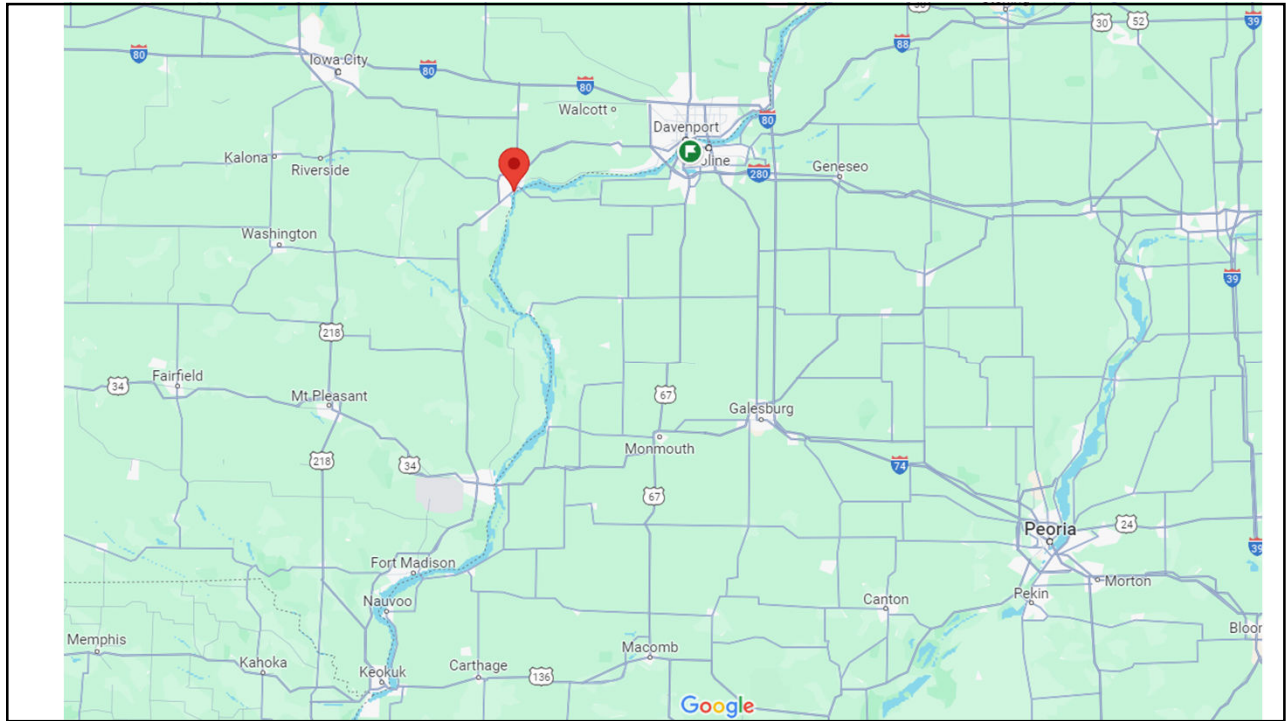


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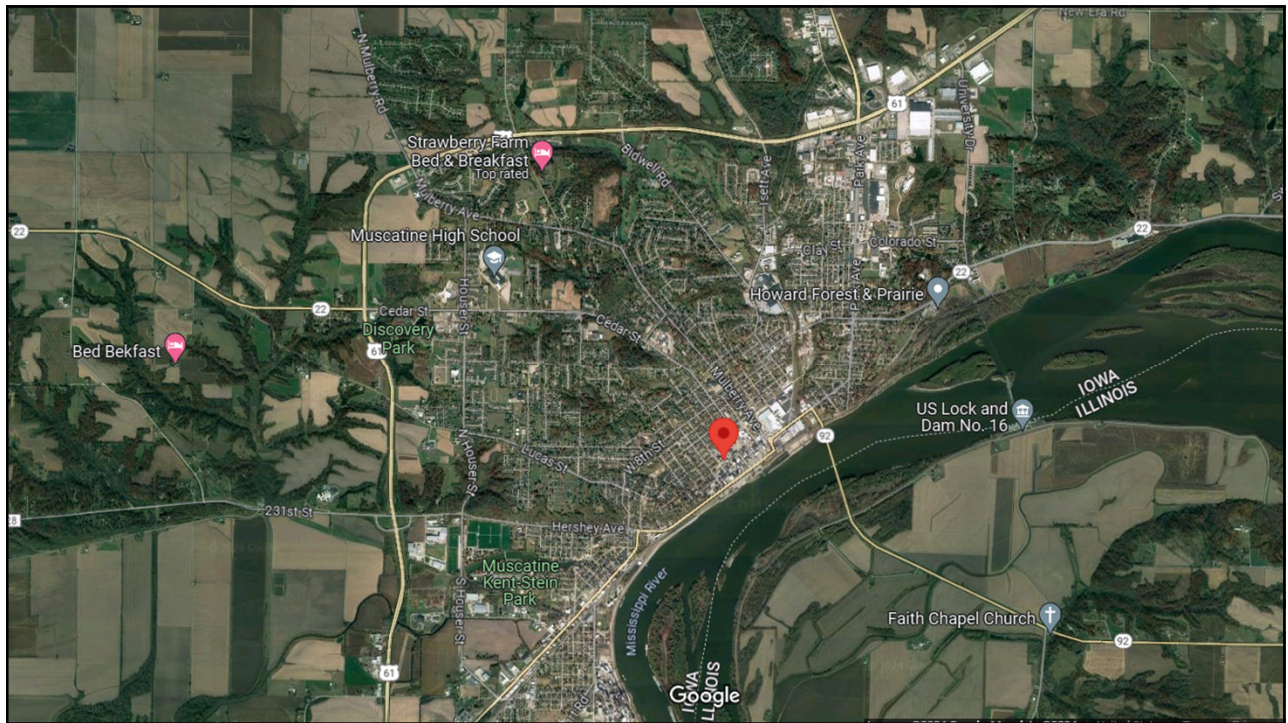
Presentation Outline

- Project Overview
- Living Building Challenge Overview
- Deeper dive on project components

