Pickleball Pilot Study Report











So, what's all the racket about pickleball?



Seattle
Parks & Recreation

healthy people healthy environment strong communities

A. SUMMARY

Over the past few years, numerous community members have reached out to Seattle Parks and Recreation (SPR) to request increased access to courts which support the game of pickleball. In order to assess the feasibility of meeting the pickleball demand, a pilot study was conducted. The report which follows is a brief summary of the findings from the pilot study. In summary, this report will:

- Provide background on the game of pickleball
- Describe the pilot study process
- Provide a summary of data collected during the pilot study
- Recommend next steps for supporting SPR's pickleball programming

B. INTRODUCTION

There has been an increased demand over the past few years for access to indoor and outdoor pickleball courts. In order to assess the feasibility of meeting this pickleball demand, a pilot study was initiated in early 2017. The pilot study looked at pickleball history, recreation trends, current court programming and included engagement with both tennis and pickleball advocates.

Outdoor Striping Project

As part of the pilot study, a striping project was initiated to quickly test the demand and interest in outdoor courts as well as the feasibility of tennis and pickleball being played on the same court. The striping project was implemented by dual-striping pickleball lines on outdoor tennis courts around the city. The striping project began in Summer 2017 and was completed in Fall 2017. The striping remains in place at all sites.

Before the 2017 striping project, one designated outdoor pickleball court existed within the SPR system at Maple Leaf Reservoir Park and two tennis courts (Kinnear Park and the Observatory Courts) already had dual-striping. Initially two additional sites were selected for the striping project. Following public testimony and an enthusiastic request for more sites by the pickleball community, five more courts were added as striping project sites. 11 portable nets, 48 paddles and balls were also purchased and made available at community centers close to the dual-striped courts. The striping project sites and the number of pickleball courts striped are as follows:

Pilot Striping Project Sites

Location	Number of Pickleball Courts Striped	Park Maintenance District
South Park Community Center	2	Southwest
Georgetown Playfield	4	Southeast
Delridge Community Center	4	Southwest
Discovery Park	4	Central West
Miller Community Center	4	Central East
Soundview Playfield	4	Northwest
Green Lake Park (East)	2	North Central
TOTAL	**24**	

Indoor Pickleball Programming

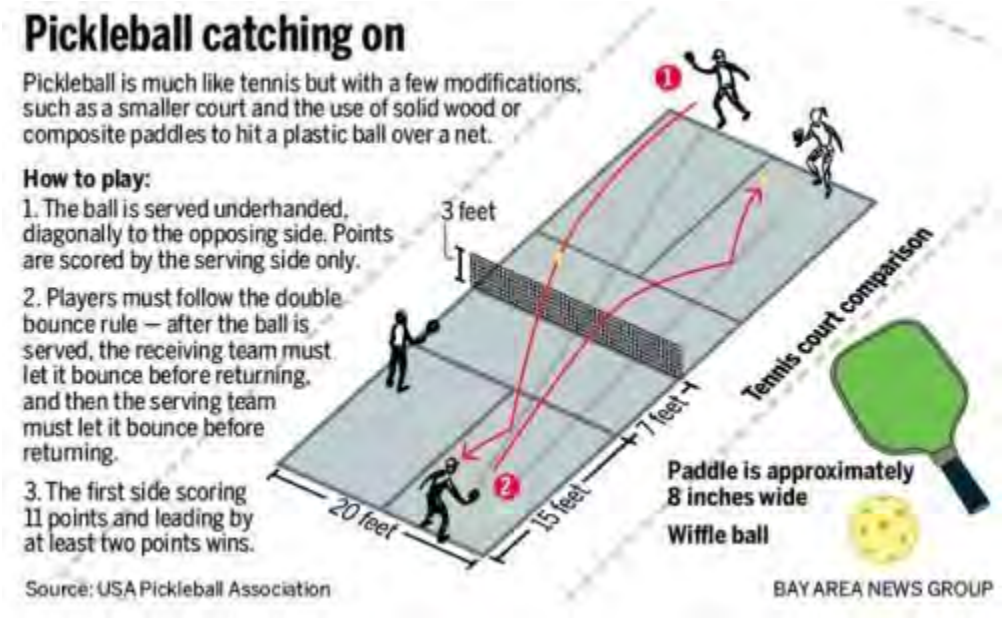
Seattle Parks and Recreation also has indoor pickleball at multiple community centers across the city. These courts have been programmed as part of Lifelong Recreation for a number of years. The establishment of free drop-in programs at community centers beginning in 2017 has led to an observable increase in attendance of drop-in pickleball. Pickleball is scheduled in many gymnasiums during both operating and non-operating hours. To maintain historic pickleball schedules, Community Centers have extended staff work schedules to monitor programs outside of operation hours without the means of recovering the cost of providing these additional hours. Beginning with the 2020 fiscal year, the Recreation Division will discontinue the practice of offering programming outside of operating hours without revenue to support Building Monitor expense.

C. BACKGROUND

History

Despite its curious name, the game of pickleball has absolutely nothing to do with pickles. Accounts vary on exactly what inspired the designation (a reference to a pickle boat or a dog named Pickles) but it's clear the name stuck.

In addition to the ambiguity surrounding the origins of the name of the game, many are unaware that pickleball started in the Seattle area. The fathers of pickleball, Joel Pritchard, Bill Bell and Barney McCallum were three Bainbridge Island dads trying to keep their children busy during the summer of 1965. They combined rules and equipment from tennis, badminton and ping pong, using a paddle for a racket and a whiffle ball, and henceforth to be known as the game of pickleball.



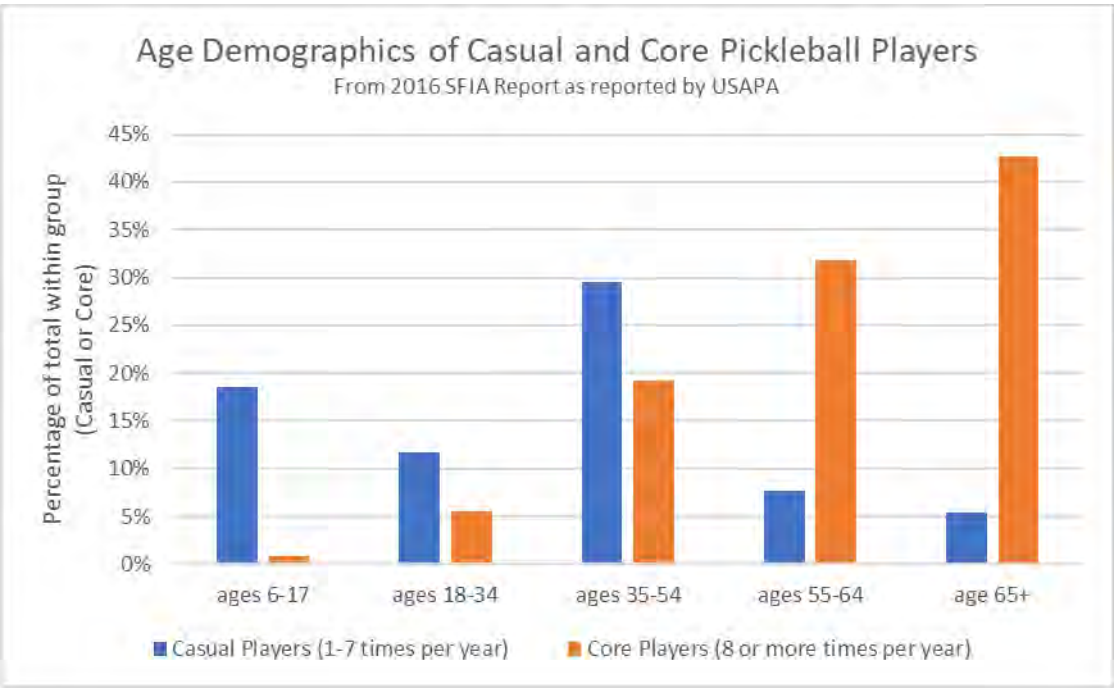
Since its humble beginnings in 1965, the game has been growing both nationally and internationally. In 1984, the USA Pickleball Association (USAPA) was formed to "perpetuate the growth and advancement of pickleball on a national level." The first rulebook was also published that year. By 1990, the game had spread outside of Washington and was now being played in all 50 states. In 2008, there were 420 places to play in the United

States and Canada combined. Now, almost a decade later there are nearly 4,000 locations around the world where pickleball can be played. Additionally, the USAPA has established a grant program to assist players in creating new courts. The program has been responsible for over 1,400 new pickleball courts. Interest in pickleball has grown to support an industry of specialized equipment manufacturers and vendors, along with tournaments throughout the country where players (some sponsored) compete for cash prizes and notoriety.

Player Demographics

Although pickleball started as a family activity, the game became popular among seniors. This was evident in 2008, when pickleball was introduced as a part of the National Senior Games Champion Festival. While still highly popular with seniors, according to a 2017 Sports & Fitness Industry Association (SFIA) report there are currently 3,100,000 pickleball players of all ages. A 2016 SFIA report characterized about 63% of these players as "Casual," meaning that they play 1-7 times a year, and 37% of players being "Core," meaning that they play 8 or more times a year. Pickleball has captured the attention of younger generations which is still a small but growing demographic. The game is being taught in middle and high school with instruction branching out to the college level as well.

The common format for pickleball play (20-30 minute doubles games to 11, after which opponents rotate) encourages a social experiences. In Seattle, many pickleball games, practices and matches include people of all ages. In an effort to continue the momentum of diverse interest, association players have been providing free clinics and events targeted to expose underrepresented communities to pickleball. This includes people with disabilities who are engaging in a version of the game modified to accommodate people playing in wheelchairs https://www.usapa.org/wheelchair-pickleball/.



D. PILOT STUDY

Community Engagement & Pilot Methodology

The striping project was implemented by adding pickleball striping to existing tennis courts. The courts were selected based upon the following criteria:

- Equitable court distribution citywide
- Existing activity
- Preventing disruption of scheduled tennis court use
- Court condition



A Dual-striped tennis/pickleball court with pickleball shown in dark blue

As part of the pickleball study SPR staff engaged with both internal and external stakeholders. Multiple meetings were held with pickleball association leadership as well as SPR recreation staff. Recommendations were solicited from national and local pickleball and tennis associations to ensure courts were striped according to accepted standards.

Tennis courts have been successfully converted to pickleball courts while keeping the courts within United States Tennis Association (USTA) and International Tennis Federation (ITF) regulations. By USTA and ITF rules, tennis court lines must be white. Pickleball court lines can be added in a different color, so that tennis or pickleball can be played on the same court. It recommended to paint the pickleball lines in a way supported by USA Pickleball Association (USAPA) and USTA which is less distractive to tennis players. Both the USTA and the USAPA recommend that for such "blended" courts or "dual-striped" courts, the pickleball lines be within the same color family as the court surface and stop 3" before all white playing lines.

An SPR staff member designed the pickleball court layout with the intent of maximizing the amount of pickleball courts per tennis court. SPR also purchased nets, rackets and balls that could be checked out by players at no cost from nearby community centers.

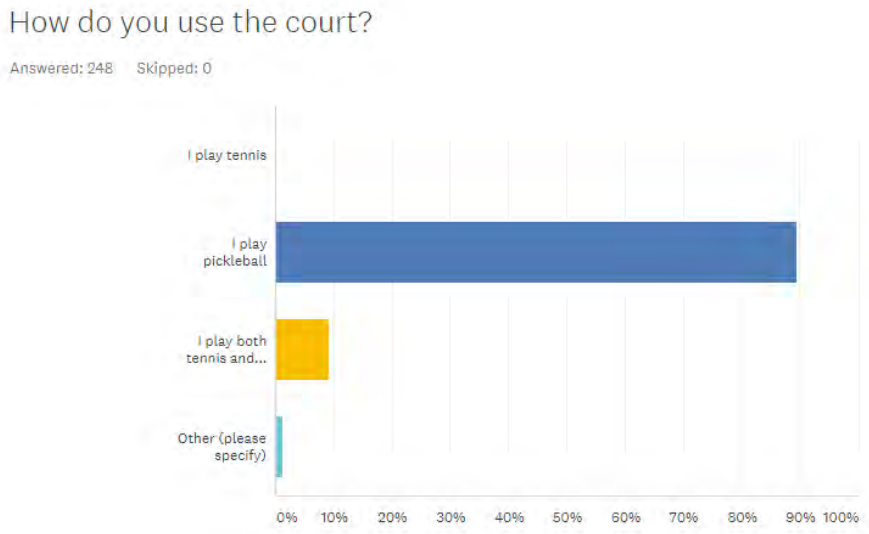
Upon launching the pilot, signage was displayed at all selected sites directing tennis and pickleball players to provide feedback on the striping. Court users were encouraged to provide feedback via email and through an online survey. SPR disseminated messaging about the pilot sites via:

- Pickleball player networks
- Tennis contacts in partnership with Amy Yee Tennis Center
- Social media

E. FINDINGS & DISCUSSION

Online Survey

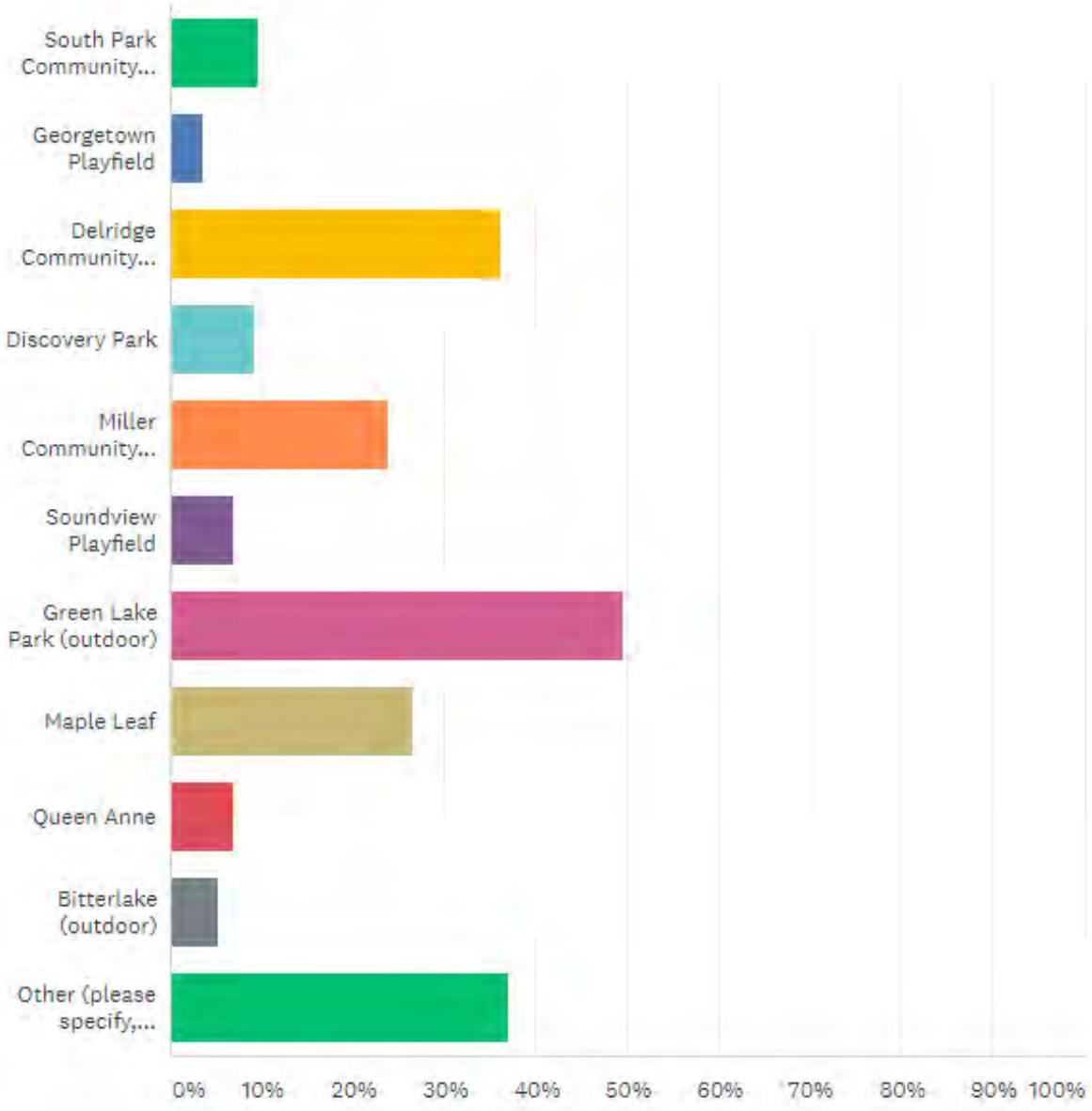
As mentioned in Section D, an online survey was created to receive input on playability and to determine if there was any conflict with tennis use. SPR received 248 responses to the survey with approximately 10% of survey responses from individuals that play both tennis and pickleball. However, we received no responses from people that exclusively play tennis. The results from the multiple choice questions of the survey are as follows:



ANSWER CHOICES		RESPONSES	
I play tennis		0.00%	0
I play pickleball		89.52%	222
I play both tennis and pickleball		9.27%	23
Other (please specify)	Responses	1.21%	3

Which courts have you been using?

