

# 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

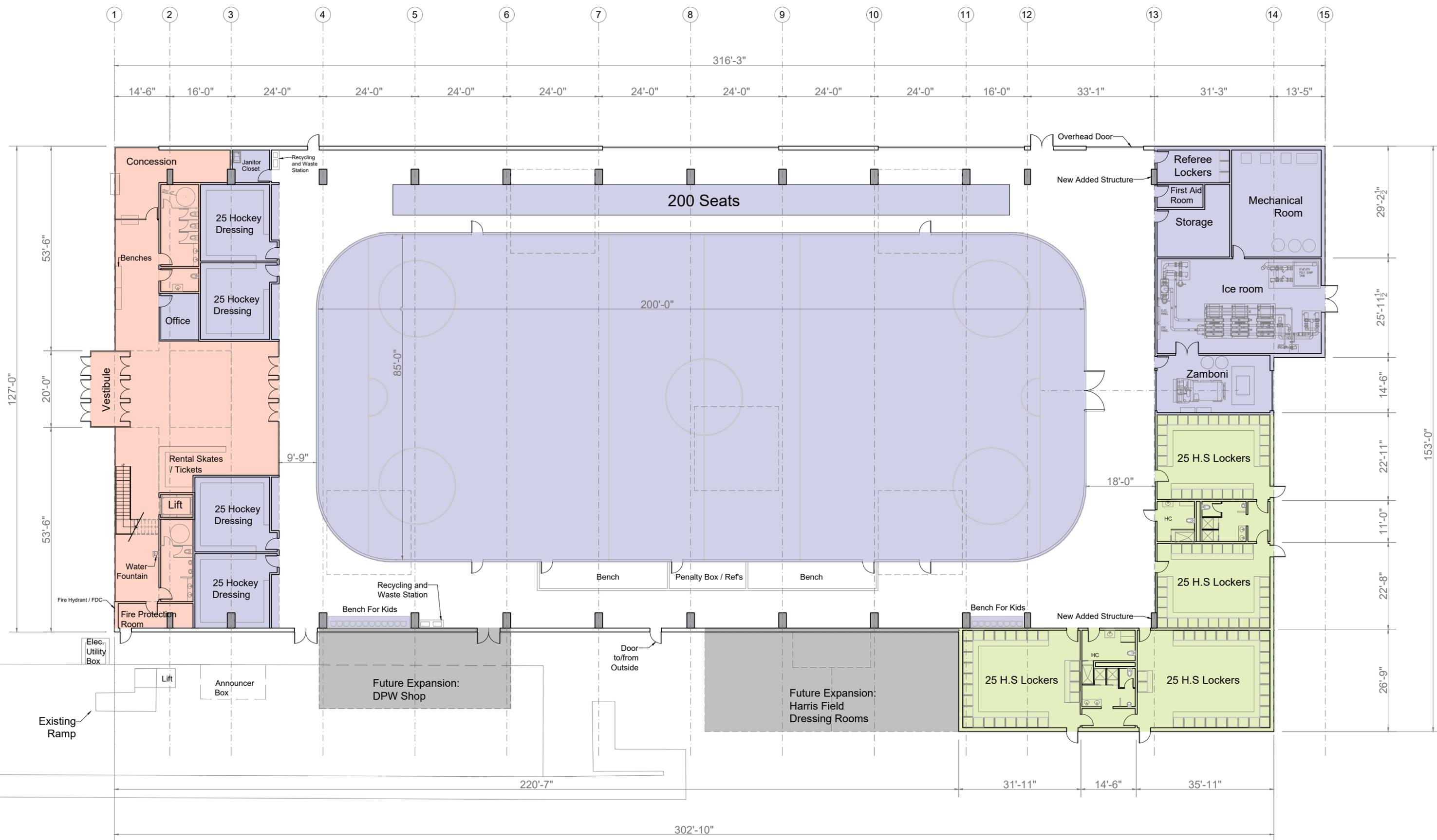
[galantearchitecture.com](http://galantearchitecture.com)





