

# THE **GALANTE** ARCHITECTURE STUDIO

## SCHEMATIC DESIGN



## TOWN OF BELMONT

# BELMONT SKATING RINK

January 25th, 2023

The Galante Architecture Studio  
146 Mount Auburn Street  
Cambridge, MA 02138

P: (617) 576-2500

[galantearchitecture.com](http://galantearchitecture.com)

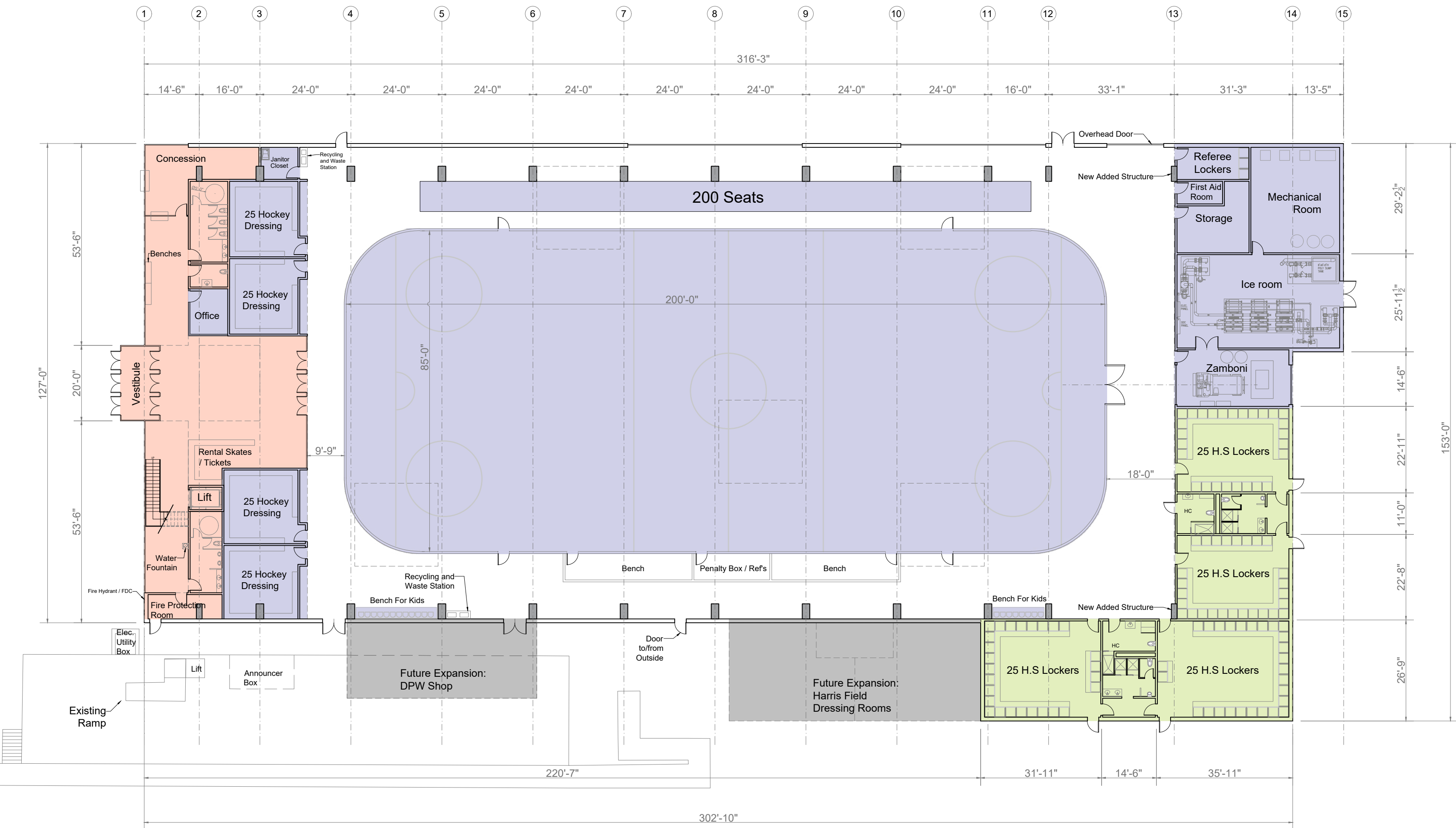








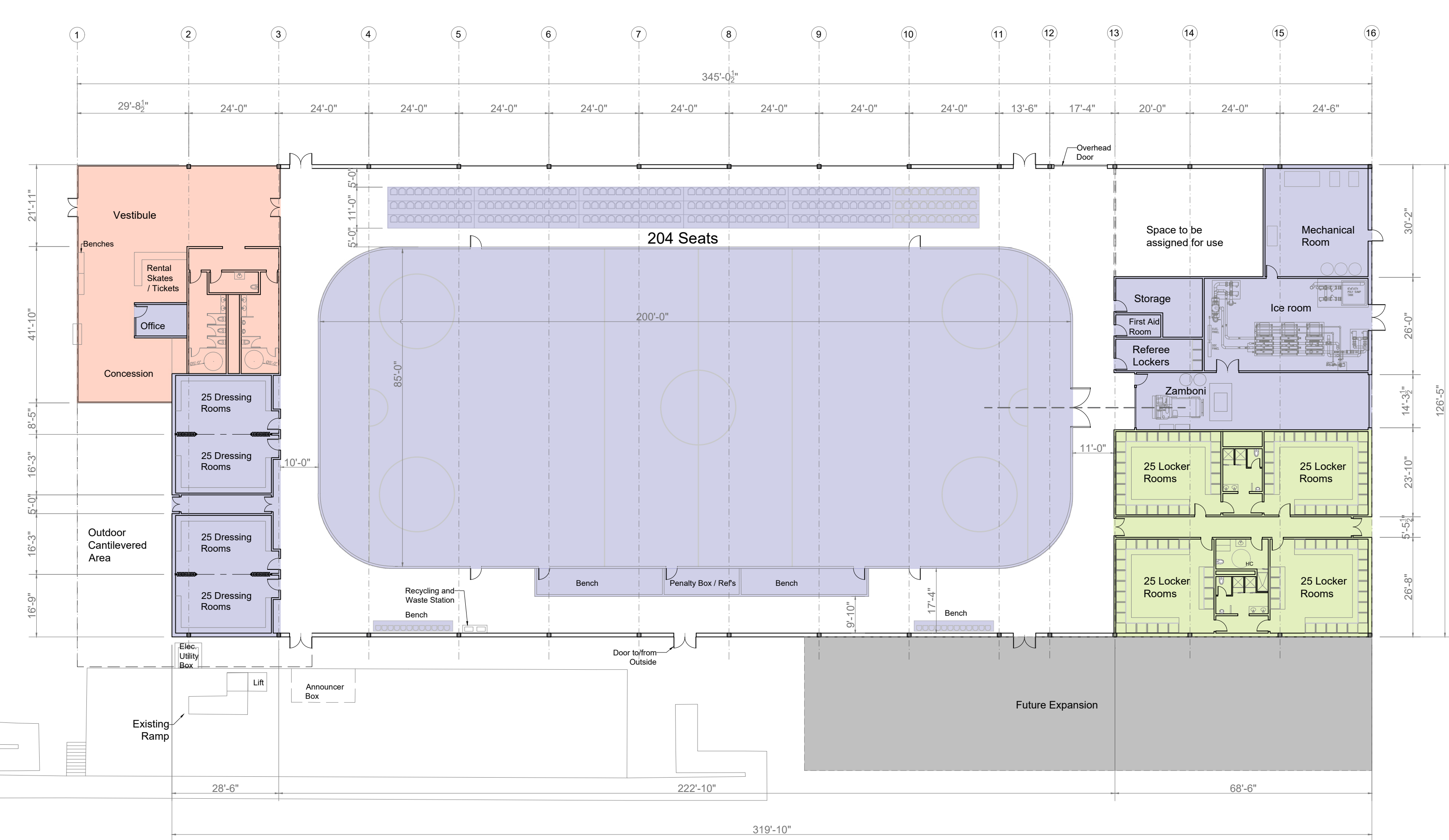
Existing Site Plan



November 2022 - Proposed Floor Plan ± 41,464 sf

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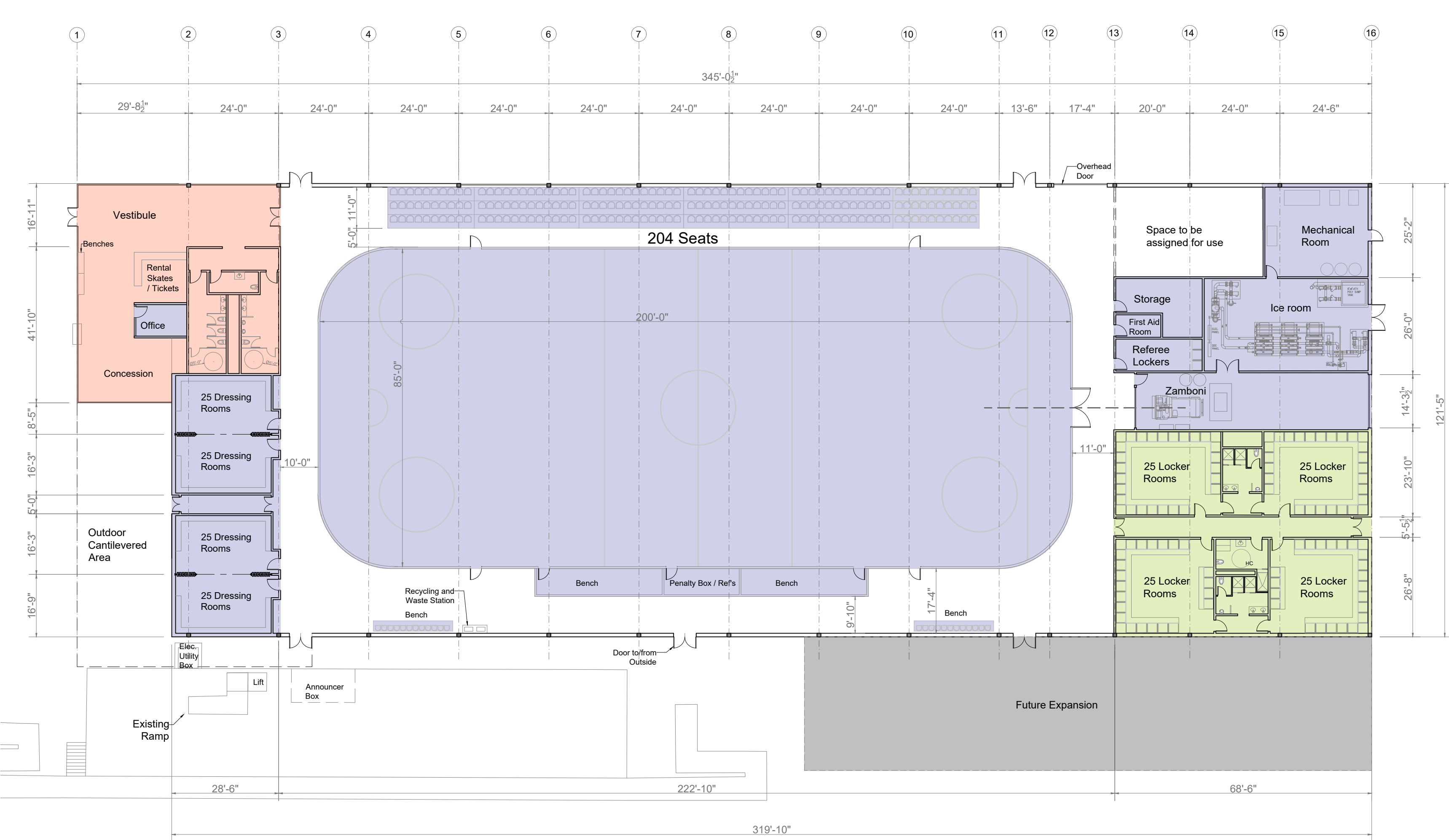




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January 2023 - Proposed Floor Plan ± 42,039 sf