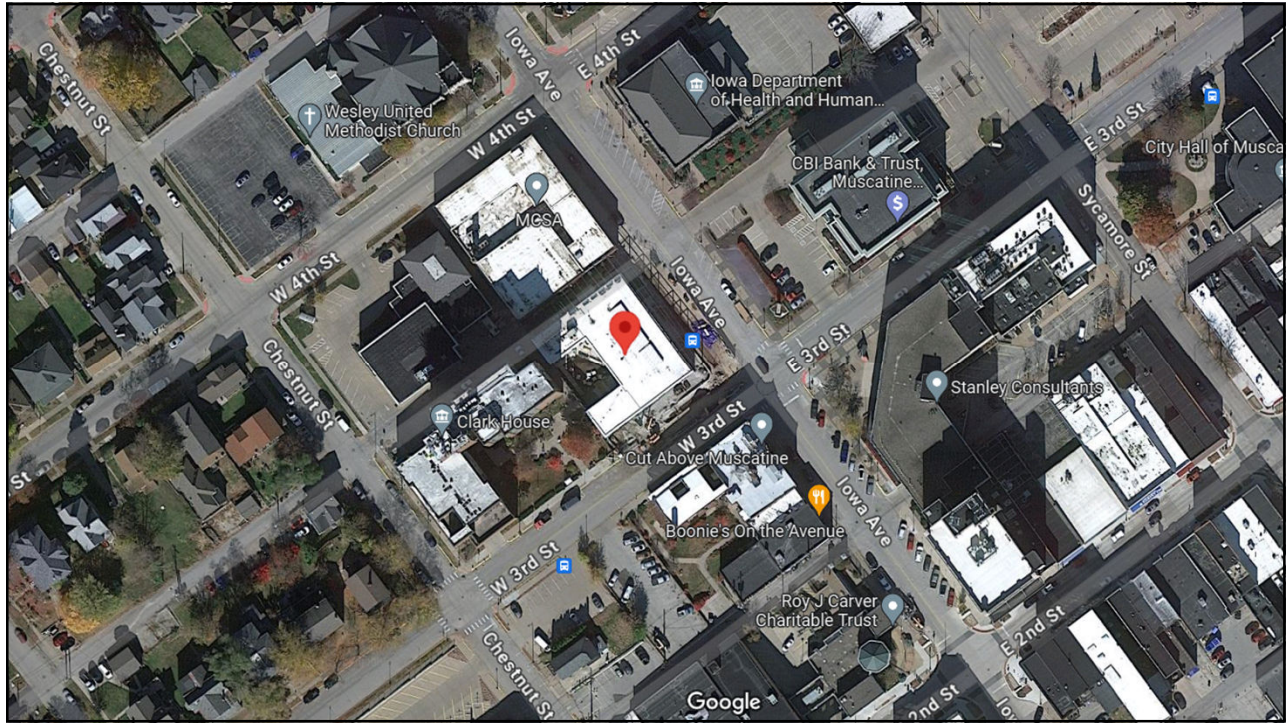
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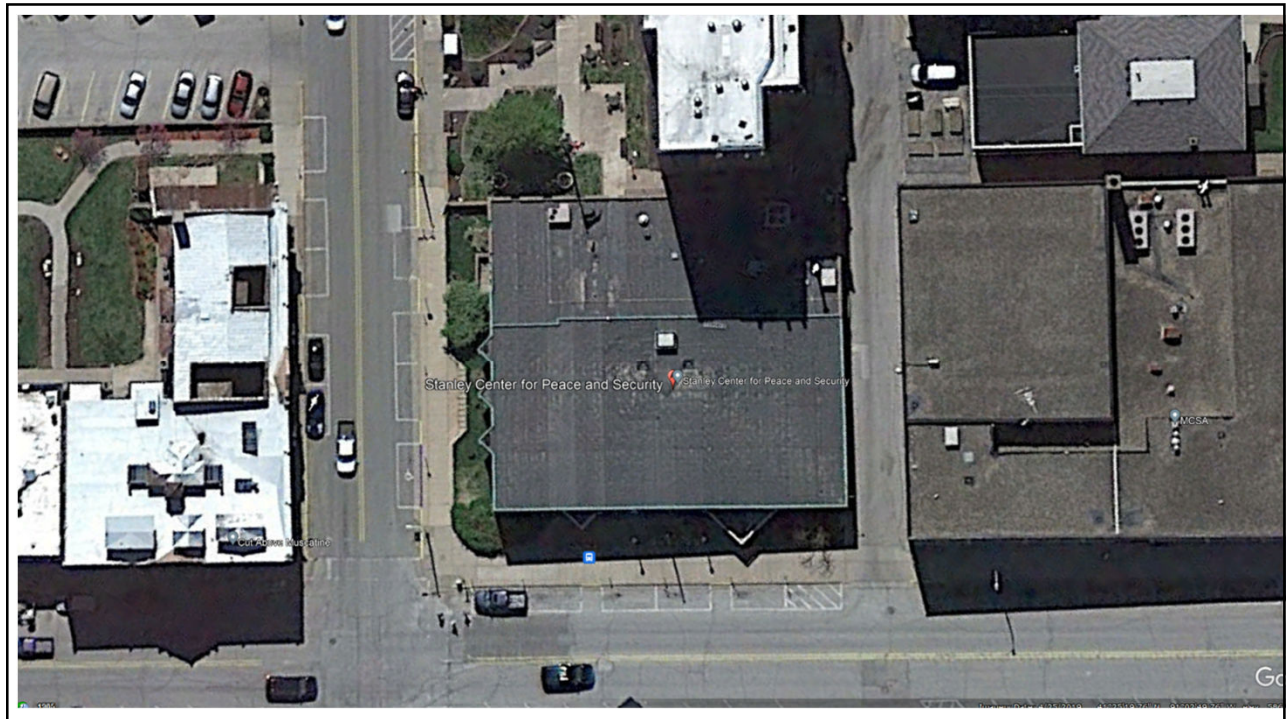
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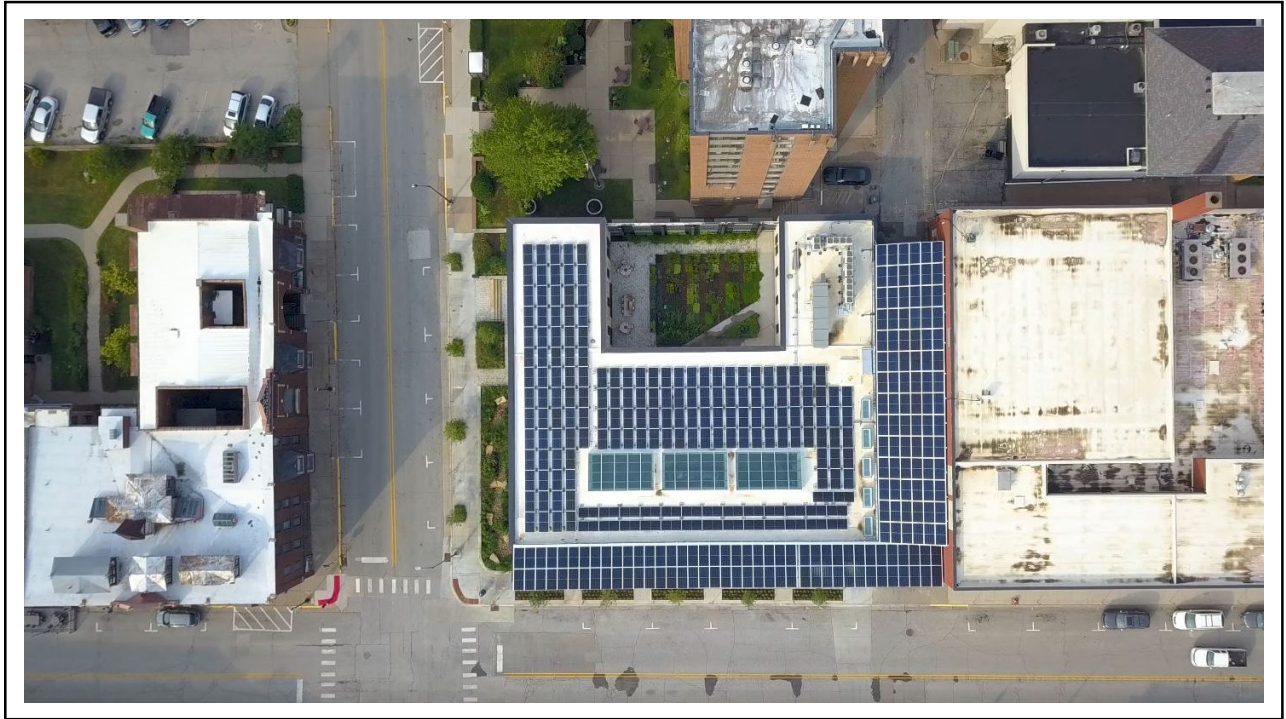
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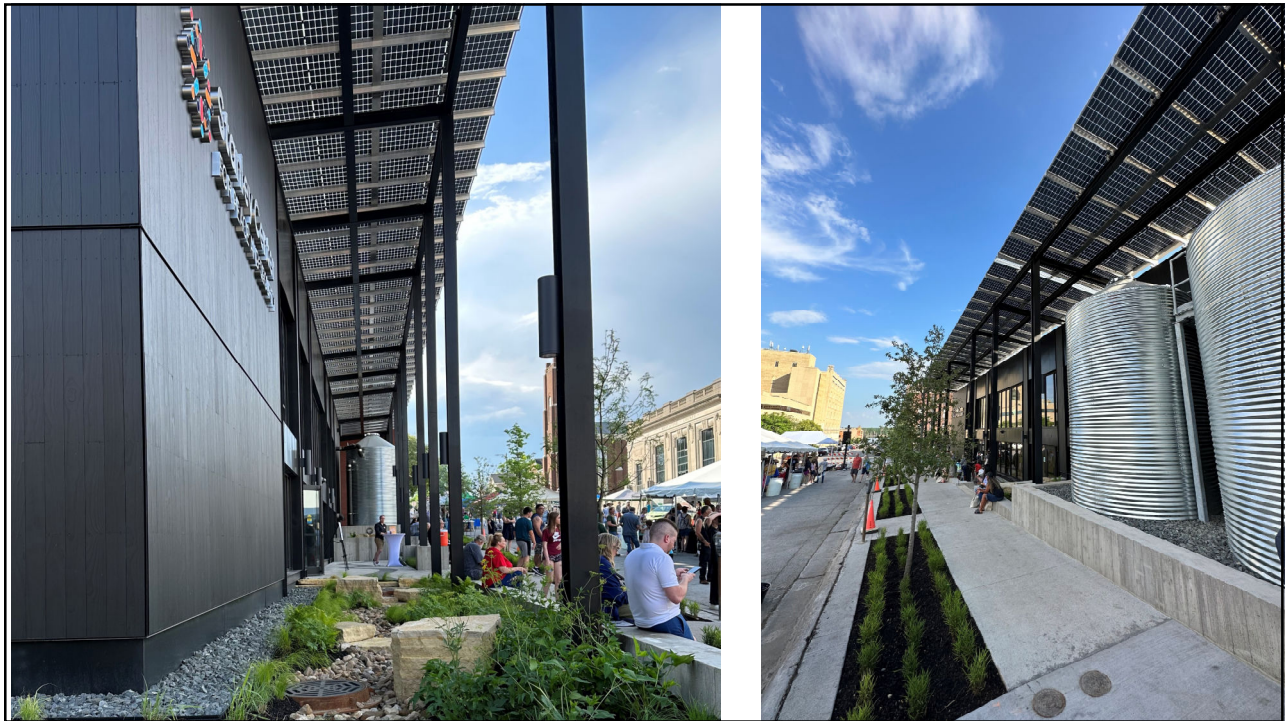
