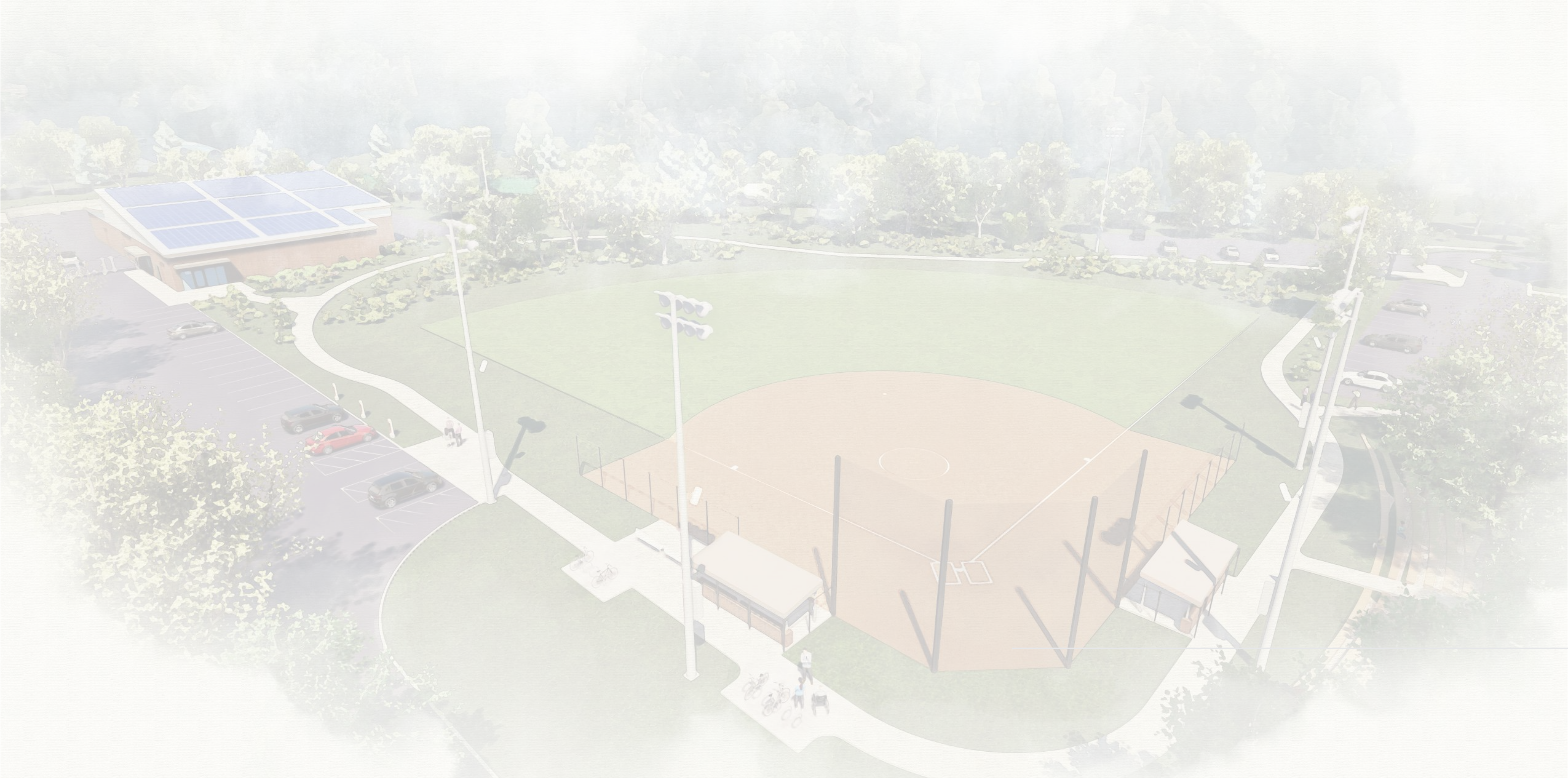
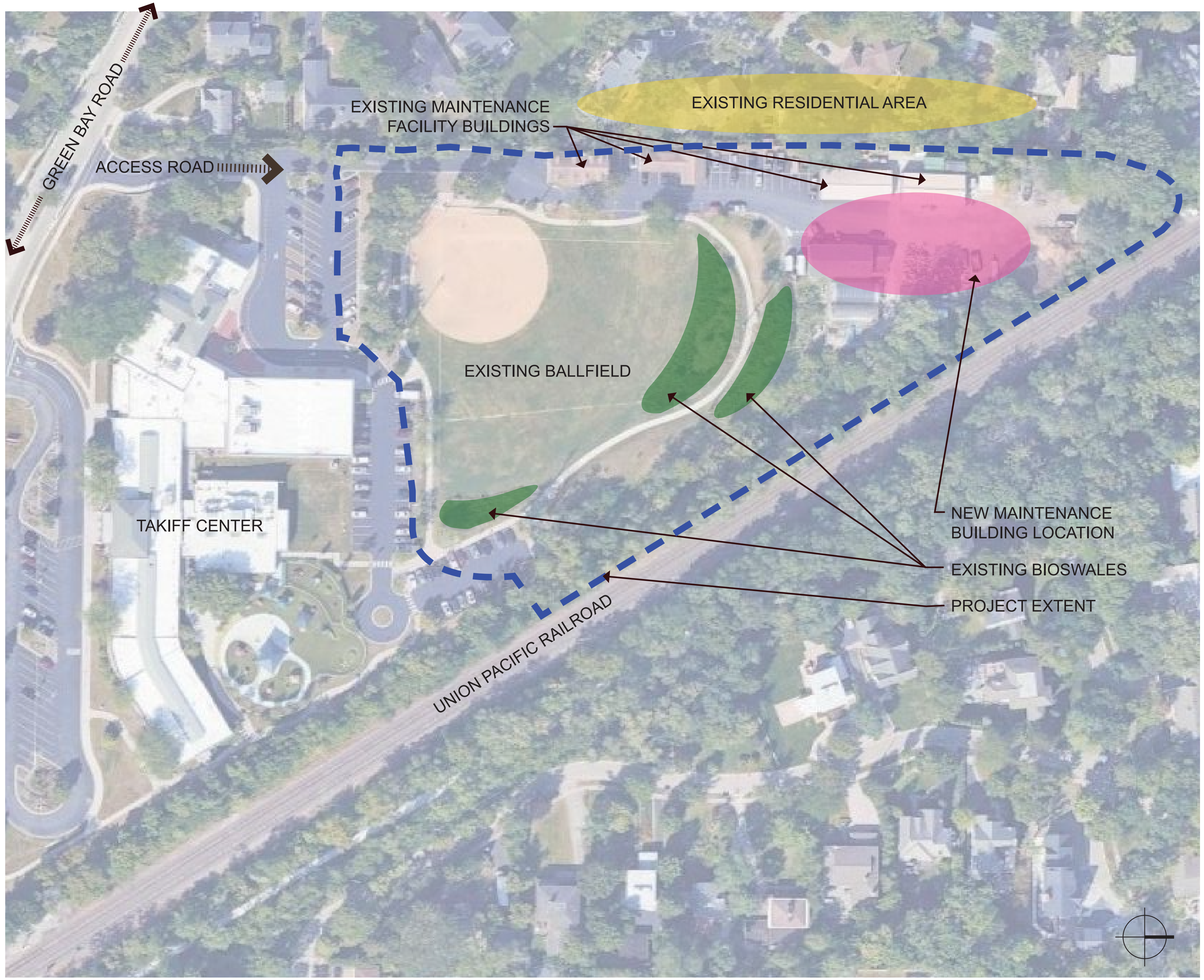