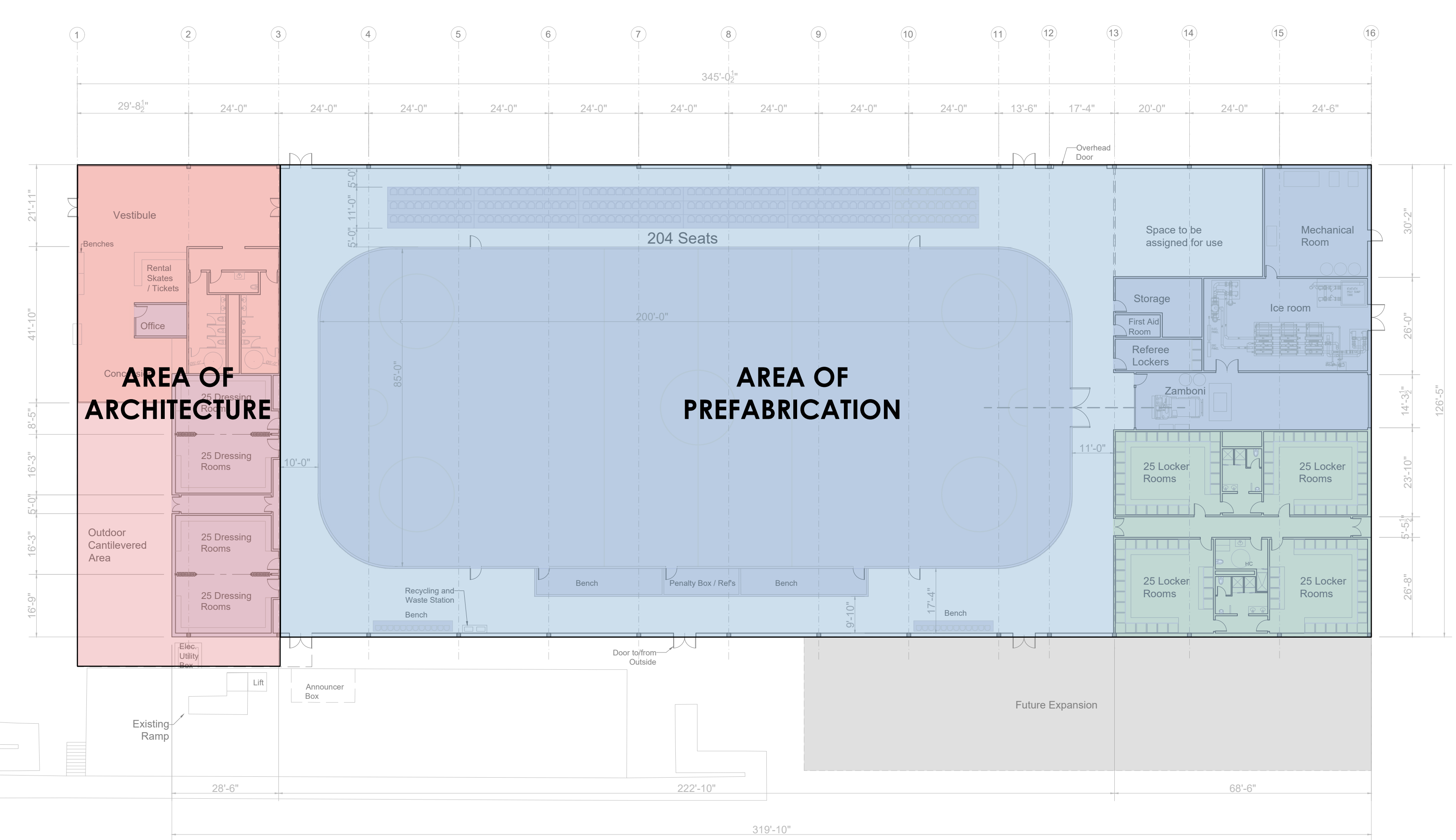


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January 2023 - Proposed Floor Plan ± 40,313 sf (1 Corridor)

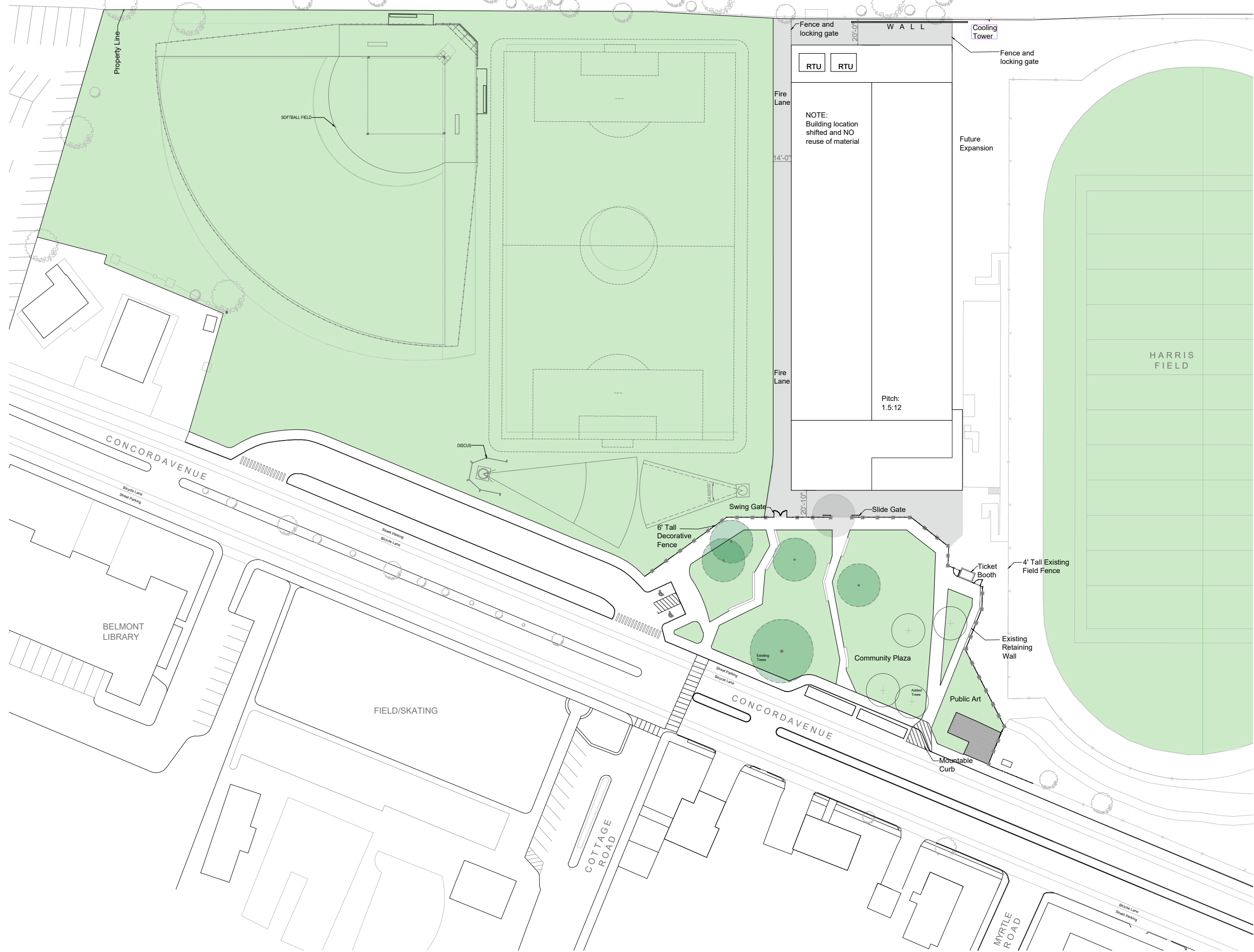






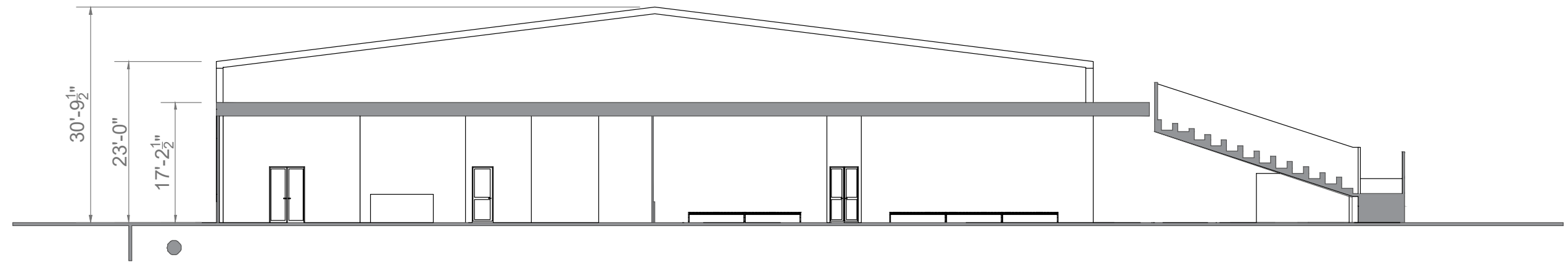
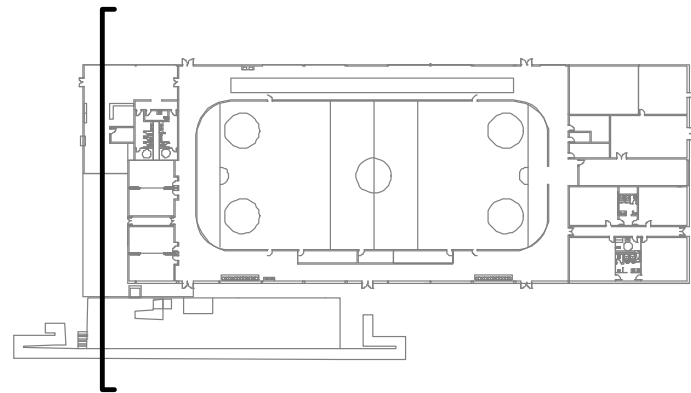




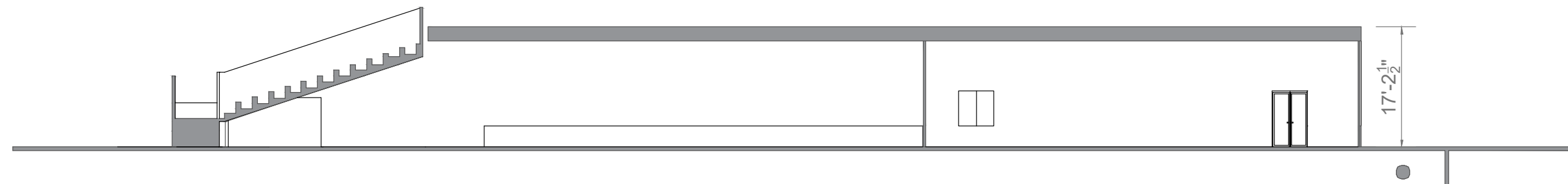
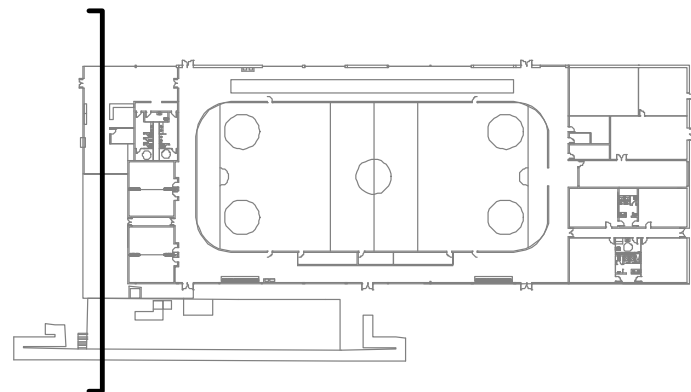


Proposed Site Plan - New Plaza



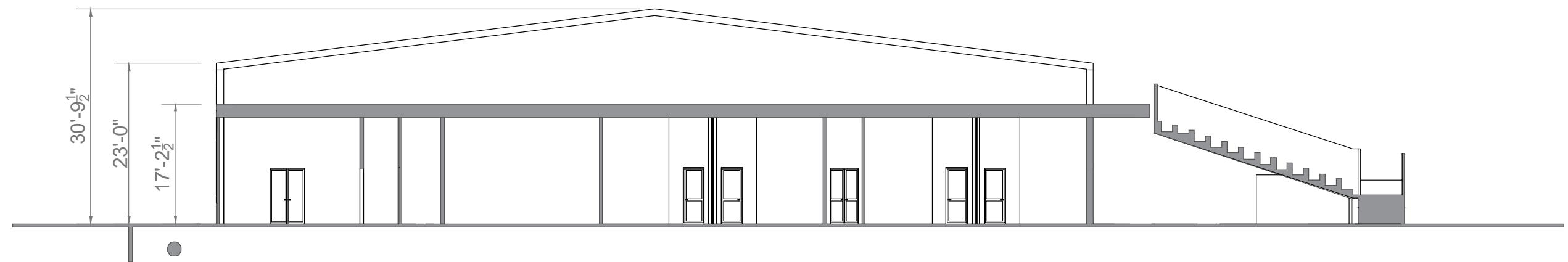
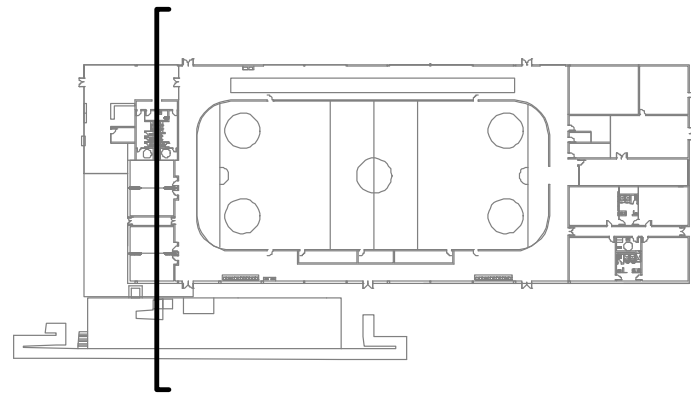