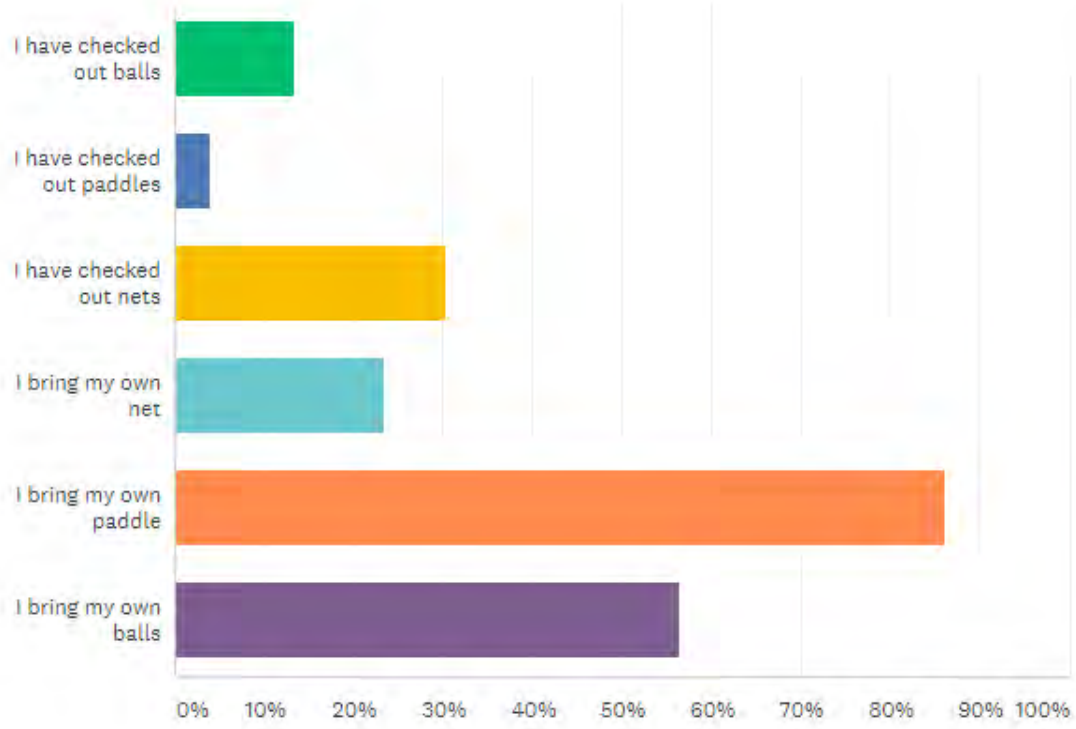
Answered: 248 Skipped: 0



**Green Lake Park refers to the courts at Green Lake Park East, north of the Green Lake Community Center parking lot.*

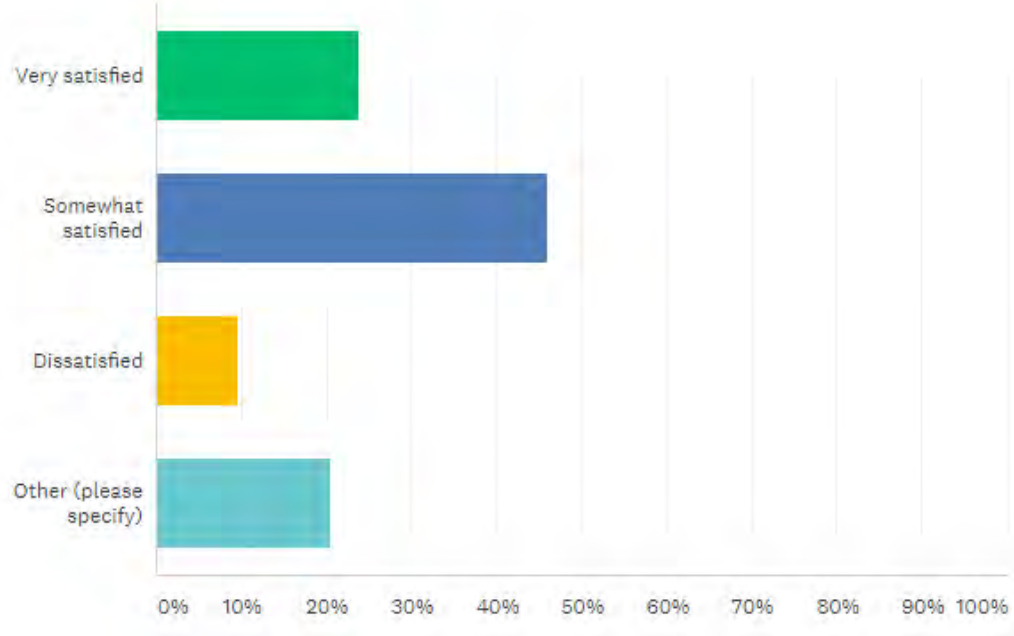
Have you checked out any pickleball equipment?

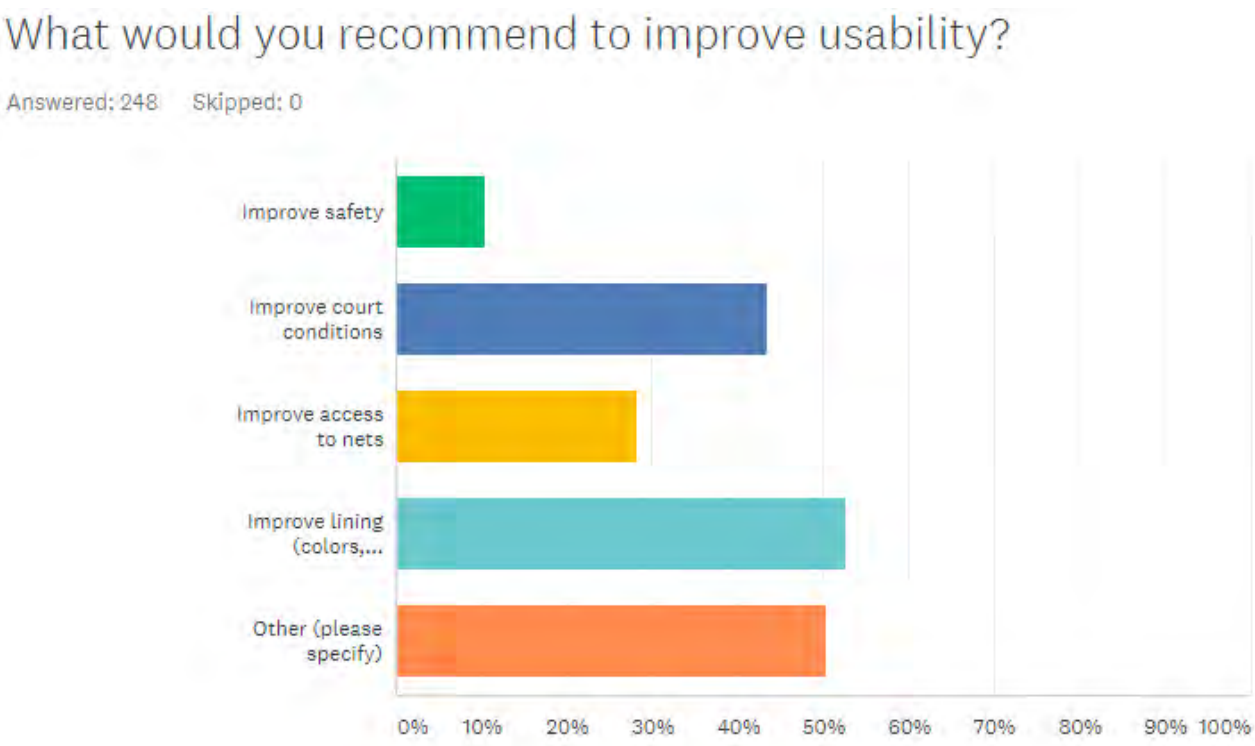
Answered: 248 Skipped: 0



How satisfied are you with the usability of the courts?

Answered: 248 Skipped: 0

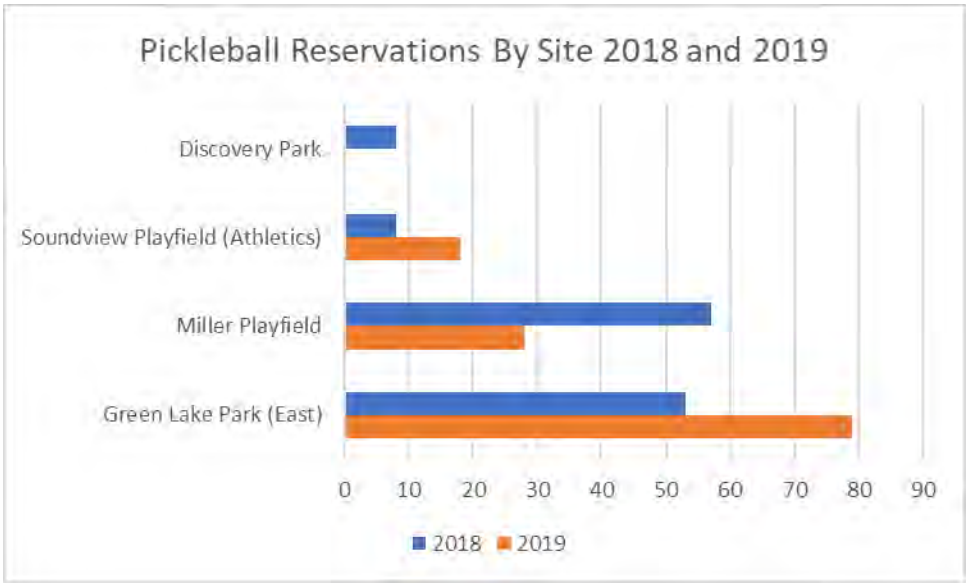




In addition to the multiple-choice questions, players had the opportunity to provide comments via the survey and via email. A summary of findings from the survey, emails, and discussions with key stakeholders are as follows:

Court Locations & Scheduling:

- Pickleball courts located next to community centers were the most popular; South Park Playfield, Delridge Playfield, Miller Playfield, and Green Lake Park (East). While most pickleball activity on outdoor courts happens on a drop-in basis, the courts at preference for Miller Playfield and Green Lake Park East was also reflected in 2018 and 2019 reservation data.



- Several SPR Community Centers hold indoor pickleball drop-in hours in gyms throughout the fall, winter, and spring, but in some locations these programs are suspended for the summer. This affects pickleball players who regularly play in their neighborhoods, leaving them without a nearby location to play.
- The Green Lake East site was the most popular. Despite having only two pickleball courts, players seemed to enjoy the opportunity to socialize in this active space. In comparison, Georgetown, a less active space without nearby community center, wasn't very well used even though it had 4 courts.
- In May of 2019, SMPA arranged with SPR to reserve courts at Soundview, Green Lake East, Delridge and Miller for weekly league and drop-in times for the summer 2019 season along with a tournament day on July 4th.

General Satisfaction:

- Most pickleball players play pickleball exclusively, with a small percentage playing both tennis and pickleball.
- Most players reported satisfaction with the courts. However, it was noted that usability could be improved with well-designed striping and improved court surfacing. Access to nets has always been an issue particularly when it comes to sharing courts with tennis players or for people who want to play and don't own nets.
- There were many comments from pickleball players requesting dedicated courts.

Equipment & Court Design:

- Court conditions, striping, and access to nets show up consistently as elements that improve usability.
- While the survey indicated that the dedicated pickleball courts at Maple Leaf Reservoir Park are relatively well-used, SPR has also received feedback that it has certain drawbacks: the wall is not often used, there's a limitation to having only two courts at the location, and the courts proximity to the walking path creates opportunity for conflict between balls, players, and walkers.



A semi-permanent net at Miller Playfield

- Front desk staff at community centers next to dual-striped courts report that checking out nets is popular (especially when the weather is good) and their check-in check-out processes runs smoothly, though SMPA representatives report that net check-out policies can vary a bit between community centers. Both players and maintenance staff have also provided positive feedback about the semi-permanent nets installed at Miller Playfield and Green Lake Park East courts.
- While the community centers are also equipped with paddles for check-out, staff report that this is much less common (consistent with the findings in the online survey).
- The pilot study included a number of different arrangements of striping. Those that maintain pickleball courts in the same orientation of the tennis courts (generally north-south) seem to be preferred by pickleball players. SPR staff received reports that the pickleball lines in general could be confusing for new tennis players. In some locations (notably Green Lake East), pickleball players began to add lines with tape to expand the number of courts for use in drop-in, tournament, and league play.

Initially, some of the tapes used damaged the surfacing of and left residue on the court until SPR staff asked players to use lower-adhesive tape.

Cost and Funding:

- The cost to resurface an outdoor sports court is estimated to be between $10,000 to $30,000 while adding the blended lines is estimated to be between $600 to $800 depending on the surface and condition of the existing court.
- SPR currently has a small capital program for items such as resurfacing, replacement of large equipment, and fencing. The total budget for outdoor sports courts is approximately $100,000 per year.
- During the course of the pilot study, SMPA was awarded a grant to add semi-permanent nets at the Green Lake Park East and Miller courts for approximately $5,000.

F. GENERAL OUTDOOR RECOMMENDATIONS

1. Maintain dual-striping at existing pilot sites.

Configuration of striping may change as courts are resurfaced to better meet the needs of pickleball and tennis players and per developed standards per General Outdoor Recommendation 3. Once striping is expanded, discontinue allowance for taping on courts which risks damage from adhesives.

2. Apply the following criteria to select future dual-striped courts:

- Select locations that allow for multiple pickleball courts where possible;
- Select locations near community centers or other hubs of activity, especially centers where indoor pickleball programming is limited during the summer;
- Eliminate locations where USTA matches are held (currently Amy Yee Tennis Center and Lower Woodland Park) and prioritize courts that are not scheduled for practices or other matches
- Prioritize distribution citywide with consideration to include both geographic and historic inequities; and
- Prioritize courts where work orders for graffiti or other vandalism indicate under-utilization.

3. Develop design standards for dual-striping that:

- are consistent with USTA and USAPA standards (white for tennis, color within the same family as the court color for pickleball);
- prioritize player safety in respect to proximity of courts and orientation;
- facilitates scheduling of courts for either tennis or pickleball; and
- minimally diminishes the playability of the court for tennis.

4. Continue ongoing intradepartmental and stakeholder coordination for discussion and addressing long term planning as well as keeping in tune to the needs of the community.

Include recreation (tennis, lifelong recreation) staff, planning staff, Seattle Metropolitan Pickleball Association members. See also Indoor Recommendation 6.