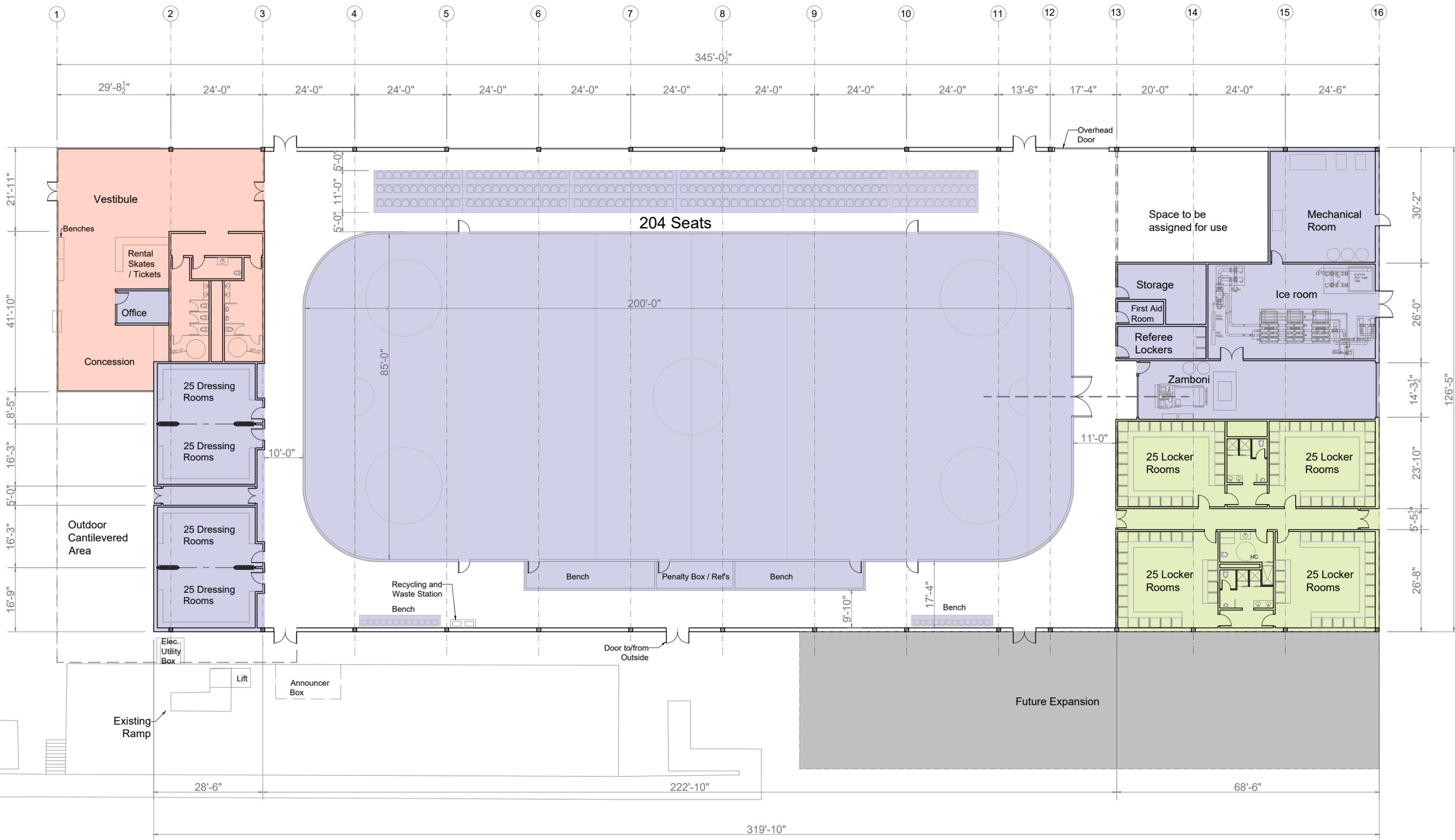
# CURRENT STATE

Existing Site Plan



November 2022 - Proposed Floor Plan ± 41,464 sf

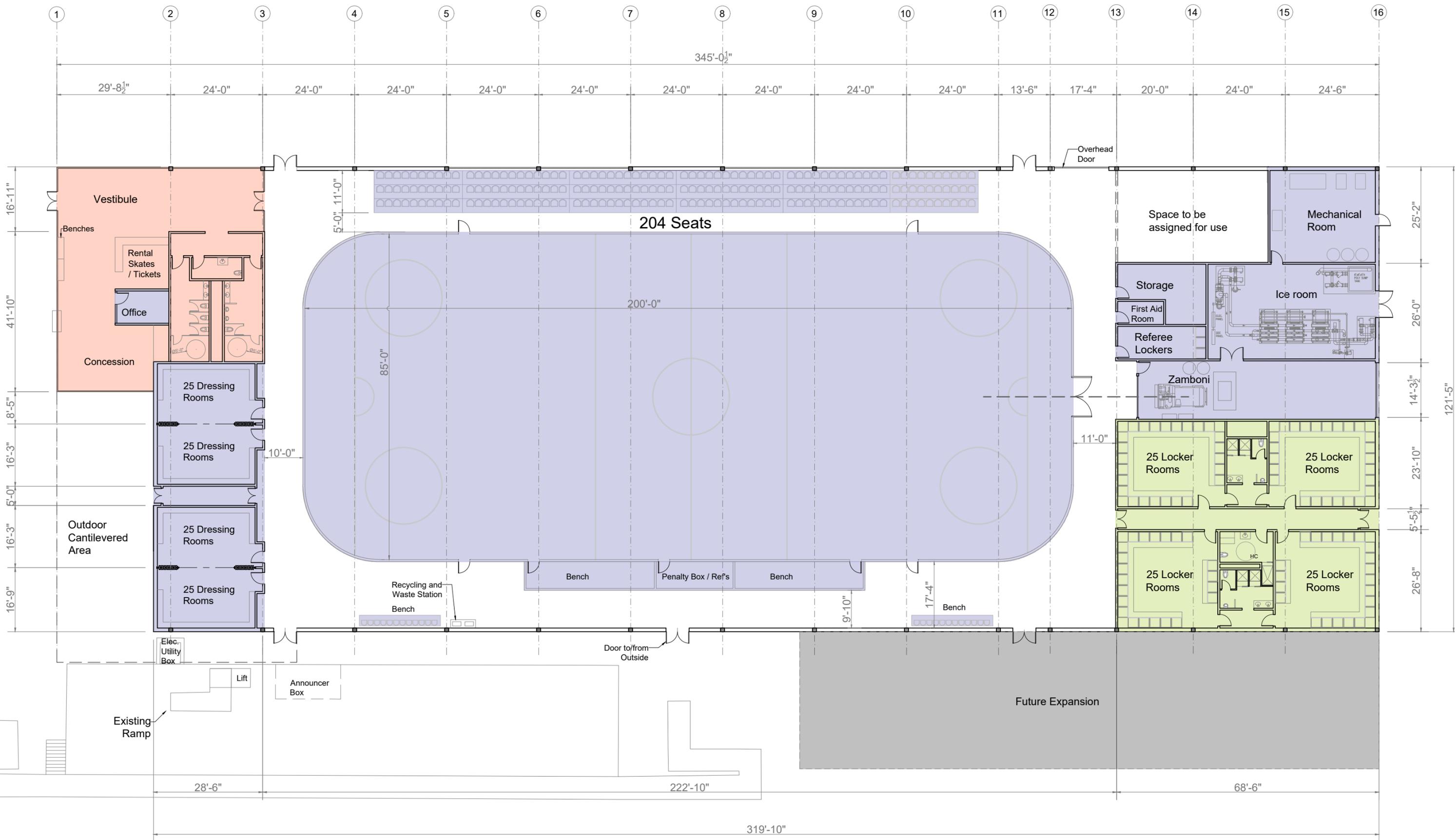




January 2023 - Proposed Floor Plan ± 42,039 sf

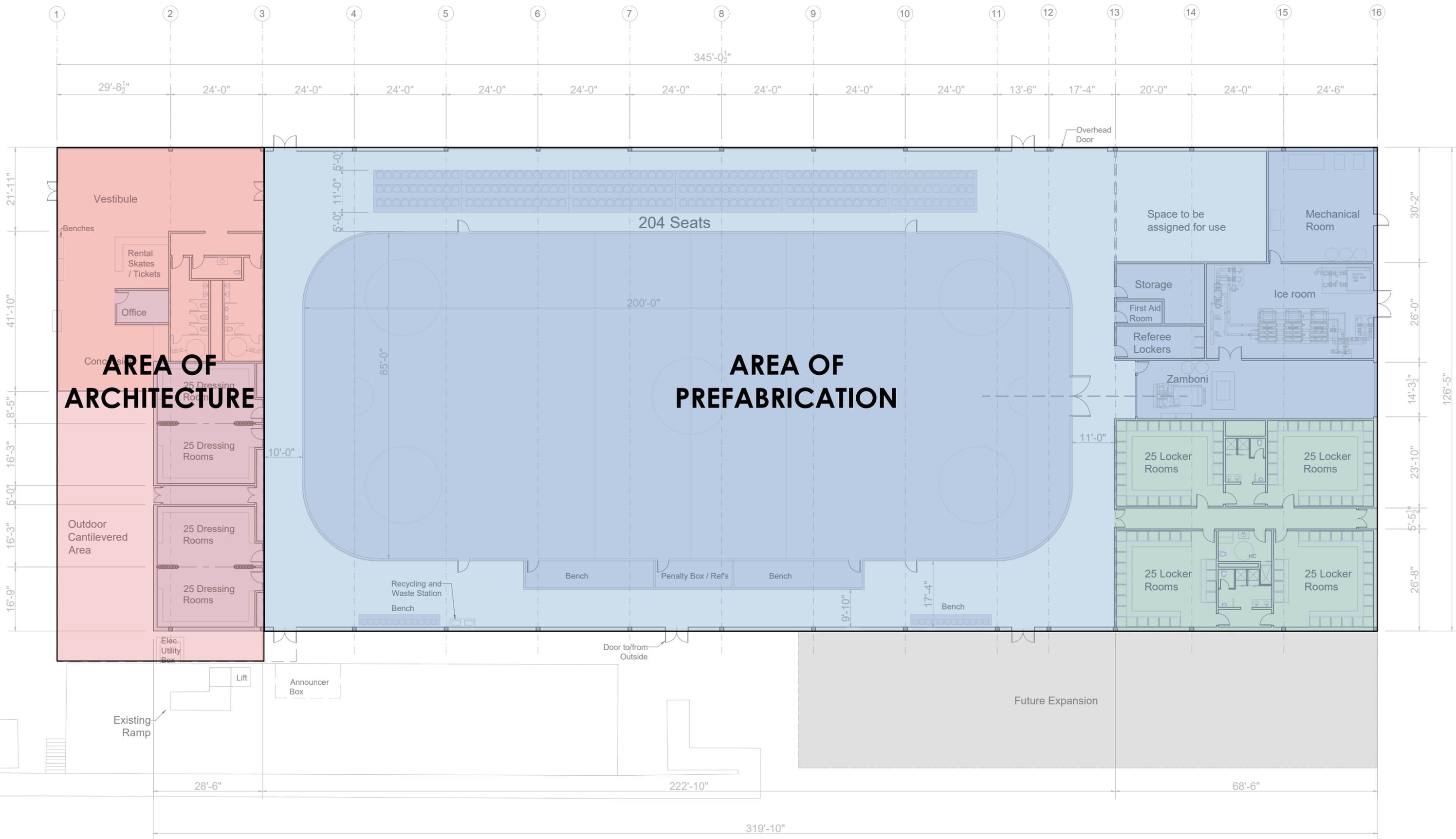
**TGAS**  
THE GALANTE ARCHITECTURE STUDIO





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





**TGAS**  
THE GALANTE ARCHITECTURE STUDIO

**PROPOSED**

Building Construction Types





Proposed Site Plan - Keeping WFH



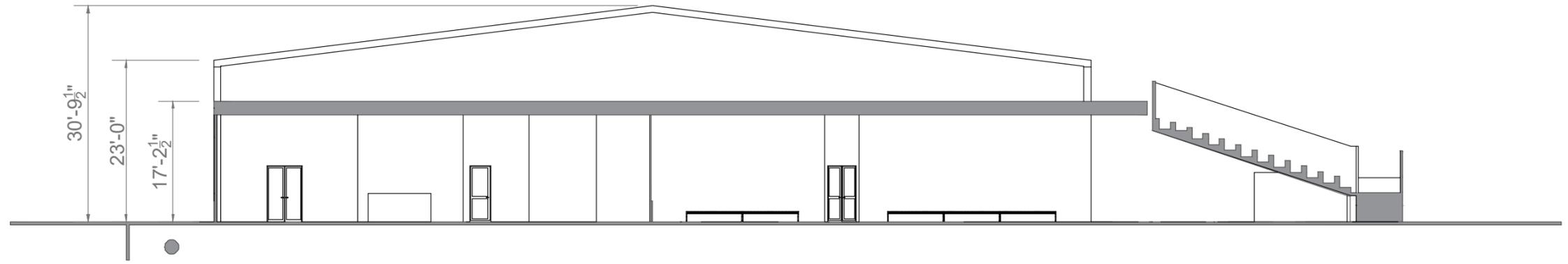
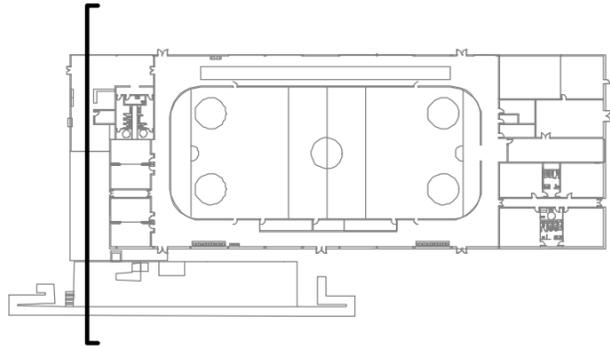


Proposed Site Plan - New Plaza

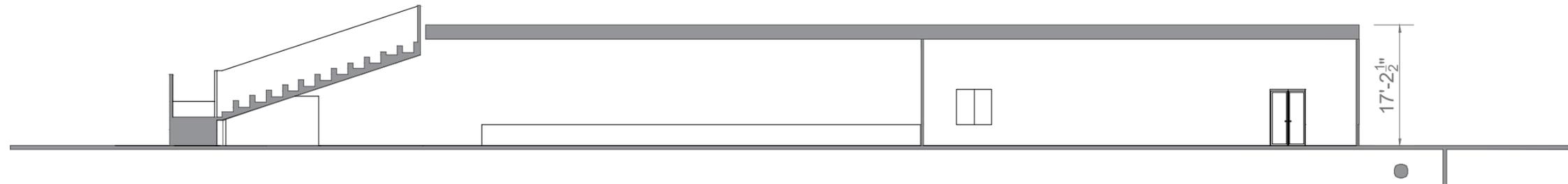
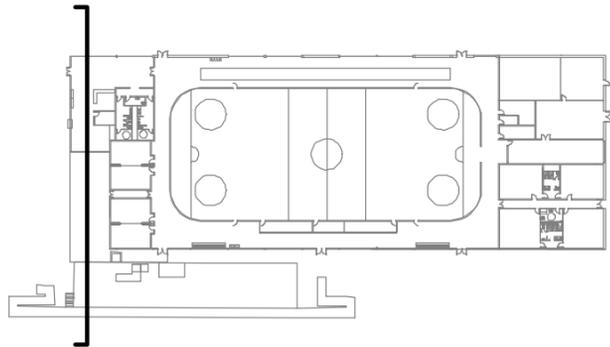
TGAS  
THE GALANTE ARCHITECTURE STUDIO

PROPOSED





South Section



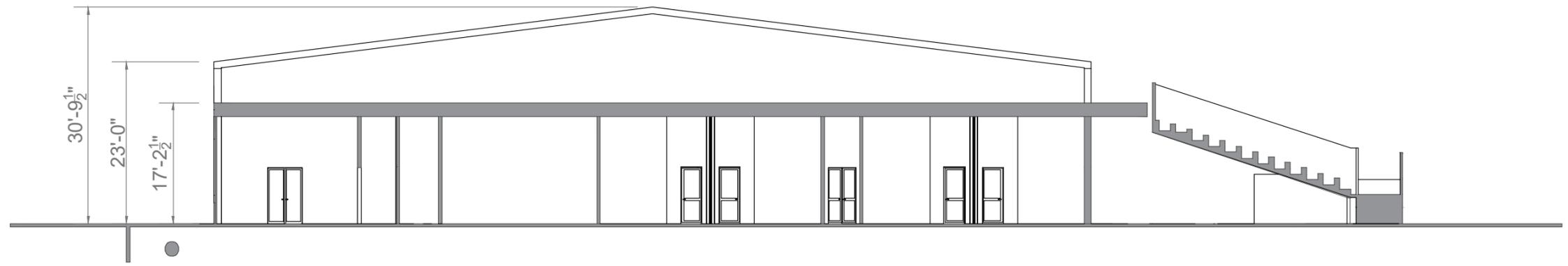
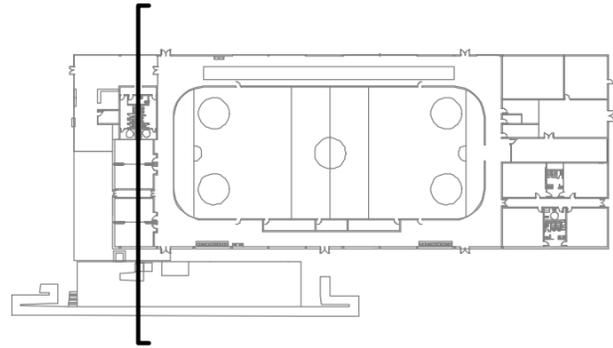
North Section

TGAS  
THE GALANTE ARCHITECTURE STUDIO

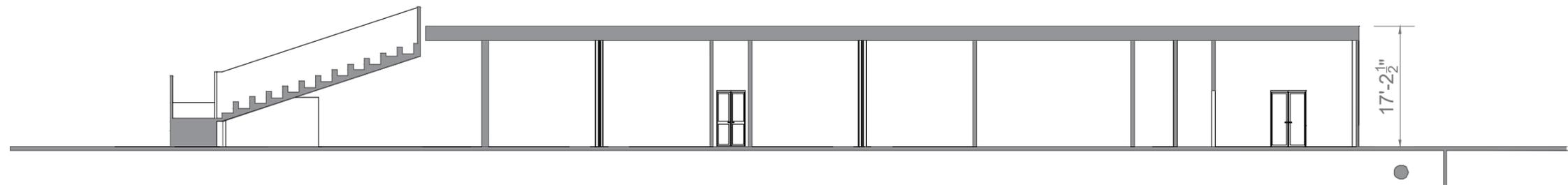
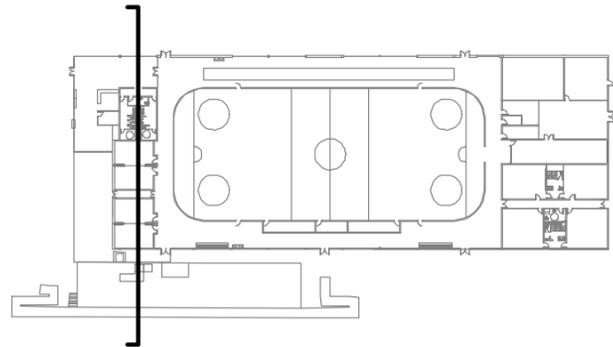
PROPOSED