South Section

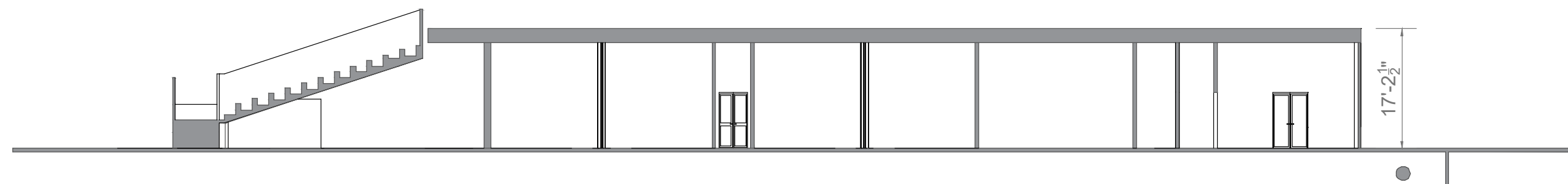
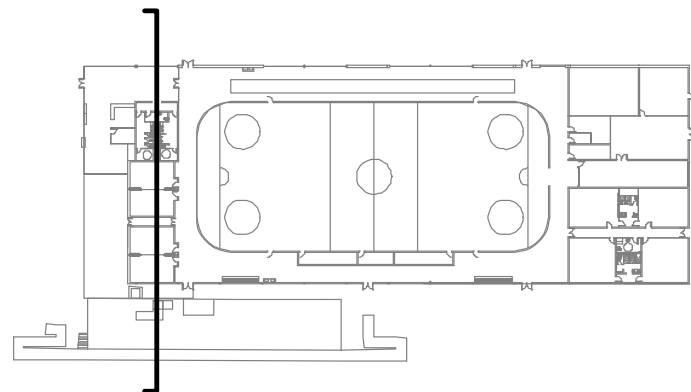


North Section



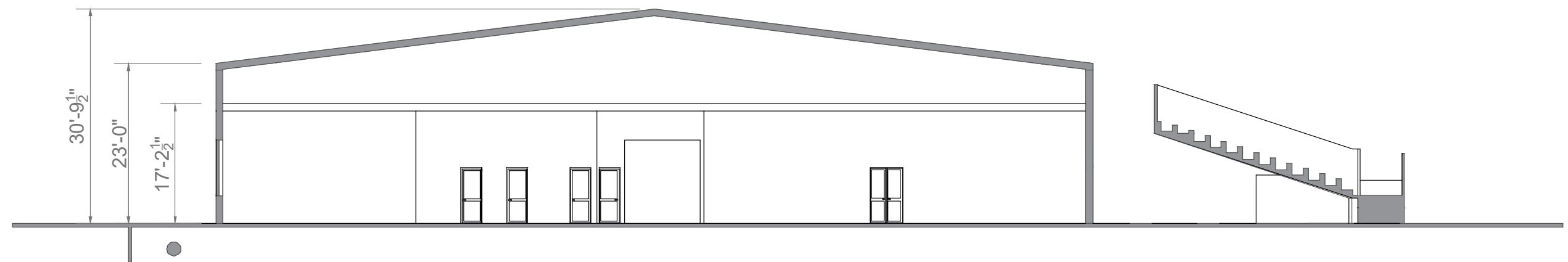
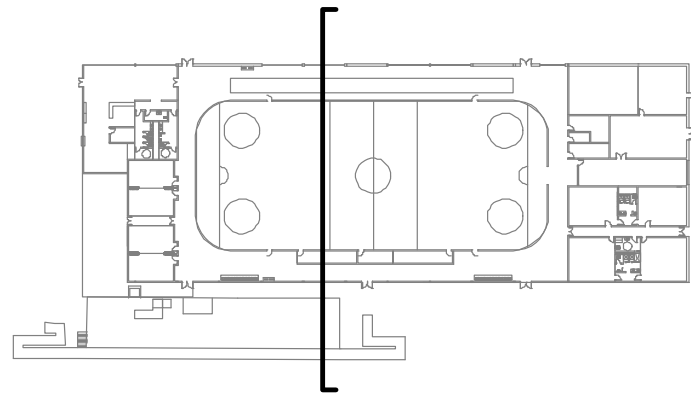


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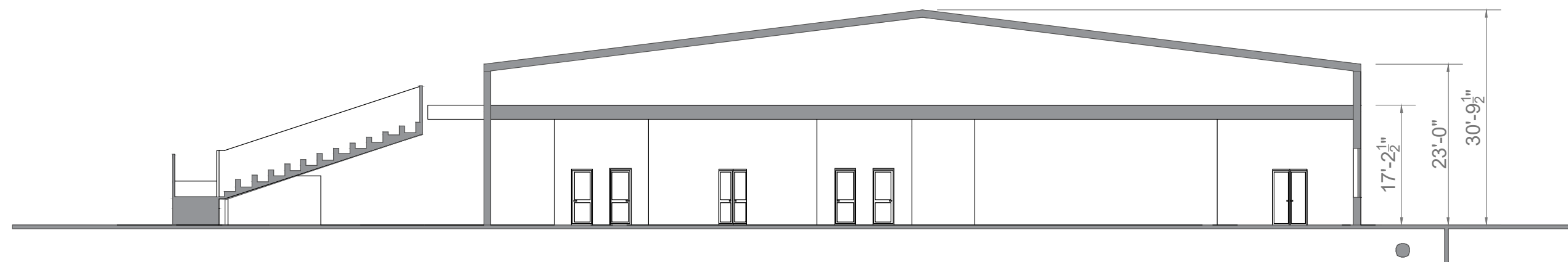
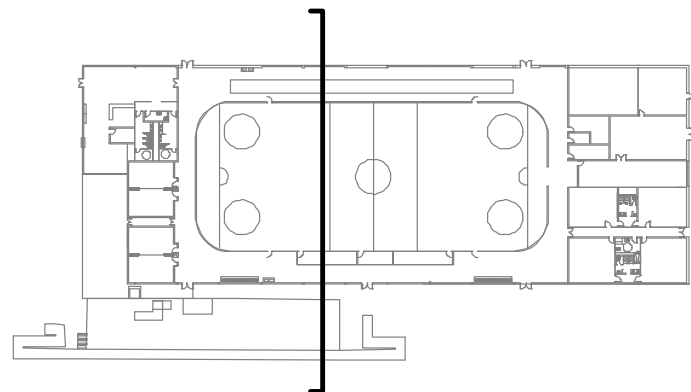


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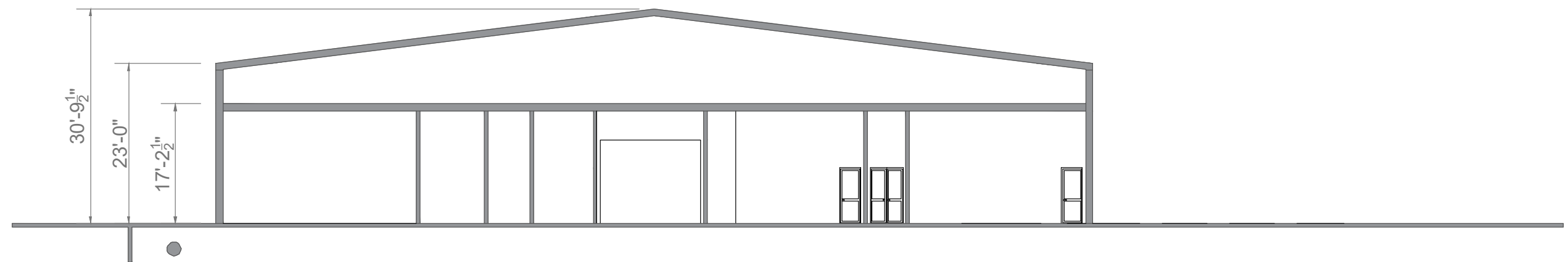
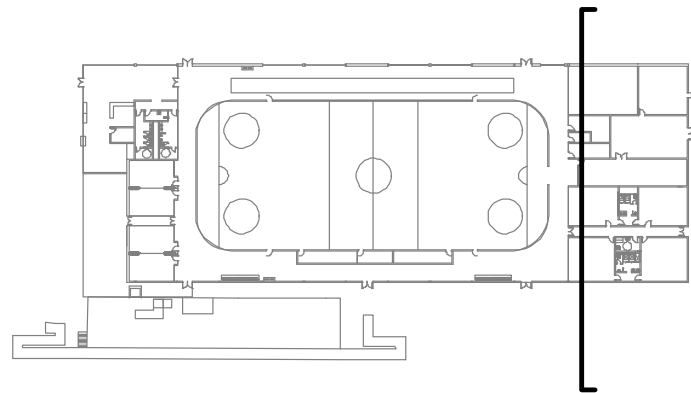


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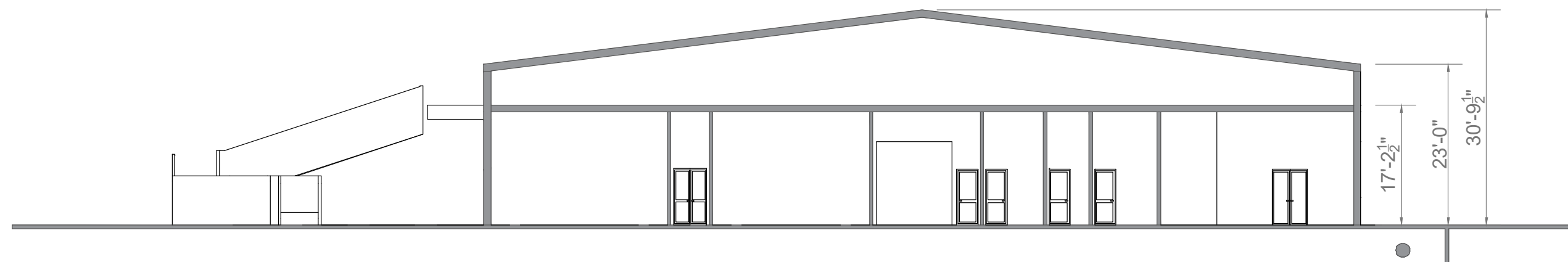
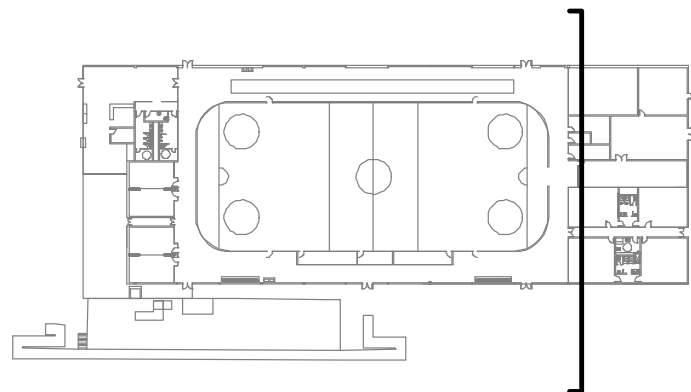


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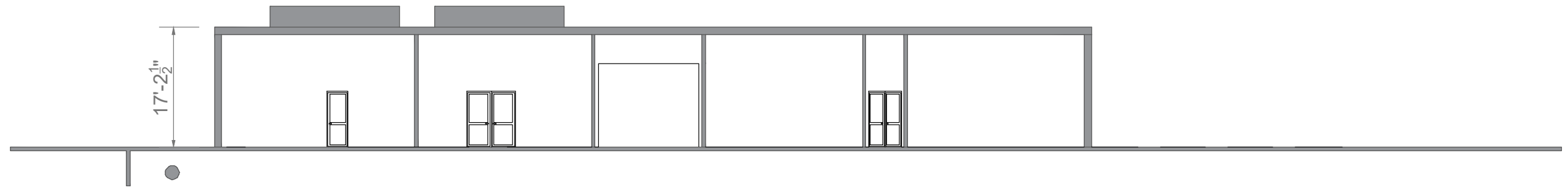
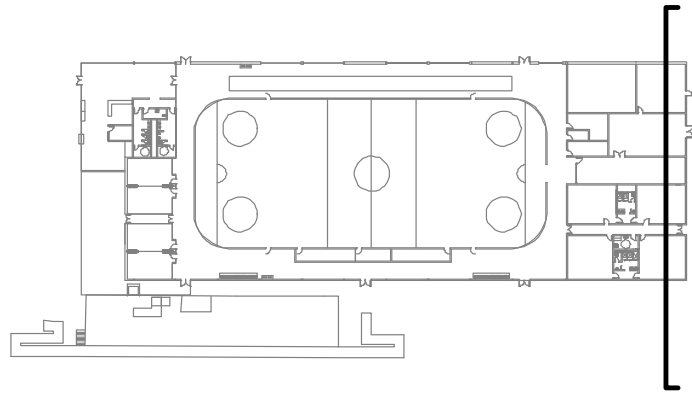