5. **Include pickleball facilities into departmental asset management planning and condition assessments.**

    - Pickleball courts will be included in condition assessments with other sport courts and resurfaced/repaired based on their relative condition across the system.
    - For projects that require design, project concepts will be added to the Asset Management Plan (AMP) with other known major maintenance needs and compete for funding based on how they score per the AMP criteria (facility integrity, safety, code/legal requirements, equity, etc.).

6. **Conduct a feasibility study for improved playability and safety at the Maple Leaf Park dedicated pickleball court.**

    - The study will inform whether a project should be added to SPR's Asset Management Plan and funded based on departmental priorities.

G. SITE-SPECIFIC OUTDOOR RECOMMENDATIONS

1. Dual-striped Sites

Based on an evaluation of all tennis courts with multiple courts and using the recommended criteria outlined in **Section F**, the following sites listed in the table below are recommended for dual-striping:

District	Current Pickleball Courts	Current Number of Courts*	Recommended New Dual-Striped Courts*
NW	Soundview Playfield Green Lake (East)	4 2	Bitter Lake Playfield
NE	Maple Leaf (dedicated)	2	Meadowbrook Playfield
CW	Kinnear Park Observatory Courts Discovery Park	2 1 4	Magnolia Playfield
CE	Miller Park	4	Garfield Playfield
SW	Delridge Playfield South Park Playfield	4 2	Walt Hundley Playfield
SE	Georgetown Playfield	4	Rainier Playfield
TOTAL		**29**	

*The number and design of future dual-striped courts will be determined per standards developed per recommendation 3 above.

For those future dual-striped courts next to community centers (Garfield, Bitter Lake, Meadowbrook, Rainier and Walt Hundley), nets, balls and at least two paddles should be made available to check out.

2. Dedicated Pickleball

The following sites are recommended to be considered for dedicated pickleball sites:

- Warren G Magnuson Park (Magnuson) tennis courts OR Ravenna Park basketball courts
    - Use of the Magnuson tennis courts is provisional until implementation of the wetland portion of the Magnuson Park Master Plan.
- Maple Leaf (improvement project for existing court)

H. GENERAL INDOOR RECOMMENDATIONS

1. Transition the coordination of drop-in Pickleball from Lifelong Recreation to the Community Centers that offer the program. Moving schedule responsibility to the facility will create direct coordination between staff responsible for facility scheduling and the community. There would need to be a commitment to maintain the historic schedule when possible.

2. Establish a consistent check-in system using Quick Cards at all facilities offering Pickleball to track attendance at existing free drop in times within operating hours.

3. Create the means to maintain historic Pickleball drop-in schedules and to increase access to more effectively meet the needs Pickleball players of all ages and abilities. The mechanisms to achieve this recommendation include:
    a. Adjust Community Center operating hours to include historic Pickleball schedule;
    b. Submit a request to the Superintendent to offer a pay-to-play Pickleball pilot program;
    c. Offer a fee-based instructional Pickleball program where the program revenue offsets the cost of Building Monitor payroll;
    d. Coordinate a gym rental program for the Pickleball community to determine a schedule and locations where players collectively cover the room rental rate and Building Monitor payroll.

4. Provide an administrative structure for programming enhanced indoor Pickleball programs to include indoor tournaments and instructional classes in select sites. Include opportunities for sponsorship from the private nonprofit and for-profit businesses to support greater diversity of programs offered.

5. Support the Pickleball community to employ a community endorsed method to improve the distribution and communication of scheduled drop to align with the player's ability and intent. Include using Pickleball industry best practices to adopt a standard rating scale to improve classification and distribution of varying levels play during drop in programs.

6. Reserve a monthly meeting time between SPR staff and representatives from the greater Pickleball community as well as members of the Seattle Metropolitan Pickleball Association for issue driven engagement. See also General Outdoor Recommendation 4.

APPENDIX A: Other Studies and Resources

- Seattle Parks and Recreation 2017 Parks and Open Space Plan *http://www.seattle.gov/parks/about-us/policies-and-plans/2017-parks-and-open-space-plan*
- *http://www.tennisindustrymag.com/articles/2015/11/15_pickleball_and_tennis_can_t.html*
- *https://www.researchgate.net/publication/320301682_Importance_of_playing_pickleball_for_older_adults'_subjective_well-being_A_serious_leisure_perspective*
- *http://www.bhpioneer.com/local_news/spearfish-city-park-basketball-tennis-courts-to-be-converted-into/article_0ff47504-d2f2-11e8-a526-ff4860944777.html*
- 2017 Outdoor Basketball Court Inventory; this includes the equity factors *GIS Mapping http://seattlecitygis.maps.arcgis.com/apps/MapSeries/index.html?appid=cf30d2368e0f47429b4c5c78b8cc7efa*
- *http://www.pickleballstation.com/*
- *https://www.mateflex.com/blog/basketball-and-pickleball/*
- *https://bleacherreport.com/articles/1857664-why-is-american-tennis-dying*
- *https://www.athleticbusiness.com/recreation/emphasis-on-youth-tennis-programming-driving-participation.html*
- *https://www.usapa.org/wp-content/uploads/2019/02/2019-Pickleball-Fact-Sheet.pdf*

APPENDIX B: Future Dual-Striping Selection Matrix

Maintenance District	Park Name * (Court, where multiple)	Number of Courts	Tennis Practice or Match Court	Race and Social Equity Index Position	Community Center on Site	Indoor Programming Limited in Summer	Total Weighted Score for All Criteria (higher score = higher priority)
Central East	Garfield Playfield	2	practice	Second highest	X		**3.42**
	Rogers Playground	2	practice	Lowest			**1.92**
	Madrona Playground	2	practice	Second lowest			**1.92**
	Montlake Playfield	2	practice	Lowest	X		**1.67**
	Madison Park	2	practice	Lowest			**0.67**
	Volunteer Park (Lower Courts)	2	practice	Lowest			**0.67**
	Volunteer Park (Upper Courts)	2	practice	Lowest			**0.67**
Central West	Magnolia Playfield	4	no	Second lowest	X		**3.58**
	David Rodgers Park	3	no	Lowest		X	**2.50**
	Magnolia Park	2	no	Lowest			**1.17**
Northeast	Meadowbrook Playfield	6	match	Second highest	X	X	**4.50**
	Ravenna Park	2	no	Middle			**2.92**
	Wallingford Playfield	2	no	Lowest			**2.42**
	University Playground	2	no	Second highest			**2.17**
	Froula Playground	2	practice	Second lowest			**1.92**
	Bryant Neighborhood Playground	2	practice	Lowest			**1.67**
	Laurelhurst Playfield	4	match	Lowest	X		**1.58**
Northwest	Bitter Lake Playfield	4	practice	Highest priority/Most disadvantaged	X		**2.83**
	Gilman Playground	2	practice	Second lowest			**1.92**
	Green Lake Park (West)	2	practice	Lowest			**1.67**
	Woodland Park (Upper Courts)	4	match	Lowest			**0.33**
Southeast	Rainier Playfield	4	match	Second highest	X	X	**4.08**
	Beacon Hill Playground	2	no	Highest priority/Most disadvantaged			**3.42**
	Jefferson Park	4	match	Highest priority/Most disadvantaged	X		**3.33**
	Rainier Beach Playfield	4	match	Highest priority/Most disadvantaged	X		**3.33**
	Dearborn Park	2	no	Highest priority/Most disadvantaged			**3.17**
	Mount Baker Park	2	no	Second highest			**2.92**
	Brighton Playfield	2	practice	Highest priority/Most disadvantaged			**2.67**
	Sam Smith Park	2	practice	Second highest			**2.42**
	Hutchinson Playground	2	no	Highest priority/Most disadvantaged			**2.17**
Southwest	Walt Hundley Playfield	2	no	Highest priority/Most disadvantaged	X		**4.17**
	Alki Playground	2	no	Second lowest	X		**3.42**
	Hiawatha Playfield	3	practice	Second lowest	X		**3.25**
	Solstice Park	6	match	Second lowest			**1.75**

*Per the recommendations, this list only includes banks of multiple courts where pickleball lines don't already exist and USTA matches are not held.

APPENDIX C: Indoor Drop-In Pickleball Hours Spring 2019

GEO/Day and Time		Level of Play	Community Center (CC)	CC Operating hours	# Hours	# Hours lost
NORTHWEST						
Mon	11:00 a.m. -1:00 p.m.	All Levels	Magnolia		2	
Tue	9:30 a.m. - 11:30 a.m.	All Levels	Ballard		2	
Wed	6:30 p.m. - 8:30 p.m. (only ½ gym)	All Levels	Ballard		2	
Tue/Fri	10:00 a.m. - 1:00 p.m.	Advanced	Bitter Lake		6	
Thu	6:45 p.m. - 8:45 p.m. (starts 4/4/19)	All Levels	Bitter Lake		2	
Thu	6:00 p.m. - 8:45 p.m. (starts 4/4/19)	All Levels	Green Lake		1.75	
Fri	Noon - 2:00 p.m.	All Levels	Loyal Heights		2	
Sat	11:00 a.m. - 2:00 p.m. (starts 4/6/19 - all ages welcome)	All Levels	Green Lake		2	
NORTHEAST						
Mon/Wed	10:00 a.m. - 1:00 p.m.	All Levels	Ravenna-Eckstein	12:30-8:30	6	**6**
Mon/Fri	11:00 a.m. - 2:00 p.m.	All Levels	Northgate		6	
Tue	6:00 p.m. - 8:00 p.m. (starts 4/2/19)	All Levels	Northgate		2	
Tue/Thu	10:00 a.m. - 2:00 p.m.	Recreational	Meadowbrook		8	
Wed	11:00 a.m. - 1:30 p.m.	All Levels	Northgate		2.5	
Th	9:00 a.m. - Noon	All Levels	Magnuson		3	
Fri	11:30 a.m. - 2:00 p.m.	Intermediate/Advanced	Ravenna-Eckstein	12:30-8:30	2.5	**2.5**
CENTRAL						
Mon	6:00 p.m. - 8:45 p.m.	Intermediate/Advanced	IDCC		1.75	
Mon	9:00 a.m. - 1:00 p.m.	Recreational	Miller	12-8	4	**3**
Wed	11:00 a.m. - 1:00 p.m.	All Levels	Queen Anne		2	
Fri	9:00 a.m. - Noon	Recreational	Miller	12-8	3	**4**
SOUTHWEST						
Mon	10:00 a.m. - 11:00 a.m.	All Levels	High Point		1	
Mon	6:00 p.m. - 7:45 p.m. (starts 4/8/19)	All Levels	High Point		1.75	
Mon/Wed	9:30 a.m. -11:30 p.m.	All Levels	Delridge	11-8	4	**4**
M/W/F	10:00 a.m. - 1:30 p.m.	All Levels	South Park		10.5	

GEO/Day and Time		Level of Play	Community Center (CC)	CC Operating hours	# Hours	# Hours lost
Tue/Thu	Noon - 2:00 p.m.	All Levels	Delridge		4	
Wed	10:00 a.m. - Noon	All Levels	High Point		2	
Fri	10:00 a.m. -Noon	Recreational	Hiawatha	12-7	2	**2**
SOUTHEAST						
Mon	10:00 a.m. - Noon	Advanced	Jefferson		2	
Tue/Thu	10:00 a.m. - 1:00 p.m.	All Levels	Rainier		6	
Tue/Thu	10:00 a.m. - Noon	All Levels	Yesler		4	
Wed/Fri	10:00 a.m. - Noon	All Levels (55+)	Van Asselt	2-8	4	**4**
				Totals	**101.75**	**25.5**

Times may vary during Seattle Public School breaks

****Community Centers W/O gym or court stripes - Alki, Laurelhurst, Lake City****

*****Community Centers with NO Pickleball drop in - Garfield, Rainier Beach, Montlake*****

Seattle
Parks & Recreation

2021-2022 Outdoor Pickleball Study



The purpose of this study is to build upon the recommendations of the 2019 Pickleball Pilot Study and guide the development, selection and operation of outdoor pickleball and dual-striped tennis-pickleball courts in Seattle parks. Specifically, it will examine layout options to establish a standard for dual-striped courts, investigate possible locations for dedicated pickleball courts, and engage users to gather feedback on design and use issues. The findings and recommendations developed within the study will be presented to the Board of Parks and Recreation Commissioners at the study's conclusion. The Seattle Park District provided $50,000 for this study. Thank you to everyone who served on the advisory committee, attended online open houses, participated in the survey, and reached out to the project team during the 2021-2022 Pickleball Study. Your input has been invaluable for informing the department's direction for developing new opportunities to play pickleball in the park system. You can download the summary report here.

Board of Parks and Recreation Commissioners Presentation

We briefed the Board of Parks and Recreation Commissioners on August 11, 2022. You can find a copy of the presentation here. You can also see a video of the full meeting on the Seattle Channel here.

View a quantitative summary of responses in the March 2022 Pickleball Survey Results document and a summary of the open-ended responses in the March 8th Qualitative Analysis of Survey Feedback memo.

Online Open House 3/30/2022

- March 30, 2022 Open House Video
- March 30, 2022 Open House Presentation
- March 30, 2022 Open House Notes From Q&A
- March 30, 2022 Open House Meeting Real Time Polling Results

Online Open House 5/25/2022

If you didn't have a chance to attend, that's okay, video of the main session, presentation materials, and meeting notes are here under the maps of the proposals for each of the breakout rooms:

- May 25, 2022 Open House Video
- May 25, 2022 Open House Presentation
- May 25, 2022 Open House Notes
- Maps for Breakout Room Discussions:
  Central
  Northeast
  Northwest
  Southeast
  Southwest

SEATTLE PARKS & RECREATION

2021-2022
Outdoor Pickleball Study

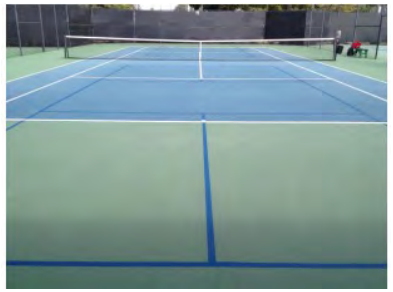
Final deliverable prepared by

BROADVIEW PLANNING

DA HOGAN

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SPR's Outdoor Pickleball Court Journey

Pickleball Pilot Program (2017)

Seattle Metro Pickleball Association Site Evaluation (2018)

Pickleball Pilot Report (2019)

2021 Pickleball Study (2021-22)

Future Pickleball Court Planning, Design, and Development

5 courts

29 courts

69 courts

77 courts

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2021-22
Outdoor Pickleball Study

- Builds off 2019 Pilot Study Recommendations:
  - Document the growth of pickleball
  - Refine where (which sites) and how (standards) for **dual-striping** tennis courts
  - Identify and recommend locations for **dedicated** outdoor pickleball courts
    - Evaluated 16 sites
    - Concepts for 2 sites
- Engage with Pickleball + Tennis Community:
  - 1:1 Interviews
  - Advisory Committee (9 meetings)
  - Online Survey (2,378 responses)
  - Public Meetings (2)

