

Village of Pemberton Recreation Facility Program and Feasibility Study

January 2014

David Hewko
Planning + Program Management

Summary of Findings

This report analyzes three options or different 'dryland' recreation building structure types, for functionality, capital cost, operating costs and revenue targets, as well as taxation impacts to residents. The report also includes functional program requirements for Phases 2 and 3, a swimming pool and an ice arena. Debt amortization and operating subsidy costs 'per household' calculations were based on a regional population base of 6,000 translating into a denominator of 2,000 households or properties, include the Village population of 2,400, additional electoral and regional districts, and First Nations communities.

Phase 1 Options

It was assumed that Phase 1 options would include an indoor artificial turf space, a full-sized gymnasium, a small gymnastics area and support spaces. Strength and Conditioning was a function identified earlier on, but was removed from consideration in these buildings as fitness does not require high-ceiling, column-free space and could be accommodated in a variety of other locations in the Village.

Option 1 proposes an air-supported structure that utilizes pressurized air to hold the fabric envelope aloft. For lightness, the insulation value (bubble-cells between foil sheets and layers of fabric) tends to be extremely low, resulting in higher operating costs both to keep the dome up, but also to compensate for heat loss (winter) and gain (summer). Option 2 is a rigid-frame fabric structure sometime known by the proprietary 'Sprung-structure', a fabric envelope supported on a light-weight metal skeleton. With more weight-bearing capacity, these buildings are much more insulated but the fabric as with Option 1 ages rapidly. Options 1 and 2 include a modest allowance for perimeter security fence to protect the fabric from vandalism. Option 3 is a simple pre-engineered, factory-manufactured metal building with metal structure and corrugated-metal exterior cladding with interior plywood to 8-feet to protect the corrugated shell.

Costs of Phase 1 – Fieldhouse and Gymnastics

	Area	Project Cost	Project Cost/Sq. Ft.	Capital Levy*	Operating Levy**	Recovery Rate***	Cost/Household/Year
Option 1 Air-Supported Structure	37,550 SF	$2.8 million	$75/SF	$105	$56	$69	$161
Option 2 Rigid-Frame Fabric Structure	37,950 SF	$4.4 million	$116/SF	$148	$48	$59	$195
Option 3 Pre-Eng, Metal Building	38,100 SF	$6.0 million	$158/SF	$184	$48	$59	$232

*Refers to annual increase to property taxes per household based on 25-year amortization at 4%; ** refers to annual subsidy cost to households assuming revenues only recover 50% of operating costs; *** refers to hourly rental revenue target for 1,600 annual prime time hours per year (50 hours/week x 8 months)

Option 1 offers the lowest project cost with the maximum square footage but also has the highest operating cost and requires the highest lifecycle funding to replace the turf (7-9 years) and fabric (10-15 years). Option 2 has higher capital cost, but lower operating cost per square foot. Option 3 is the long-range solution of a permanent building that could be added to in the future. Options 1 and 2 are considered 'temporary' buildings, but could last up to two decades.

Option 3 is the most costly with the highest construction unit cost but could last in excess of four decades. Option 3 if constructed out of wood (with steel long-span structure) would cost premium would be at least an additional 30%, possibly less if the material is donated. All costs are expressed in 2014 dollars and would need to be indexed by 3% per year for each year out. Operating costs can be expected to rise at a rate of 5% per year primarily due to climbing energy costs and expected inflation. All operating costs assume union labour rates (approximately double of non-union labour).

Cost of Sports Fields

In general terms and without additional specific site geotechnical information, natural grass soccer fields vary in cost from high-quality sand-based (with drainage and irrigation) averaging about $250,000 to a low-end sod or all-weather gravel field costing $125,000. A sand-based natural grass field can support about 350 hours of play per year and maintenance costs for all grass fields about $10-20,000 per year. Baseball diamonds need not be sand-based as the outfield is used less intensively and the infield is skinned.

For planning purposes, it was assumed that the programmed FIFA-regulation soccer field would be a sand-based grass field. For comparison purposes, an artificial outdoor turf would cost about $1.5 million (project) plus $100,000 for lights for a FIFA-regulation field but offers 7-10 times as much playability providing the field is lit. For information only, an outdoor 6-lane track would cost about $1.0 million (project), half the cost civil and drainage and half for the synthetic surface. A shale track would cost about $400,000. A track was not included in this estimate.