GLENCOE PARK DISTRICT · New Maintenance Facility & Ballfield Improvements

Committee Meeting · 04/01/2025

SPACE NEEDS					
	SPACE NEEDS				NOTES
DEPARTMENT	Staff / Occupant	Space Qty	NSF Each	Total NSF	
Outdoor / Site Program					
Staff & Visitor Parking					
Specialty (Bus/Van)					
EV Parking		3			
Pedestrian Drop-Off					
Dugouts		2	200	400	20'x10'
Bike Parking		13			
Entry Plaza					
Flag Poles					
Monument Sign					
Trash Enclosure					
Generator Enclosure					
Loading					
Detention / Retention					

SPACE NEEDS					
	SPACE NEEDS				NOTES
DEPARTMENT	Staff / Occupant	Space Qty	NSF Each	Total NSF	
GARAGE					
Enclosed Vehicle Storage		6	320	1,920	3 snow service vehicles, 3 additional large size vehicles / equipment
Wash Bay		1	500	500	within enclosed garage
Workshop		1	1,000	1,000	with workbench and tools
Materials Storage		1	1,800	1,800	enclosed, but not heated
Outdoor Covered Vehicle Storage		6	320	1,920	sized for (6) F-450, with dump bed
		Circulation	10%	714	
Total	***0***			***7,854***	
ADMIN					
Office	3	3	120	360	U shape desk + guest chair
Conference Rm		1	220	220	8 person, with TV
Staff Room		1	380	380	12 person, with kitchenette
Locker room		1	200	200	12 lockers, size?
T/Shower		2	90	180	Universal, with shower
Janitor		1	150	150	mop sink, washer and dryer
Storage		1	90	90	archives; dry storage
		Circulation	35%	553	
Total	***3***			***2,133***	
BATTING CAGES					
Lobby/Lounge		1	500	500	access to admin, access to garage
Batting Cages		2	770	1,540	55ft x 14ft x 12 ft netting
Restrooms		2	50	100	in entry zone / lobby
		Circulation	20%	428	
Total	***0***			***2,568***	
TOTAL DEPARTMENTAL GROSS AREA (DGSF)				**12,555**	**not including common circulation or building support areas (mechanical, electrical, sprinkler)**
Building Gross Factor			**20%**	**2,511**	**MEP rooms, common circulation**
TOTAL BUILDING GROSS SQUARE FEET				***15,066***	***GSF***