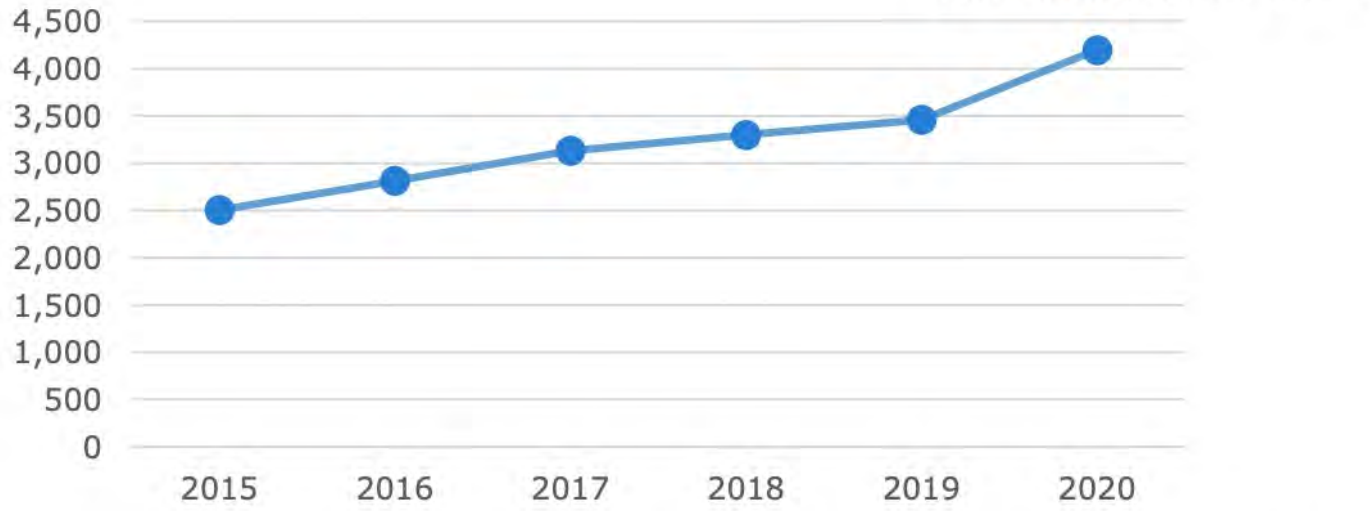
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Pickleball Trends

Total Pickleball Participation Trends

2015	2016	2017	2018	2019	2020	Change (2019-2020)	3-Year AAG	5-Year AAG
2,506	2,815	3,132	3,301	3,460	4,199	21.3%	10.5%	11.0%

*AAG= Average Annual Growth



*Participation figures are in the thousands

Source: Sports & Fitness Industry 2021 Single Sport Report on Pickleball

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Benchmark Cities

- **Portland** **1 court: 215,097 people**
  - 645,000 people; 3 City courts
- **Austin** **1 court: 21,129 people**
  - 951,000 people; dedicated: 16 outdoor courts, 17 indoor courts; 12 dual-striped outdoor courts
- **Phoenix** **1 court: 26,338 people**
  - 1,633,000 people; 24 indoor courts, 38 outdoor courts
- **Omaha** **1 court: 13,600 people**
  - 476,000 people; 14 outdoor dedicated, 21 outdoor dual-striped

- **Seattle** **1 court: 9,905 people**
  - (763,000 people; 77 outdoor courts)

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COMMUNITY ENGAGEMENT

Community Engagement Overview

- One-on-One Interviews
  - 8 interviews with tennis + pickleball stakeholders

- Advisory Committee
  - 9 Meetings
  - *The role of the Advisory Committee is to collaborate with SPR, and each other, to provide insight into developing new recreational opportunities for pickleball.*

- Online survey
  - 3,378 responses

- Two Community meetings
  - March, early May

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Advisory Committee Members

Anne Corsano, Community member

Gary Epstein, Amy Yee Advisory Council

Miguel de Campos, Seattle Metro Pickleball Association

Wil Look, Amy Yee Tennis Foundation

Clark Bailey, Amy Yee Advisory Council

Shari Bell, Community member

Johann Tan, Tennis Center Sand Point

John Hasslinger, Seattle Parks & Recreation

Matt Look, Seattle Parks & Recreation

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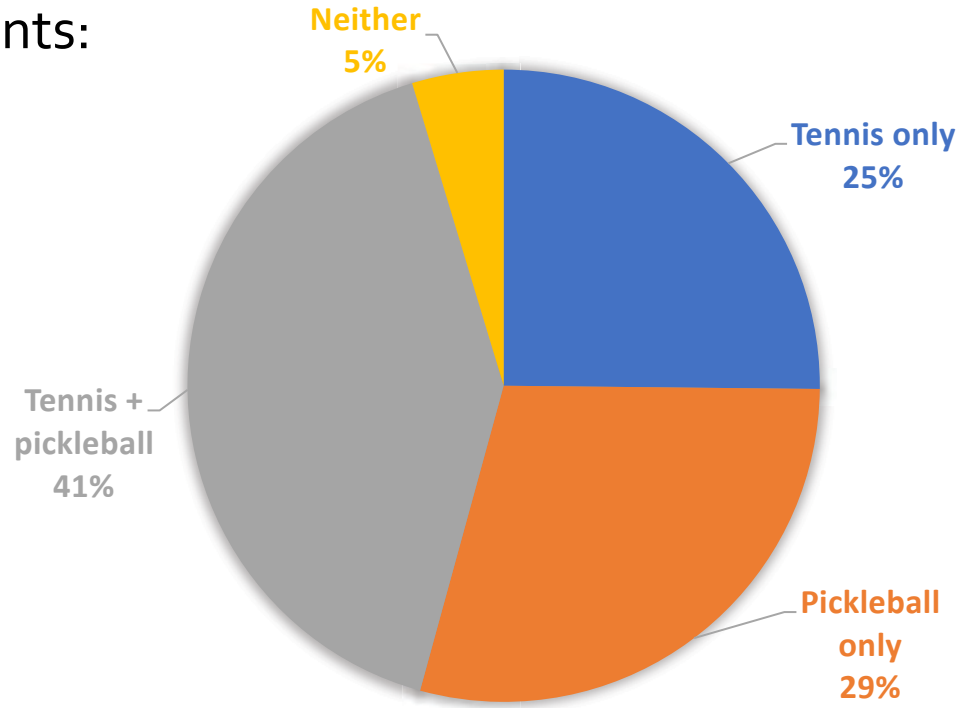
Engagement: 1:1 Interview Themes

- Pickleball builds community – it's a good social activity for all ages, all cultures, and all ability levels.
  - It's a growing sport for a reason - it's fun, accessible, and easy to learn.
  - Spans generations and builds inter-generational engagement.
  - Even tennis players have tried pickleball…
- But pickleball is a sport people are leaving Seattle to play.
  - Growing so fast there is a real value to having more and better courts
  - Seattle lags behind other cities in terms of addressing the growth of pickleball.
- Can cause conflict with tennis.
  - Pickleball noise and lines on tennis courts are distracting.
  - The more social nature of pickleball can be perceived as a lack of court etiquette and respect:
    - Disregard for existing permits, crowding courts, not removing equipment
- Both tennis and pickleball share a mutual demand for more, and better court resources.

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Engagement: Community Survey Results

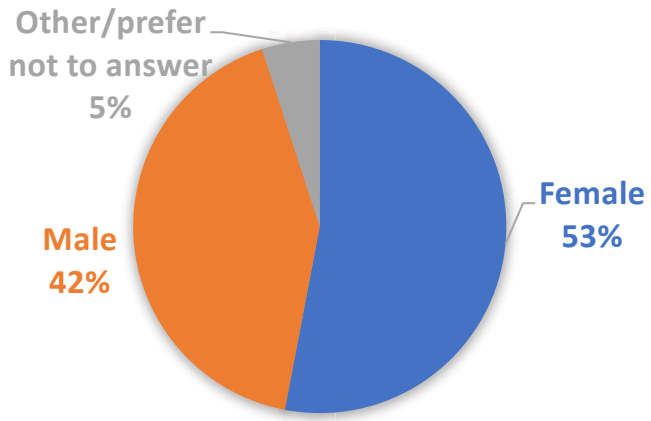
- A qualitative engagement tool, not quantitative.
- January 25 – February 11, 2022
- 3378 total responses, 75% response rate, average time: 6 minutes
- Good mix of respondents:



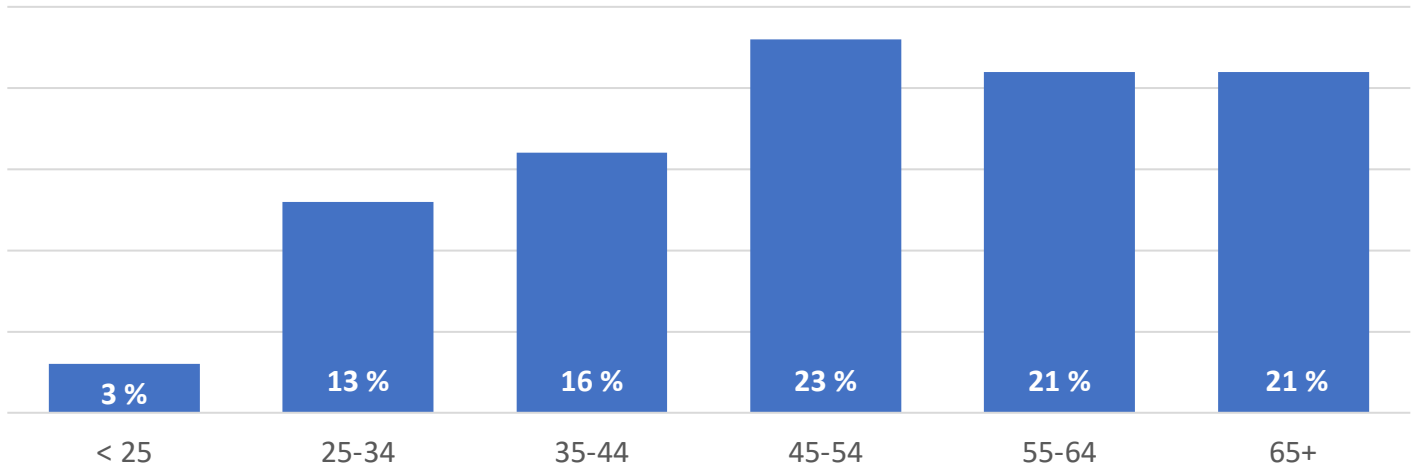
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Survey demographics

- Gender:



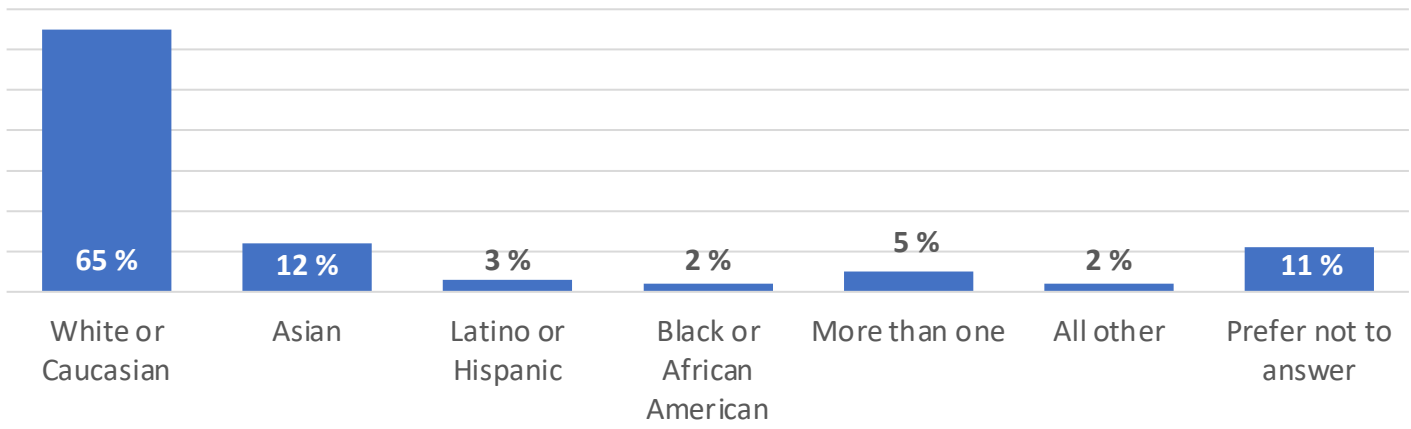
- Age:



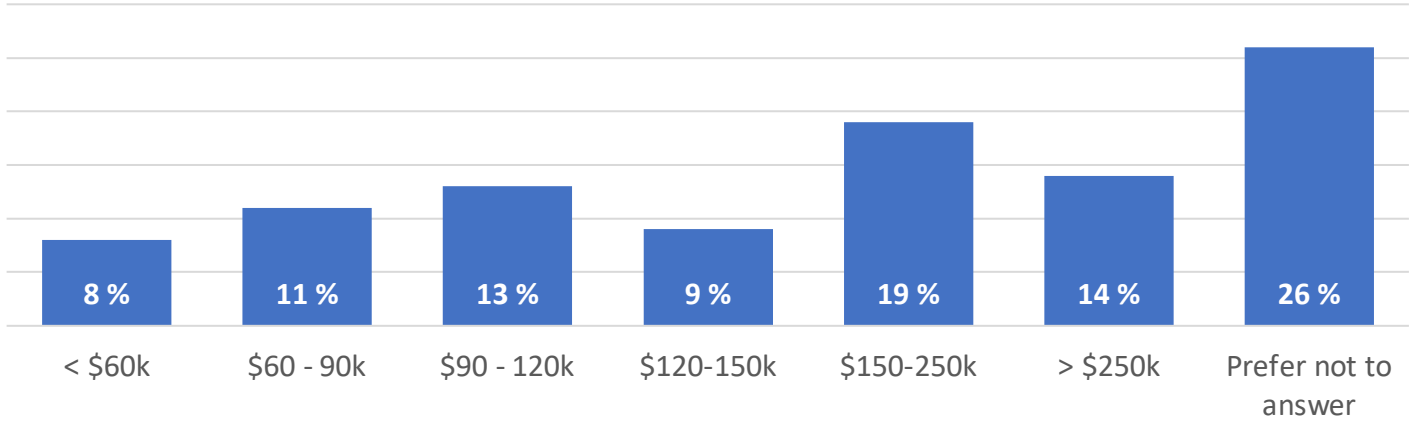
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Survey demographics

- Race/ethnicity:



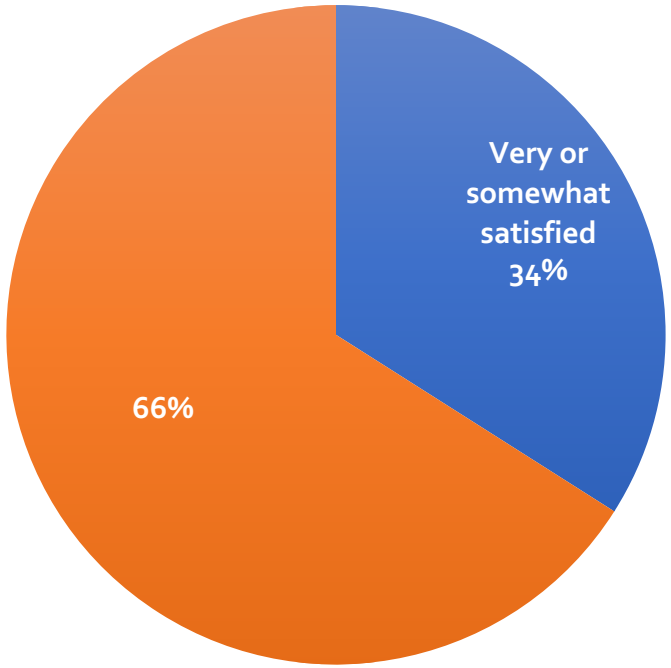
- Household income:



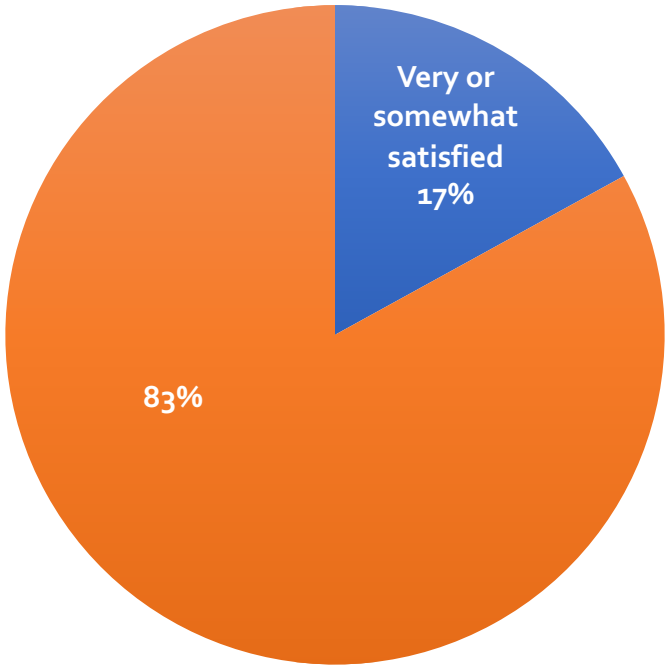
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Pickleball players are **generally dissatisfied** with the quality and quantity of pickleball courts in Seattle.