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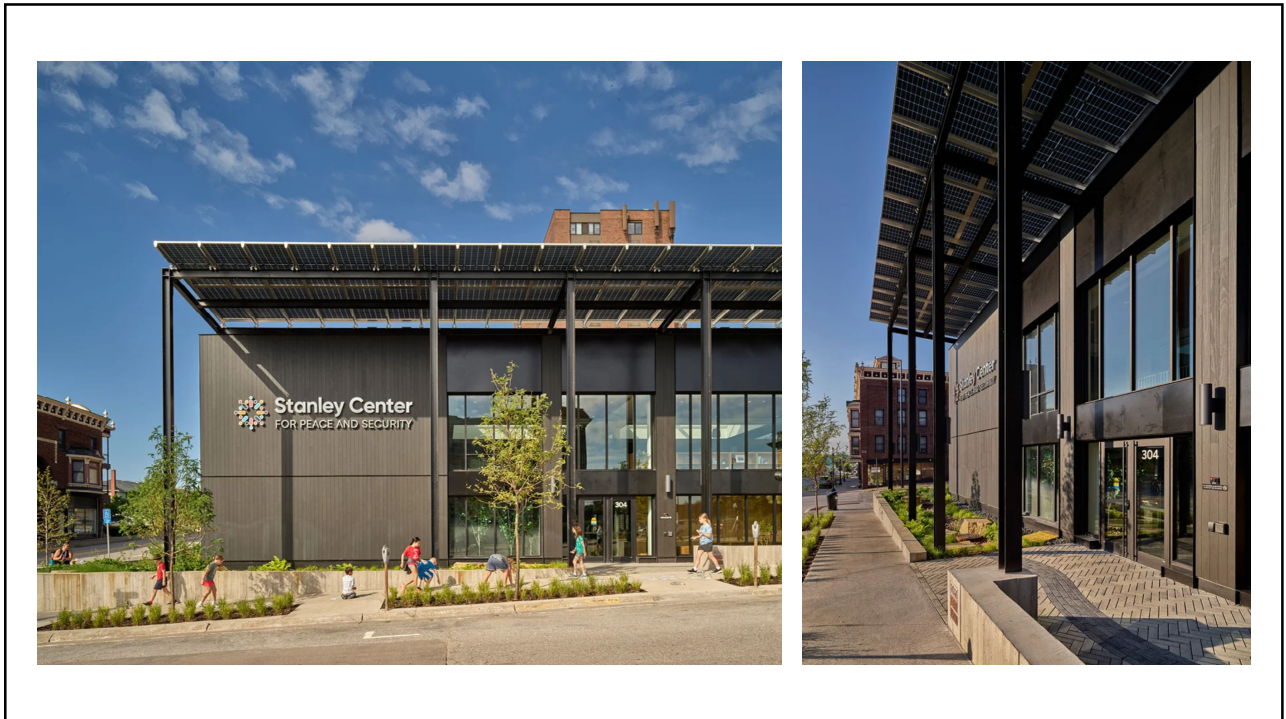
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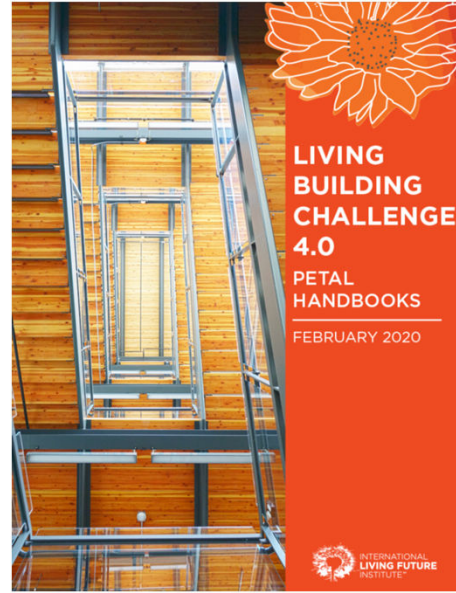
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> Living Building Challenge