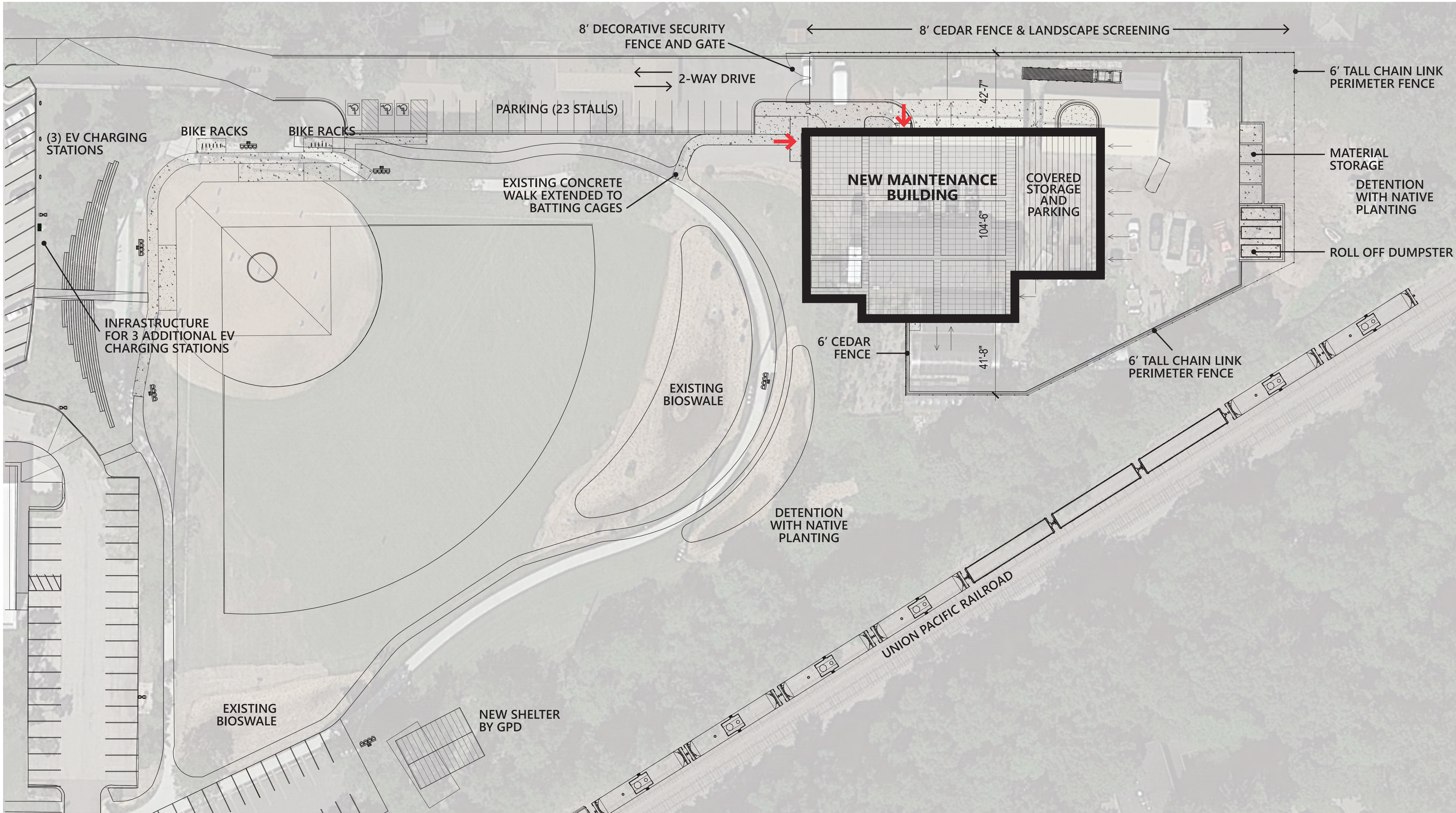
999 GREEN BAY RD, GLENCOE, IL 60022

OVERALL SITE AREA