Quality



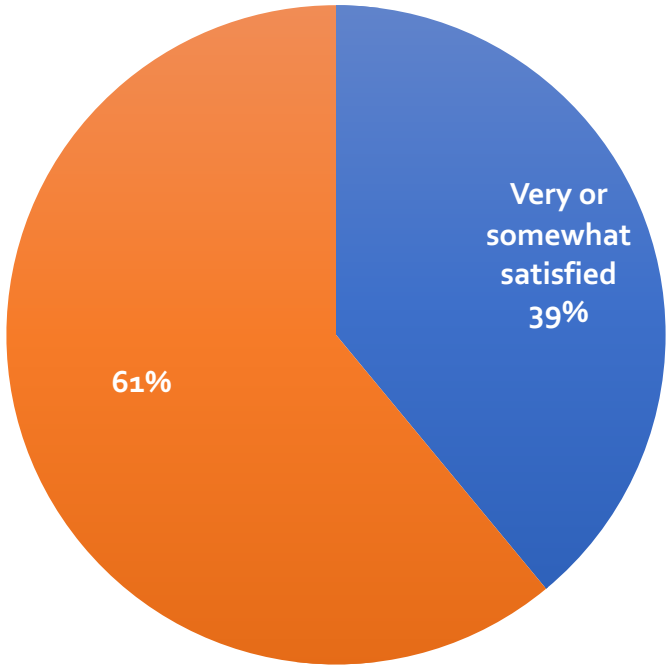
Quantity/availability



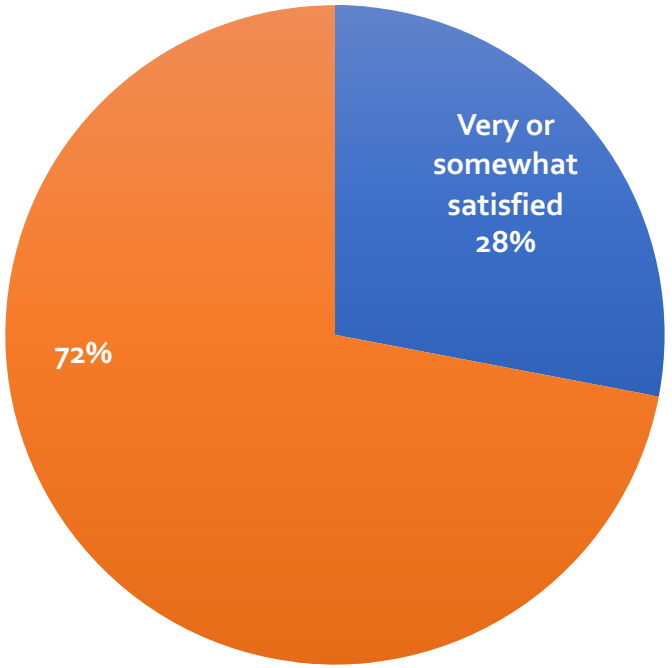
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Tennis players are *also* **generally dissatisfied** with the quality and quantity of tennis courts in Seattle.

Quality



Quantity/availability



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Priorities for pickleball facilities were fairly consistent across different respondent types.

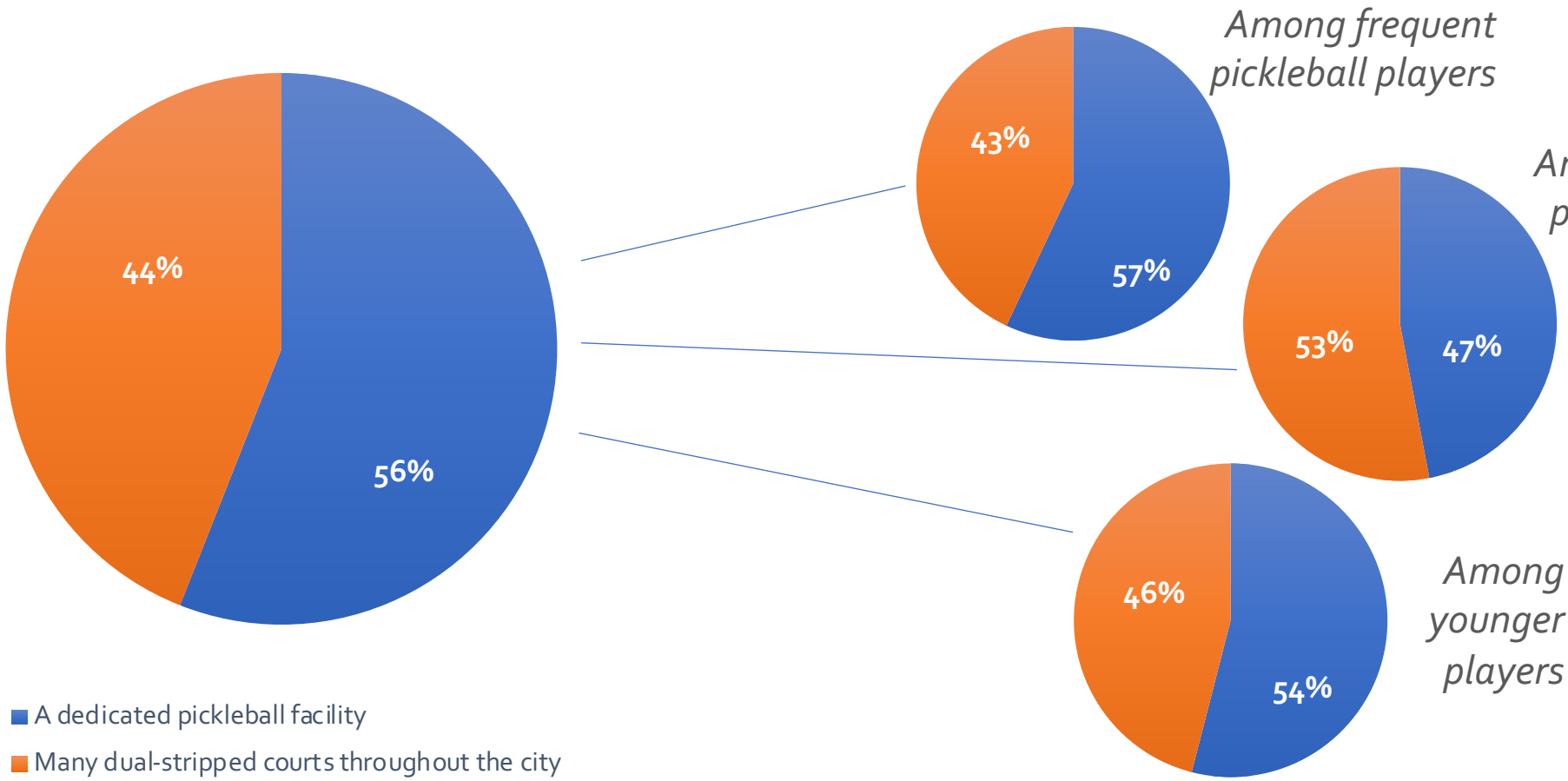




** No shared courts with tennis ranked higher among tennis players.*

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When we asked whether people preferred a dedicated pickleball facility or many dual-stripped courts throughout the city, no clear strategy emerged.



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OUDOOR COURT APPROACHES

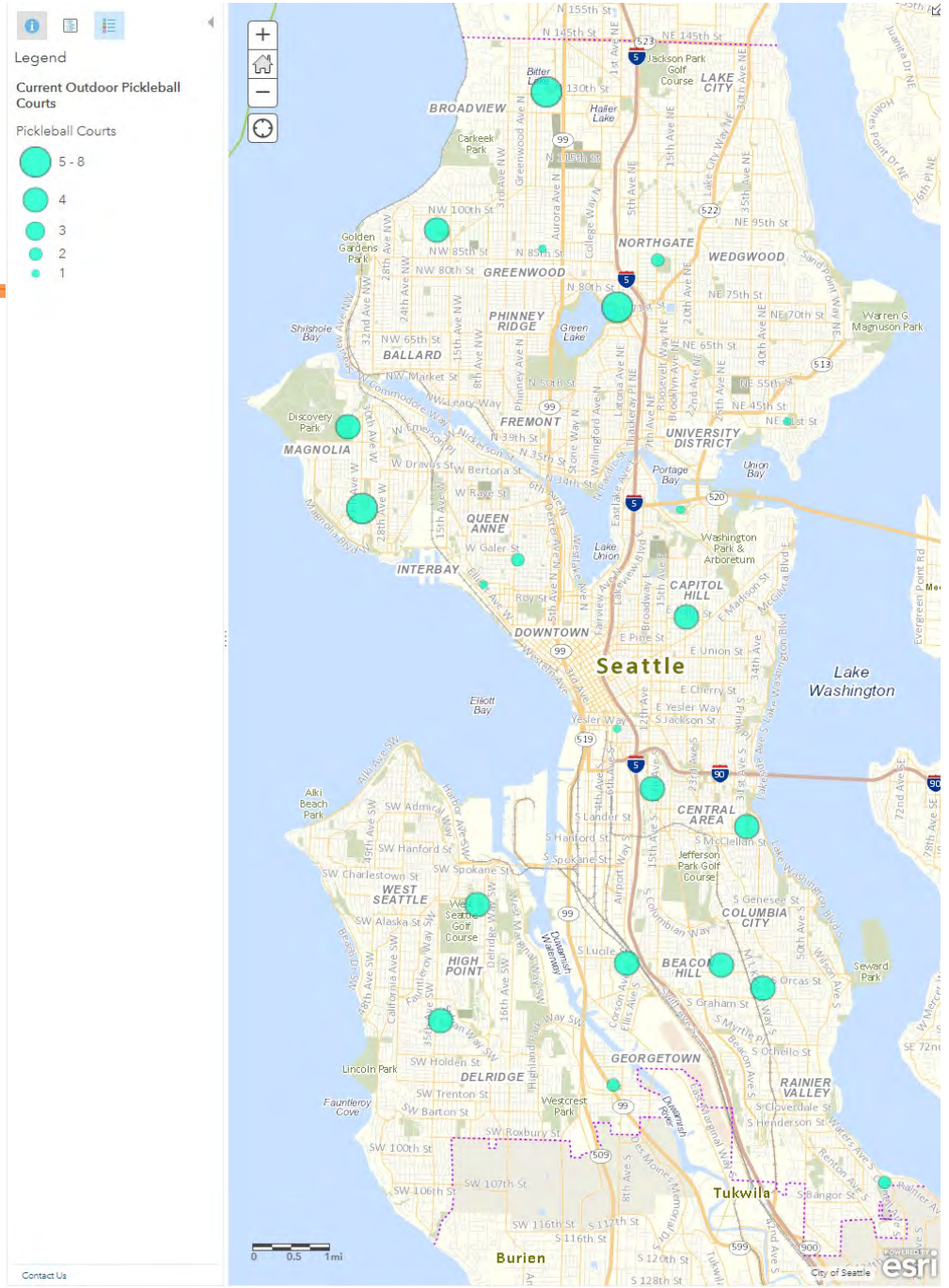
Strategic Framework

Approaches

1. Dual striping (immediate) *add PB lines only or with resurfacing*
2. Convert existing tennis courts to pickleball only (mid-term) *during resurfacing or renovation*
3. Construct new dedicated pickleball facility (long-term)

Guiding Considerations

- Geographic distribution
- Accessibility
- Existing amenities (restrooms, parking/transit, lights, etc. community centers)
- Size + capacity
- Court condition
- Court Classification and Use (e.g. Joint Use Agreement or other high school use)
- Residential Proximity (noise)



Immediate Approach: Dual Striping

Add pickleball lines to some neighborhood and community tennis courts throughout the city.

- *Advantages:* increases number of pickleball courts to accommodate demand; can begin this summer (funded); opportunities city-wide for play.
- *Drawbacks + considerations:* decreases availability of tennis courts; dual-striping may be confusing for players; increased probability of on-court conflict (noise/reservations/etc.)
- Would not be done at locations where USTA tournaments are held (Amy Yee or Lower Woodland)
- Standard is 2 pickleball courts to each tennis court
- Ideally done with resurfacing of the court

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Dual Striping Context

Pressure to add more pickleball courts to existing courts

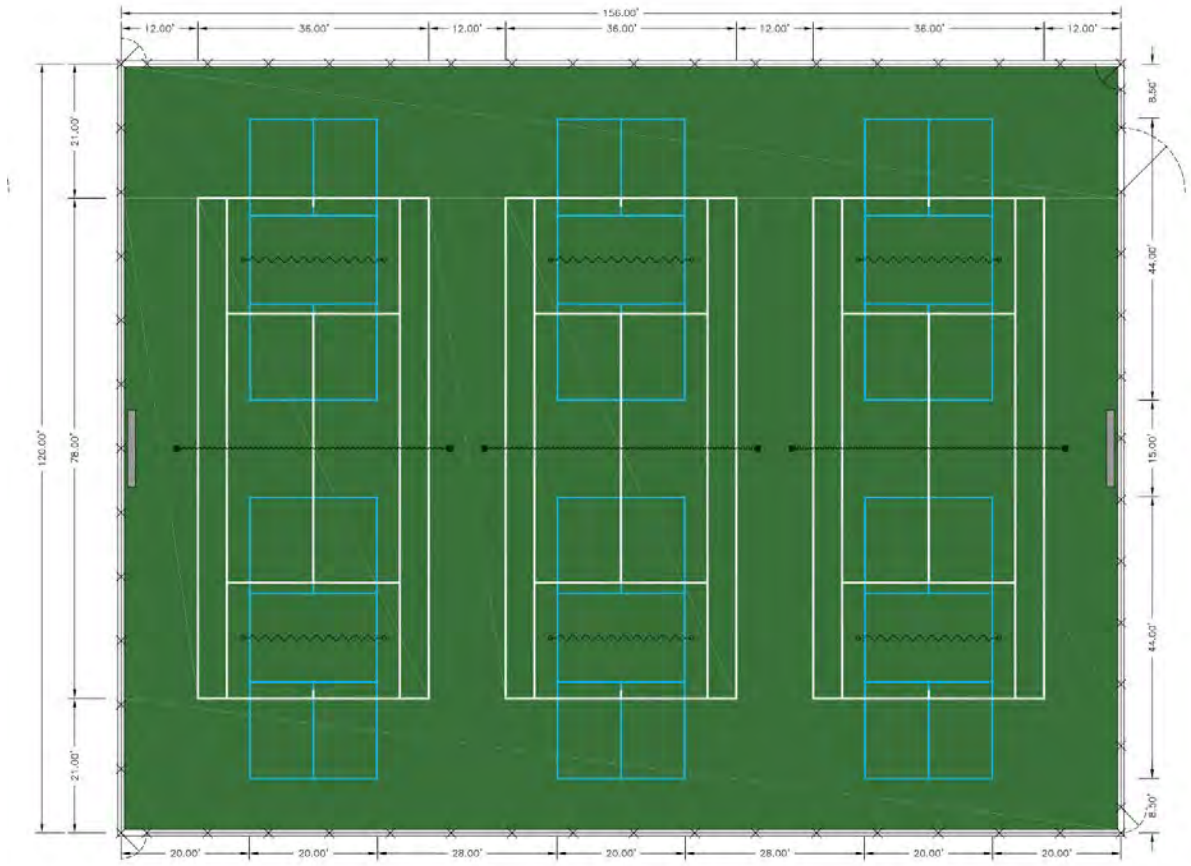
- Advocacy from Seattle Metro Pickleball Association to match growth
- Opportunity for SPR leadership
- Conflict at Green Lake courts