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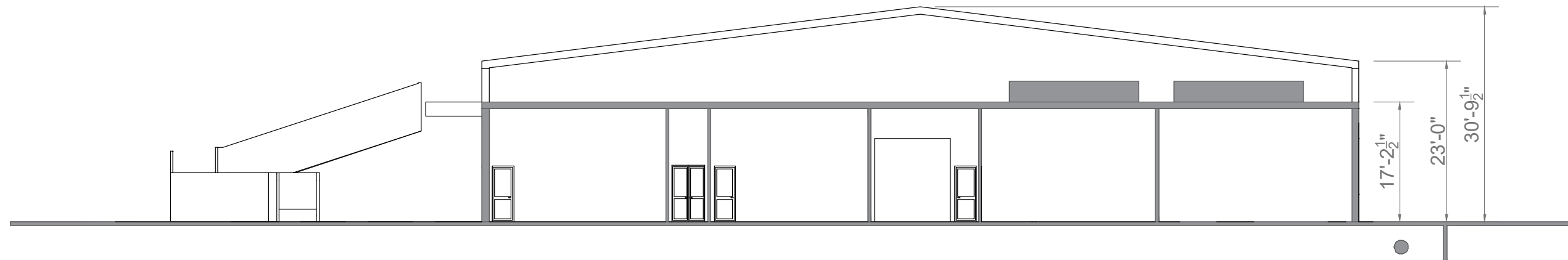
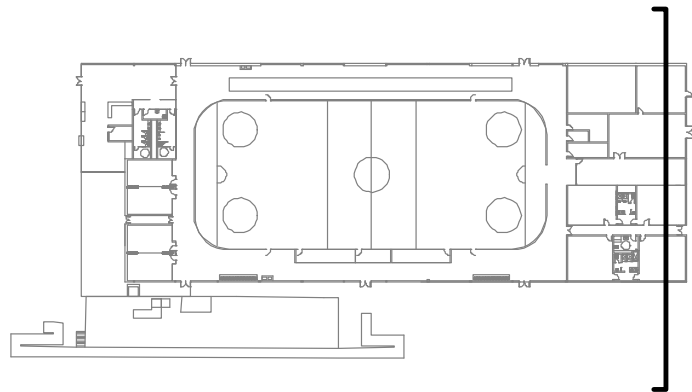


North Section





South Section

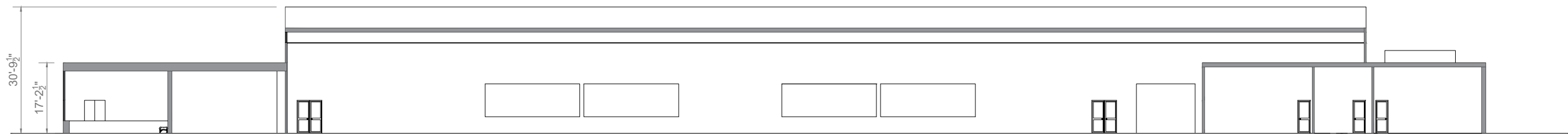
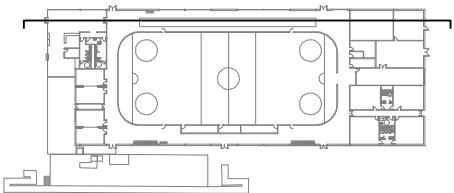


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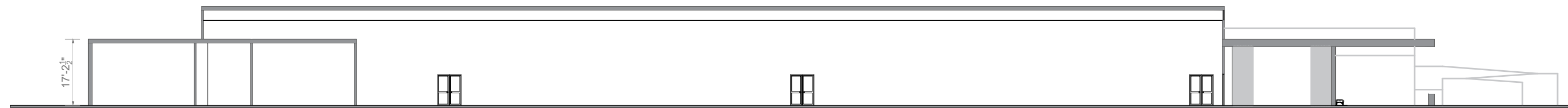
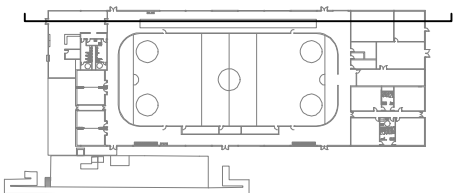
PROPOSED

January 2023 - Proposed Sections





East Section

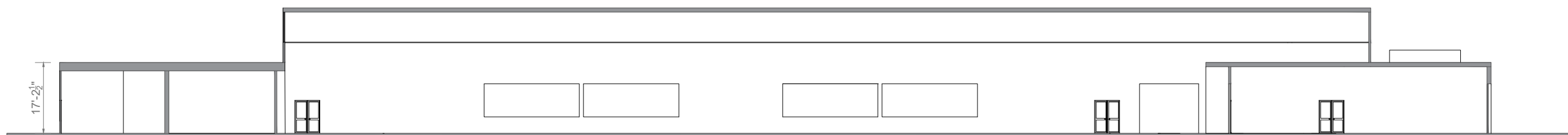
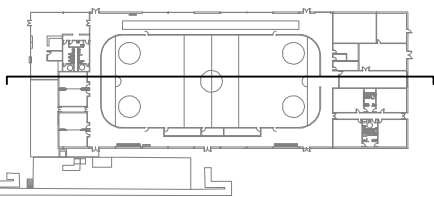


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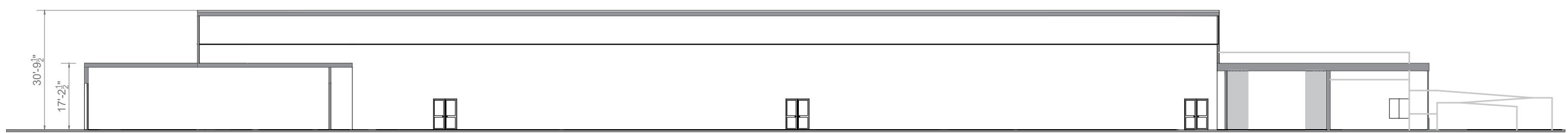
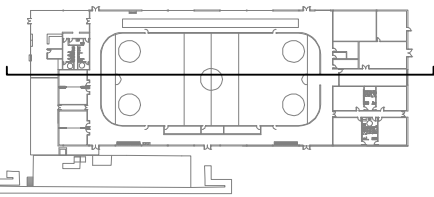
PROPOSED

January 2023 - Proposed Sections





East Section



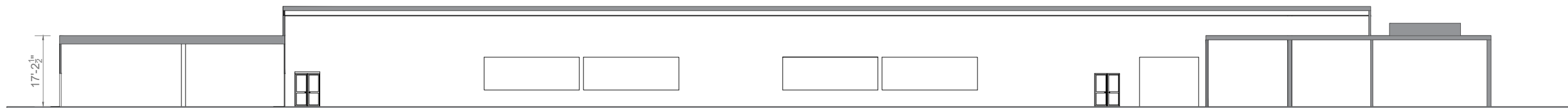
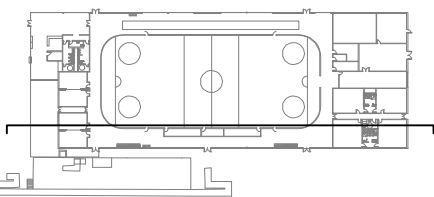
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PROPOSED

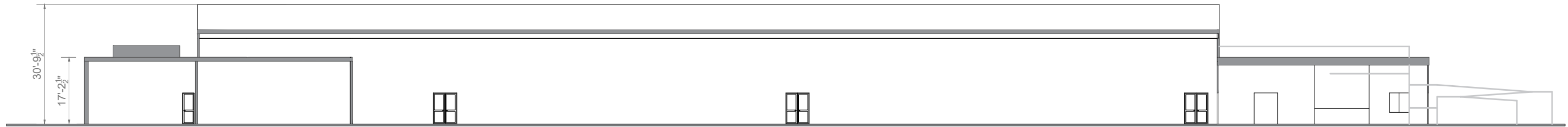
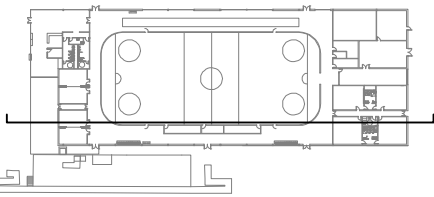
January 2023 - Proposed Sections