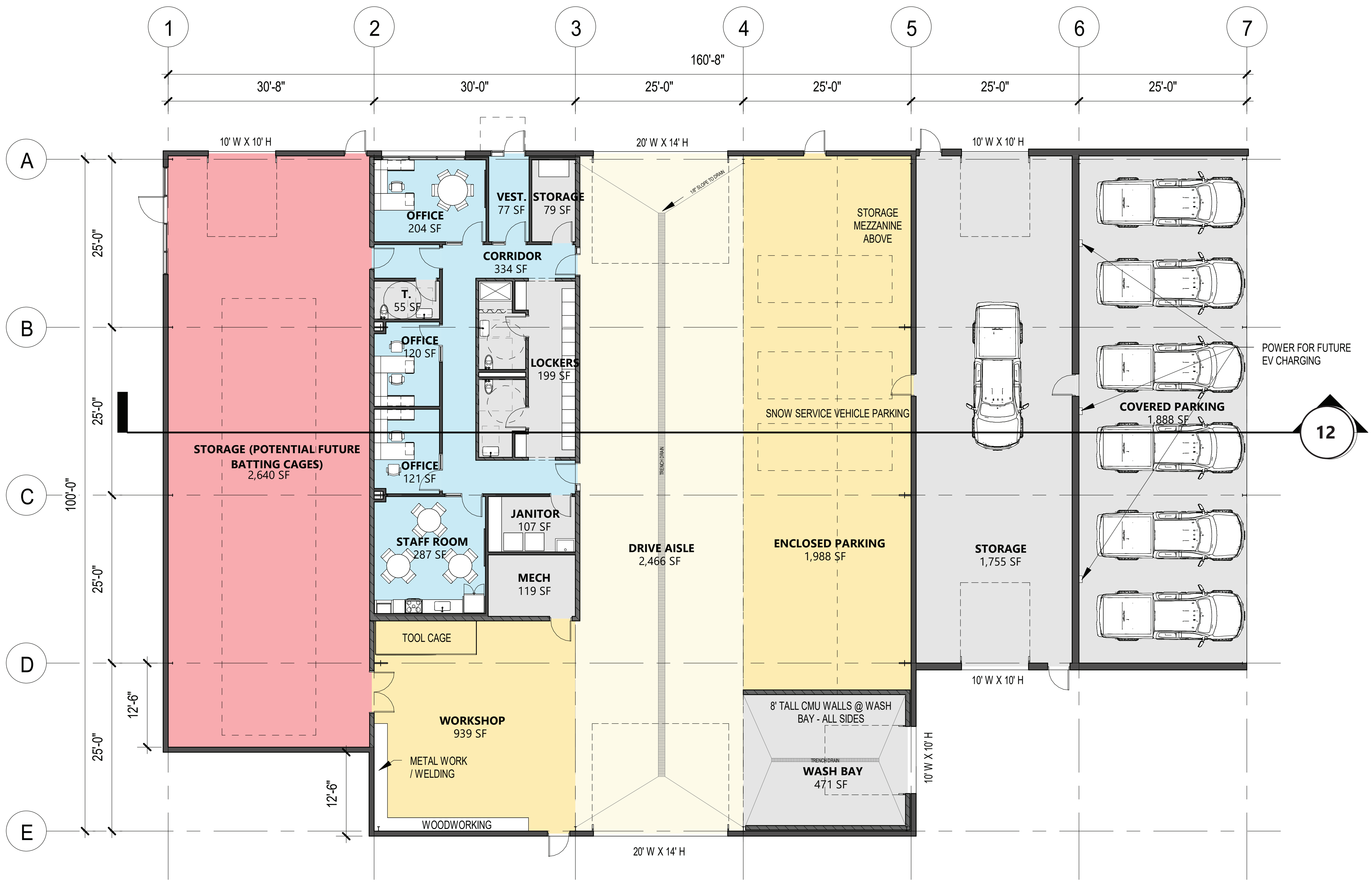
PROPOSED NEW MAINTENANCE BUILDING LOCATION