January 2023 - Proposed Sections





South Section



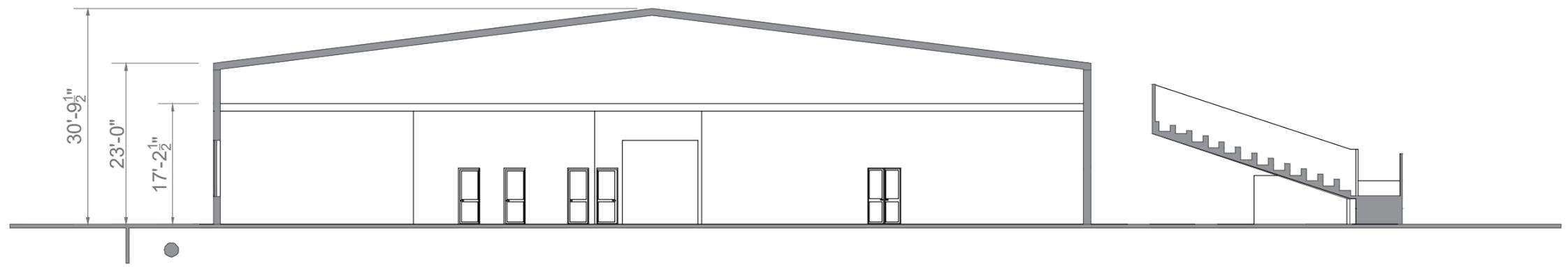
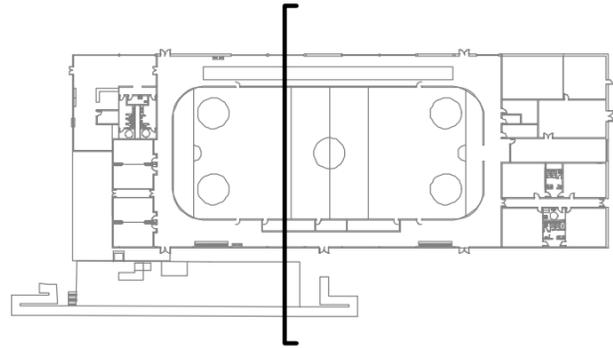
North Section

**TGAS**  
THE GALANTE ARCHITECTURE STUDIO

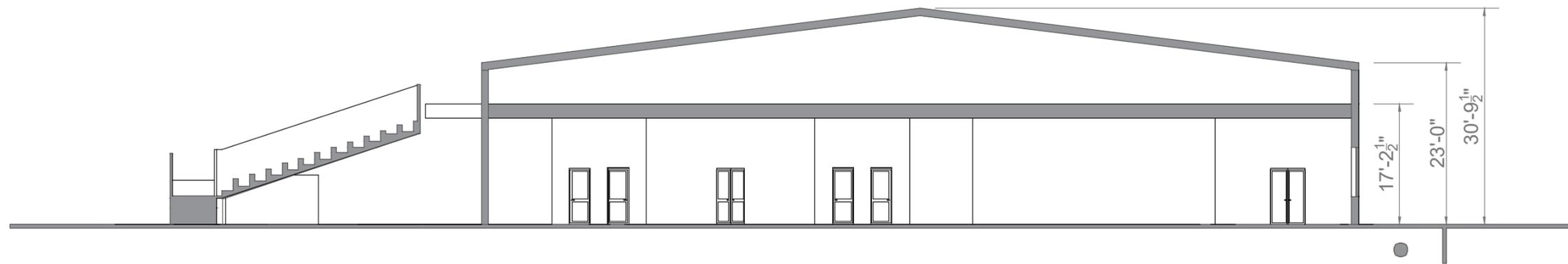
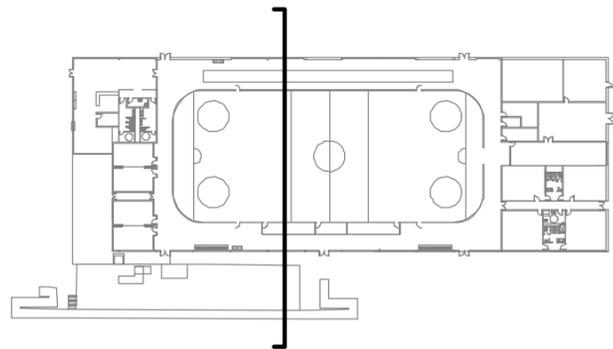
**PROPOSED**

January 2023 - Proposed Sections





South Section



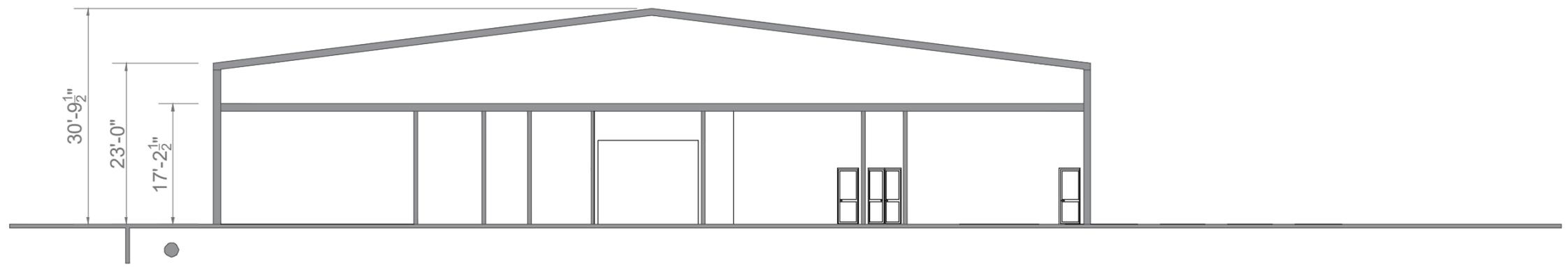
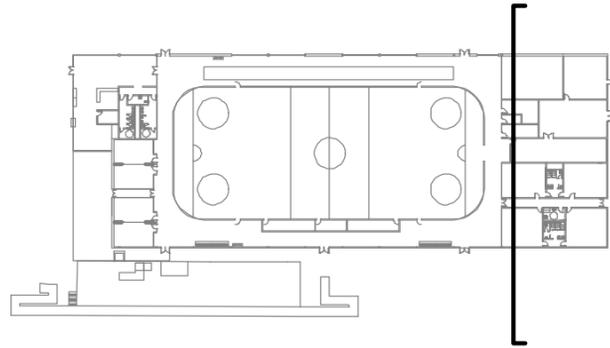
North Section

TGAS  
THE GALANTE ARCHITECTURE STUDIO

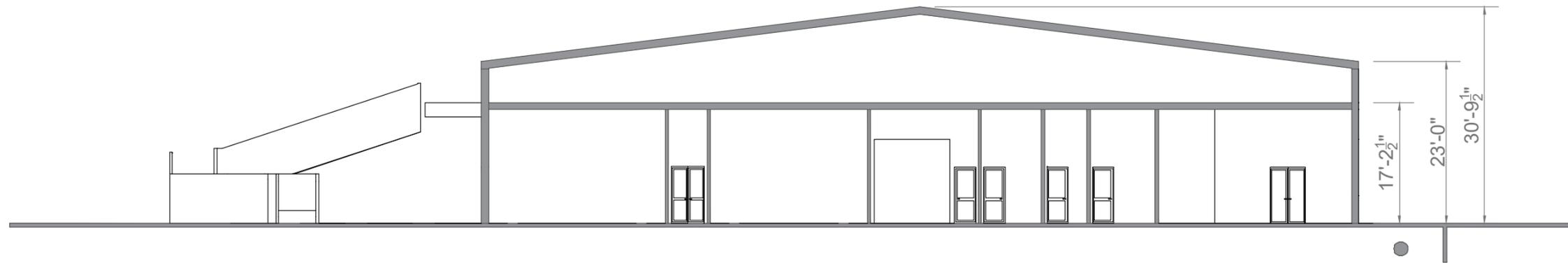
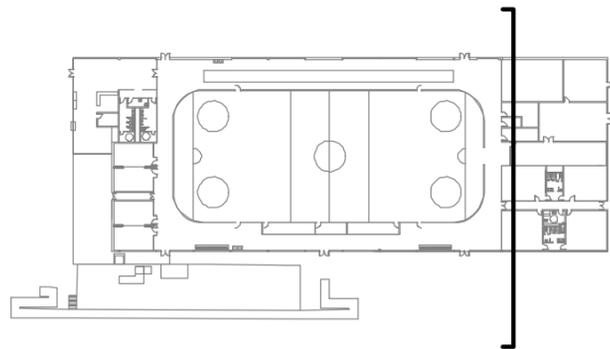
PROPOSED

January 2023 - Proposed Sections





South Section



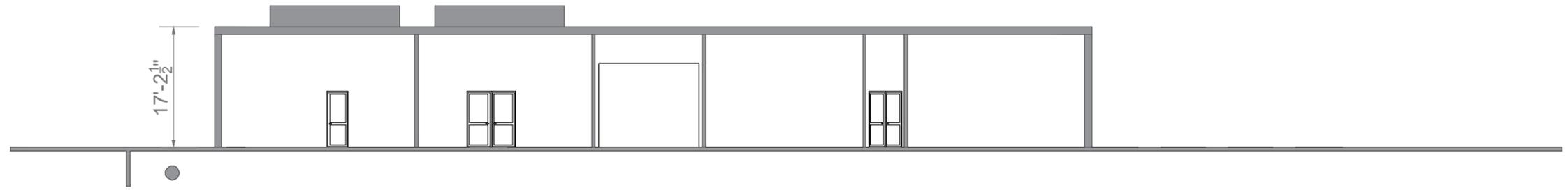
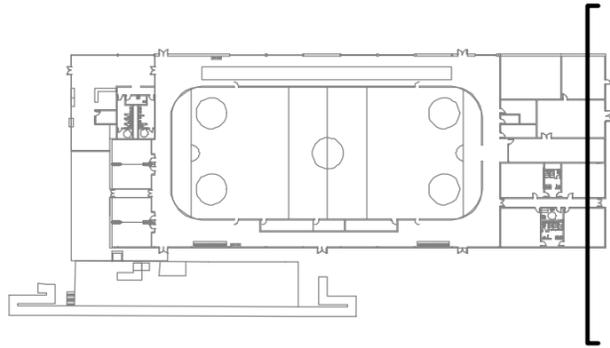
North Section