- International Living Futures Institute rating system
- Currently the most rigorous rating system
- 20 Imperatives within 5 categories (Petals)



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SUMMARY MATRIX

The Living Building Challenge is composed of 20 Imperatives grouped into seven petals. Some Imperatives are not required for all Typologies.

		TYPOLOGY			
		New Building	Existing Building	Interior	Landscape + Infrastructure
PLACE	1 Ecology of Place	Core Imperative	Core Imperative	Core Imperative	Core Imperative
	2 Urban Agriculture	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	3 Habitat Exchange	Imperative Required	Imperative Required	Imperative Required	Imperative Required
WATER	4 Human Scaled Living	Core Imperative	Core Imperative	Core Imperative	Core Imperative
	5 Responsible Water Use	Imperative Required	Imperative Required	Imperative Required	Imperative Required
ENERGY	6 Net Positive Water	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	7 Energy + Carbon Reduction	Imperative Required	Imperative Required	Imperative Required	Imperative Required
HEALTH + HAPPINESS	8 Net Positive Energy	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	9 Healthy Interior Environment	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	10 Healthy Interior Performance	Imperative Required	Imperative Required	Imperative Required	Imperative Required
MATERIALS	11 Access to Nature	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	12 Responsible Materials	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	13 Red List	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	14 Responsible Sourcing	Imperative Required	Imperative Required	Imperative Required	Imperative Required
EQUITY	15 Living Economy Sourcing	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	16 Net Positive Waste	Imperative Required	Imperative Required	Imperative Required	Imperative Required
BEAUTY	17 Universal Access	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	18 Inclusion	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	19 Beauty + Biophilia	Imperative Required	Imperative Required	Imperative Required	Imperative Required
	20 Education + Inspiration	Imperative Required	Imperative Required	Imperative Required	Imperative Required

- CORE IMPERATIVE
- SCALE JUMPING ALLOWED
- HANDPRINTING IMPERATIVE
- IMPERATIVE REQUIRED FOR TYPOLOGY
- REQUIREMENT DEPENDENT ON SCOPE
- NOT REQUIRED FOR TYPOLOGY

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> Water Petal Imperative Overview

Intent

- realign how people value water; to address the energy and chemicals involved in transporting, purifying and pumping water; and to redefine “wastewater” as a precious nutrient and resource

Imperatives

- Responsible Water
- Net Positive Water



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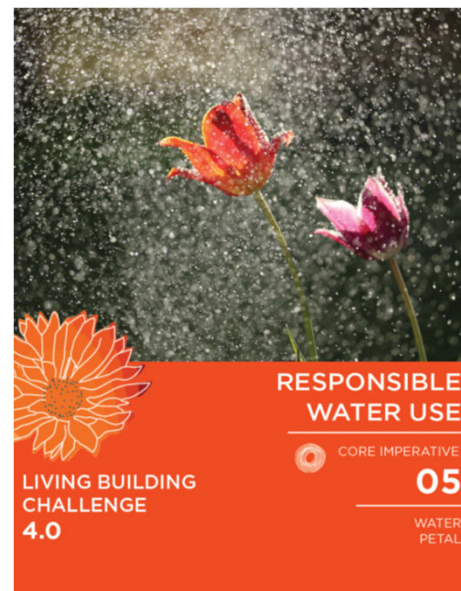
> Responsible Water Imperative Overview

Intent

- Treat water as a precious resource , minimizing waste and the use of potable water, while avoiding downstream impacts and pollution

Requirements

- No potable water for irrigation
- Use 50% less water than a baseline condition
- Treat all stormwater on-site through natural means
- Match pre-development hydrology



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> Net Positive Water Imperative Overview