EXISTING BALLFIELD

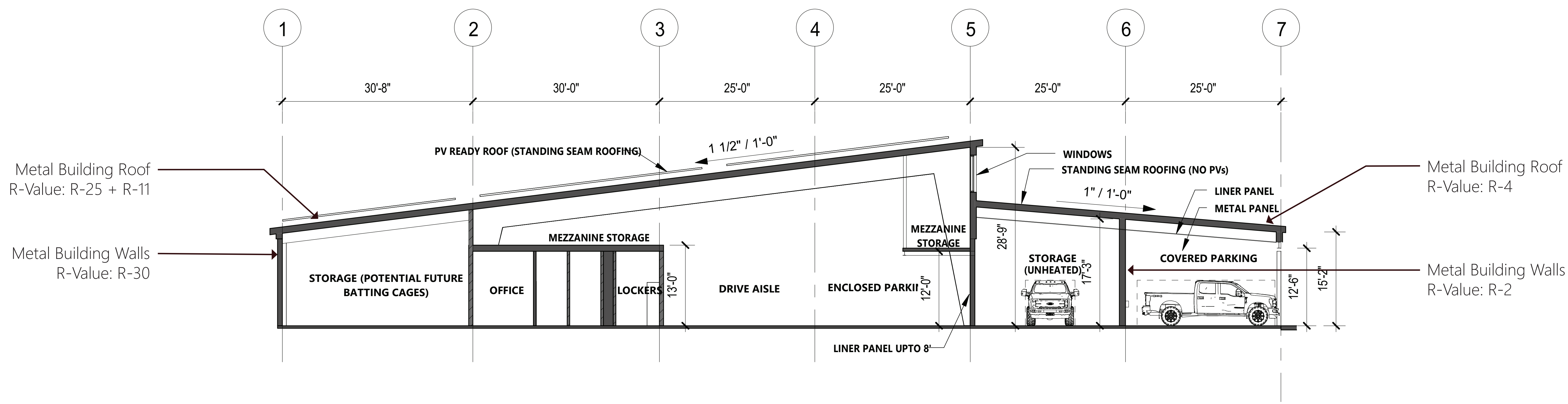
PROPOSED SITE PLAN



Maintenance Building
FLOOR PLAN



Maintenance Building
SECTION

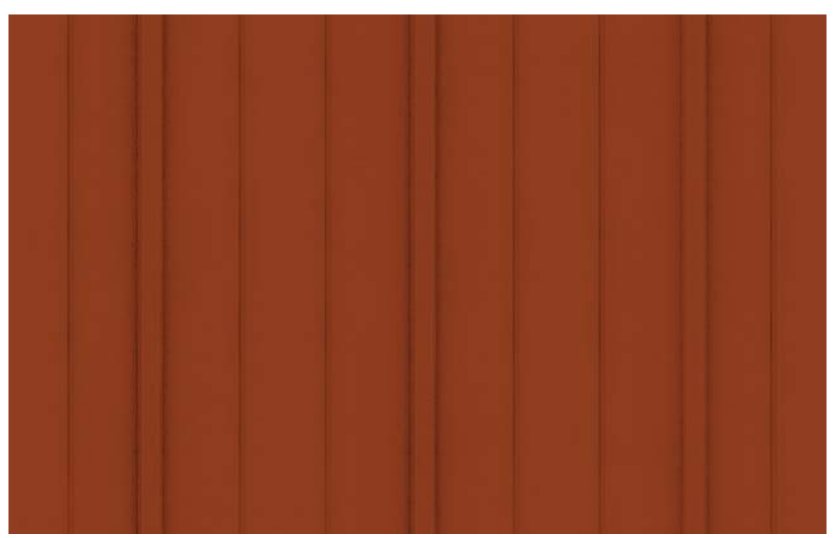


Maintenance Facility
AXON VIEW

Metal Wall Panel - Reflective White

PV panels on the Roof

Standing Seam Roof



Metal Wall Panel - Terracotta

Metal Building Interior finish

- The Wight Sustainability Standard (WSS), which includes base sustainable strategies and material with healthy ingredients, is applied to all Wight & Company projects.
- Wight's Architectural and Engineering teams will track and record certain aspects of the project, i.e. Light Power Density, Energy Use Intensity, embodied carbon and report to national database as a part of commitment to track, review, and improve projects to reduce operational and embodied carbon and specify materials with healthy ingredients

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Energy / Operational Carbon Reduction:

Reducing the emissions from a building's energy consumption

Net Zero (Energy, Waste or Water) :

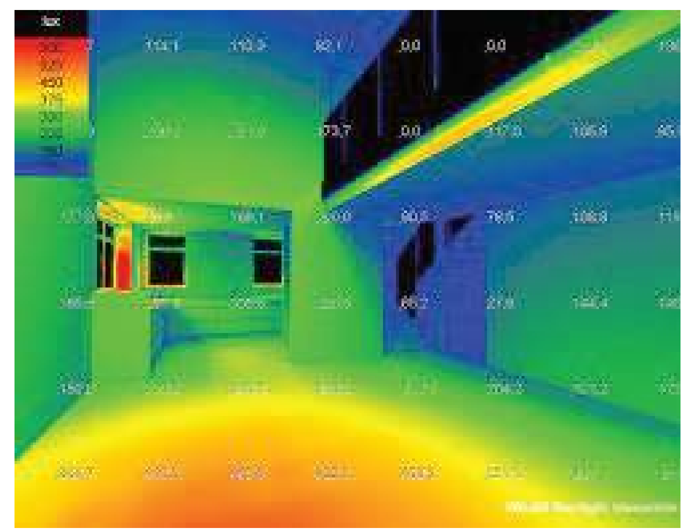
Energy used = Energy produced (on-site or off-site through community solar or renewable energy credits)

Wellness:

Improving all aspects that affect human health - air & water quality, nourishment, light, movement and mental health

Embodied Carbon Reduction:

Reducing the CO2 emissions in materials by looking at the full life cycle of products - manufacturing, transportation, installation & end of life



focusing on

ENERGY

Building Orientation: Orienting the building with the largest roof surface facing south maximizes photovoltaic (PV) production by capturing the most sunlight throughout the day.