**TGAS**  
THE GALANTE ARCHITECTURE STUDIO

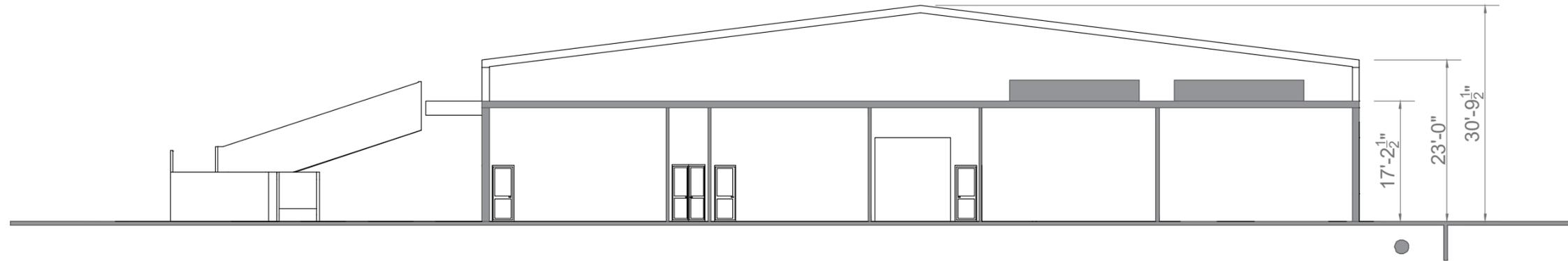
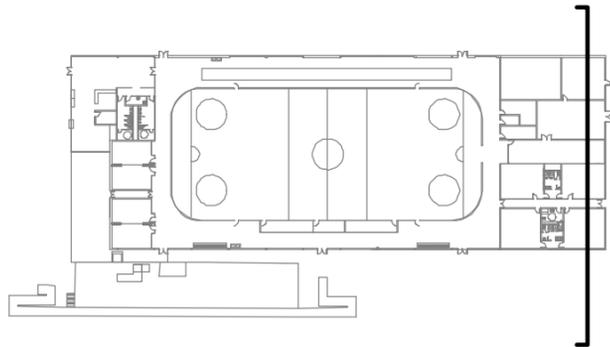
**PROPOSED**

January 2023 - Proposed Sections





South Section



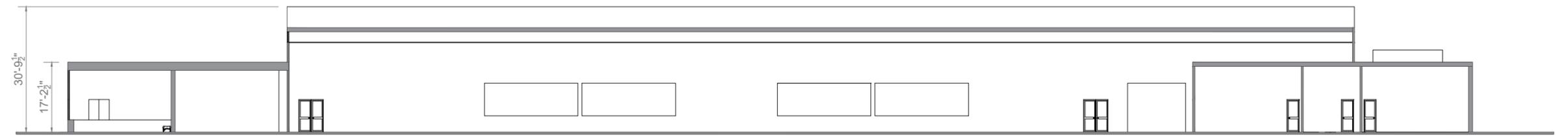
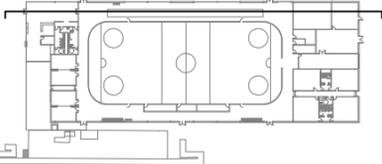
North Section

TGAS  
THE GALANTE ARCHITECTURE STUDIO

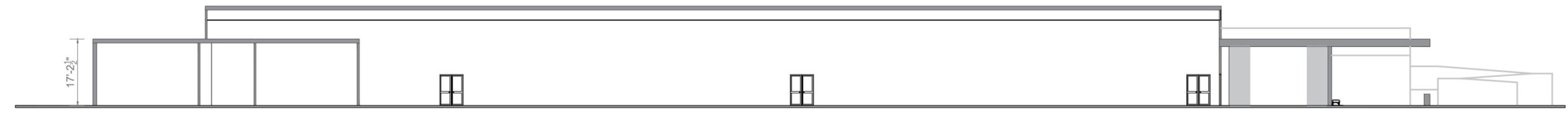
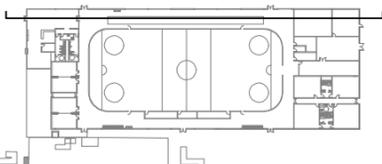
PROPOSED

January 2023 - Proposed Sections





East Section



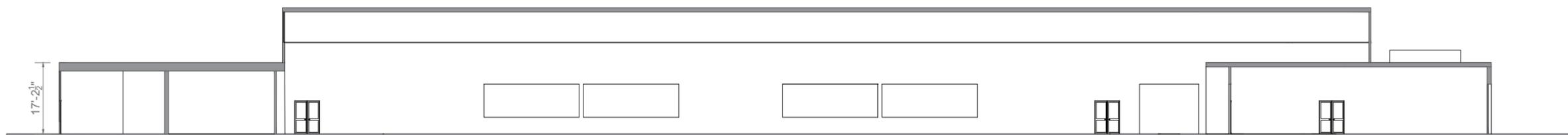
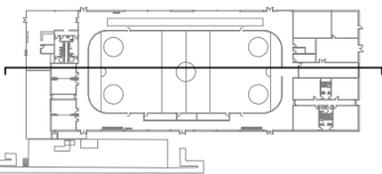
West Section

TGAS  
THE GALANTE ARCHITECTURE STUDIO

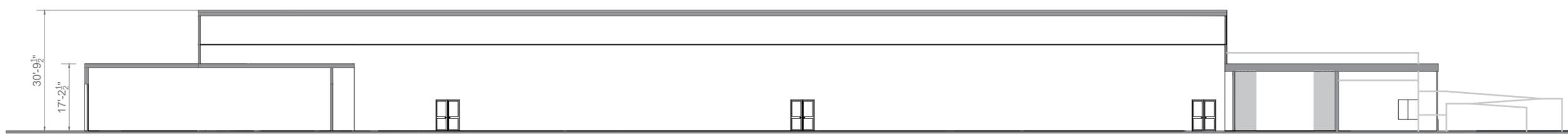
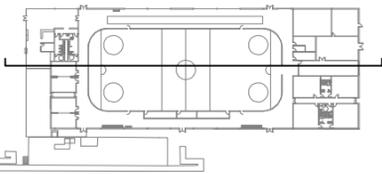
PROPOSED

January 2023 - Proposed Sections





East Section

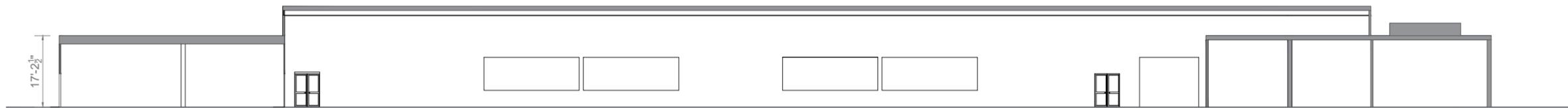
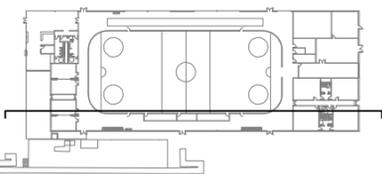


West Section

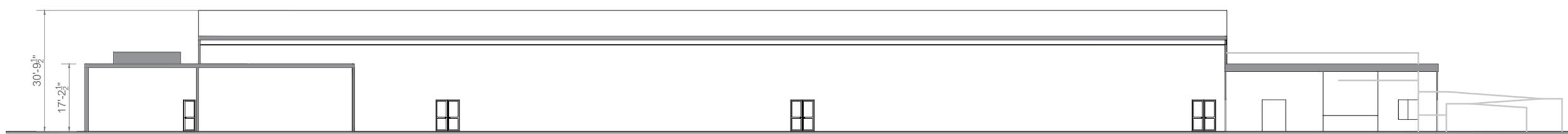
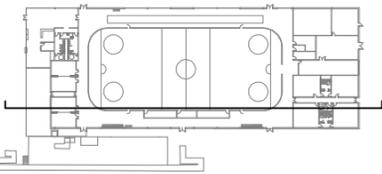
TGAS THE GALANTE ARCHITECTURE STUDIO  
PROPOSED