East Section

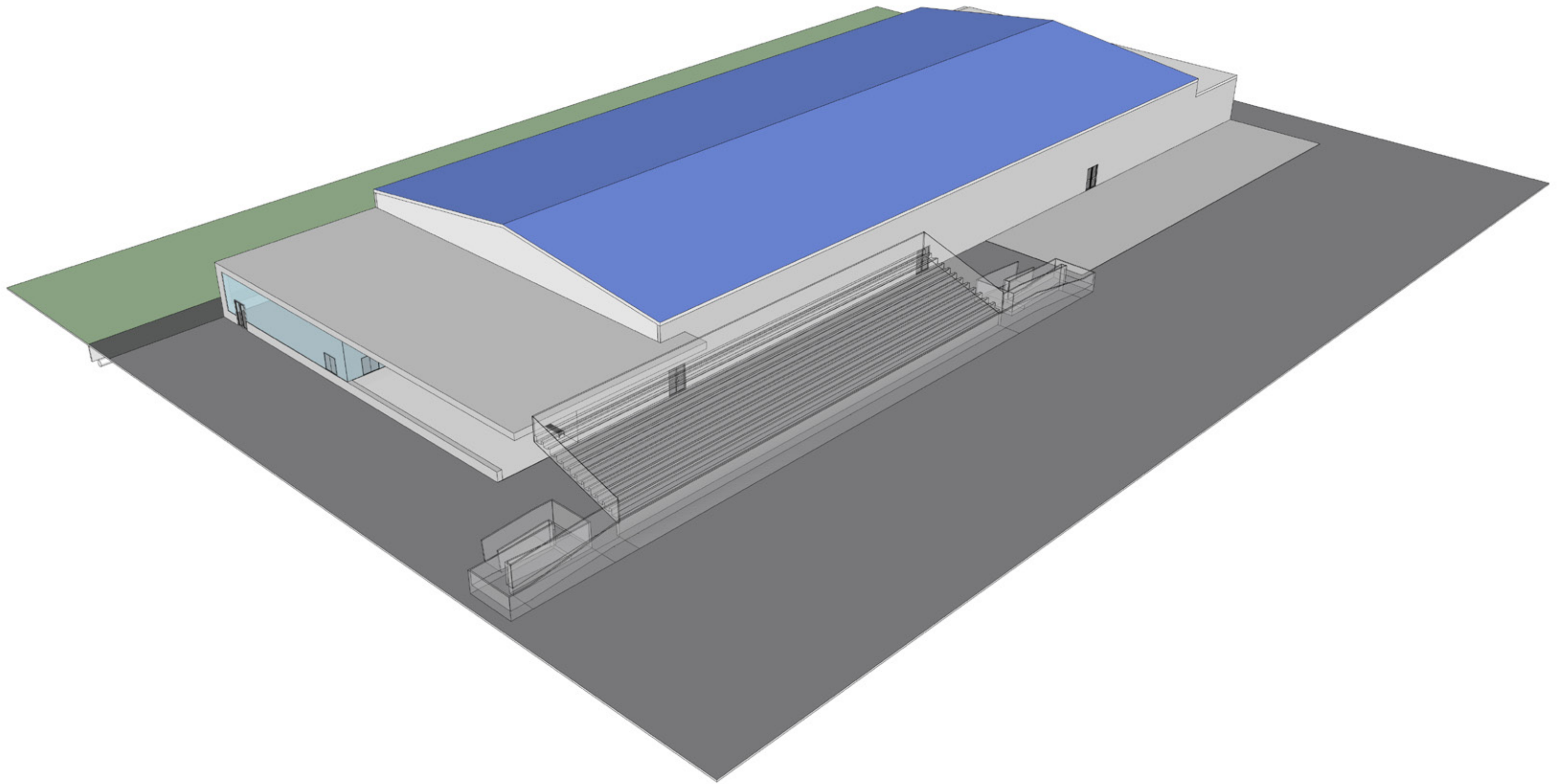


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PROPOSED

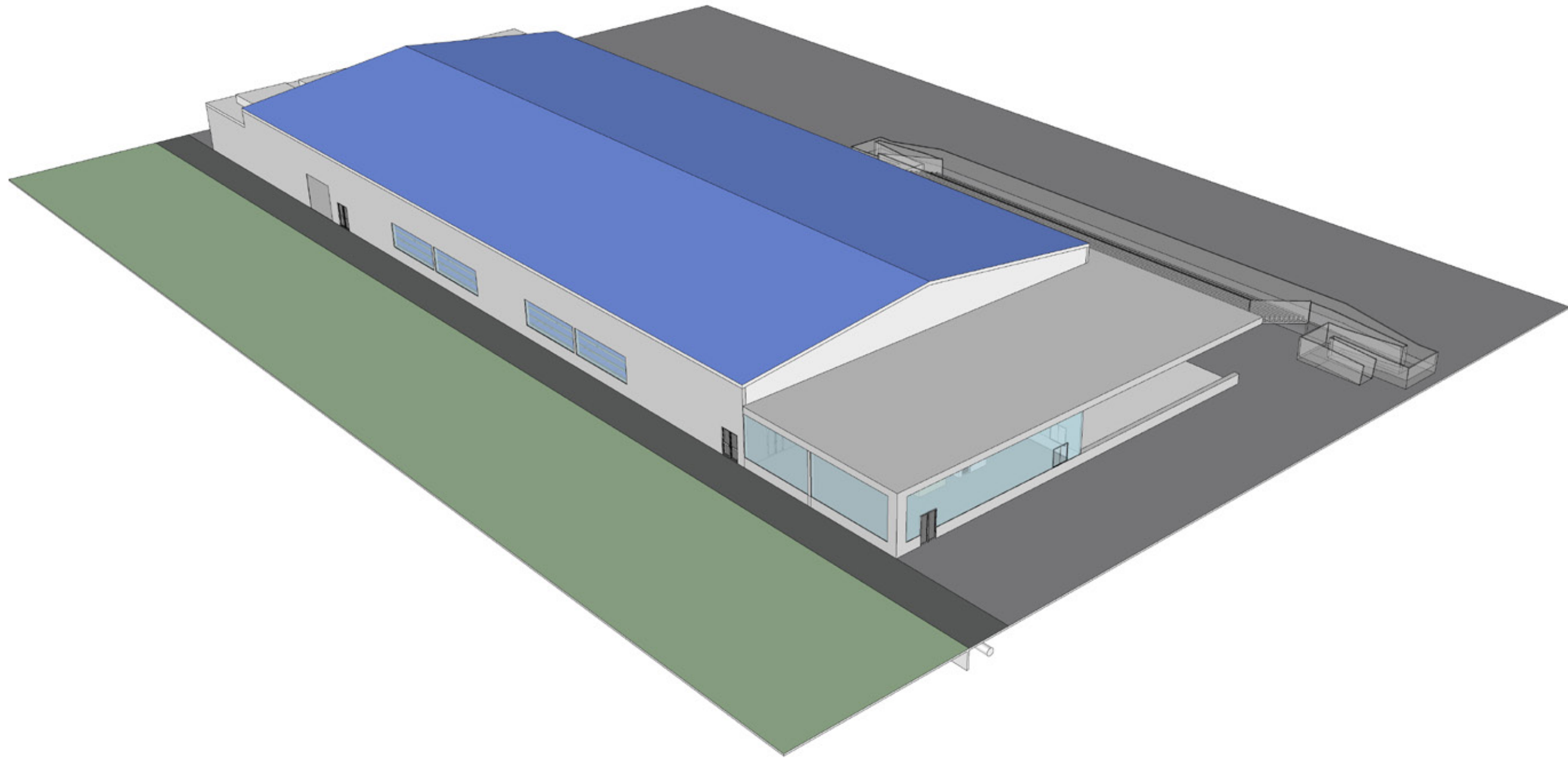
January 2023 - Proposed Sections





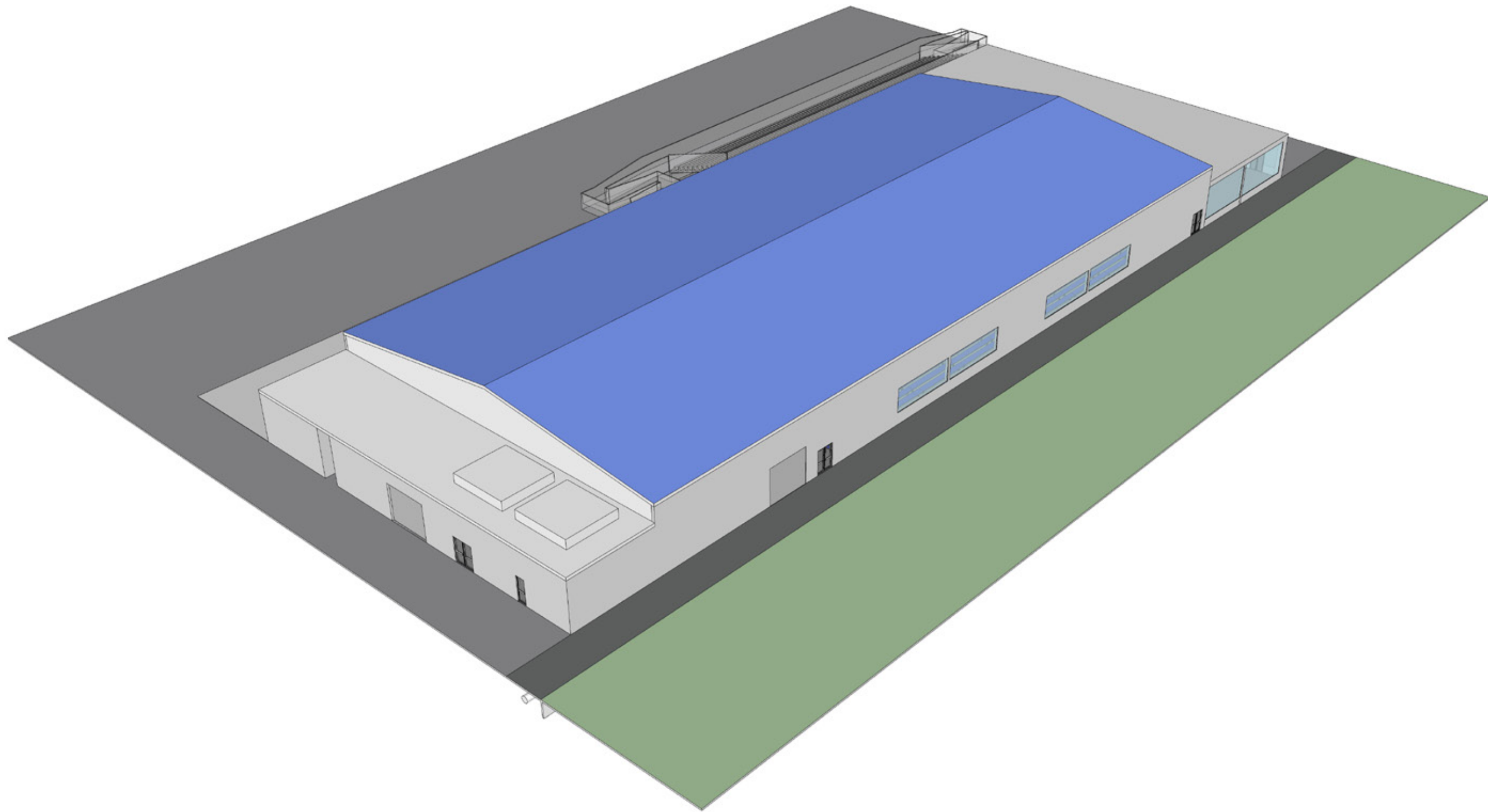
South East Conceptual View





South West Conceptual View

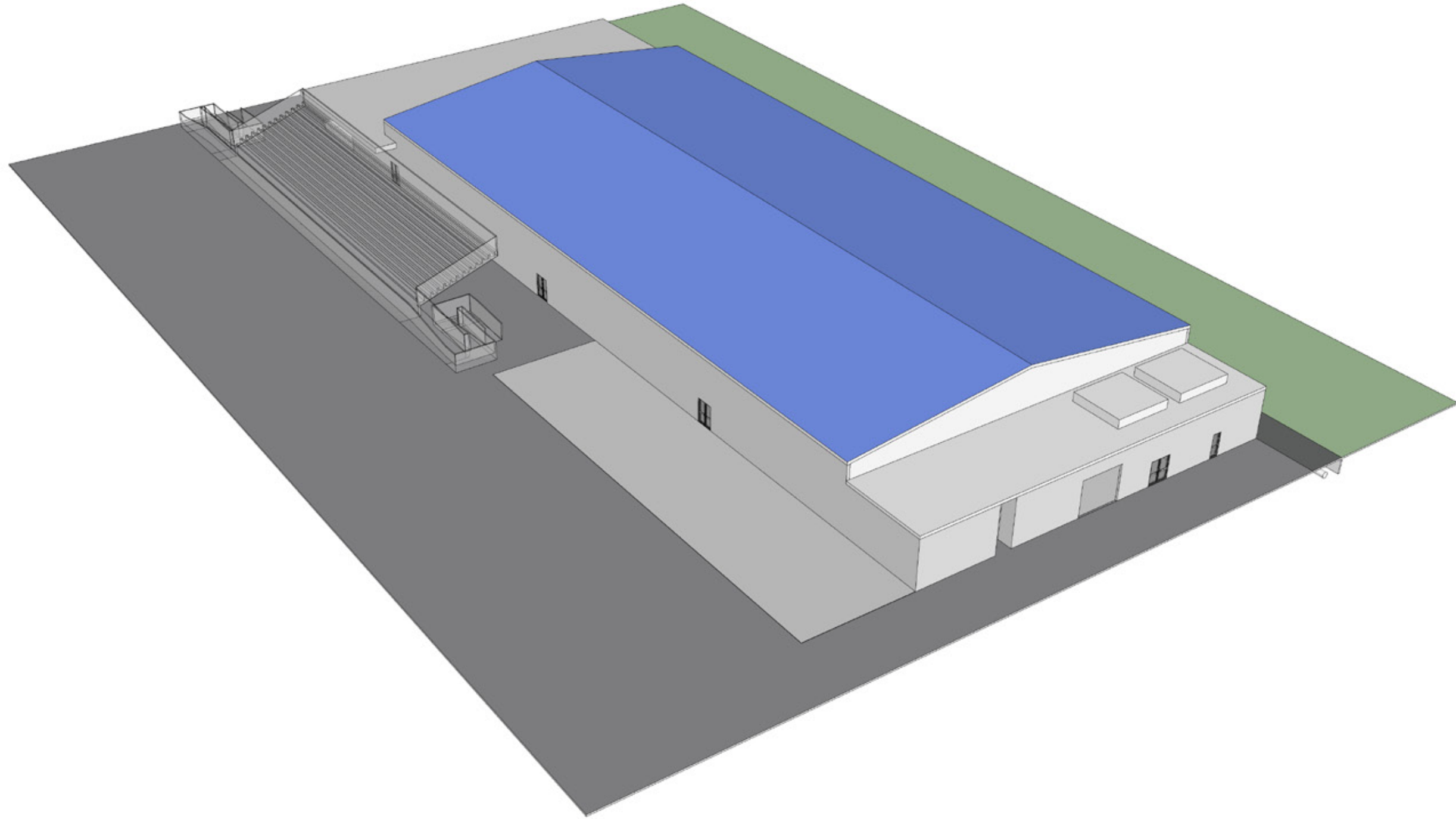
PROPOSED



North West Conceptual View

PROPOSED



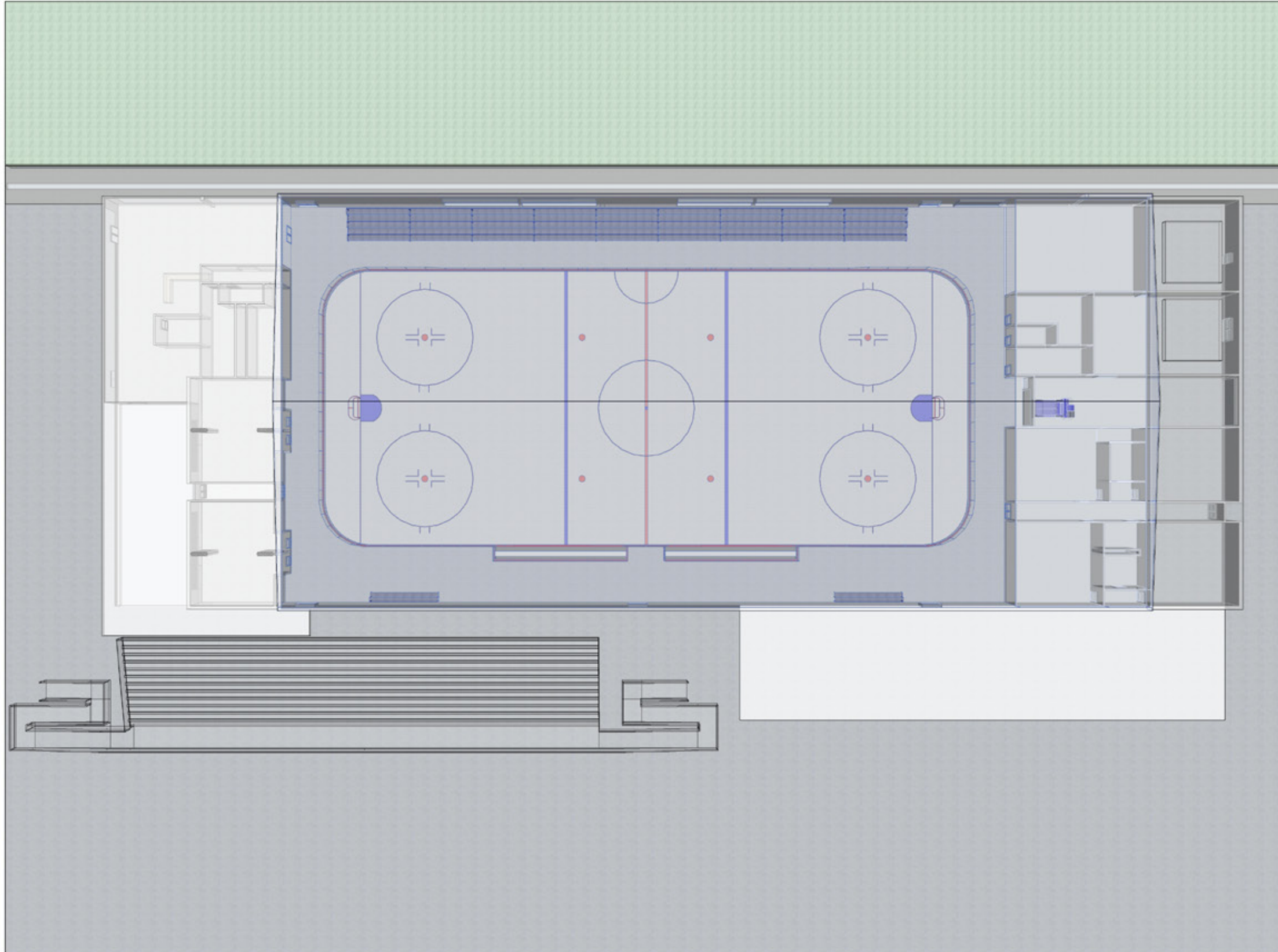


North East Conceptual View