Net Zero Potential: A large roof area covered with PV panels, combined with the low energy intensity of a maintenance building, can make it possible to achieve Net Zero energy consumption.

Staff Area Location: Placing the staff area within the heated part of the garage minimizes energy losses and provides an additional insulation layer for the occupied areas, enhancing overall energy efficiency.

Cool Roof: Using a light-colored "cool roof" helps minimize heat gains in the garage areas, reducing the need for cooling.

Clerestory Windows: Installing clerestory windows along the north elevation allows natural daylight to enter the garage space, reducing the reliance on artificial lighting.

Optimized Lighting: Implementing optimized lighting power density ensures efficient use of energy for lighting needs.

Sensors: Using daylight and occupancy sensors helps in efficient energy use by adjusting lighting based on natural light availability and occupancy.

HEALTHY & RESPONSIBLE MATERIALS

Low-VOC paint
Casework with no added urea-formaldehyde
Selection of materials with recycled content.

WATER

Low-flow plumbing fixtures to conserve water.

PV PRODUCTION STUDY FOR MAINTENANCE FACILITY (Helioscope Model)

Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,429.8	
	POA Irradiance	1,520.5	6.3%
	Shaded Irradiance	1,520.5	0.0%
	Irradiance after Reflection	1,462.9	-3.8%
	Irradiance after Soiling	1,356.3	-7.3%
	Total Collector Irradiance	**1,356.3**	**0.0%**
Energy (kWh)	Nameplate	186,532.4	
	Output at Irradiance Levels	184,718.6	-1.0%
	Output at Cell Temperature Derate	182,352.2	-1.3%
	Output After Mismatch	176,701.6	-3.1%
	Optimal DC Output	176,107.3	-0.3%
	Constrained DC Output	175,942.5	-0.1%
	Inverter Output	171,544.0	-2.5%
	Energy to Grid	**170,686.2**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		12.2 °C
	Avg. Operating Cell Temp		18.7 °C
Simulation Metrics			
	Operating Hours		4697
	Solved Hours		4697

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km Grid (42.15,-87.75), NREL (prospector)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.075	3°C
Flush Mount	-2.81	-0.0455	0°C
East-West	-3.56	-0.075	3°C
Carport	-3.56	-0.075	3°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
37.5	42.7	19.3	0.8	0.6	0.7	0.9	1	1	1	3.5	25.2

Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Module & Component Characterizations

Type	Component	Characterization
Module	MSE350SX5T (Mission Solar)	Spec Sheet Characterization, PAN
Inverter	TS480XL-10k (HiQ Solar)	Spec Sheet

Report

Project Name	250035_Glencoe PD Maintenance Bldg
Project Address	999 Green bay rd, Glencoe, IL
Prepared By	Megan Zack mzack@wightco.com

System Metrics

Design	Design 3
Module DC Nameplate	137.6 kW
Inverter AC Nameplate	139.7 kW Load Ratio: 0.98
Annual Production	170.7 MWh
Performance Ratio	81.6%
kWh/kWp	1,240.9
Weather Dataset	TMY, 10km Grid (42.15,-87.75), NREL (prospector)
Simulator Version	ef3e19925a-72d357cc63-3a188fe18e-9c612191bd

Project Location

Components

Component	Name	Count
Inverters	TS480XL-10k (HiQ Solar)	14 (139.7 kW)
Strings	10 AWG (Copper)	28 (3,659.2 ft)
Module	Mission Solar, MSE350SX5T (350W)	393 (137.6 kW)

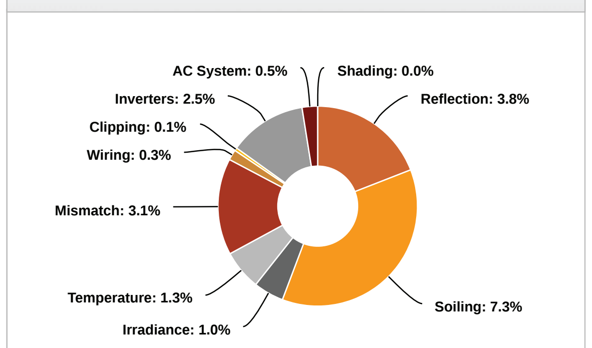
Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	14-21	Along Racking