January 2023 - Proposed Sections





East Section

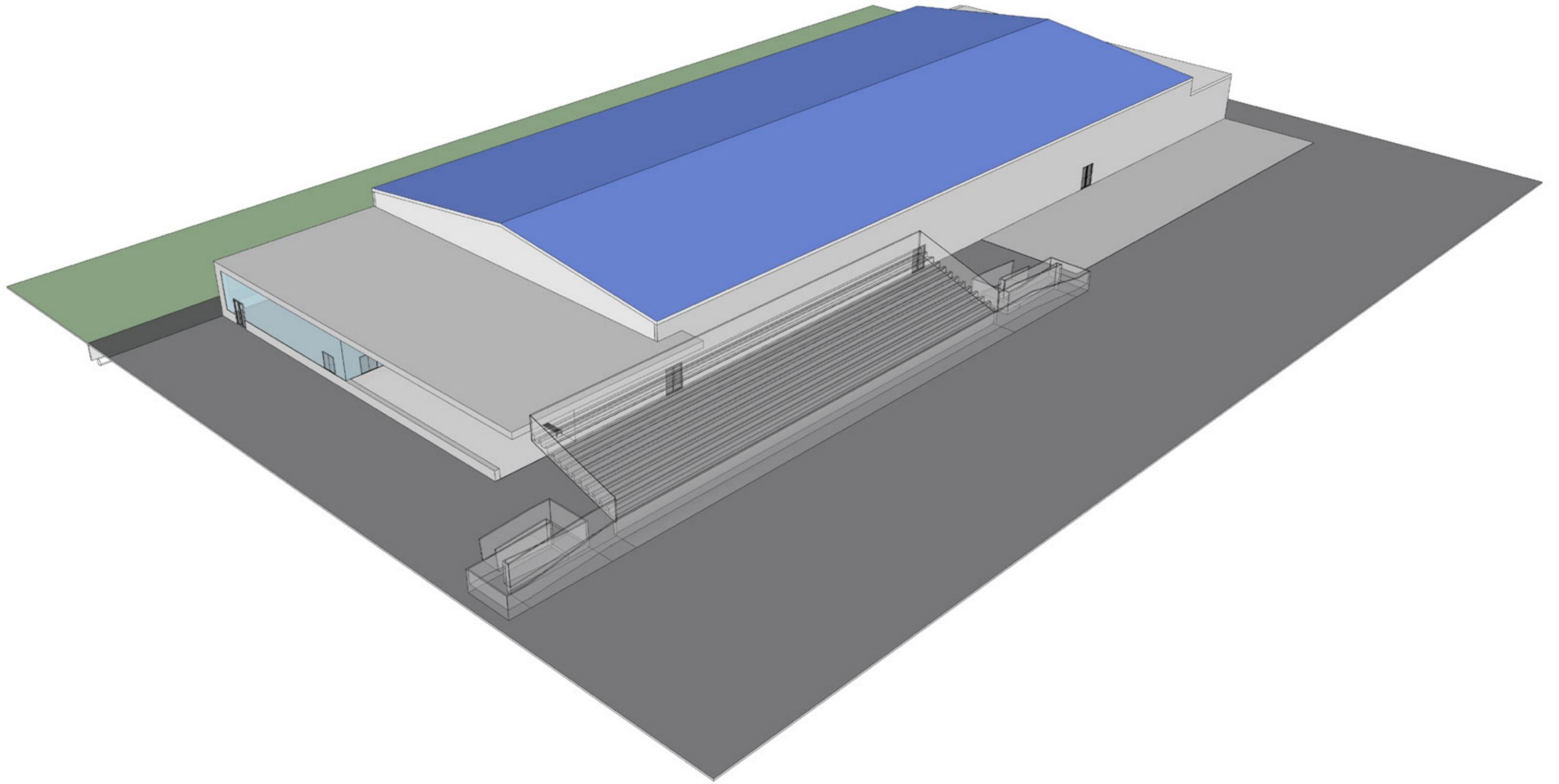


West Section

TGAS THE GALANTE ARCHITECTURE STUDIO  
PROPOSED

January 2023 - Proposed Sections



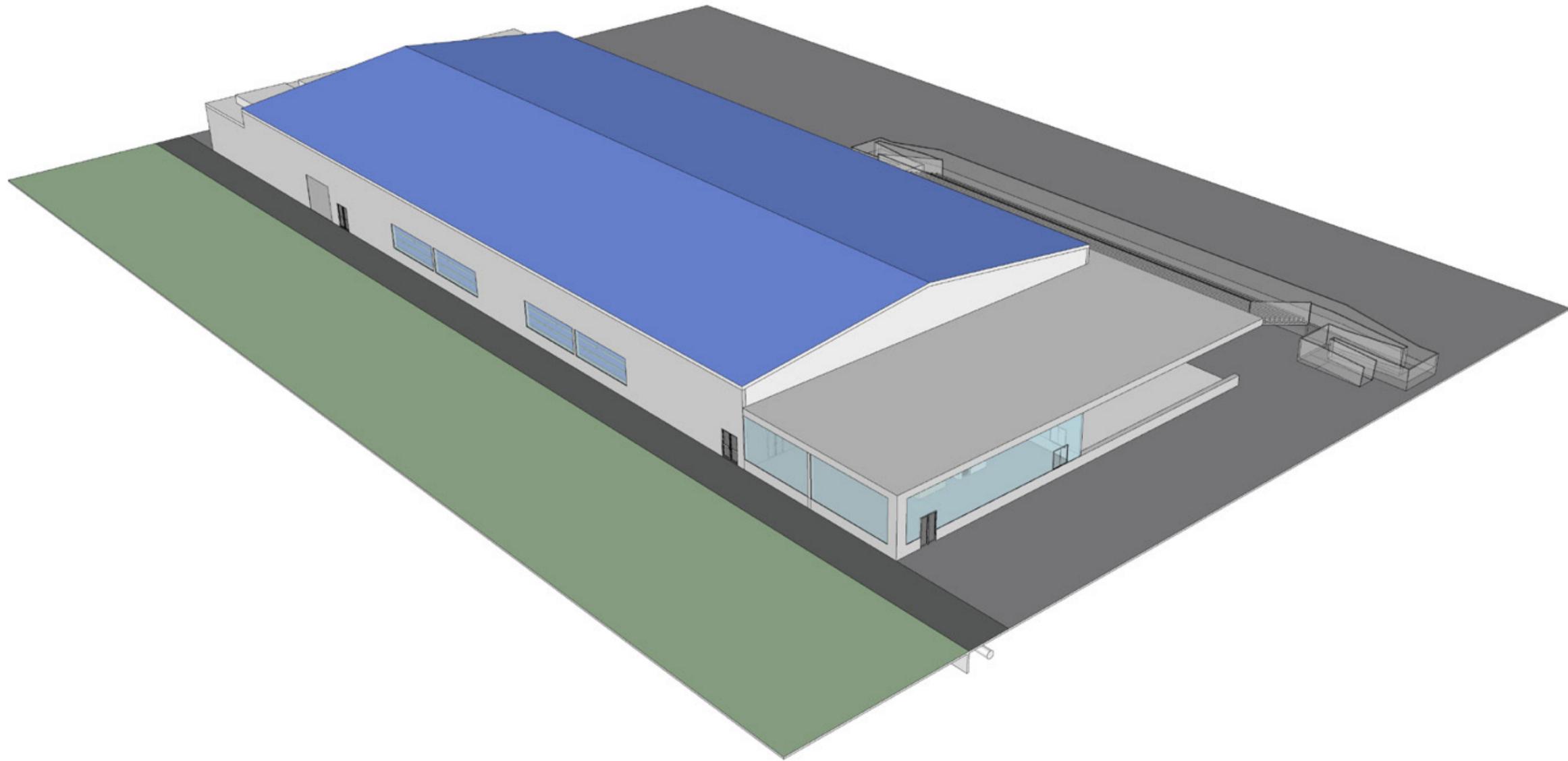


South East Conceptual View

TGAS  
THE GALANTE ARCHITECTURE STUDIO

PROPOSED



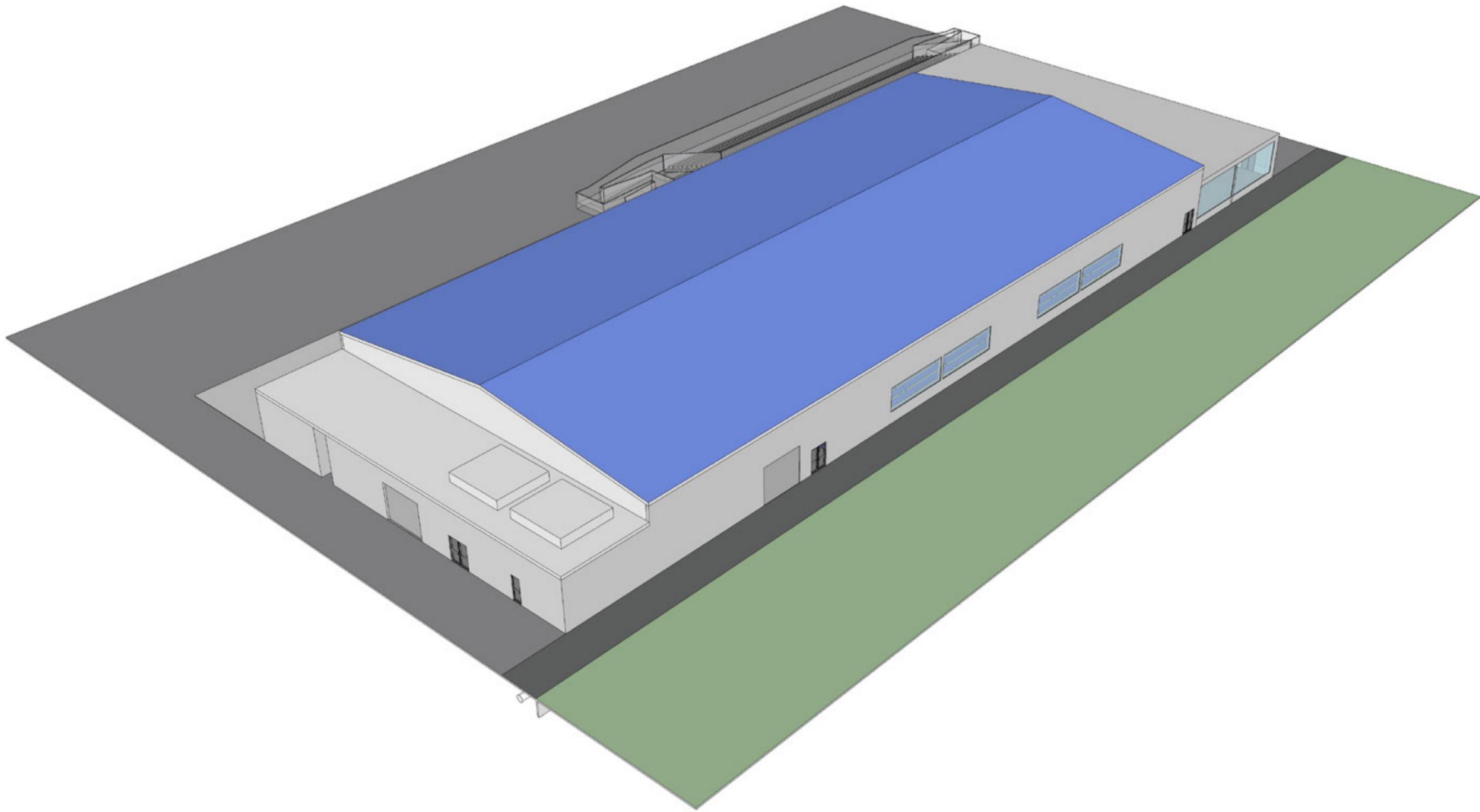


South West Conceptual View

TGAS  
THE GALANTE ARCHITECTURE STUDIO

PROPOSED



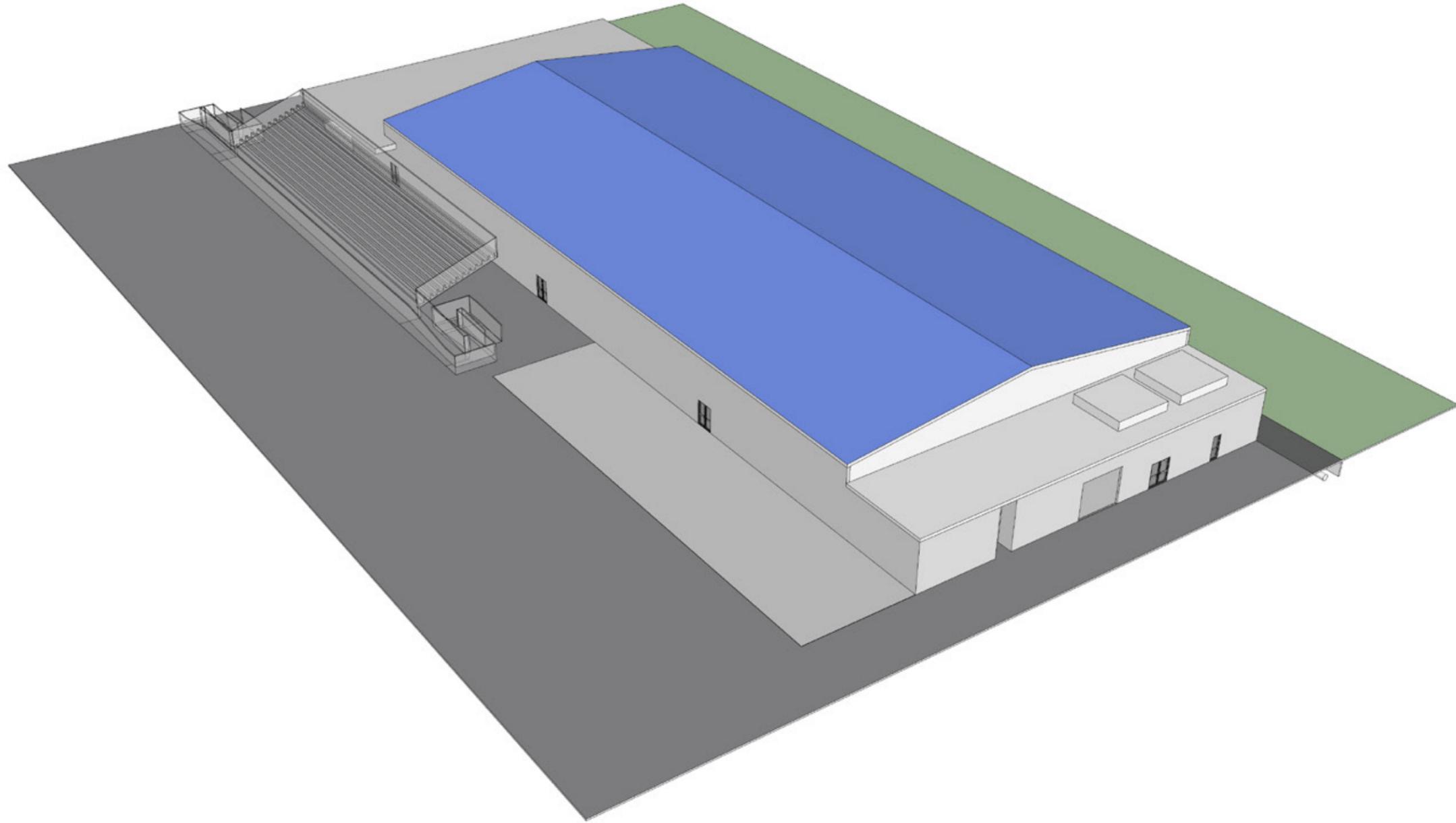


North West Conceptual View

TGAS  
THE GALANTE ARCHITECTURE STUDIO

PROPOSED



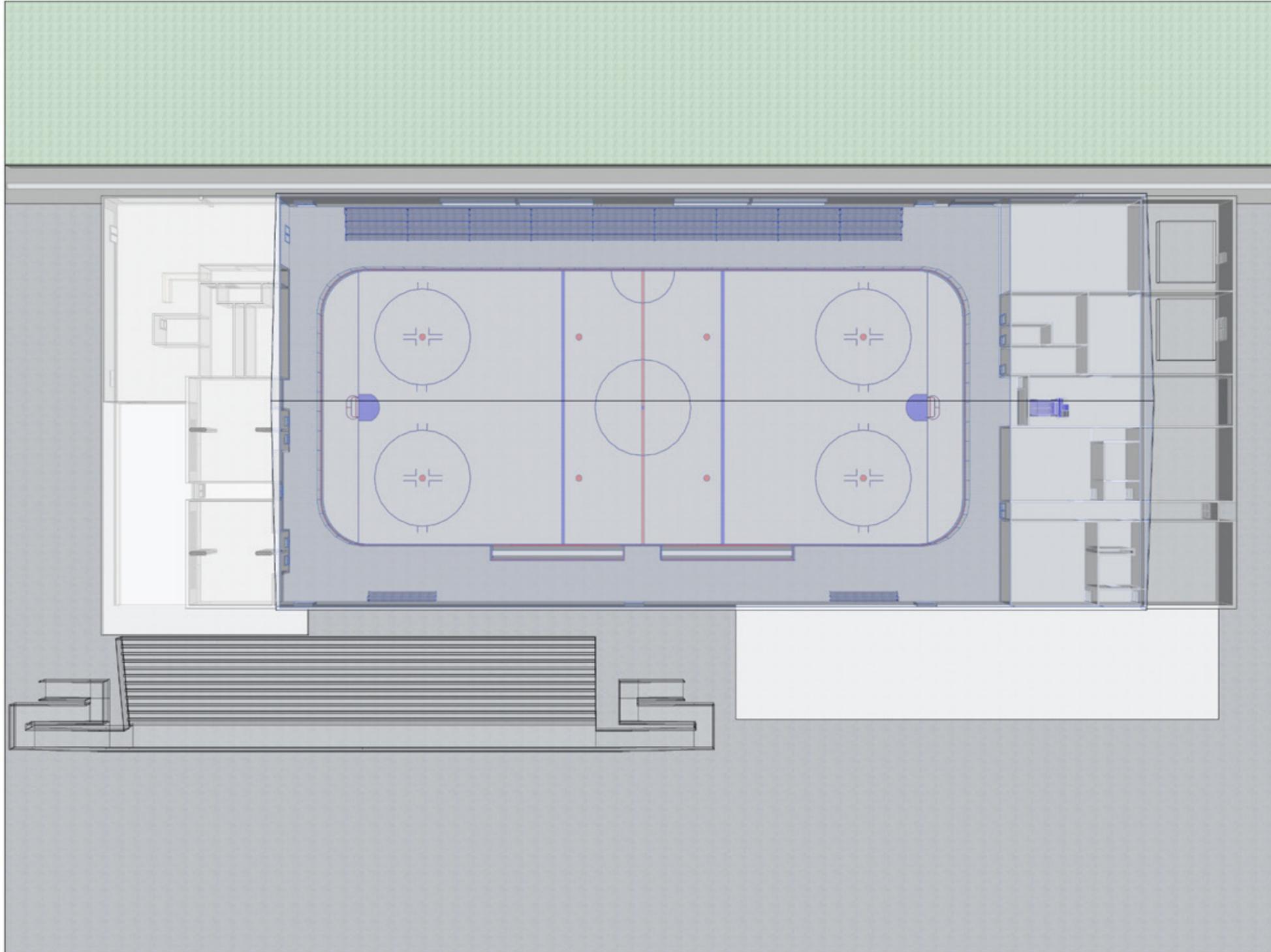


North East Conceptual View