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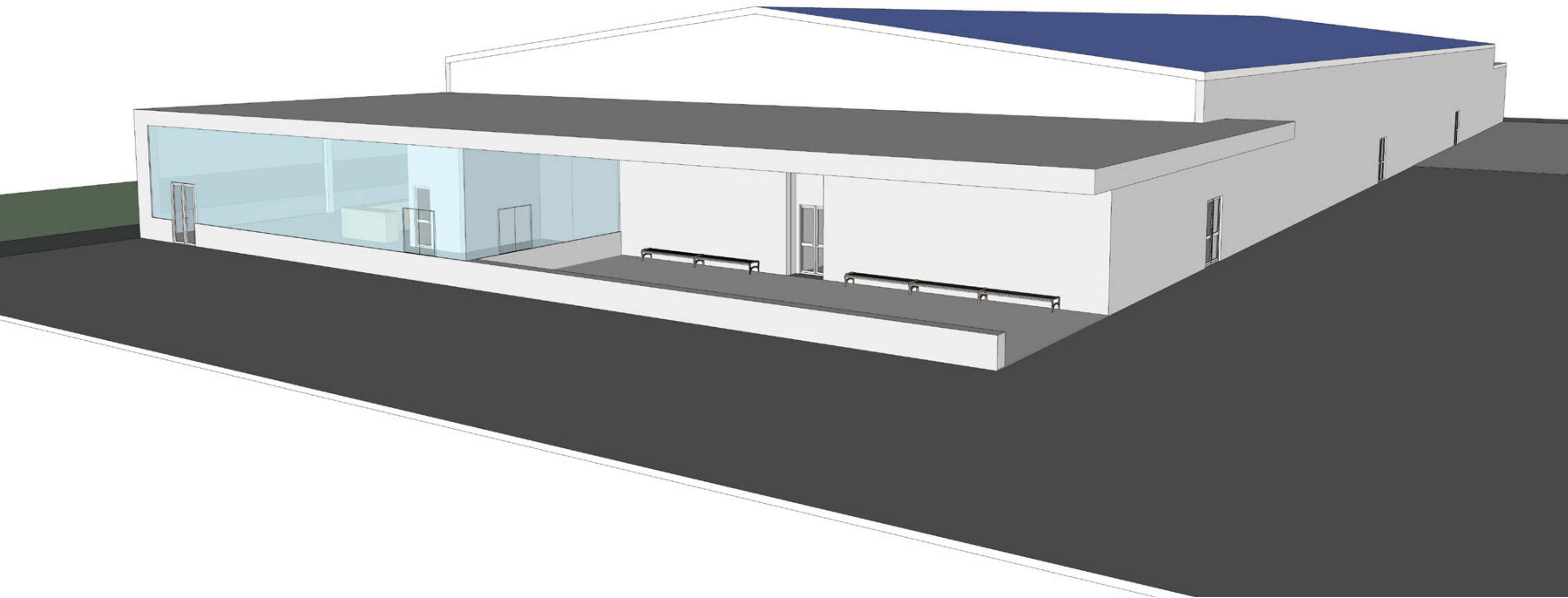
PROPOSED





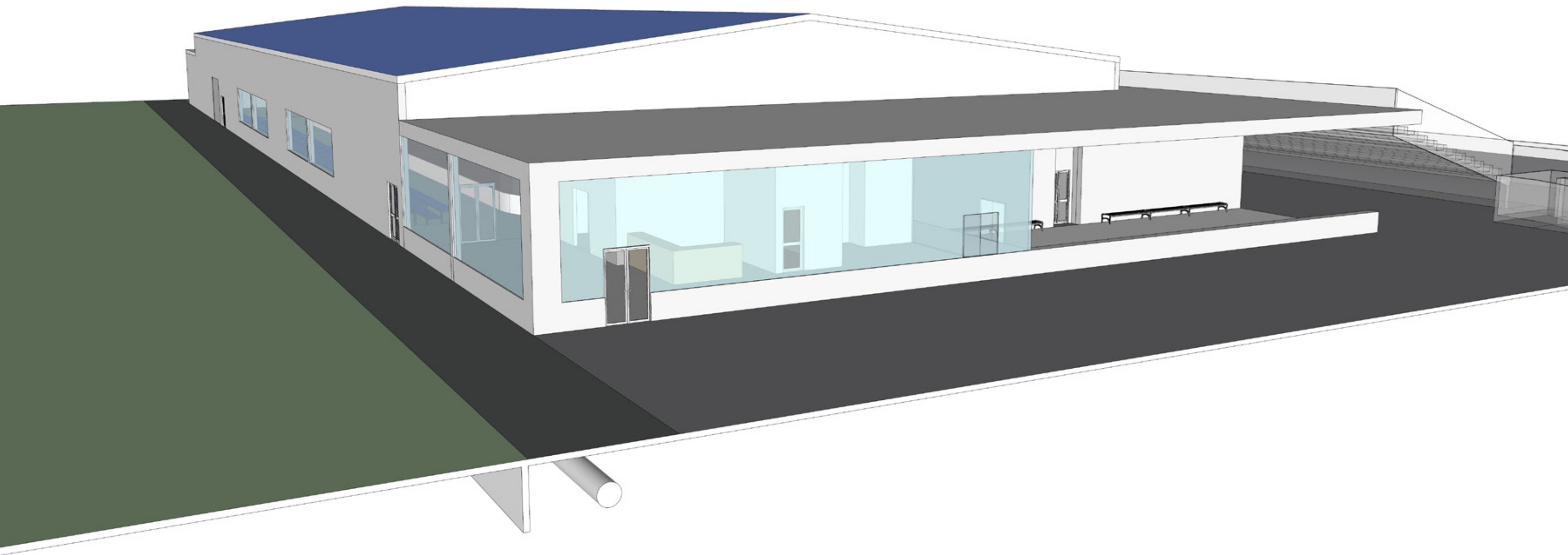
**PROPOSED** Top Conceptual View





North East Conceptual Facade View

PROPOSED



PROPOSED

South West Conceptual Facade View



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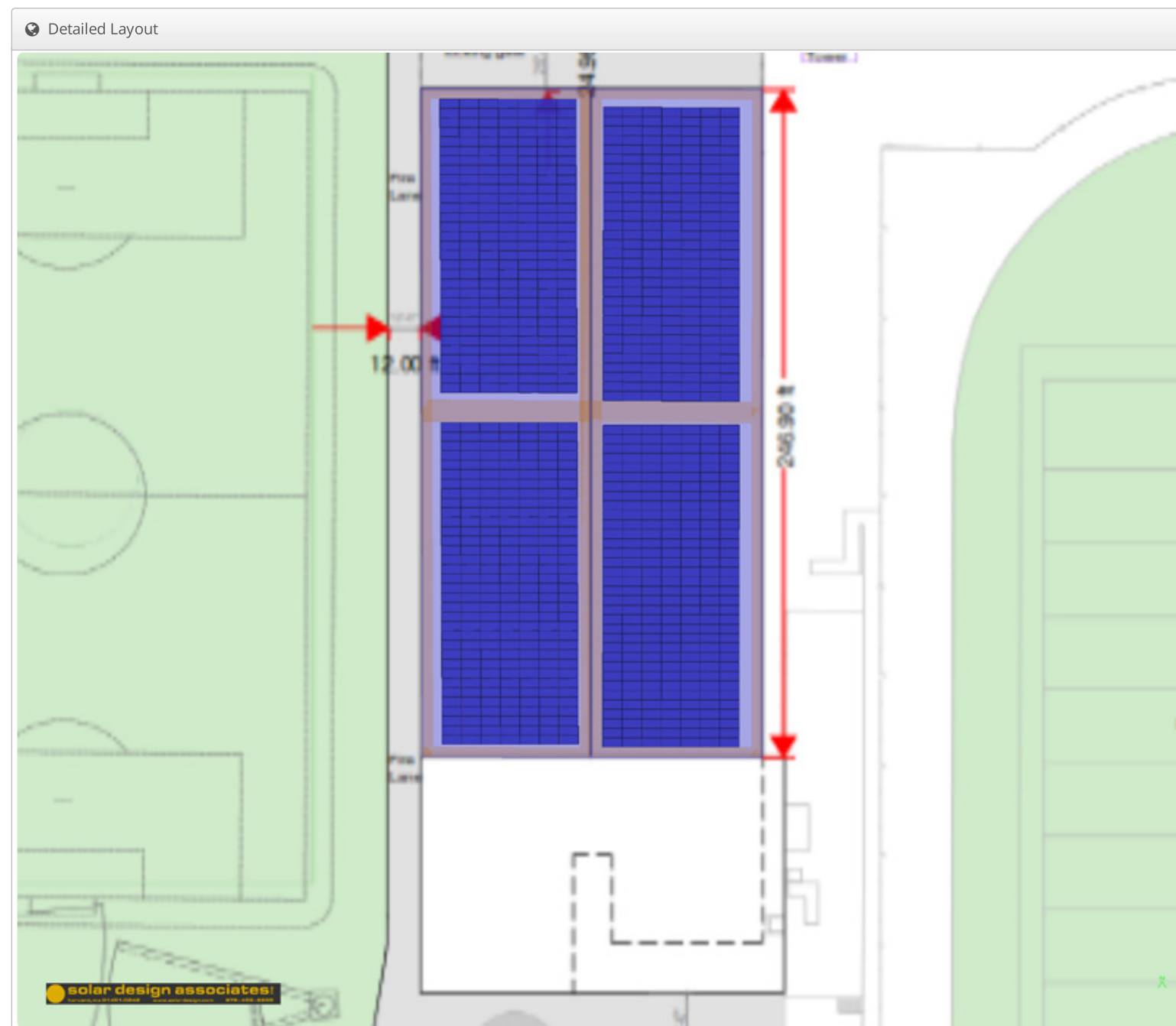
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# Photovoltaic Panels