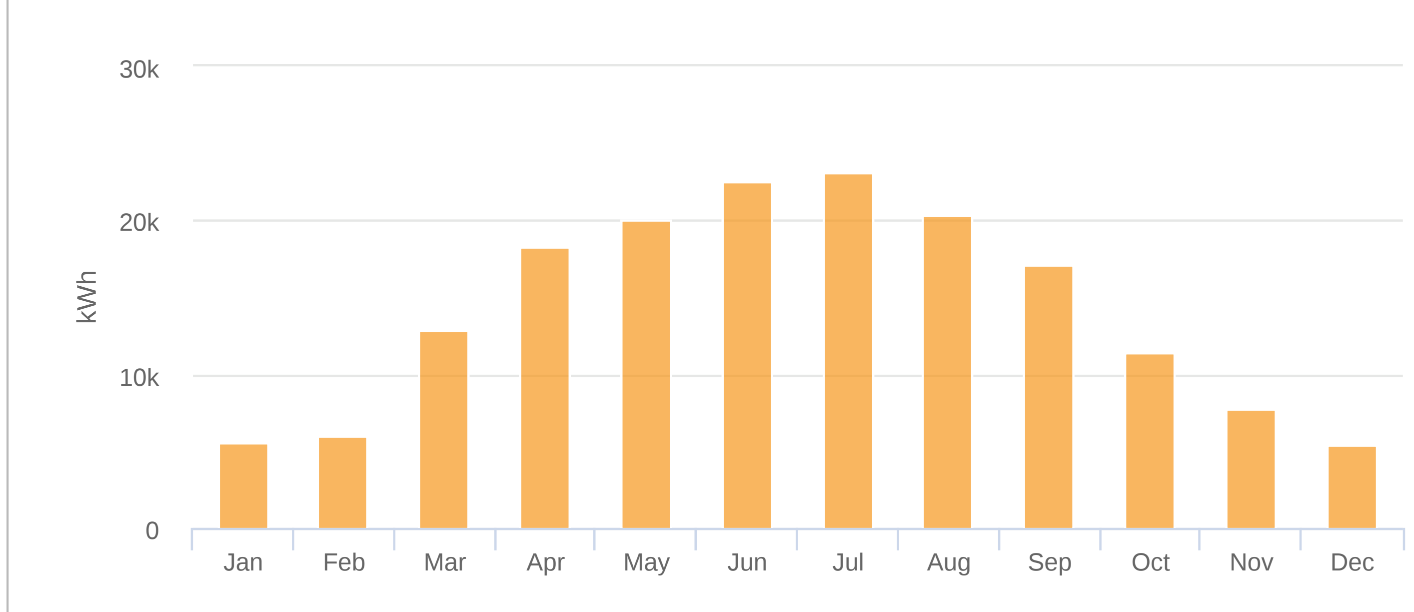
Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Carport	Landscape (Horizontal)	7.5°	180°	0.0 ft	1x1	393	393	137.6 kW

Sources of System Loss



Monthly Production



ESTIMATED ANNUAL PV PRODUCTION: 170.6 kWh

ENERGY MODELING: An IES energy model is run during early SD to review different envelope and mechanical system options.
The goal is to find the system that works best for the space, it's use and the client. We think about energy efficiency, thermal comfort and acoustic implications of different systems. And balance the first cost of the system with the annual energy cost to make the best recommendation.

RESULTS OF VARIOUS SCENARIOS:

Tag	consumption (kBTU)	Cost($)	EUI (kBTU	Electricity (kBTU)	Gas (kBTU)	Ton CO2 eq	Notes
1	1,061,344.11	18,291.50	81.0	345,824	715,521	78.4	Base (gas RTU + elec VAV; Gas UH, listed envelope, 0.6 infiltration(inf))
2	655,605.83	13,180.84	50.1	287,127	368,479	53.1	Base + 0.2 inf (good)
3	856,515.49	15,785.64	65.4	319,087	537,429	65.8	Base + 0.4 inf (IECC 2021)
4	741,943.85	25,166.72	56.7	725,295	16,648	85.9	Base + 0.4 inf + elec UH
5	768,998.79	14,827.94	58.7	312,078	456,921	60.7	Base + 0.4 inf + improved envelope on 55F perimeter
6	672,203.94	22,753.51	51.3	655,259	16,945	77.7	Base + 0.4 inf + improved envelope on 55F perimeter + elec UH
7	665,594.43	22,507.63	50.8	647,951	17,643	76.9	Base + 0.4 inf + improved envelope on 55F perimeter + improved envelope on conditioned perimeter + elec UH
8	642,159.59	22,140.27	49.0	641,743	417	75.2	Base + 0.4 inf + improved envelope on 55F perimeter + improved envelope on conditioned perimeter + elec UH +50%ERW
9	560,005.51	19,295.19	42.8	559,150	855	65.6	Base + 0.3 inf + improved envelope on 55F perimeter + improved envelope on conditioned perimeter + elec UH +50%ERW
10	477,878.56	16,447.72	36.5	476,457	1,422	55.9	Base + 0.2 inf + improved envelope on 55F perimeter + improved envelope on conditioned perimeter + elec UH +50%ERW
11	537,252.56	18,522.66	41.0	536,878	375	62.9	Base + 0.4 inf + improved envelope on 55F perimeter + improved envelope on conditioned perimeter + elec UH +50%ERW + 45F