TGAS  
THE GALANTE ARCHITECTURE STUDIO

PROPOSED



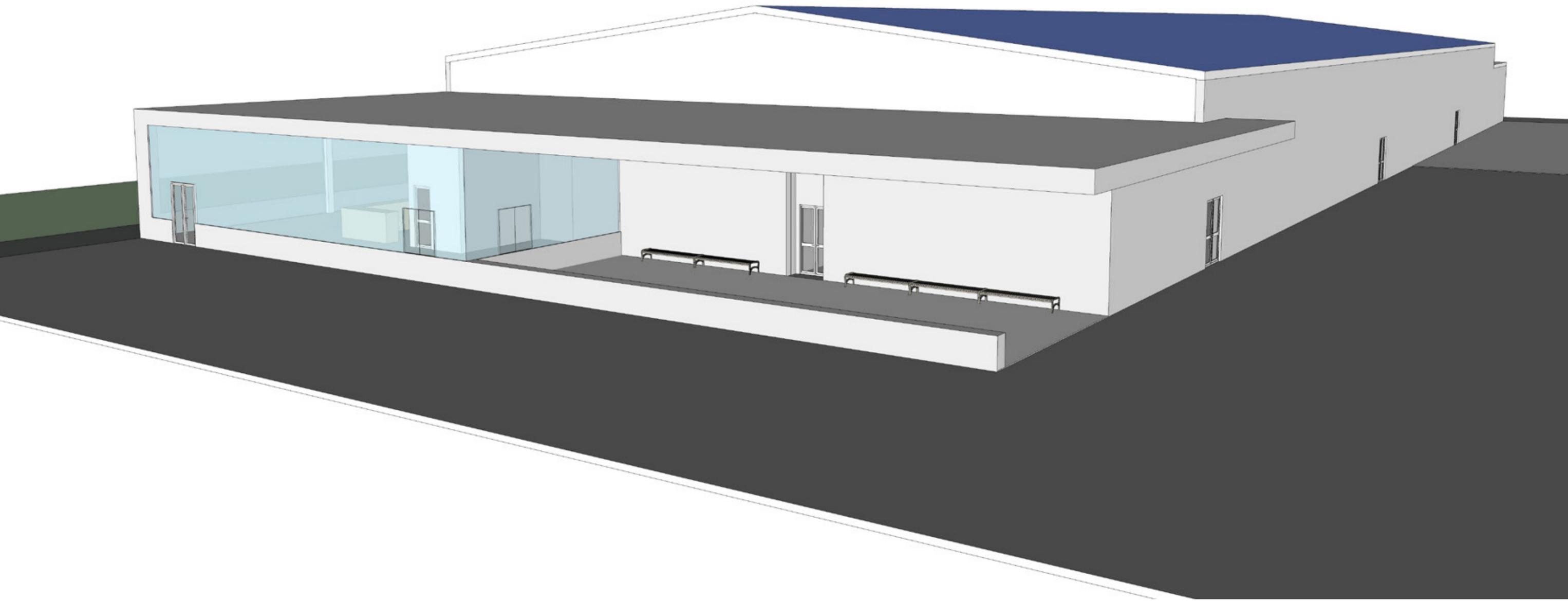


TGAS  
THE GALANTE ARCHITECTURE STUDIO

PROPOSED

Top Conceptual View



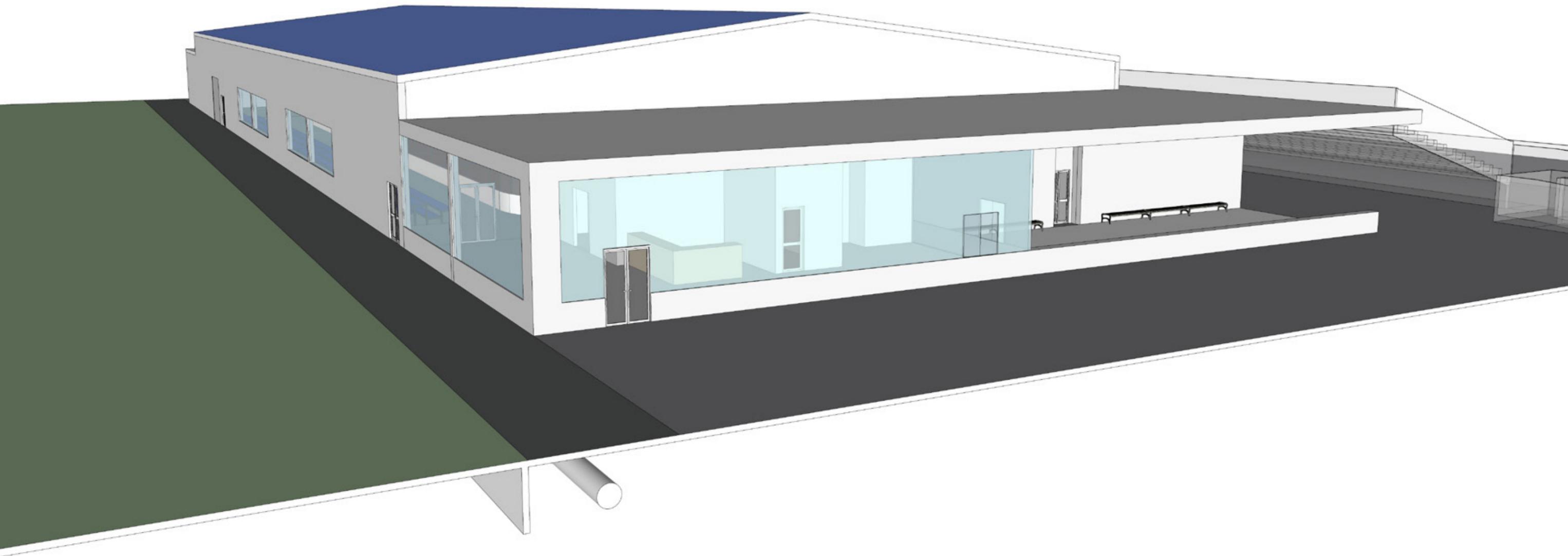


TGAS  
THE GALANTE ARCHITECTURE STUDIO

PROPOSED

North East Conceptual Facade View





TGAS  
THE GALANTE ARCHITECTURE STUDIO

PROPOSED

South West Conceptual Facade View

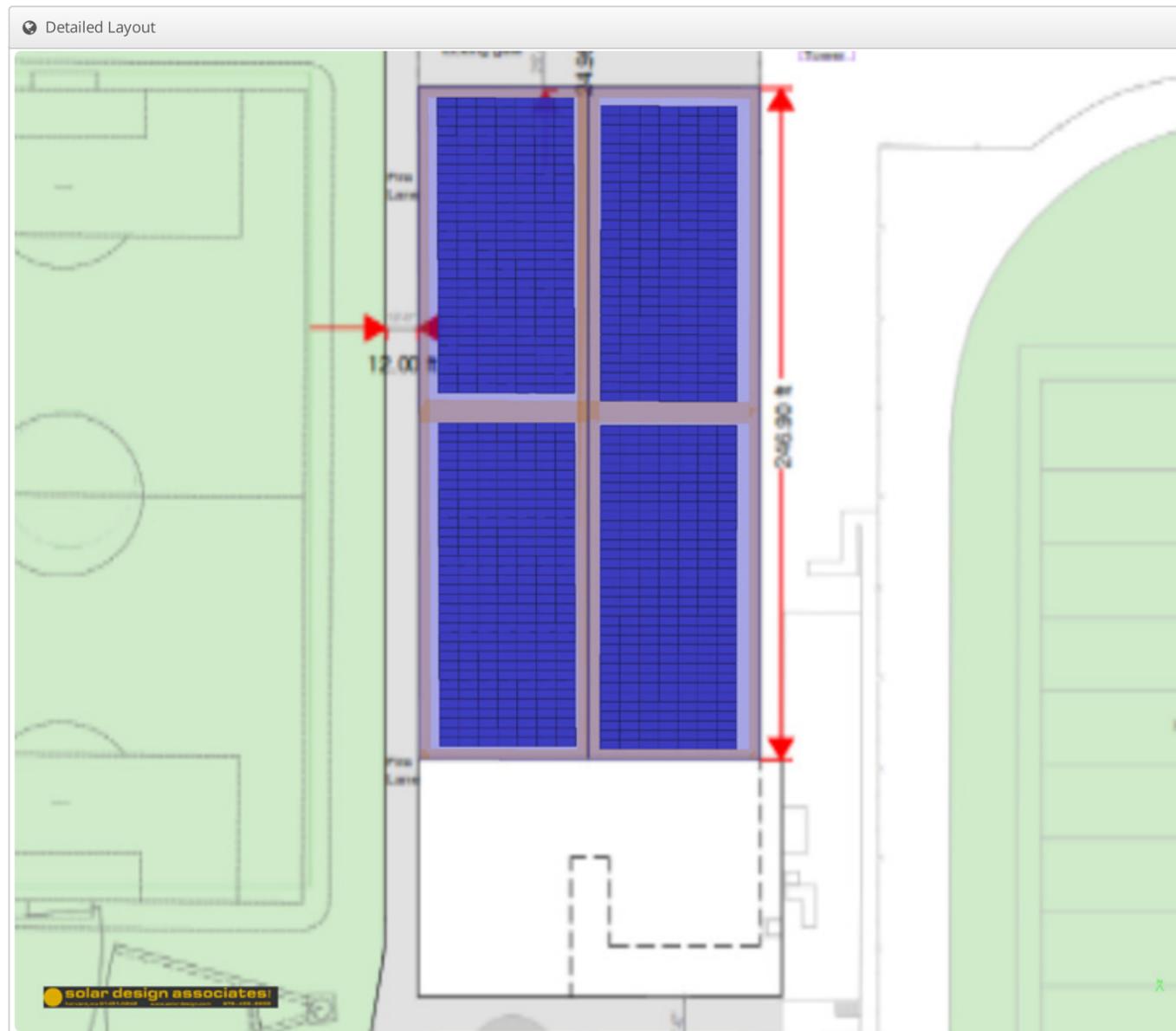


TGAS  
THE GALANTE ARCHITECTURE STUDIO



# Photovoltaic Panels

## Solar Design

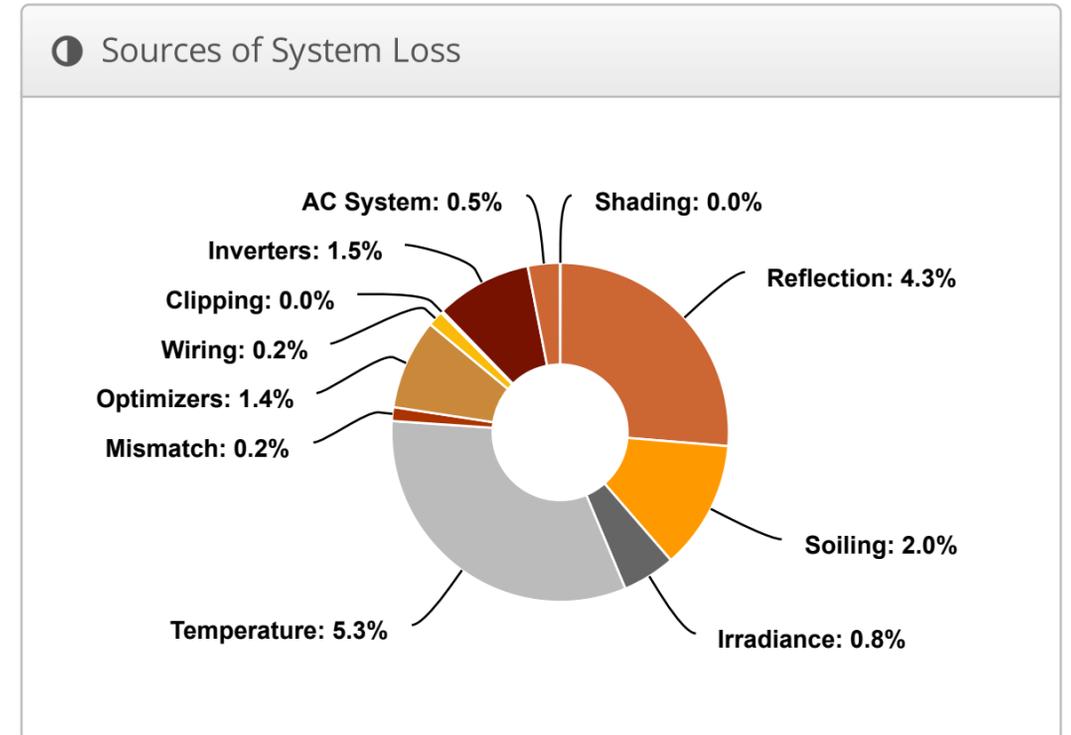
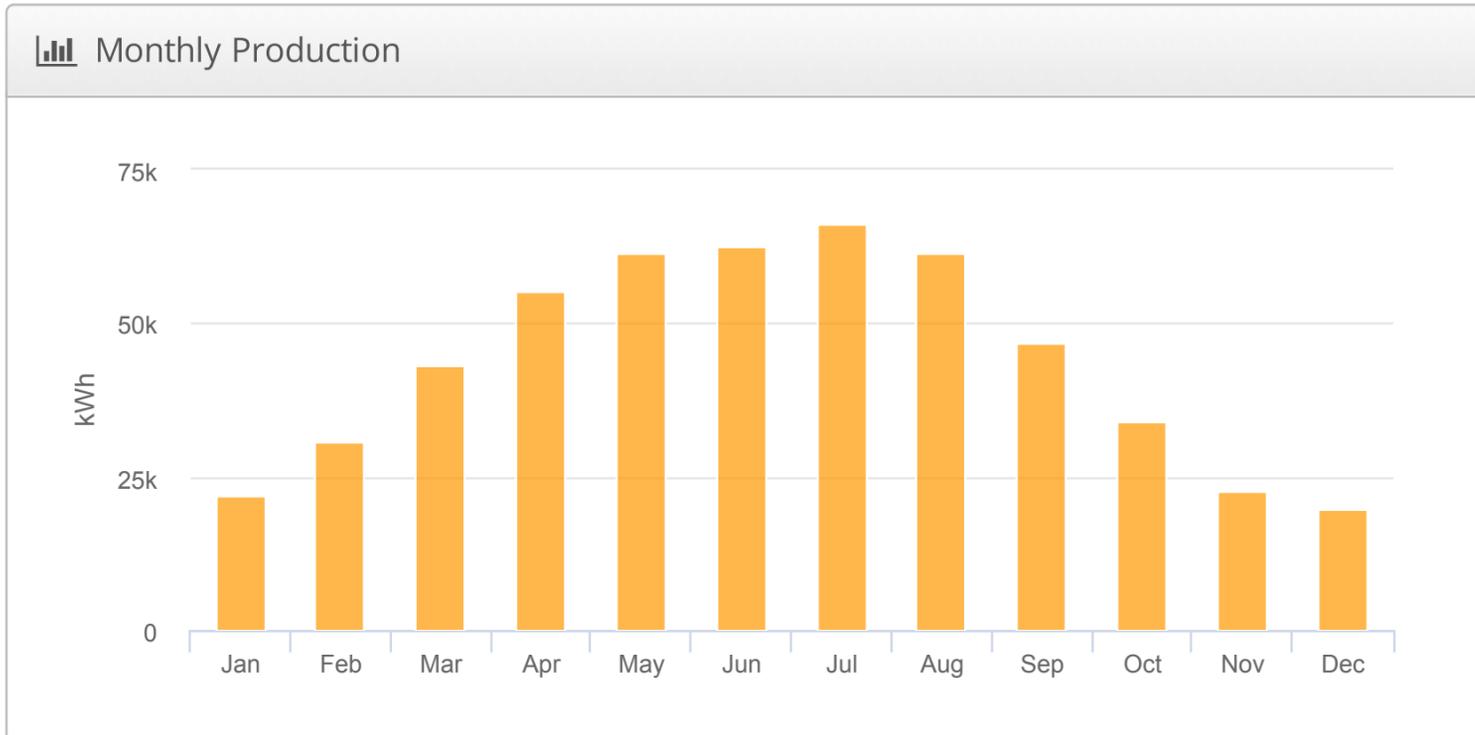