Intent

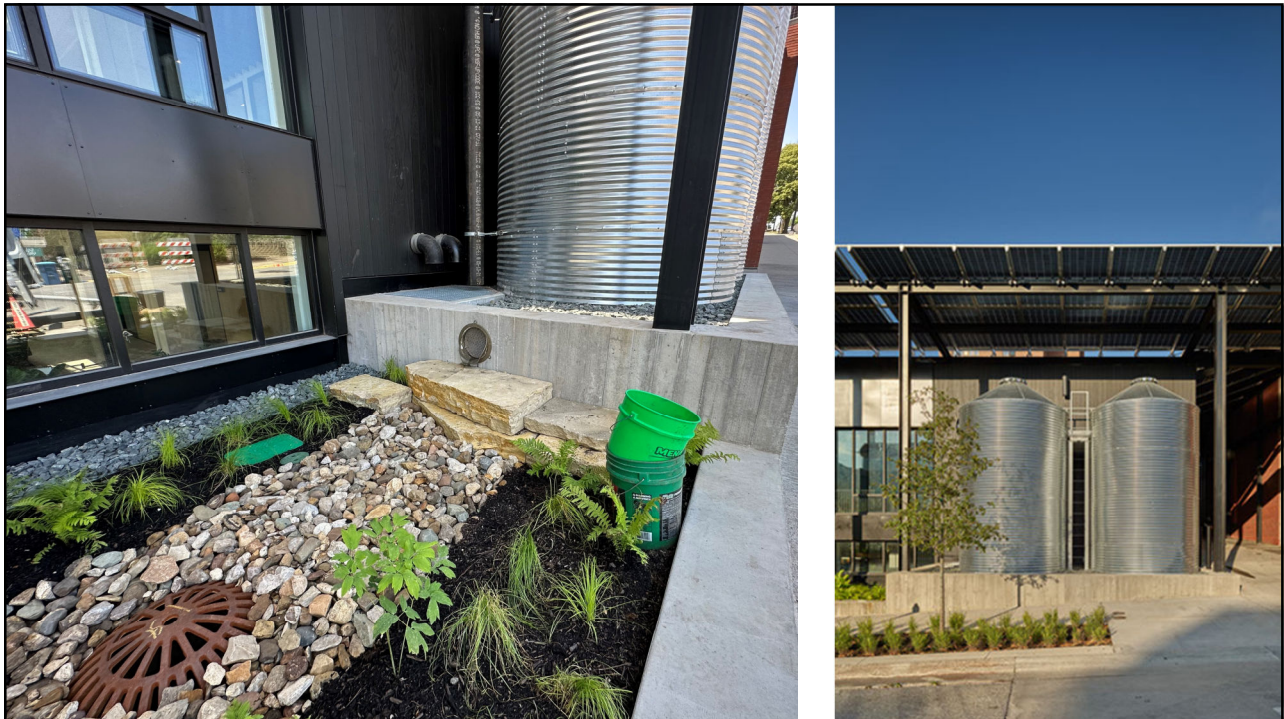
- water use and release should work in harmony with the natural water flows of the site and its surroundings

Requirements

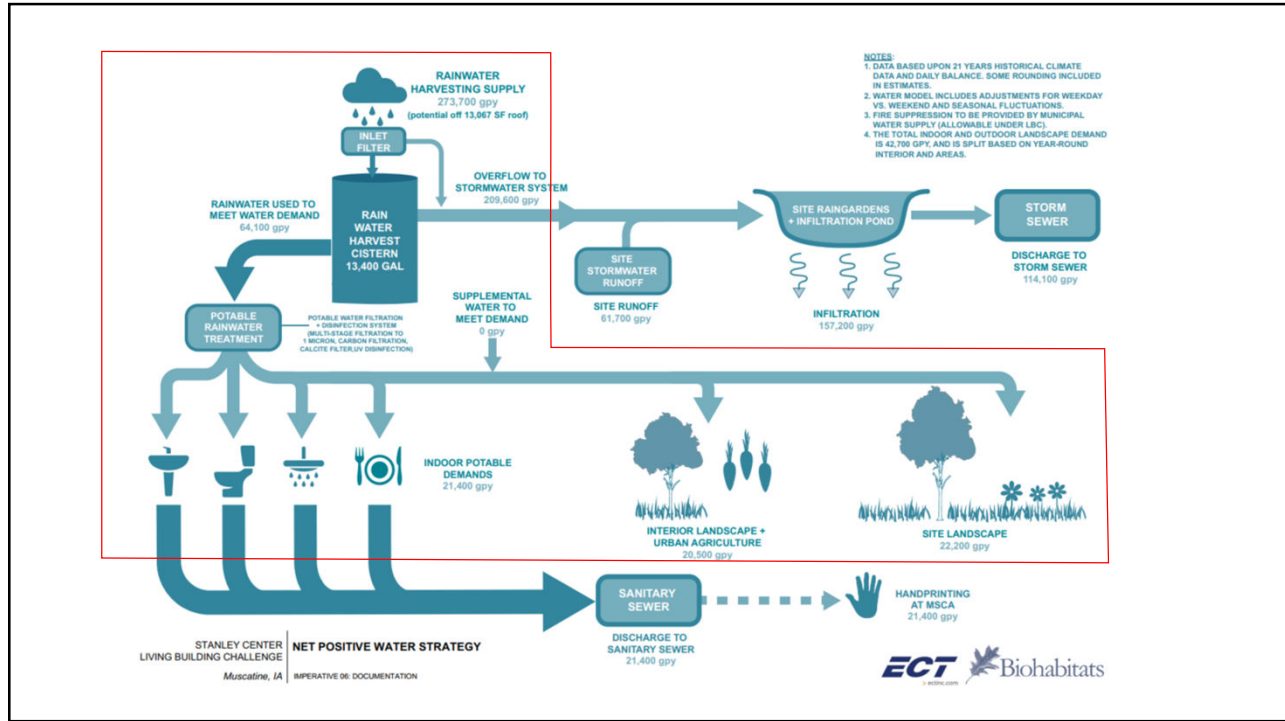
- Supply 100% of water needs through captured precipitation or use of closed loop systems
- Address all grey & black water through on-site treatment & managed reuse.



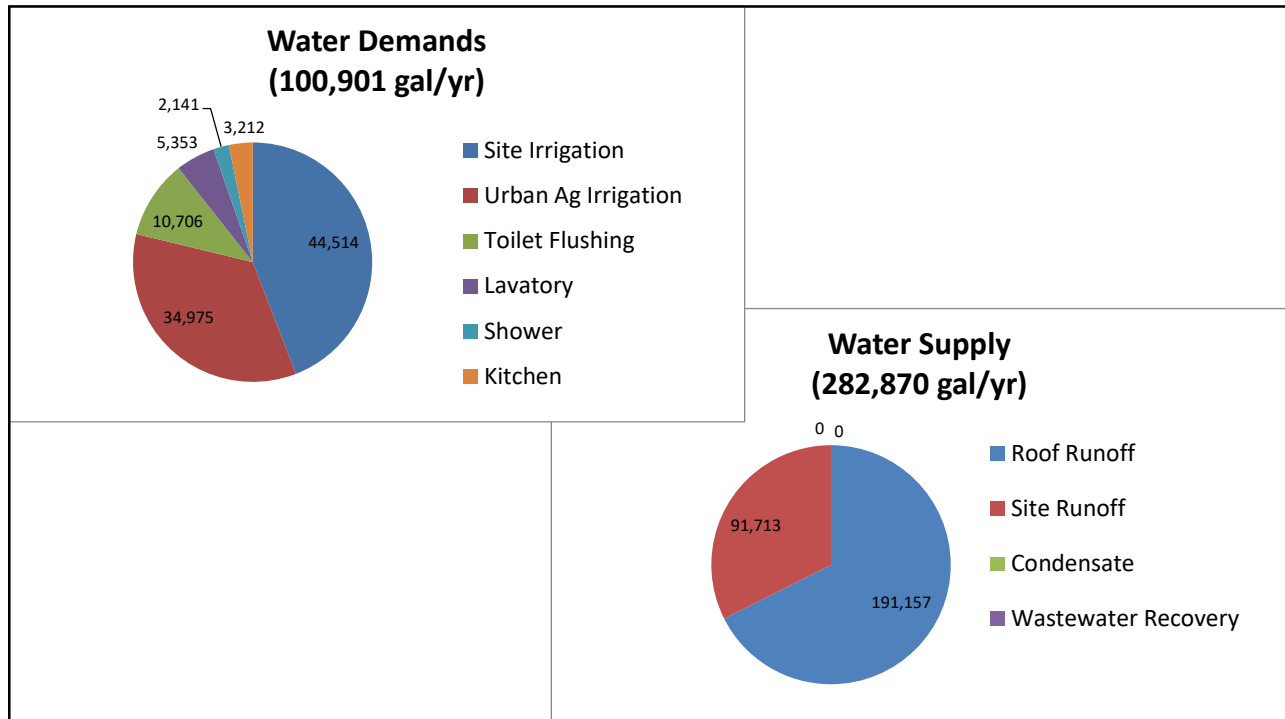
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Stanley Center Water Budget