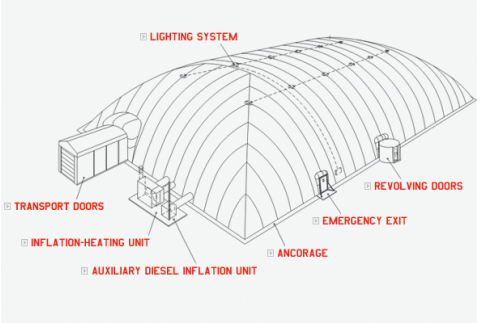
Cost of Phase 2 and 3

Recreation planning guidelines suggest a population base of 40,000 is required to adequately capitalize and support a pool and, 10,000 are required to support an ice sheet. The arena may the more likely of the two to be realized first, but either Phase 2 Aquatics or Phase 3 Ice Arena could be built first or the two phases combined yielding a modest construction cost savings. A pool would be about twice the unit cost of an arena to build, but is about half the square footage of the arena, therefore the project costs are about the same. Each project would cost the current tax-base of 2,000 households about $155 / year to repay capital. Both projects are assumed to be of the most modest pre-engineered structure.

	Area	Project Cost	Project Cost/Sq. Ft.	Capital Levy*	Operating Cost	Revenues	Operating Levy
Phase 2 – Aquatics	14,000 SF	$7.0 million	$500	$155	+/-$1.15 million/yr.	+/-$500,000	$290 (50% subsidy)
Phase 3 – Ice Arena	28,000 SF	$7.0 million	$250	$155	+/-$500,000/yr.	+/-$400,000	$55 (20% subsidy)

Scaling comparative recent pool operating budget data from Qualicum Beach population 9,000, in the Regional District of Nanaimo (60,000 excluding City of Nanaimo), operating costs for a modest pool would be between $1.0 to $1.25 million per year, roughly 50% of that being (union) labour, 20% energy costs and 30% for all other overheads including insurance. The cost recovery models relies on a large enough population base to generate about 50% of operating costs through revenues and the remaining 50% through subsidy funded by taxation. In this case, it would translate into a subsidy cost per current household of $290 per year. Arenas are less expensive to operate owing to fewer staff, slightly lower energy costs and only an 8-month operating year. Arena operating costs are

usually 40% (20% if a twin arena), almost 20% energy costs and 40% other overheads. Arenas have more a predictable and reliable revenue stream as rentals tend to be almost entirely bookings for the entire season, whereas pools rely on a combination of program registrations and less predictable drop-in visits. Subsidy for an arena translates into $55 / year for the current tax-base. With arenas, if the regional demand is significant enough, there is potential to break even or even yield a modest operating surplus – depending entirely if most of off-prime time can be sold to adult leagues at higher rates.



Isometric diagram of an air-supported structure

Exterior view of a Rigid-Frame Fabric Structure arena

A pre-engineered metal building with sport flooring and plywood panels to protect metal walls

On the following pages are the functional program area spacelists for the three Phase 1 options as well as Phases 2 and 3. This is followed by a financial analysis of Phase 1 and conceptual layouts.

Village of Pemberton Recreation Centre Space Program

Phase 1 - Fieldhouse / Gymnasium

		Air-Supported Dome SF	Rigid-Frame Fabric SF	Pre-Eng. Metal SF
1.1	Indoor Soccer Pitch	21,850	21,850	21,850
1.2	Gymnasium Court	8,050	8,050	8,050
1.3	Gymnastics (dedicated)	5,250	5,250	5,250
1.4	Locker Rooms / Washrooms (2)	950	950	950
1.5	Storage	600	500	500
1.6	Reception and Office	250	250	250
1.7	Bonus Mezzanine (not in total)	-	1,550	1,550
1.8	Circulation / Lobby / Vestibules	600	1,100	1,050
1.9	Mechanical	Outdoor	Outdoor	Rooftop
1.10	Walls and Structure	-	-	200
	Gross Building Area SF	**37,550**	**37,950**	**38,100**