Key questions considered:

- Location
- Universal striping
- Layout + number of courts
- Line color
- Line overlap



Dual Striping (blended lines)





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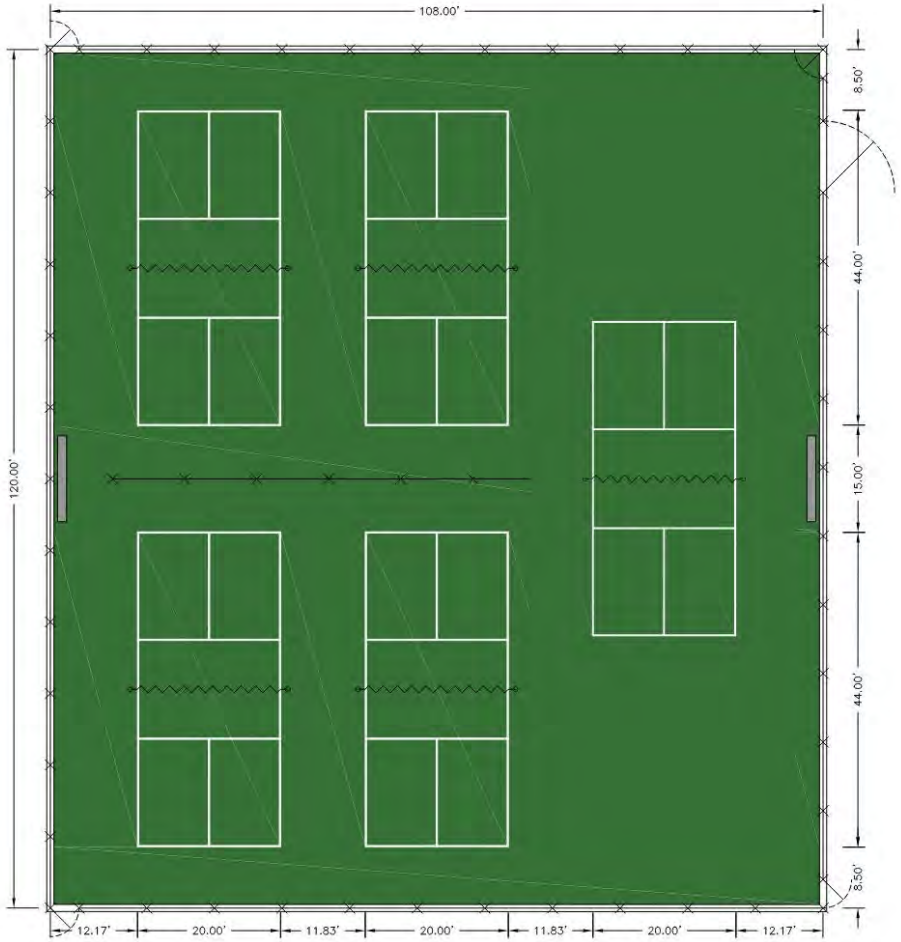
Midterm Approach: Court Conversion

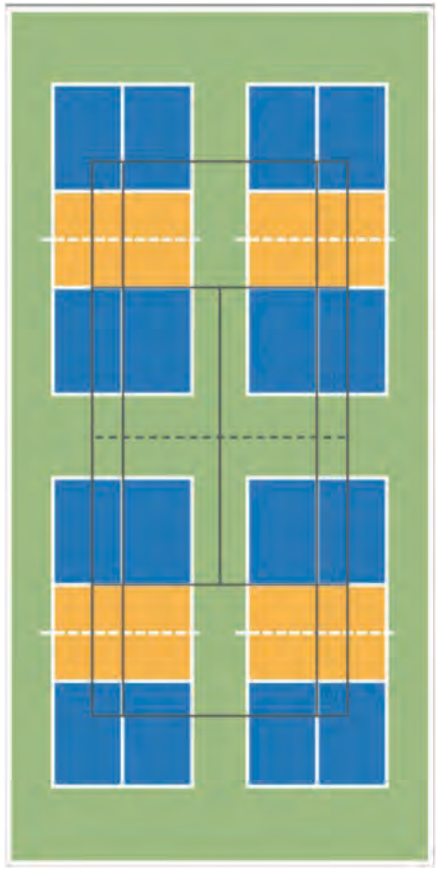
Convert some old tennis courts to dedicated pickleball courts.

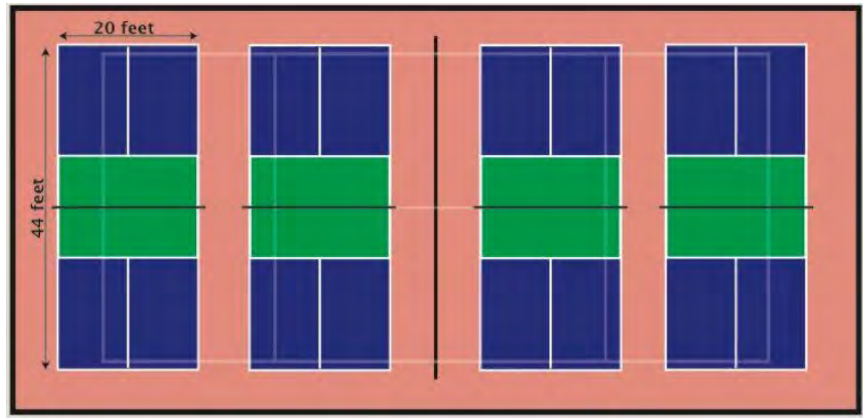
- *Advantages:* increases number of pickleball courts to accommodate demand; because they will be pickleball-only, allow for a higher density of co-located courts.
- *Drawbacks + considerations:* decreases number of tennis courts; need to do engagement with communities once options are identified; some courts may require significant rehabilitation.
- Engagement and implementation would take place during the course of resurfacing or renovation projects at recommended facilities.

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Court Conversion







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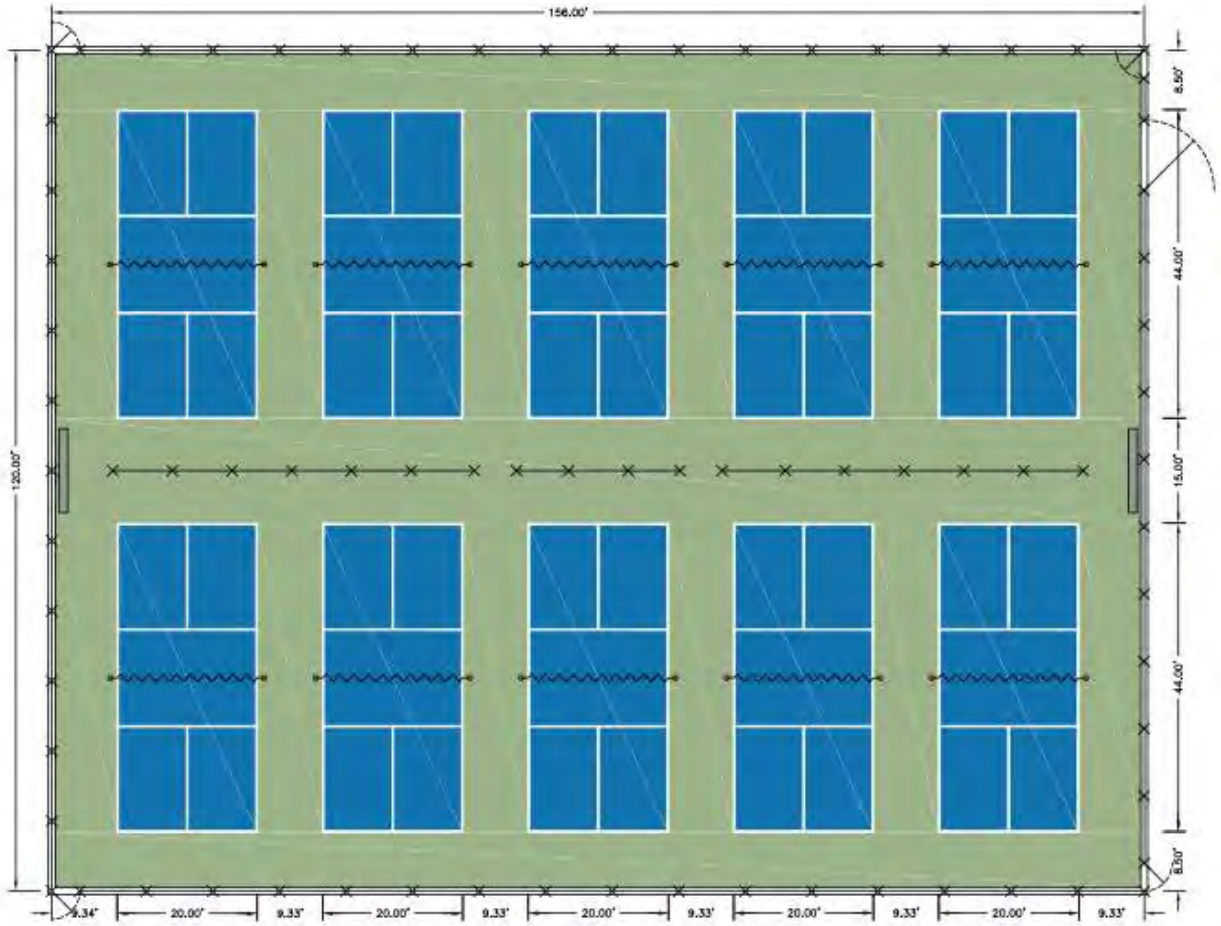
Long-term Approach: Dedicated Facilities

Create new larger-scale dedicated pickleball facilities.

- *Advantages:* significantly increases the number of pickleball courts that are co-located; does not impact tennis.
- *Drawbacks + considerations:* reduces open space; likely most costly; longest time horizon; site and budget constraints will likely determine feasibility of lighting, roof, and other amenities.

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Dedicated Sites





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SITE ASSESSMENTS

Criteria Matrix: Informed Dual-Striping and Conversion Recommendations

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2021-2022 Pickle Ball Study
Assessment Criteria Database, Dual Use Facilities (Existing Compatible Facilities)
rev. 1-27-22 eg

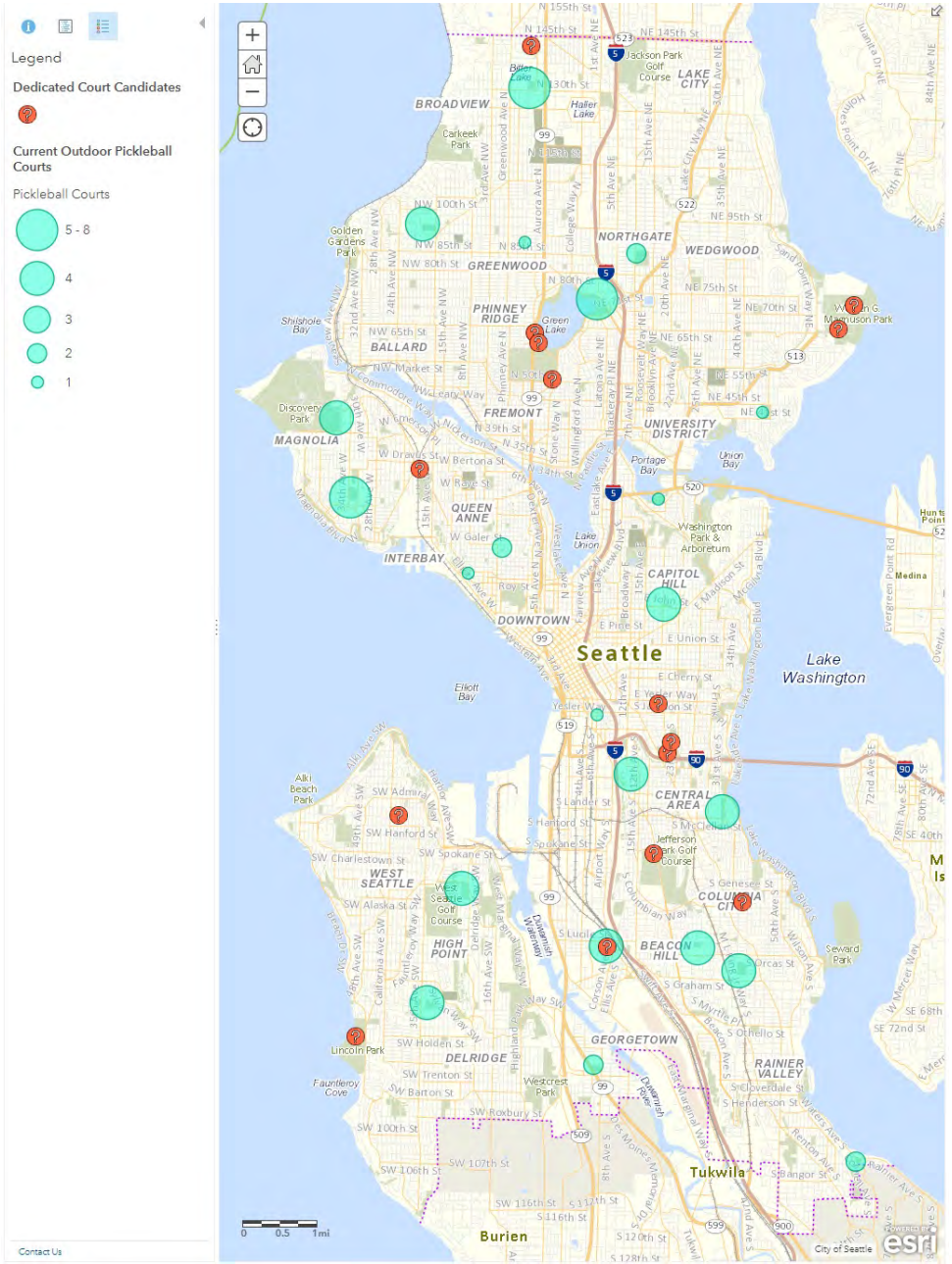
Site	Facility Designation	Court type	# Courts	# PB Courts (Existing)	Indoor?	Base Construction	O&M Score 2019	Program Score 2019	Adjacent CC?	Nearby RR's?	Lights?	Parking?	SMPA 2018 List?
Bitter Lake Playfield	Tier 2 Community Courts	Tennis	4	8	N	Concrete	2.78	2.83	Y	Yes	Yes	Street	Yes
Delridge Playfield	Tier 2 Community Courts	Tennis	2	4	N	Asphalt	3.18	2.17	Y	Yes		Limited	Yes
Green Lake Park (East)	Tier 2 Community Courts	Tennis	3	6	N	Concrete	3.64	1.75	Y	Yes		Difficult	Yes
Hiawatha Playfield	Tier 2 Community Courts	Tennis	3			Asphalt	4.44	3.25		Yes	Yes	Street	Yes
Jefferson Park	Tier 2 Community Courts	Tennis	4			Asphalt	5.00	3.33	Y	Yes	Yes	Yes	Yes
Rainier Beach Playfield	Tier 2 Community Courts	Tennis	4			Concrete	5.00	3.33	Y	Yes	Yes	Limited	Yes
Rainier Playfield	Tier 2 Community Courts	Tennis	4			Asphalt	3.52	4.08	Y	Yes		Street	Yes
Brighton Playfield	Tier 3 Neighborhood	Tennis	2	4		Asphalt	2.50	2.67	No	Yes	No	Street	
Lakeridge Playground		Tennis	1			Concrete	0.68	2.08		Yes		Yes	Yes
David Rodgers Park	Tier 3 Neighborhood	Tennis	3			Concrete	3.86	2.50		Seasonal		Street	Yes
Sam Smith Park	Tier 3 Neighborhood	Tennis	2			Asphalt	4.32	2.42		Portable		Limited	Yes
Woodland Park (Lower Courts)	Tier 1 Major Complex	Tennis	10			Concrete	4.26	1.08		No	Yes	Yes	Yes