FTE: 15
 Average FTE Occupancy 100%
 Baseline Demand(gal/FTE/day): 5.49
 Percent of Baseline use: 100%

Month	Precipitation (inches)	Water Supplies (gallons)			Site Uses (gallons)		Building Water Uses (gallons)					Total Water Uses (gallons)	
		Runoff*		Condensate**	0	1	Potable?	1	1	1	1	Potable	Non-Potable
		Roof	Site		Site Landscape	Urban Ag + interior	Total interior	50% Toilet	25% Lavatory	10% Shower	15% Kitchen		
Jan	1.52	6,048	2,628		1,290	1,014	1,818	909	455	182	273	2,832	1,290
Feb	1.96	8,586	3,811		1,290	1,014	1,642	821	411	164	246	2,656	1,290
Mar	2.67	11,311	5,151		3,226	2,534	1,818	909	455	182	273	4,353	3,226
Apr	4.14	18,914	9,053		3,226	2,534	1,760	880	440	176	264	4,294	3,226
May	5.58	25,744	12,583		6,451	5,069	1,818	909	455	182	273	6,887	6,451
Jun	5.86	27,340	13,431		6,451	5,069	1,760	880	440	176	264	6,829	6,451
Jul	4.46	20,708	10,262		6,451	5,069	1,818	909	455	182	273	6,887	6,451
Aug	4.21	20,100	9,859		6,451	5,069	1,818	909	455	182	273	6,887	6,451
Sep	4.19	19,084	9,490		3,871	3,041	1,760	880	440	176	264	4,801	3,871
Oct	3.18	14,894	7,161		3,226	2,534	1,818	909	455	182	273	4,353	3,226
Nov	1.96	8,768	3,966		1,290	1,014	1,760	880	440	176	264	2,774	1,290
Dec	2.19	9,659	4,319		1,290	1,014	1,818	909	455	182	273	2,832	1,290
Totals	41.91	191,157	91,713	0	44,514	34,975	21,411	10,706	5,353	2,141	3,212	56,386	44,514

* Runoff parameters

** From Design Engineers

Description	Area (sf)	Runoff Coefficient	Initial Abstraction	
Std Roof	9127	0.95	0.05	Potable supply
Green Roof	0	0.25	0.20	
Landscape	2637	0.25	0.25	Non-potable supply
Pavement*	4,411	0.95	0.10	
16,175				

*pavement + roof bypassing cistern

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Stanley Center - Potable Water Cycle

Potable Water Cycle

Input Information:

Constant Daily Average Demand (gallons)	59
Irrigation Area (Sq ft)	4,265
Weekly Irrigation Rate (inches)	1.00
Cistern volume (gallons)	13,400 (>0)
Daily Supply (gallons)	
Bi-Monthly supply (gallons)	0
Contributing	
Description	Area (Sq ft)
Std Roof	9,127
Green Roof	0
Pavement	0
Runoff Coefficient	
Std Roof	0.95
Green Roof	0.25
Pavement	0.25
Initial Abstraction	
Std Roof	0.05
Green Roof	0.20
Pavement	0.10
Total	
Area	9,127
Runoff	0
Initial	0

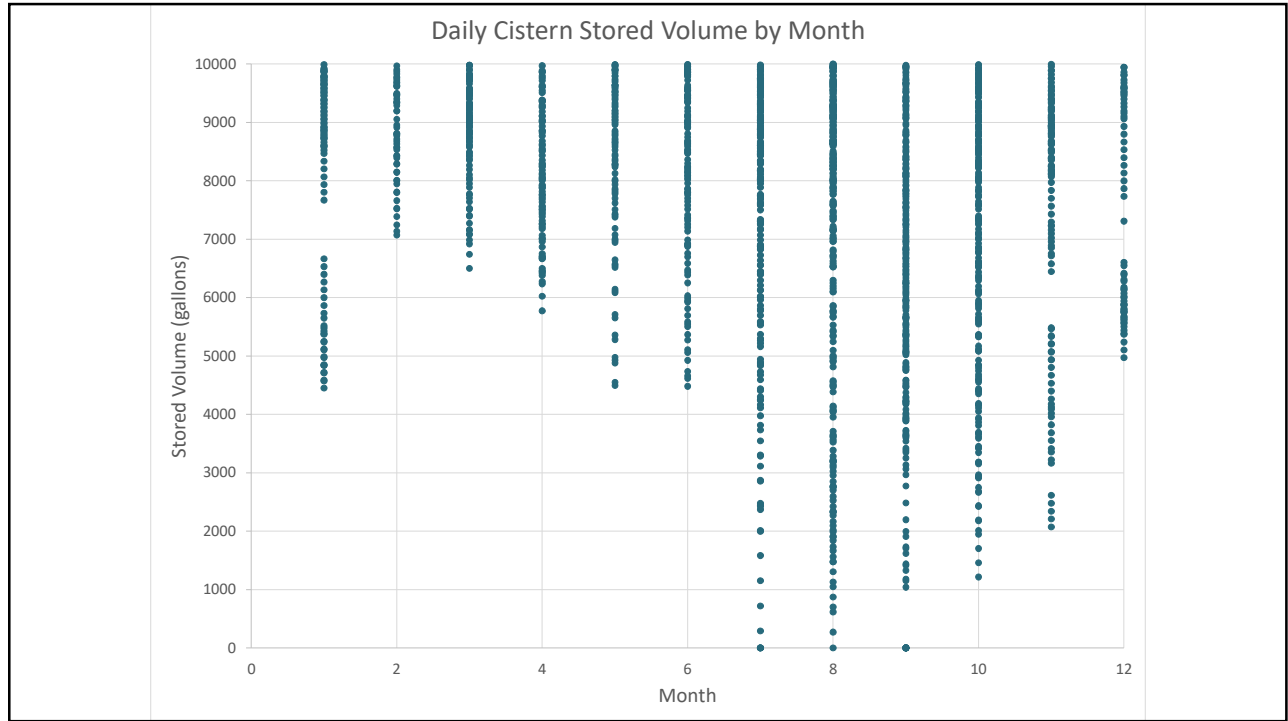
Results:

# of shortages	2
# of shortages/year	0.06
Avg annual shortage:	291 gallons
Avg annual shortage:	0.37% of demand
Average annual supply	79,389 gallons
Average annual supply:	99.63% of demand
Avg annual spill:	111,780 gallons
Avg annual spill:	58.47% of precip supply (may exceed 100% due to other supply sources)
# of spills/year	18.22
Annual runoff reduction:	41.53% of supply

year	month	day	Prcp	Snow	Prcp Supply gallons	Condensate + Constant Supply	Continuous onthly varying Demand	Irrigation Demand gallons	Rainfall Irrigation gallons	Net Irrigaion Demand	Total Demand	Stored Volume	
1999	JUL	7	1.03	0	5,297	0	59	372	2,738	0	59	13400	
1999	JUL	7	2	0.00	0	0	59	372	0	372	430	12970	
1999	JUL	7	3	0.00	0	0	59	372	0	372	430	12539	
1999	JUL	7	4	0.00	0	0	59	372	0	372	430	12109	
1999	JUL	7	5	0.00	0	0	59	372	0	372	430	11679	
1999	JUL	7	6	0.00	0	0	59	372	0	372	430	11249	
1999	JUL	7	7	0.00	0	0	59	372	0	372	430	10818	
1999	JUL	7	8	0.00	0	0	59	372	0	372	430	10388	
1999	JUL	7	9	0.19	0	757	0	59	372	505	0	59	11086
1999	JUL	7	10	0.04	0	0	0	59	372	106	265	324	10762
1999	JUL	7	11	0.00	0	0	0	59	372	0	372	430	10332
1999	JUL	7	12	0.00	0	0	0	59	372	0	372	430	9902
1999	JUL	7	13	0.00	0	0	0	59	372	0	372	430	9471
1999	JUL	7	14	0.00	0	0	0	59	372	0	372	430	9041
1999	JUL	7	15	0.00	0	0	0	59	372	0	372	430	8611
1999	JUL	7	16	0.00	0	0	0	59	372	0	372	430	8180
1999	JUL	7	17	0.00	0	0	0	59	372	0	372	430	7750
1999	JUL	7	18	0.00	0	0	0	59	372	0	372	430	7320
1999	JUL	7	19	0.00	0	0	0	59	372	0	372	430	6890
1999	JUL	7	20	0.21	0	865	0	59	372	558	0	59	7696
1999	JUL	7	21	0.00	0	0	0	59	372	0	372	430	7265
1999	JUL	7	22	0.00	0	0	0	59	372	0	372	430	6835
1999	JUL	7	23	0.00	0	0	0	59	372	0	372	430	6405
1999	JUL	7	24	0.97	0	4,972	0	59	372	2,579	0	59	11318