Phase 2 - Aquatics Centre

		Area SF
2.1	6-Lane 25-Metre Tank	4,050
2.2	Tot Pool	450
2.3	Spa Pool	150
2.4	Steam Room (optional)	150
2.5	Deck Area	3,200
2.6	Locker Room Expansions (2)	1,500
2.7	Family Change Rooms (4)	250
2.8	Pool Staff / Lifeguards Room	150
2.9	Pool Storage	200
2.10	Pool and Building Mechanical	900
2.11	Dance Studio / Multi-Purpose Room	1,500
2.12	Servery Kitchen	150
2.13	MPR Storage	150
2.14	Lobby Expansion / Circulation	950
2.15	Walls and Structure	250
	Gross Expansion Area SF	**14,000**

Phase 3 - Ice Arena

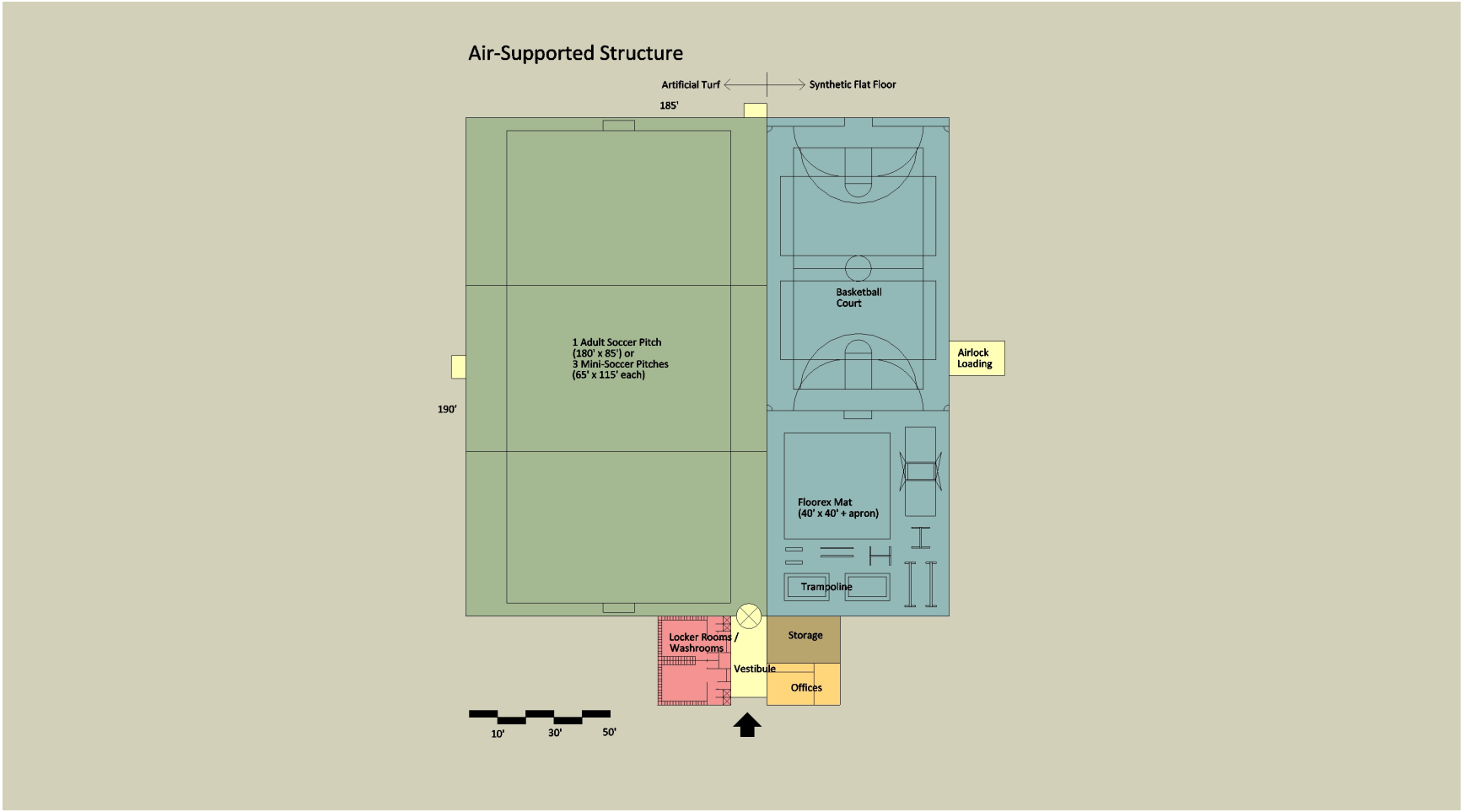
		Area SF
3.1	NHL-size Ice Surface	16,500
3.2	Team Benches, Penalty Boxes	650
3.3	Circulation, Header Trench, Apron	3,400
3.4	Bleacher Seating Footprint (cap. 20(	800
3.5	Team Rooms (4)	1,800
3.6	Refs / Mixed-Gender Locker Rooms (	600
3.7	First Aid Room	100
3.8	Skate Shop	100
3.9	Arena Manager's Office	100
3.10	Workshop	200
3.11	Ice Resurfacer / Ice Pit	1,250
3.12	Ice Plant / Arena Mechanical	950
3.13	Chiller	Outdoors
3.14	Lobby / public skate change	1,000
3.15	Walls and Structure	550
	Gross Expansion Area SF	**28,000**