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Initial Site Assessments: Dedicated Courts

- NORTH SEATTLE
  - Finalists: Magnuson E3 Parking Lot, Bitter Lake Reservoir
  - Also considered: Interbay, Woodland Park Lower, Woodland Park Horsehoe, Woodland Triangle, Magnuson Tennis Courts

- SOUTH SEATTLE
  - Finalists: Hiawatha, Genessee, Georgetown
  - Also considered: Jefferson Park, Pratt Park, Judkins Lower Field, Lincoln Park



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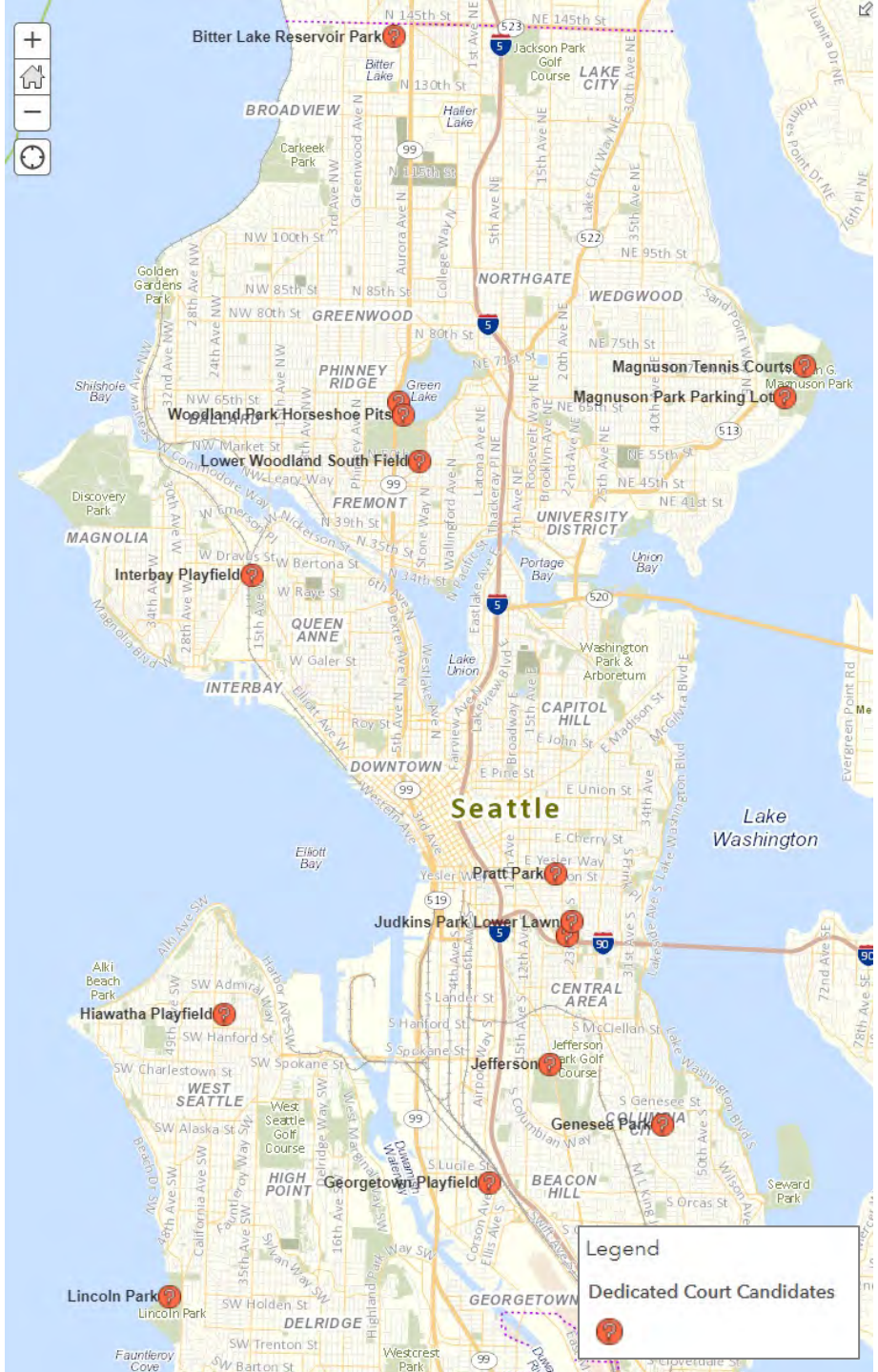


OPEN HOUSE RESULTS

Online Open Houses

Meeting 1:
Presented initial approach ideas for feedback, extensive Q&A
- 130 participants

Meeting 2:
Facilitated breakout rooms by geography to discuss specific neighborhood options, opportunities, and concerns
- 63 participants



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Breakout Room Discussion Questions

- How do you feel about this suite of options for this part of Seattle?
- Does this strike the right balance of providing more resources for pickleball while keeping options available for tennis?
  - Why or why not?
- Is there anything about this (your) community we should know that we don't?
  - How do people use this space that would be influenced or changed if pickleball was present?
- Are there any unintended consequences like being too close to neighbors and might have noise impacts?

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WHAT'S HAPPENING NOW

Next Steps

- Local community engagement and refining potential dedicated sites
- Racial Equity Toolkit
- 2022 Dual Striping:
  - Gilman Playground (4 courts)
  - Alki Playground (4 courts)
  - Rainier Beach Playfield (8 courts)

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Concept site: Genessee Park

- The Concept Plan has the potential for establishing a "progressively challenging" competitive environment based on the linear arrangement of the courts. This side-by-side arrangement of courts is flexible enough to accommodate a variety of daily drop-in and organized tournament play.
- The total cost of development of this facility, as shown, is estimated at approximately **$5,160,000**.



Note: These concepts and associated cost estimates were developed to provide a high-level understanding of what a full-suite complex might include and cost. Future engagement, planning and design will inform final site selection and budget.

Concept site: Magnuson Park

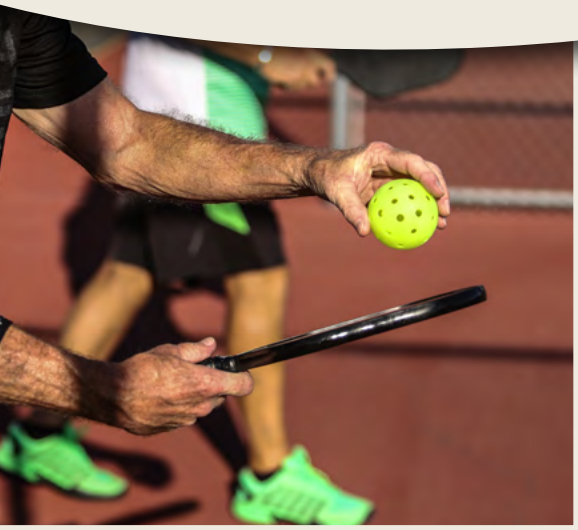
- The Concept Plan illustrates a total of 14 courts, arranged in groups of 3, allowing for a logical and flexible competitive hierarchy to be established for both day-to-day drop-in use and organized tournaments.
- A large, central gathering space and restroom provides a welcoming and convenient social experience for drop-in use and greeting/check-in space for tournaments.
- The total cost of development of this facility, as shown, is estimated at approximately **$7,800,000**.



Note: These concepts and associated cost estimates were developed to provide a high-level understanding of what a full-suite complex might include and cost. Future engagement, planning and design will inform final site selection and budget.

Pickleball Courts

Construction & Maintenance Manual 2023









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Construction & Maintenance Manual 2023

Third Edition





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Acknowledgements

This Construction & Maintenance Manual is a joint effort of the American Sports Builders Association (ASBA) and USA Pickleball (USAP) and represents the two organizations' dedication and commitment to the sport of pickleball. It reflects an awareness on the part of both organizations that optimum performance and enjoyment of pickleball depends on having safe, well-constructed and well-equipped facilities at which to play. This manual utilizes the knowledge offered by members and staff of both organizations to provide information the pickleball community needs to plan, build and maintain facilities.

About USA Pickleball

USA Pickleball (USAPickleball.org) is the national governing body for the sport of pickleball in the U.S. USA Pickleball is a nonprofit 501(c) (3) corporation, with a mission to promote the development and growth of pickleball by maintaining the rules, growing youth and adult programs, setting player ratings, sanctioning tournaments, certifying officials and advancing the sport through its national network of ambassadors. According to the Sports & Fitness Industry Association, pickleball is the fastest growing sport in the U.S. To learn more, get involved and find a place near you to play, go to USAPickleball.org.

About American Sports Builders Association

The American Sports Builders Association (sportsbuilders.org) is a non-profit association helping designers, builders, owners, operators and users understand quality athletic facility construction. Through informative meetings, newsletters, books and technical construction guidelines, the ASBA keeps its members informed of the latest developments in sports facility design and construction. The ASBA also runs Certified Builder programs for Tennis Court, Track and Field builders. Certified Tennis Court Builders can also add a Pickleball Court Builder Certificate to their credentials. In addition, the organization publishes construction guidelines, position papers, brochures and books designed to help consumers in selecting a contractor, deciding upon a surface and finding a suitable location for athletic facilities, including pickleball courts. The ASBA also publishes comprehensive "Construction & Maintenance" manuals

for Tennis Courts, Running Tracks, Sports Fields and Indoor Sports Surfaces.

About this Manual

The manuscript for this third edition was created and compiled by a volunteer editorial board with representatives from USA Pickleball and ASBA.

USA Pickleball staff who contributed to this manual include Justin Maloof, USA Pickleball COO, and Carl Schmits, Managing Director–Equipment Standards & Facilities Development.

ASBA members who contributed include a number of Certified Tennis Court Builders (CTCB) and supplier members, including Randy Futty, chair of the editorial board, Executive Vice President–Business Development, Putterman Athletics, LLC; Todd Dettor, Vice President, Fast-Dry Courts Inc.; Eric Loftus, Vice President, Cape and Island Tennis & Track; Mike Mehaffey, McConnell & Associates; Fred Kolkmann, President, Fred Kolkmann Tennis & Sport Surfaces LLC; and Alex Levitsky, AIA, Global Sport & Tennis Design Group. ASBA staff who contributed include Fred Stringfellow, CAE, Cynthia Sanchez and Kristin Evans.

USA Pickleball and ASBA also acknowledge the information in the latest edition of "Tennis Courts: A Construction & Maintenance Manual," produced by the ASBA and U.S. Tennis Association. (To obtain a copy of the "Tennis Courts" manual, visit sportsbuilders.org.)

Alex Levitsky, AIA, produced the drawings for this manual. Bruce Frasure, owner, Frasure Reps/LSI Sports Lighting, contributed to the lighting sections of this manual.

Peter Francesconi of Ace Media Group LLC worked with the editorial board and edited this third edition of *Pickleball Courts: Construction & Maintenance Manual*, with assistance from Mary Helen Sprecher.

USA Pickleball and ASBA thank the members of the ASBA for many of the photos used in this manual.

In addition, USA Pickleball and ASBA thank the following for the use of their images:

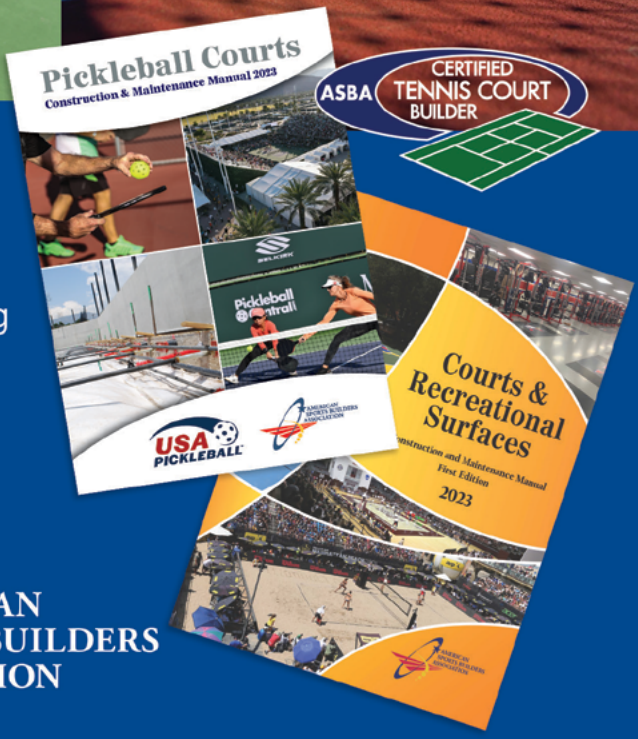
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- Chapter 4: USA Pickleball (2), Rock 'N' Roll Pickleball (1)
- Chapter 5: USA Pickleball (4)
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- Chapter 7: Douglas Industries (2), Desert Champions LLC/USA Pickleball (1), USA Pickleball (1)
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- Chapter 9: California Sports Surfaces (2), Desert Champions LLC/USA Pickleball (1)
- Appendix: Laykold (1)
- Glossary: California Sports Surfaces (2), Desert Champions LLC/USA Pickleball (1), Laykold (1), ASBA (1)
- Index: Desert Champions LLC/USA Pickleball (2), California Sports Surfaces (1), Fred Kolkmann Tennis & Sport Surfaces (1), The Tennis Design Studio/ASBA (1), ASBA (1)

The American Sports Builders Association

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Introduction

The purpose of this manual is to promote the quality construction, maintenance and repair of pickleball courts and facilities by providing information to builders, architects, engineers, facility owners, managers, park & rec personnel and professionals. Realizing that many pickleball courts have already been built or renovated and have been in use, the guidelines in this manual are recommended for new construction or renovations.

This manual is designed to explain various choices and the rationales for those choices, so court/facility owners will be able to ask important questions to make educated decisions. USA Pickleball and ASBA are committed to providing information to assist facility owners and managers in making informed choices in order to promote the construction of quality pickleball courts and facilities.

For more information, visit USAPickleball.org. Under the "What Is Pickleball?" tab is information on Pickleball Courts & Construction, and under the "Contact Us" tab is a contact for Facility Development.

Dimensional Notation

Dimensions are expressed in English units. Metric dimensional equivalents can be determined using the following formulas:

English		Metric	Metric		English
1"	=	0.02540 meter	2.54 cm	=	1"
1'	=	0.30480 meter	1 meter	=	3.2808'

Metric equivalents for specific items such as court playing lines, layout and net heights must be converted as accurately as possible to conform to the rules of pickleball. These are called hard conversions. In practice, however, other conversions may be adapted that are to the nearest appropriate metric dimension—appropriate in terms of feasibility of construction, design intention, etc. These are called soft conversions.

Slope Notation

Slopes less than 1.00% are typically noted in the form of inches per feet written as 1" in "x" feet. Slopes of 1.00% and over typically are noted as straight percentages. In order to ensure clarity, it is best

to use either the inches per feet or the percentage notation system in combination with a specific ratio (expressed as vertical rise “y” to horizontal run “x” or “y:x”—in other words, a slope of 1:120 means a change in elevation of 1” over the course of 120”, or 10’). Expression of slope with a ratio can be easily understood by engineers, architects, landscape architects and/or contractors, whether they are using the English or metric systems:

Inches per Feet	Percentage	Ratio
1” in 10’	0.83%	1:120

Disclaimer

The drawings for this book are intended to provide clarification of the design and construction concepts discussed in the text. These illustrations are meant to represent generic solutions typically used in the design and construction of pickleball courts today. Each drawing represents only a single option to address the needs described in the text. In every case, there are other ways to achieve the design construction intent. In addition, readers of this book are cautioned that site conditions can vary widely. Local climates, construction methods, availability of materials and site engineering requirements make the development of construction details for use everywhere virtually impossible. While every effort has been made to ensure the accuracy of the drawings, neither USA Pickleball nor the ASBA is responsible for any errors or omissions.