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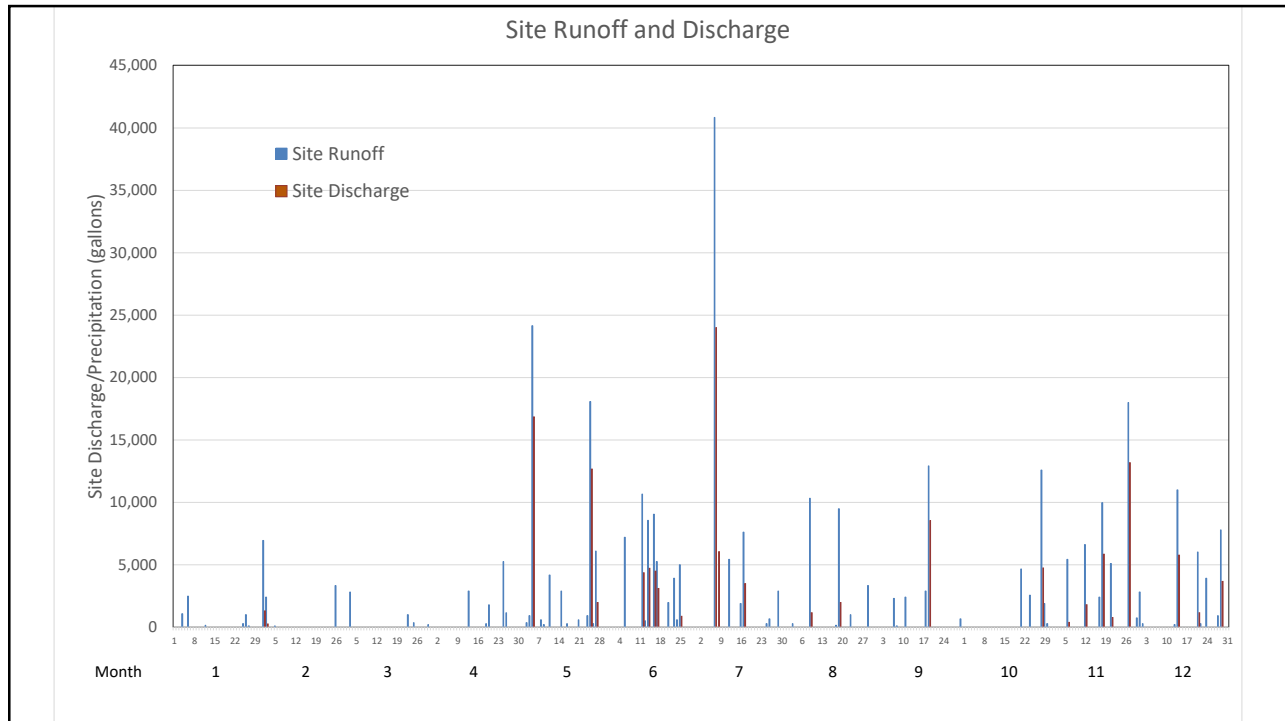
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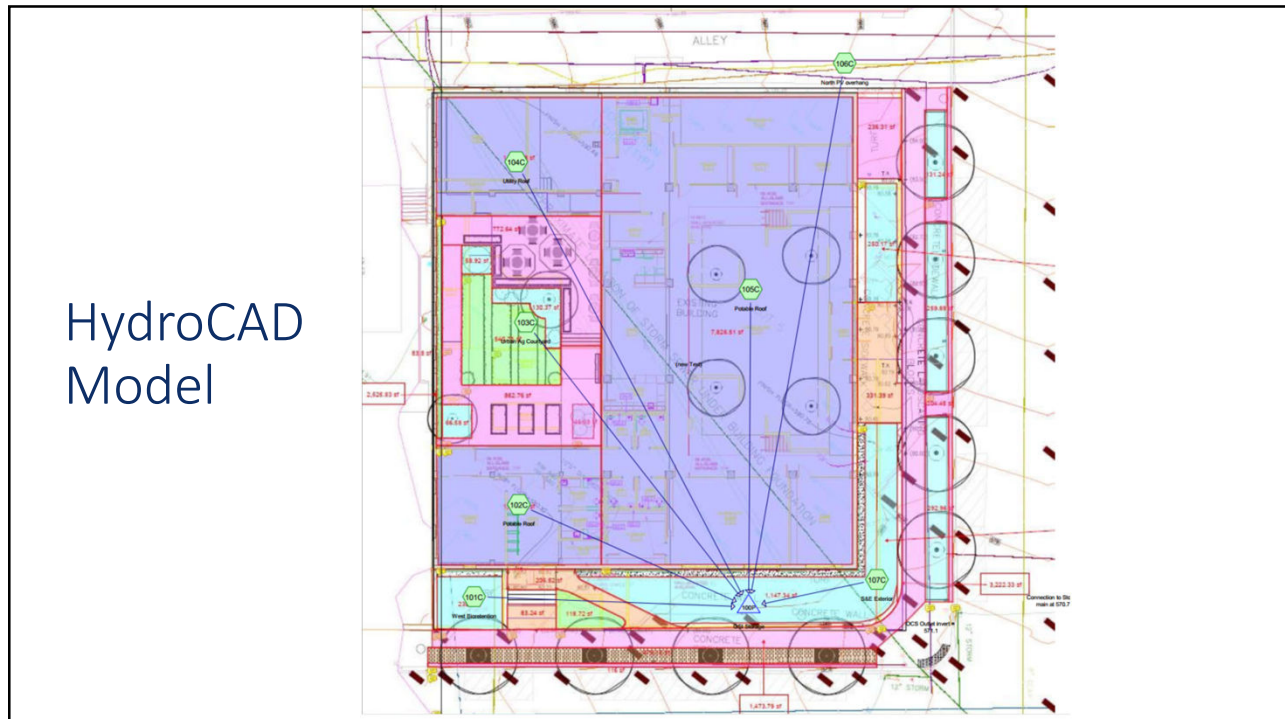
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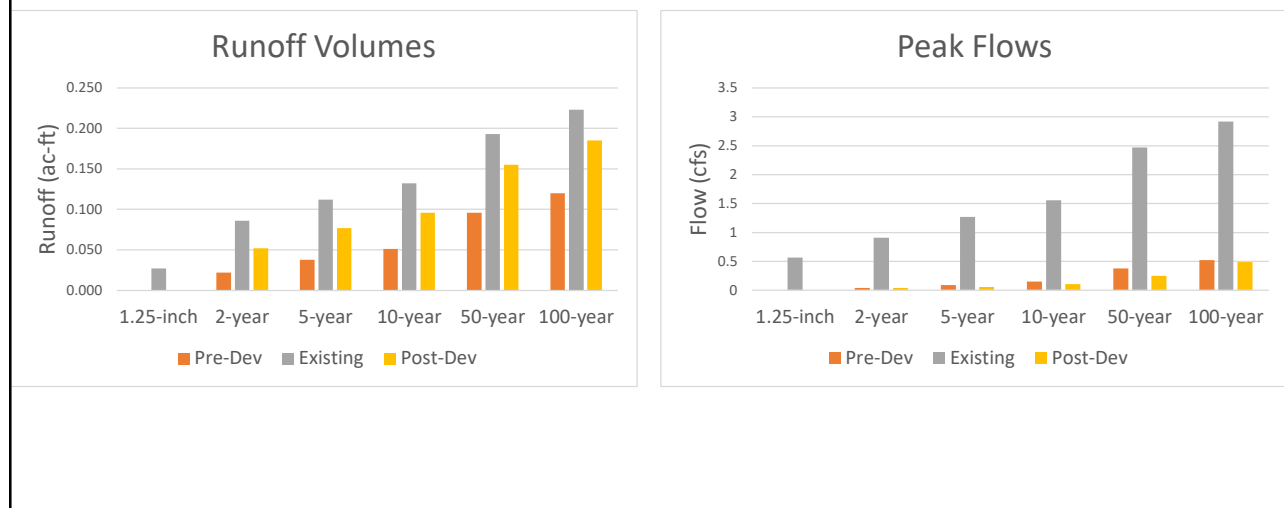
HydroCAD Modeling Results

Event	24-hr Precipitation		Pre-dev		Existing Conditions		Post-Dev with GI system	
	(inches)	(acre-feet)	Vol (af)	Q (cfs)	Vol (af)	Q (cfs)	Vol (af)	Q (cfs)
1.25-inch	1.25	0.04	0.000	0	0.027	0.57	0.000	0
2-year	3.06	0.10	0.022	0.04	0.086	0.91	0.052	0.04
5-year	3.84	0.13	0.038	0.09	0.112	1.27	0.077	0.06
10-year	4.44	0.15	0.051	0.15	0.132	1.56	0.096	0.11
50-year	6.25	0.21	0.096	0.38	0.193	2.47	0.155	0.25
100-year	7.13	0.24	0.120	0.52	0.223	2.92	0.185	0.49
Continuous Annual Runoff (inches)*	40.48		1.59		29.02		9.85	

*From 21-year continuous simulation spreadsheet model

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HydroCAD Modeling Results



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Water Quality Results

Constituent	Percent Removal by		Proportion Managed by		Removal (%)	Notes
	Infiltration	Filtration	Infiltration	Filtration		
TSS	100%	80%	58%	42%	92%	Removal by filtration based on Wisconsin DNR
TP	100%	0%	58%	42%	58%	Removal by filtration based on Wisconsin DNR
TN	100%	40%	58%	42%	75%	Removal by filtration assumed
Metals	100%	80%	58%	42%	92%	Removal by filtration same as TSS
Organics	100%	80%	58%	42%	92%	Organics typically adsorbed to sediment
Pathogens	100%	0%	58%	42%	58%	Viruses and other pathogens typically too small to be filtered

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Questions?



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