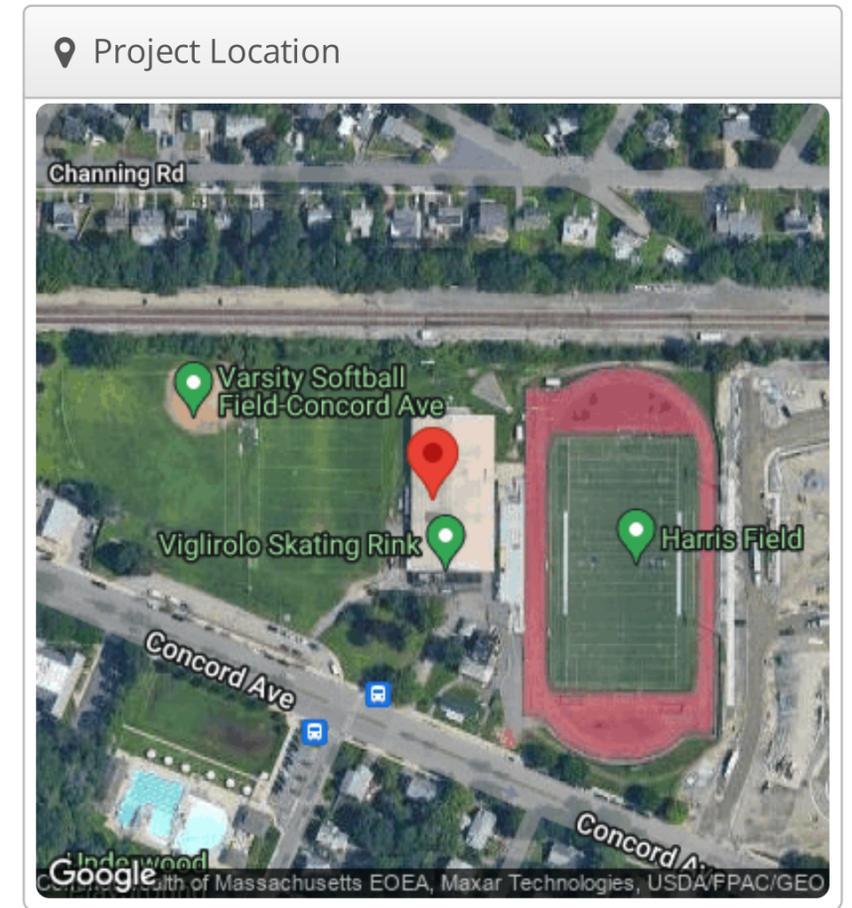


Preliminary estimate at system sizing and cost:

- 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	Belmont 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/m <sup>2</sup> )	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%
	<b>Total Collector Irradiance</b>	<b>1,333.0</b>	<b>0.0%</b>
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%
	<b>Energy to Grid</b>	<b>526,070.3</b>	<b>-0.5%</b>
	<b>Temperature Metrics</b>		
	Avg. Operating Ambient Temp		12.1 °C
	Avg. Operating Cell Temp		26.0 °C
<b>Simulation Metrics</b>			
	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					