## Solar Design



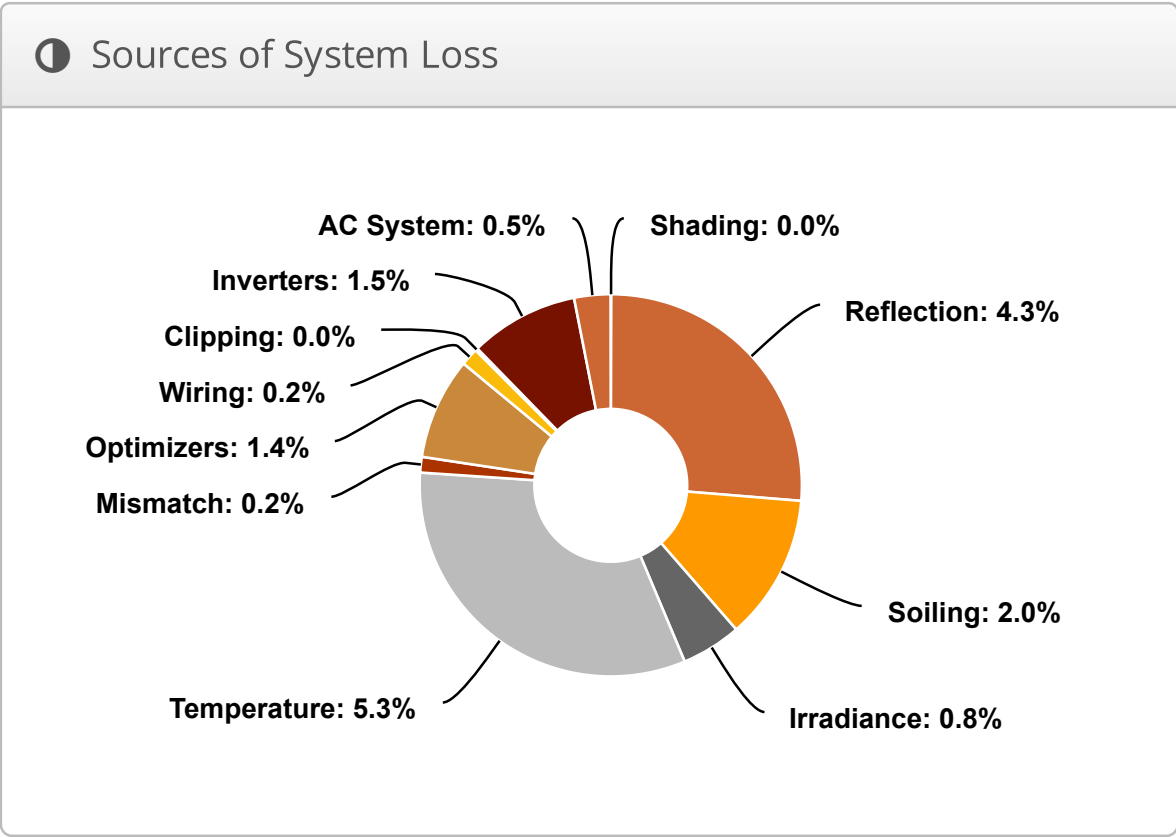
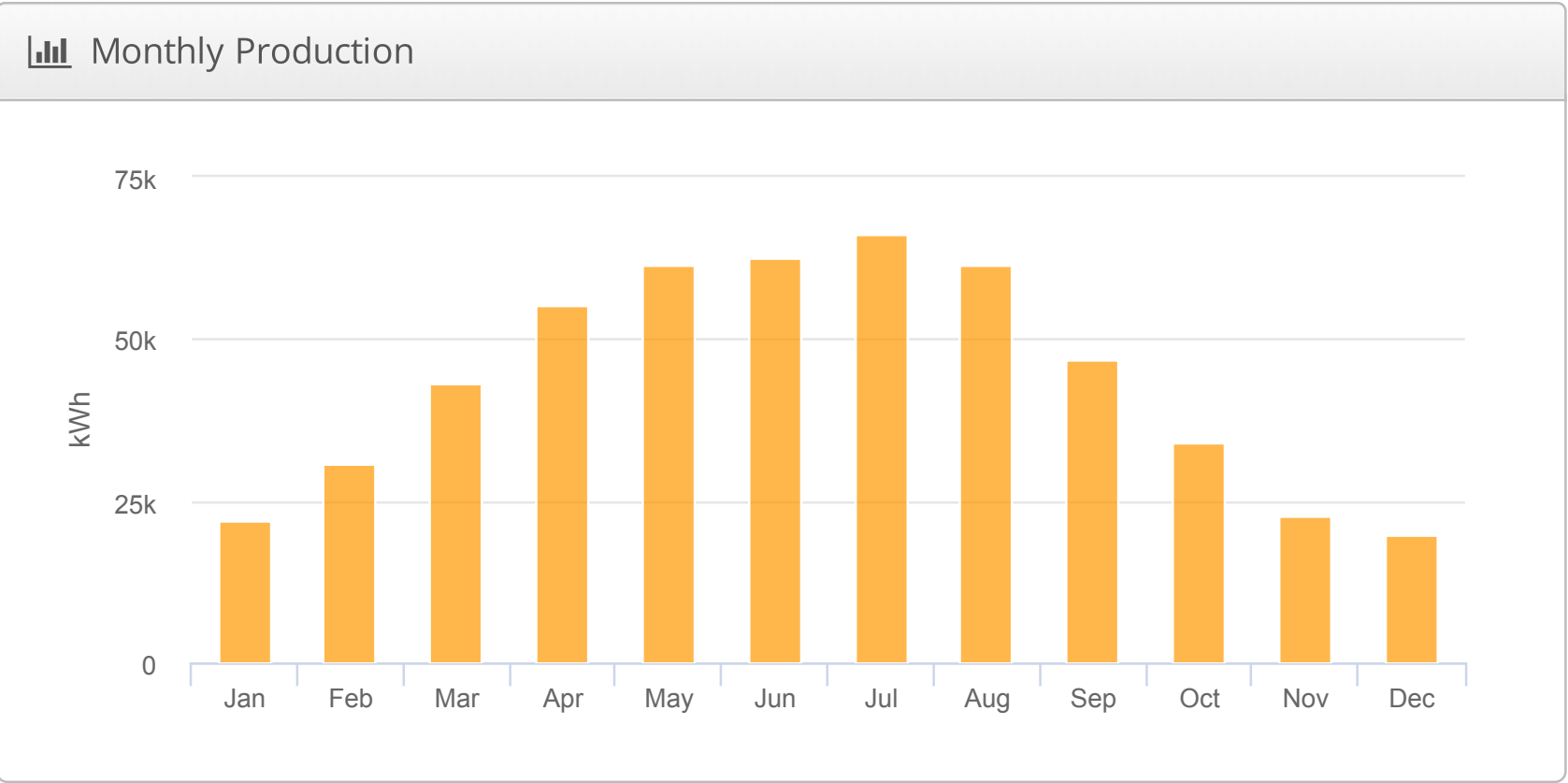
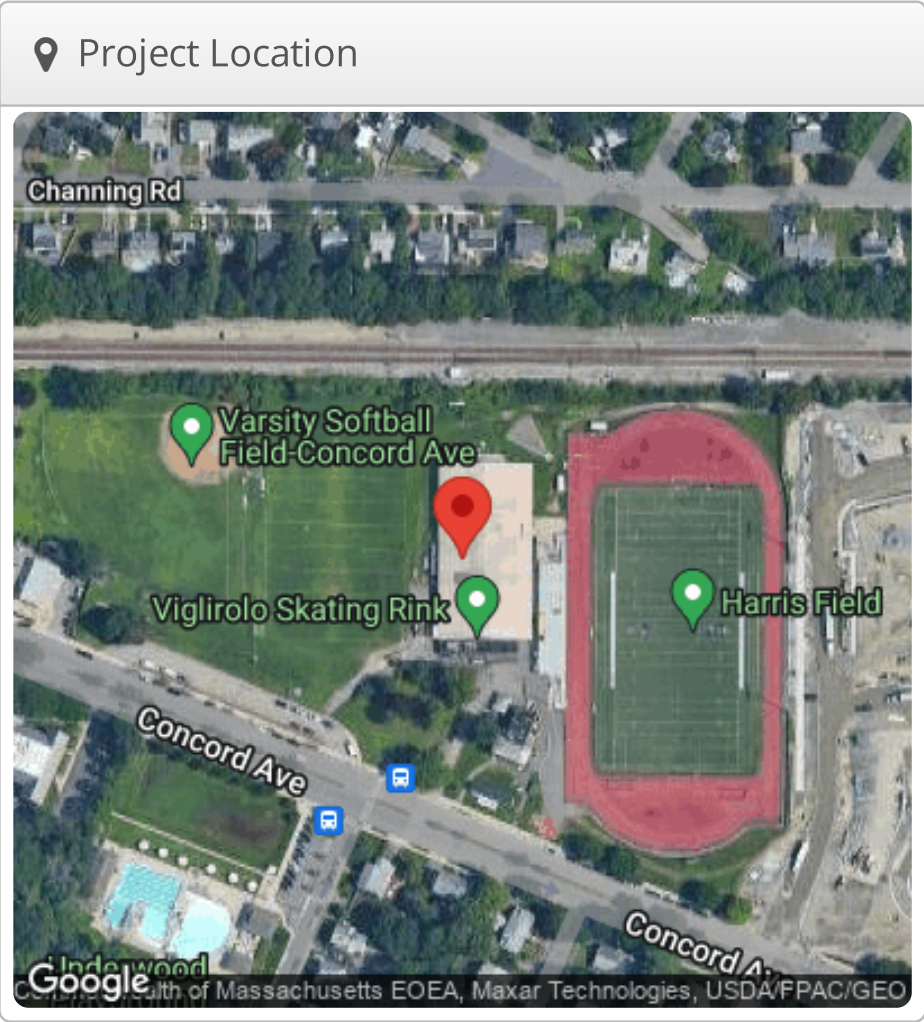


Preliminary estimate at system sizing and cost:

- 436.8 kWdc
  - 400.0 kWac
  - 526,070 kWhr/year
  - \$1,092,000 total system cost, assuming \$2.50/Wdc
- o As a note: under the IRA, municipal projects now qualify for an ITC direct payment of ~26.5% of the total system cost, or ~\$289,380. This should be vetted by town officials and lawyers.

🔧 Report	
Project Name	Belmonte Skating Rink
Project Address	221 Concord Ave, Belmont, MA 02478
Prepared By	Nicholas Lawrence nlawrence@solar design.com

📊 System Metrics	
Design	Parametric design 1
Module DC Nameplate	436.8 kW
Inverter AC Nameplate	400.0 kW Load Ratio: 1.09
Annual Production	526.1 MWh
Performance Ratio	84.8%
kWh/kWp	1,204.4
Weather Dataset	TMY, 10km grid (42.35,-71.15), NREL (prospector)
Simulator Version	42f17df9d2-29fbd7cae3-be39569fd0-3d3015eac0





⚡ Annual Production			
	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,422.7	
	POA Irradiance	1,421.0	-0.1%
	Shaded Irradiance	1,420.9	0.0%
	Irradiance after Reflection	1,360.2	-4.3%
	Irradiance after Soiling	1,333.0	-2.0%
	Total Collector Irradiance	1,333.0	0.0%
Energy (kWh)	Nameplate	582,324.5	
	Output at Irradiance Levels	577,512.8	-0.8%
	Output at Cell Temperature Derate	547,071.3	-5.3%
	Output After Mismatch	545,899.9	-0.2%
	Optimizer Output	538,253.2	-1.4%
	Optimal DC Output	536,952.3	-0.2%
	Constrained DC Output	536,765.4	0.0%
	Inverter Output	528,713.9	-1.5%
	Energy to Grid	526,070.3	-0.5%
Temperature Metrics			
Avg. Operating Ambient Temp		12.1 °C	
Avg. Operating Cell Temp		26.0 °C	
Simulation Metrics			
Operating Hours			4692
Solved Hours			4692

☁ Condition Set													
Description	Condition Set 1												
Weather Dataset	TMY, 10km grid (42.35,-71.15), 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	
	2	2	2	2	2	2	2	2	2	2	2	2	
Irradiation Variance	5%												
Cell Temperature Spread	4° C												
Module Binning Range	-2.5% to 2.5%												
AC System Derate	0.50%												
Module Characterizations	Module					Uploaded By			Characterization				
	Q.PEAK DUO XL-G10 480 (Qcells)					HelioScope			Spec Sheet Characterization, PAN				
Component Characterizations	Device			Uploaded By					Characterization				