Village of Pemberton Recreation Centre Phase 1 - Fieldhouse / Gymnasium

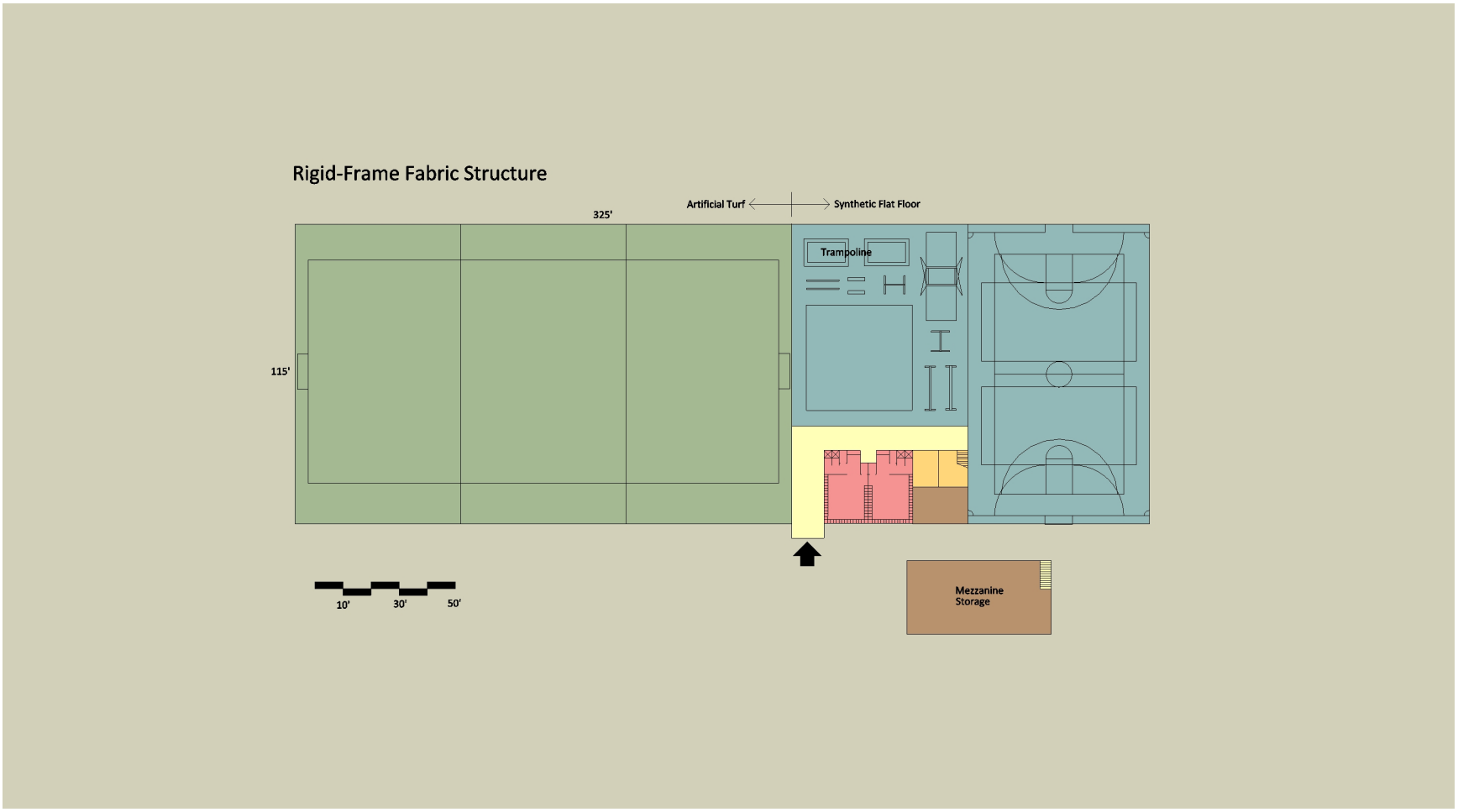
		Option 1 Air-Supported Dome	Option 2 Rigid-Frame Fabric	Option 3 Pre-Eng. Metal
1	Area Main Structure Footprint	35,150 SF (190' x 185')	37,950 SF (330' x 115')	38,100 SF (260' x 185')
2	Service Life	10-15 Years	10-20 Years	25-35 Years
3	R-Value	R2-R7 (claims of R12)	R-20 (maximum)	R-12 walls R-20 roof
4	Manufacturer's Price	$600,000 ($17/SF)	$2,270,000 ($60/SF)	$3,620,000 ($95/SF)
5	Lighting (300 lux)	$35,000	$35,000	$25,000
6	ATCO 'wet' units ($175/SF)	$350,000	n/a	n/a
7	Civil Work,Services, Foundation and Drain System	$550,000 ($15/SF)	$550,000 ($15/SF)	$800,000 ($30/SF)
8	Code Life Safety Requirements ($2/SF)	$80,000	$80,000	$50,000
9	Turf / E-layer ($5/SF)	$110,000	$110,000	$100,000
10	Sport Flooring ($5/SF)	$50,000	$50,000	$30,000
11	Fence	$15,000	$15,000	n/a
12	Site and Parking	$100,000	$100,000	$70,000
13	FF&E and Fitness Equipment	$150,000	$150,000	$85,000
14	Outdoor FIFA Soccer Grass Soccer Field	$250,000	$250,000	$250,000
15	Children's Playground	$45,000	$45,000	$45,000
16	**Construction Total**	**$2,335,000**	**$3,655,000**	**$4,975,000**