options with Net Zero potential (EUI less than PV production ~44)

Conclusion

- Controlling air leakage is the key to net zero for this project. Due to the nature of garage door, this project tends to have high air leakage. A 0.6 cfm/sqft-fac infiltration will guarantee the project not meeting net zero, it must be lower than 0.3 cfm/sqft-fac to be net zero possible. IECC 2021 requires 0.4 cfm/sqft-fac.
- Improving envelope on 55F perimeter translate to an improvement of 5.9 EUI; improving envelope on conditioned perimeter translate to an improvement of 0.5 EUI
- Electric EUH should be the way to go. The 20% efficiency difference between electric and gas is significant for this project. Although electric UH will result a higher operation energy cost.
- ERW on RTU improves the EUI by 1.8
- Reduce the garage area from 55 F to 45F makes a significant change, reduced the EUI by 8. But it may not be good for occupancy comfort.

Other methods to improve performance

- Lower the roof where possible. High volume space consumes more energy and result in more envelope load.

LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

Project Name: Glencoe Park District New Maintenance Building
Date: March 25, 2025

Y	?	N			
1			Credit	Integrative Process	1

Y	?	N		Location and Transportation	16
2	2	12		**Location and Transportation**	**16**
0			Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
		2	Credit	High Priority Site	2
		5	Credit	Surrounding Density and Diverse Uses	5
		5	Credit	Access to Quality Transit	5
	1		Credit	Bicycle Facilities	1
	1		Credit	Reduced Parking Footprint	1
1			Credit	Green Vehicles	1

Y	?	N			
2	6	2		**Sustainable Sites**	**10**
Y			Prereq	Construction Activity Pollution Prevention	Required
1			Credit	Site Assessment	1
		2	Credit	Site Development - Protect or Restore Habitat	2
1			Credit	Open Space	1
	3		Credit	Rainwater Management	3
	2		Credit	Heat Island Reduction	2
	1		Credit	Light Pollution Reduction	1

Y	?	N			
3	6	2		**Water Efficiency**	**11**
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
	2		Credit	Outdoor Water Use Reduction	2
3	3		Credit	Indoor Water Use Reduction (35% 3pts, 40-50% 4-6pts)	6
		2	Credit	Cooling Tower Water Use	2
	1		Credit	Water Metering (2 submeters; boiler, reclaimed, washout)	1

Y	?	N			
8	23	2		**Energy and Atmosphere**	**33**
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
3	3		Credit	Enhanced Commissioning (+1 for MBCx)	6
4	14		Credit	Optimize Energy Performance (38% 15pts, 42-50% 16-18pts)	18
	1		Credit	Advanced Energy Metering	1
		2	Credit	Demand Response	2
	3		Credit	Renewable Energy Production (10% 3pts)	3
1			Credit	Enhanced Refrigerant Management (confirm no VRF)	1
	2		Credit	Green Power and Carbon Offsets	2

Y	?	N			
6	5	2		**Materials and Resources**	**13**
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
2	1	2	Credit	Building Life-Cycle Impact Reduction	5
1	1		Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
	2		Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
1	1		Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

Y	?	N			
9	6	1		**Indoor Environmental Quality**	**16**
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1	1		Credit	Enhanced Indoor Air Quality Strategies	2
3			Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
1	1		Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
2			Credit	Interior Lighting	2
	3		Credit	Daylight	3
		1	Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

Y	?	N			
3	3	0		**Innovation**	**6**
2	3		Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

Y	?	N			
0	4	0		**Regional Priority**	**4**
	1		Credit	Regional Priority: Enhanced IAQ (2pts)	1
	1		Credit	Regional Priority: Advanced Energy Metering/Protect or Restore Habitat	1
	1		Credit	Regional Priority: Rainwater Management (3pts)	1
	1		Credit	Regional Priority: High Priority Site/Building Life-cycle	1

Y	?	N			
34	55	21	**TOTALS**	Possible Points:	**110**

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

GLENCOE PARK DISTRICT

Wight