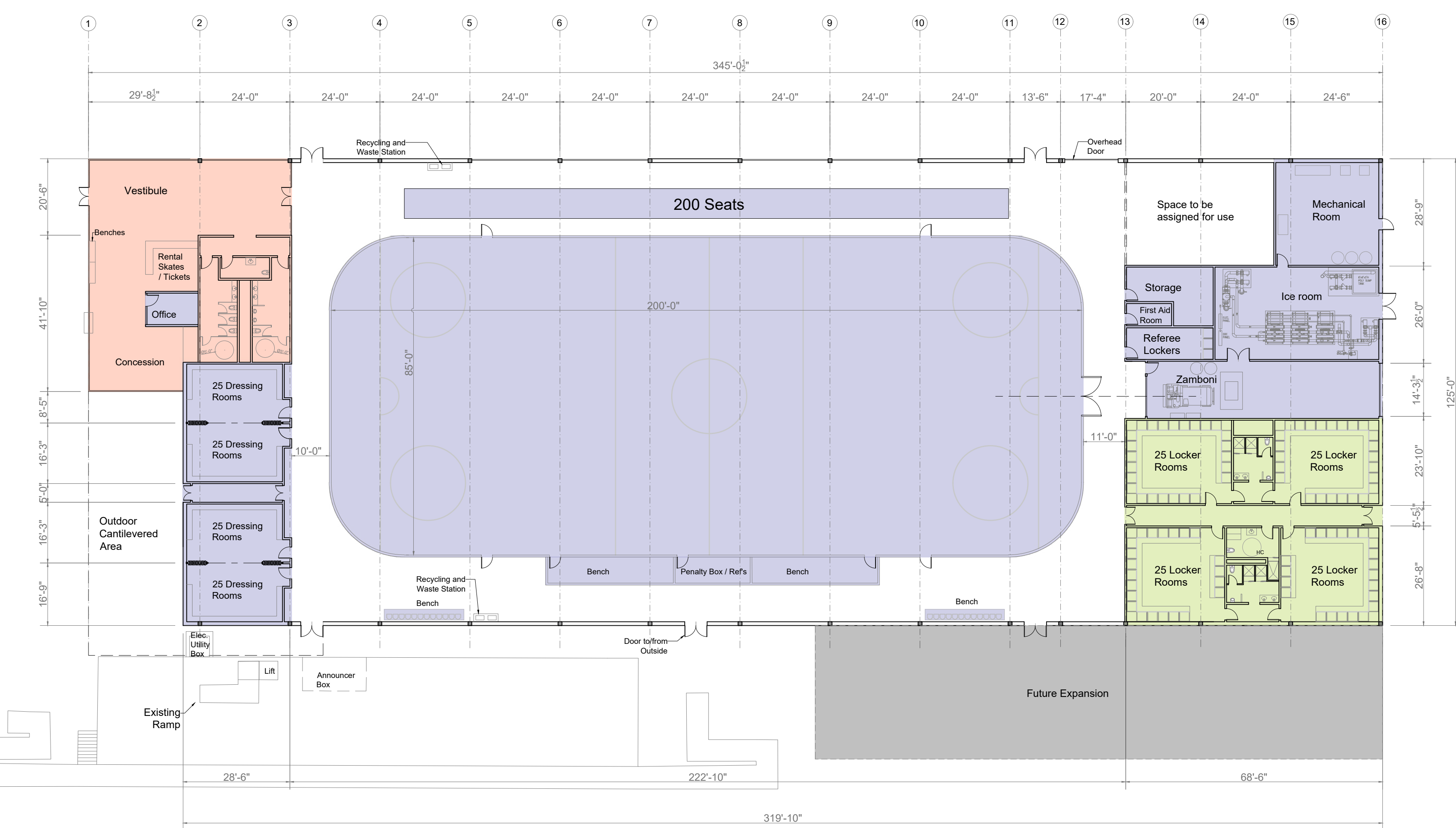
📦 Components		
Component	Name	Count
Inverters	SE100KUS (2022) (SolarEdge)	4 (400.0 kW)
Strings	10 AWG (Copper)	30 (3,651.8 ft)
Optimizers	P1101 (SolarEdge)	460 (506.0 kW)
Module	Qcells, Q.PEAK DUO XL-G10 480 (480W)	910 (436.8 kW)

🔌 Wiring Zones			
Description	Combiner Poles	String Size	Stringing Strategy
East Zone	-	13-31	Along Racking
West Zone	-	13-31	Along Racking

🏠 Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Portrait (Vertical)	7°	90.06591°	0.0 ft	1x1	455	455	218.4 kW
Field Segment 2	Flush Mount	Portrait (Vertical)	7°	269.7993°	0.0 ft	1x1	455	455	218.4 kW





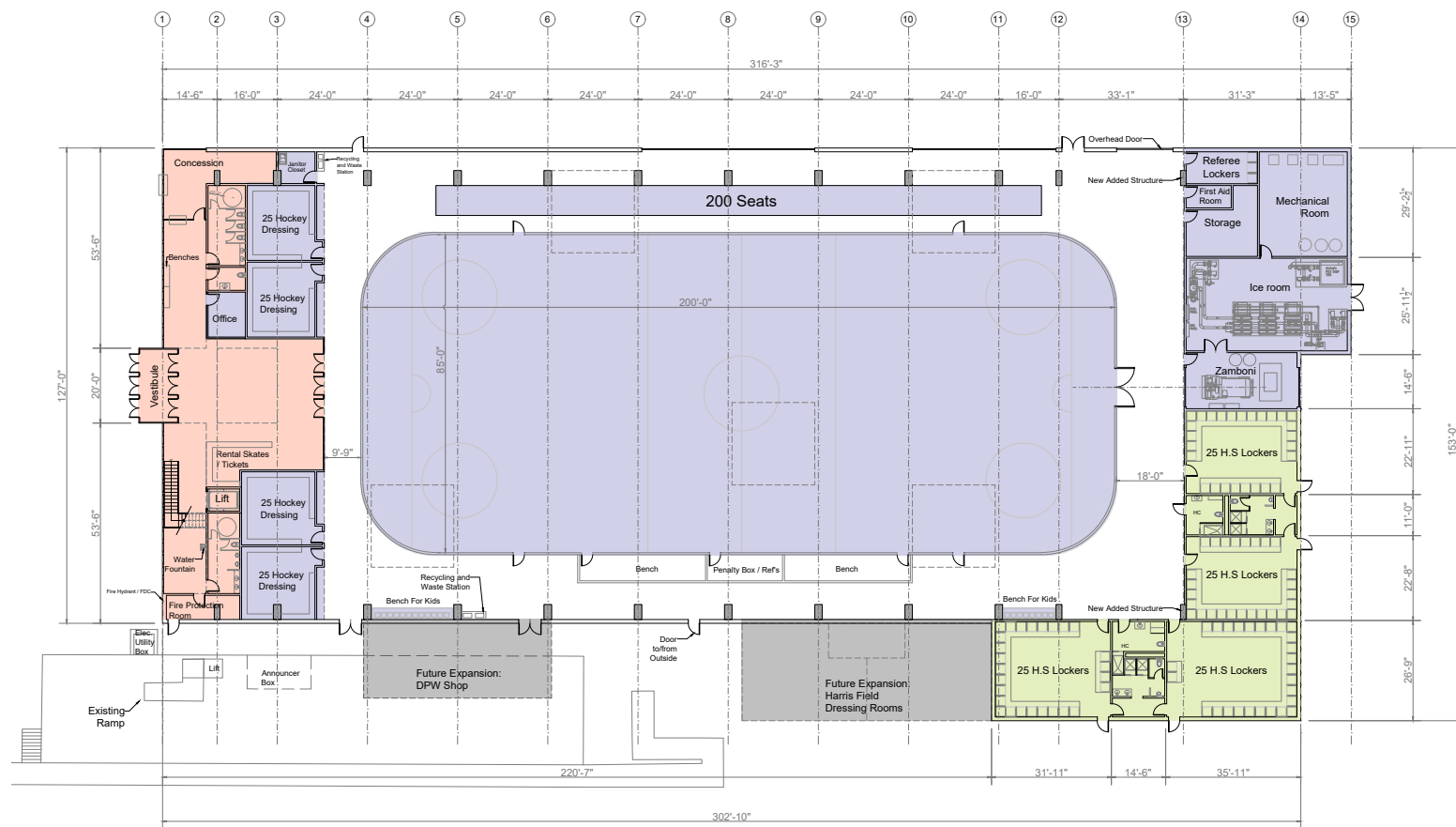


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**PROPOSED**

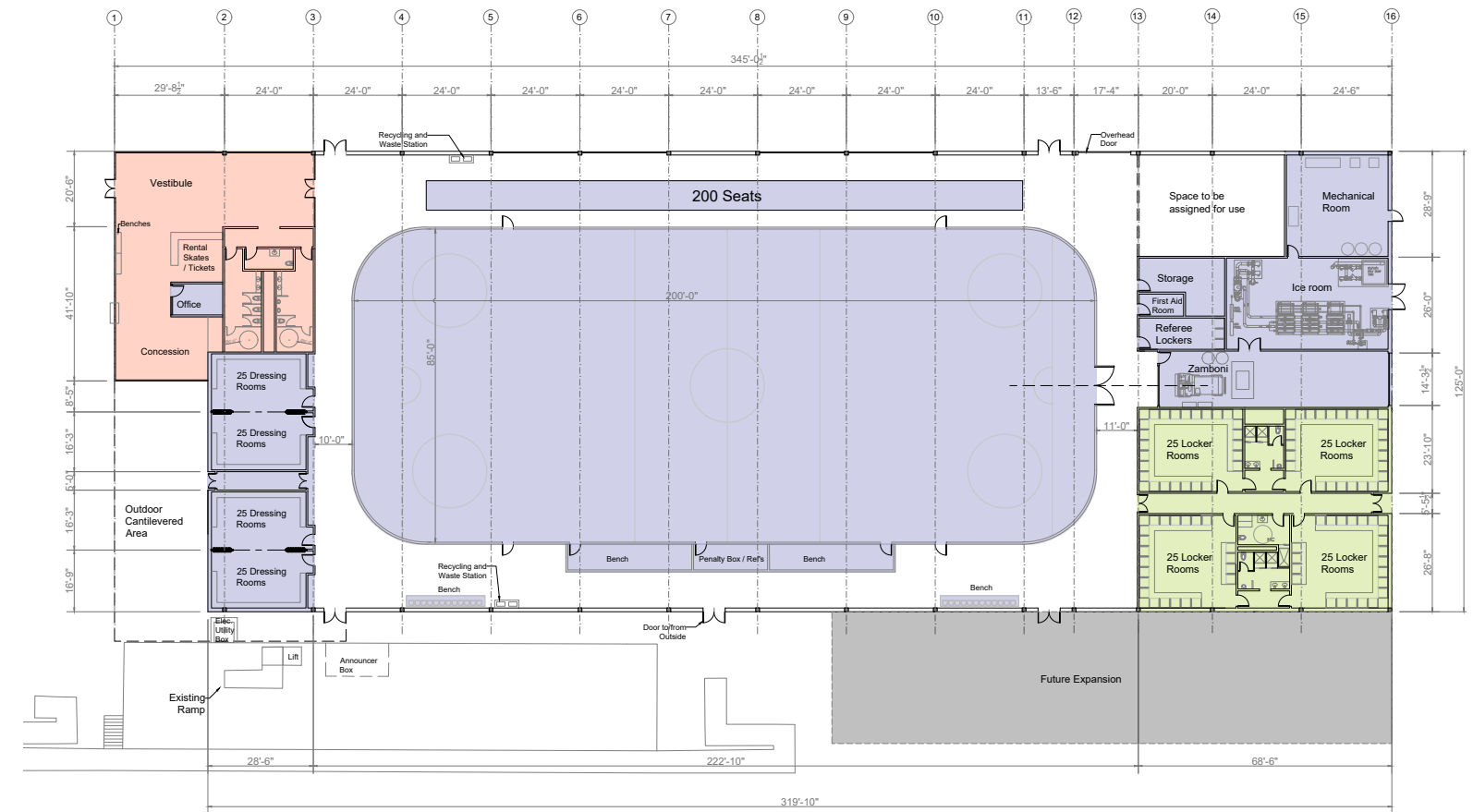
January 2023 - Proposed Floor Plan (1)  $\pm$  40,870 sf





November 2022 Proposal

41,464sf @ \$628/sf  
= \$26,039,392



January 2023 Proposal (1)

40,870sf @ \$628/sf \*  
= \$25,666,360

\* application of \$628/sf ?