		Option 1 Air-Supported Dome	Option 2 Rigid-Frame Fabric	Option 3 Pre-Eng. Metal
16	**Construction Total**	**$2,335,000**	**$3,655,000**	**$4,975,000**
17	Soft Costs 20%	$467,000	$731,000	$995,000
18	**Total Project Cost (excl. tax)**	**$2,802,000**	**$4,386,000**	**$5,970,000**
19	Debt Cost (4%, 25 years amortization) ($60,000 annual cost per $1.0 million)	$170,000	$260,000	$360,000
20	Capital Replacement Sinking Fund	$40,000 5% of fabric and turf	$35,000 5% of fabric and turf	$8,000 2% of building
21	Cost per Household (6,000/3 = 2,000 Households)	$105	$148	$184
22	Operating Costs: Labour and Overheads	$ 148,000 * ($4/SF)	$ 152,000 ($4/SF)	$152,000 ($4/SF)
23	Operating Costs: Energy Costs	$ 74,000 * ($2/SF)	$ 38,000 ($1/SF)	$38,000 ($1/SF)
	Cost per Household with 50% Revenue Recovery	$ 56	$ 48	$ 48
24	**Average Hourly Required Revenue** for 50% recovery based on 1,600 Primetime hours / year (50 hrs./wk. x 32 weeks)	**$ 69**	**$ 59**	**$ 59**
25	**Total Cost Per Household Per Year**	**$161**	**$195**	**$232**