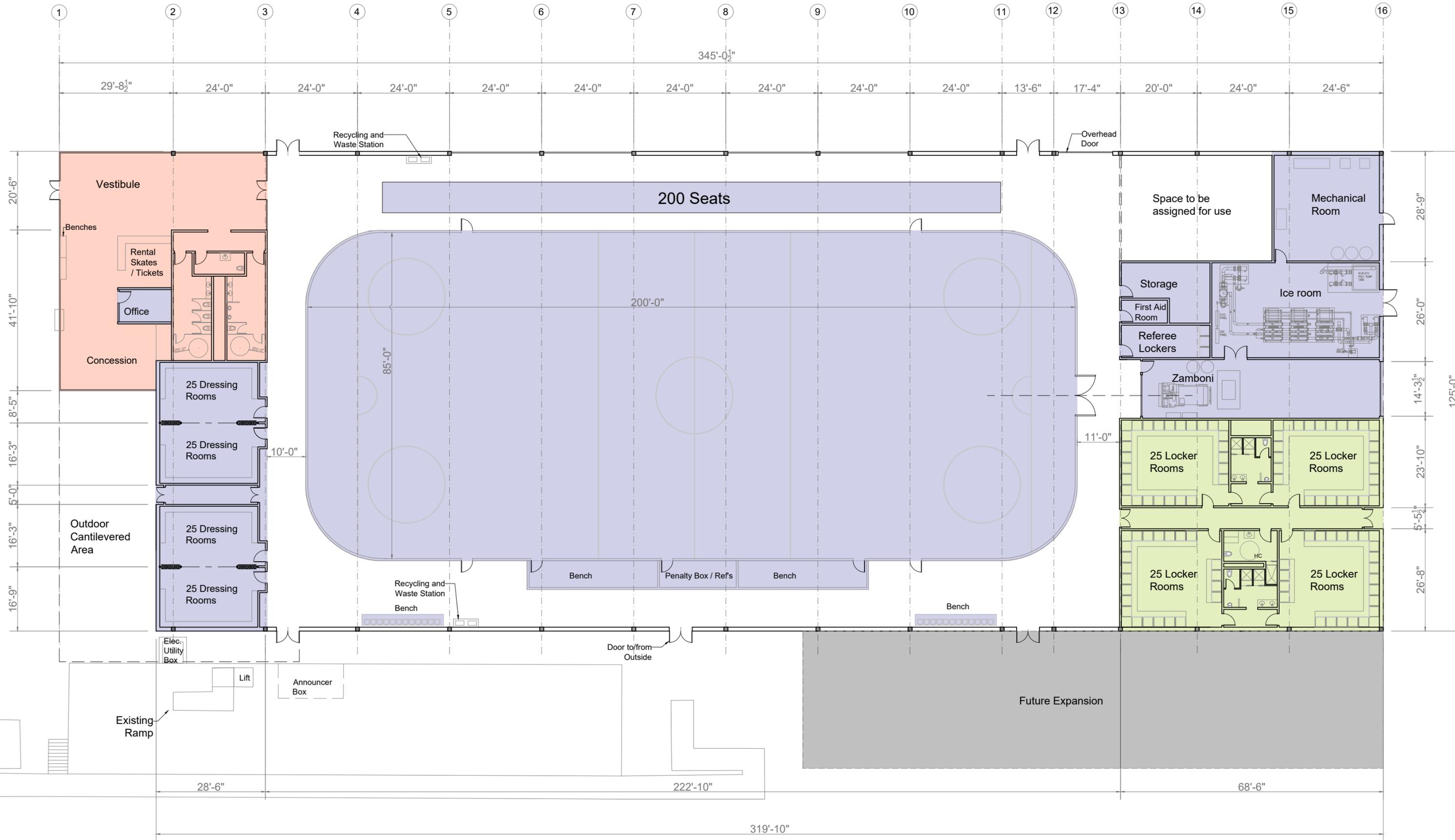


📦 Components		
Component	Name	Count
Inverters	SE100KUS (2022) (SolarEdge)	4 (400.0 kW)
Strings	10 AWG (Copper)	30 (3,651.8 ft)
Optimizers	P1101 (SolarEdge)	460 (506.0 kW)
Module	Qcells, Q.PEAK DUO XL-G10 480 (480W)	910 (436.8 kW)

🔌 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

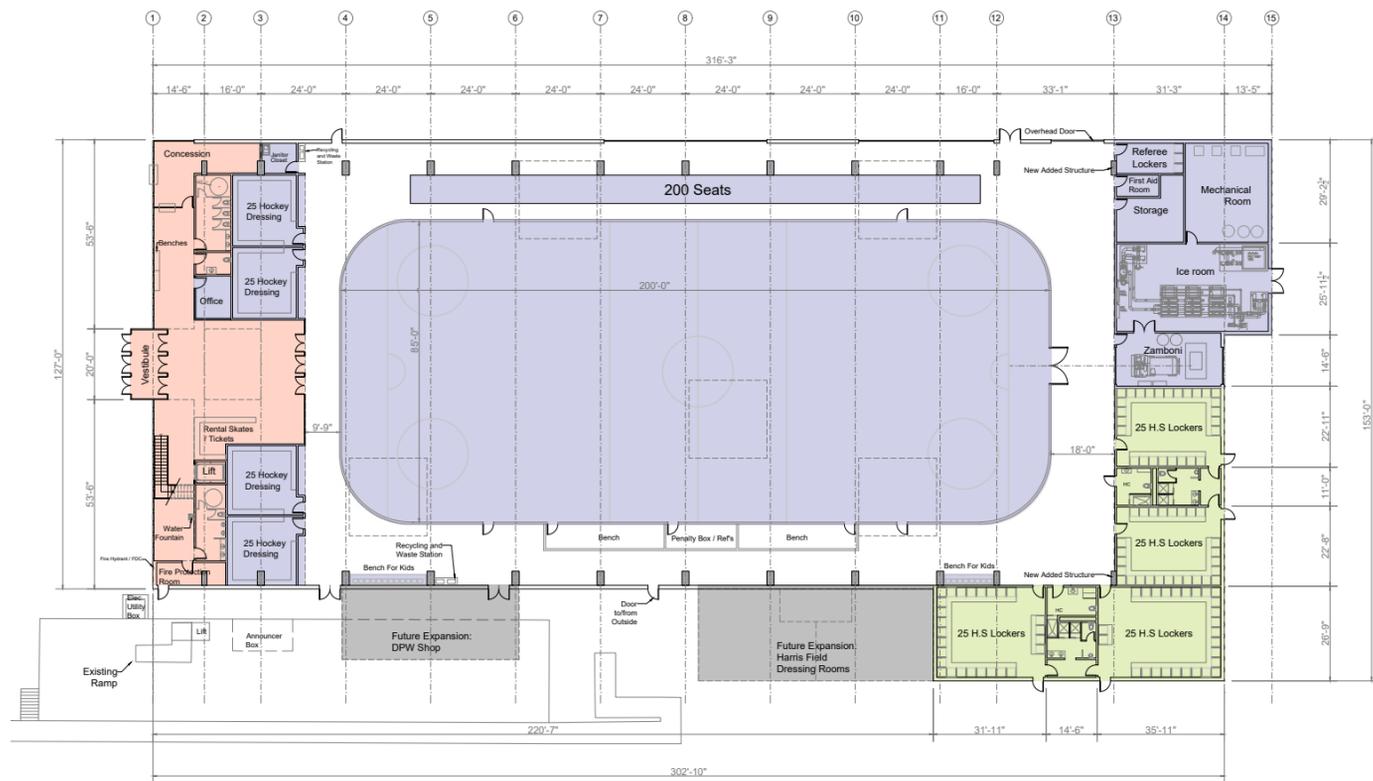




January 2023 - Proposed Floor Plan (1) ± 40,870 sf

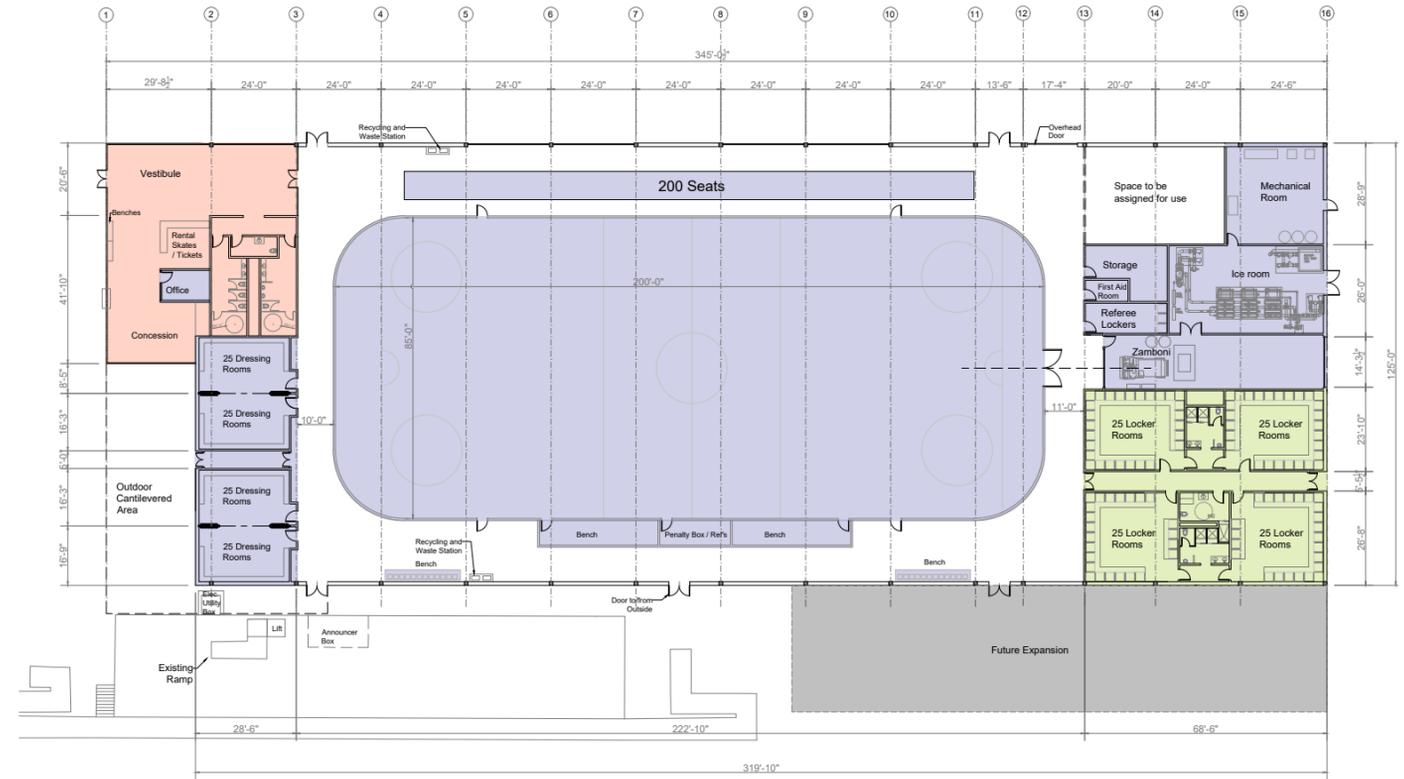
**TGAS**  
THE GALANTE ARCHITECTURE STUDIO





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 ?

Current Savings = ± \$373,032  
(Not yet including PV of \$2.1 million)