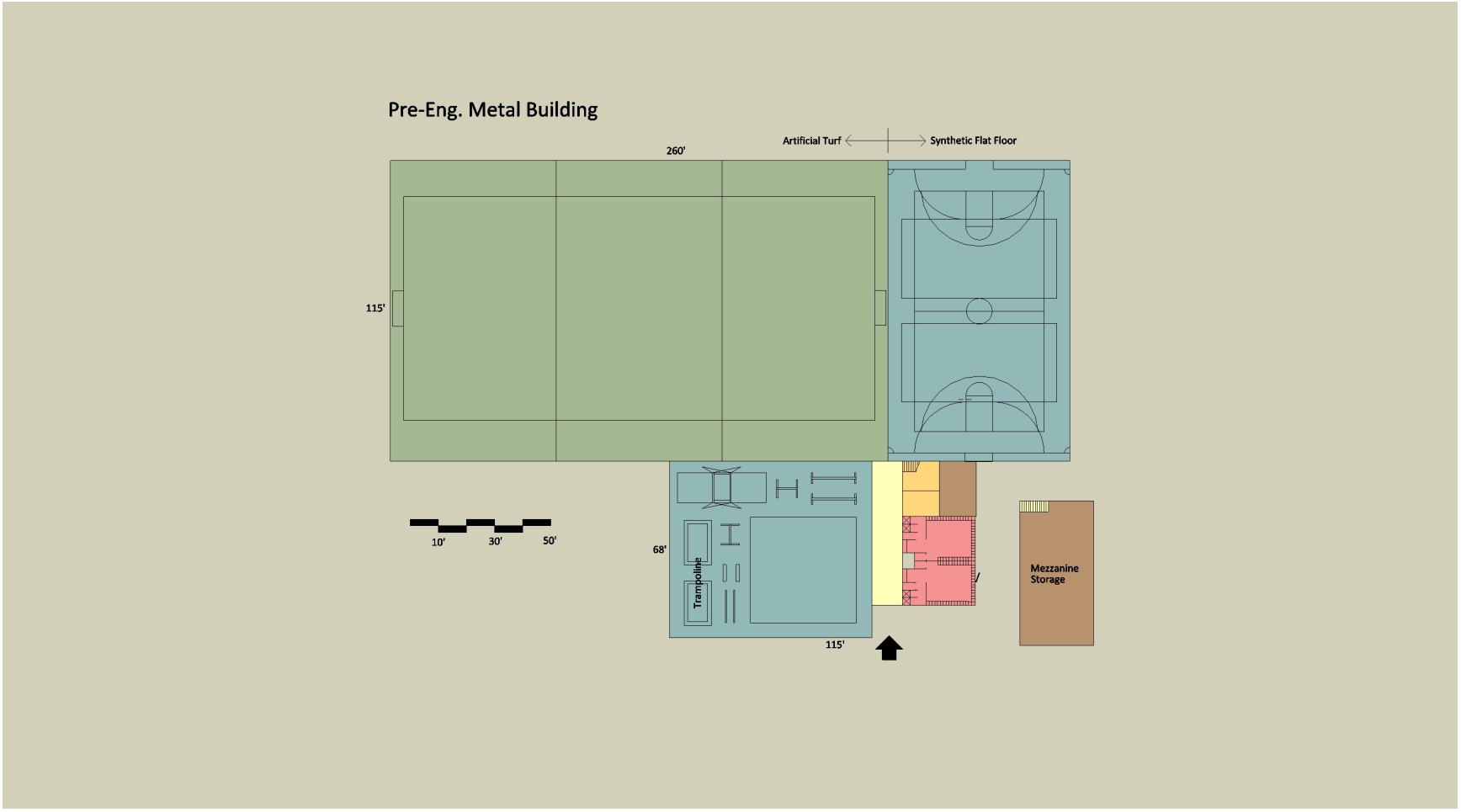
* Note: Energy costs projected to rise between 5-10% each year for next 5 years, increasing operating costs annually



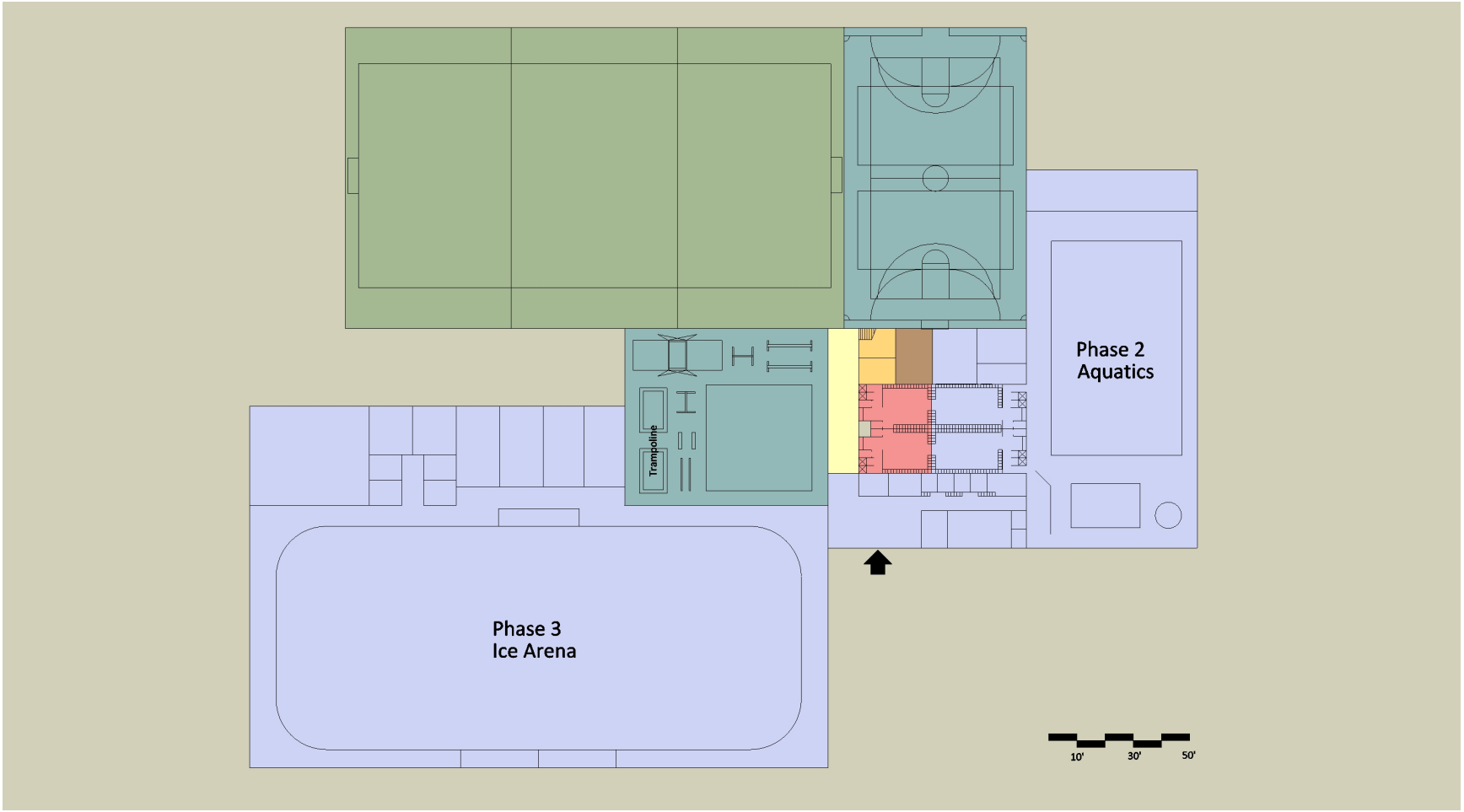
Option 1. Bubble or Dome would feature an indoor soccer pitch (board-less) with three mini-soccer perpendicular, a gymnasium (1 basketball, or 2 volleyball), and an gymnastics area (40' x 40' floorex mat, bars, beams, trampolines). Artificial turf shown in green, synthetic flooring blue, locker rooms red, offices in orange, storage in brown and circulation in yellow.



Option 2. A Sprung-type structure minimizing structural span resulting in a long narrow building. Sprung prefers rounded ends for structural stability but will design with flat-end gables. Team rooms and offices are built as a building-within-a-building with a small usable mezzanine above suitable for viewing or storage.



Option 3. Metal-clad building is comparatively more expensive to build, but would be the most durable and long-lasting and represents the best long-term investment. This building type can be added to whereas the previous options require a setback on all sides. The option could also feature a small usable mezzanine.



Option 3. Metal building with Phase 2 Aquatics with lobby expansion and Phase 3 Ice Arena added.