The recommendations in this book are suggestions for use by architects, engineers, contractors and owners. Except where they refer to the rules of pickleball, these guidelines provide options, explanations or illustrations of typical generic solutions to construction issues. Due to the differences in design intent, climates and construction sites, each project is different. The ASBA and USA Pickleball make no representations regarding the suitability of a particular design or decision to a specific project. Readers are urged to consult with qualified and experienced design professionals and/or contractors before deciding upon the specific design, materials and construction methods to be utilized in proposed pickleball facilities.

“Recommended” and “preferred” dimensions and specifications in this manual are a reflection of current practice in the industry and not supported by scientific data regarding safety. The owner/builder should use their own judgment as to what is safe.

Player's Responsibility: The risk of player injury from being struck by a paddle, or falling or colliding with a fence, other fixed obstructions or other player is inherent in all racquet/paddle sports. It is the player's responsibility to participate only when physically and mentally prepared and when he/she determines that all aspects of the courts and weather are appropriate for participation. A player should not participate if physically injured or otherwise impaired in such a manner that activities on the court could cause injury to themselves or others.



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Chapter 1

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The Sport of Pickleball

Pickleball is an easy-to-learn and fun sport that combines many elements of tennis, badminton and ping-pong. It can be played both indoors or outdoors on a badminton-sized court with a slightly modified tennis net. Pickleball uses a solid and/or composite paddle and a seamless, perforated plastic ball approximately the size of a baseball. Like other racquet and paddle sports, the object of pickleball is to hit the ball over the net so the opposing player or team cannot return it successfully.

According to USA Pickleball, in 2023 there were nearly 45,000 indoor and outdoor pickleball courts in the U.S. (which are listed in USA Pickleball's Places2Play database) in all 50 states. The sport is played by all ages, and at all levels, from social and recreational players to competitive tournament players. The Sports & Fitness Industry Association's 2023 Participation Report puts the number of players in the United States at 8.9 million. According to the report, pickleball participation almost doubled in 2022, increasing by 85.7 percent year-over-year and by an astonishing 158.6 percent over three years.

Because pickleball players enjoy both the social aspects of the game and the ability to stay active and healthy, the sport is being introduced to kids and teenagers in physical education classes in school, it is growing for adults in local communities around the country, and it continues to expand among senior players and in retirement locations. All this has led to the growth of new pickleball court construction in the U.S.

Note that the specifications and guidelines in this manual are recommended for new construction and renovation projects. USA Pickleball and the American Sports Builders Association recognize that many pickleball courts have already been built and are in use around the country.

The rules for the sport of pickleball can be found in USA Pickleball's "Official Rulebook" (available at USAPickleball.org), which is updated annually. For all rules, go to the website and/or download the most current Official Rulebook.

The Pickleball Court

Section 2 of the USAP "Official Rulebook" specifies dimensions, measurements, lines, areas and net for the standard pickleball court:

- **Rule 2.A.1:** The court shall be a rectangle measuring 20' (6.10 m) wide and 44' (13.41 m) long for both singles and doubles matches.
- **Rule 2.A.2:** Court measurements shall be made to the outside of the perimeter and non-volley zone lines. All lines should be 2" (5.08 cm) wide and the same color, clearly contrasting with the color of the playing surface.
- **Rule 2.A.3:** The minimum playing surface area measures 30' (9.14 m) wide and 60' (18.29 m) long. A 10' (3.05-m) surrounding margin measures 40' (12.19 m) by 64' (19.51 m).

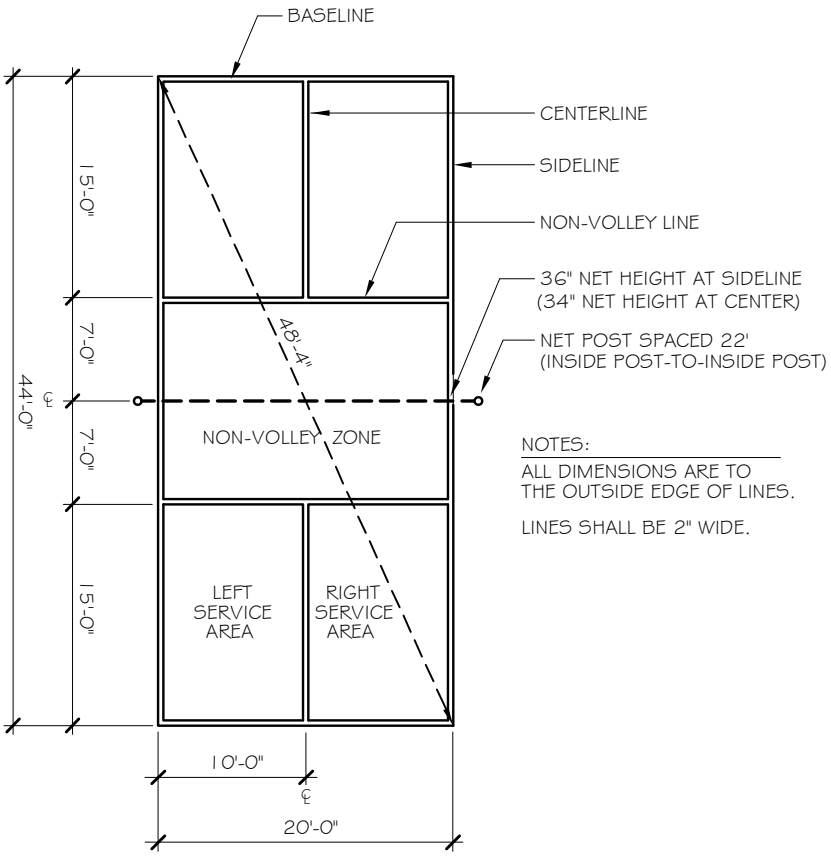
Note: *In support of and addition to the above dimensions, USA Pickleball and ASBA recommend:*

- *Minimum total playing area for recreational/drop-in play: 30' (9.14m) x 60' (18.28 m).*
- *Recommended total playing area for competitive/ tournament play and new construction: 34' (10.36 m) x 64' (19.51 m).*
- *Recommended total playing area for wheelchair play: 44' (13.41 m) x 74' (22.55 m).*
- *Recommended total playing area for a stadium court: 50' (15.24 m) x 80' (24.384 m).*

The lines and areas of the standard pickleball court are:

- **Baselines.** The baselines are the lines parallel to the net at each end of the court.
- **Sidelines.** The sidelines are the lines perpendicular to the net on each side of the court.
- **Non-Volley Line.** The non-volley line is the line on each side of the net between the sidelines and parallel to the net. These lines are located 7' (2.13 m) from the net.

Note: *Measurement of the non-volley line is from the outside edge of the line to the net.*



NOTES:

ALL DIMENSIONS ARE TO THE OUTSIDE EDGE OF LINES.

LINES SHALL BE 2" WIDE.

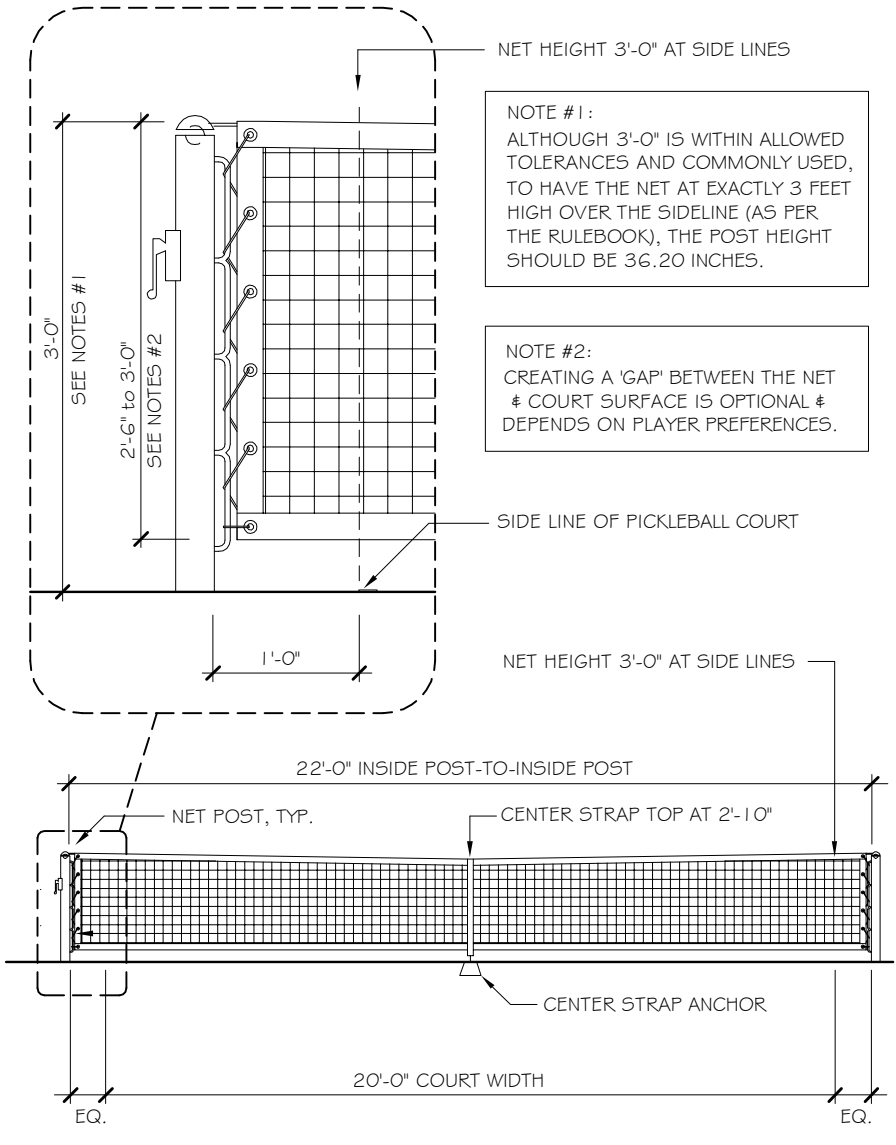
LINE TOLERANCE GUIDE:

NET LINE TO OUTSIDE OF NVZ LINE:	7'-0"	+/- 1/8"
NET LINE TO OUTSIDE OF BASELINE:	22'-0"	+/- 1/4"
OUTSIDE SIDELINE TO OUTSIDE SIDELINE:	20'-0"	+/- 1/4"
OUTSIDE SIDELINE TO CENTERLINE:	10'-0"	+/- 1/8"
DIAGONAL DIMENSION:	48'-4"	+/-3/4"

COURT - PLAYING LINE LAYOUT

NOT TO SCALE

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PICKLEBALL NET ELEVATIONS

NOT TO SCALE

02rNETELEV.AVL.23

- **Non-Volley Zone (NVZ):** The Non-Volley Zone is the 7-foot by 20-foot area adjacent to each side of the net. All lines bounding the NVZ are part of the NVZ. The NVZ is two-dimensional and does not rise above the playing surface.

Note: *The Non-Volley Zone is commonly referred to as "the kitchen."*

- **Centerline.** The centerline is the line on each side of the net bisecting the area between the non-volley line and the baseline.
- **Service Courts.** The service courts are the areas on either side of the centerline, bounded by the non-volley line, the baseline, and the sideline.

Note: *Each service court is 15' (4.6m) long and 10' (3m) wide.*

Net Specifications

Specifications listed below are from the USAP "Official Rulebook" (with reference numbers) and from USAP/ASBA recommendations.

- **Rule 2.C.1: Material.** The net may be made of any mesh fabric material that will not allow a ball to pass through it. [See Chapter 7 for more on net materials.]
- **Net Size.** With net posts placed 12" outside the sidelines, the net length shall be at least 21' 9" (6.63 m) finished length. The height of the net, from bottom edge to top, shall be at least 2.5' (0.8 m).
- **Net Height.** The net shall be suspended over the center of the court and shall be 36" (0.914 m) high at the sidelines and 34" (0.86 m) high at the center of the court.

Note: *Pickleball players often prefer the net to end 6" above the court surface, so balls can be passed under the net between points.*

- **Rule 2.C.5: Center Strap and Height.** A center strap is recommended for a permanent net and must be placed at the center of the net to enable easy adjustment to the 34" (0.86 m) requirement at center.
- **Rule 2.C.4: Net Edge.** The top of the net should be edged with a 2" (5.1 cm) white tape binding over a cord or cable running

through the binding. This binding must rest upon the cord or cable.

- **Posts.** Net posts should be placed outside the sidelines. Recommended placement is 12" (30.48 cm) from the sideline. The maximum diameter of the net post should be 3" (7.62 cm). (Rule 2.C.2 of the Official Rulebook states: "Net posts should be 22' (6.71 m) from the inside of one post to the inside of the other post.") See Chapter 7 for more on posts.

Overall Playing Area

ASBA and USA Pickleball recommend the following overall sizes for playing areas ("playing surface"), as per Rule 2.A.3. (See "Court Overruns" drawing on page 10.)

- Minimum total playing area for recreational play: 30' (9.14m) x 60' (18.28 m).
- Recommended total playing area for competitive/tournament play and new construction: 34' (10.36 m) x 64' (19.51 m).
- Recommended total playing area for wheelchair play: 44' (13.41 m) x 74' (22.55 m).
- Recommended total playing area for a stadium court: 50' (15.24 m) x 80' (24.384 m).

Note: *The recommended overruns in this manual reflect current industry practice regarding a reasonable balancing of player performance and comfort considerations and practical considerations regarding utilization of space.*

Note: *Measurements of the Overall Playing Area ("Playing Surface") of a pickleball court are taken from the inside face of any fixed objects, fence or wall and to the edge of the continuous playing surface where no obstructions are present.*

Note: *Best Practice—Center the court in the Overall Playing Area so that the distance to fixed obstructions is the same from both sidelines and from both baselines.*

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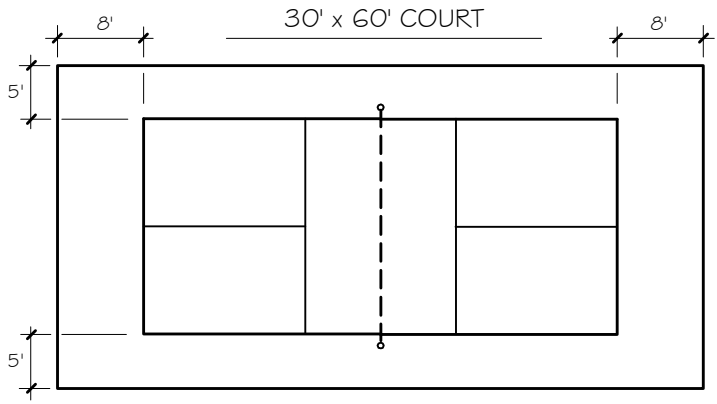
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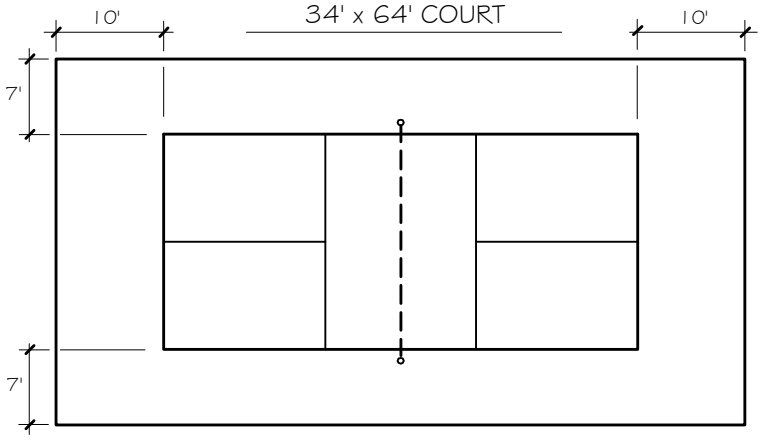
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MINIMUM PLAYING SURFACE AREA

(COMMON TO CONVERSIONS)



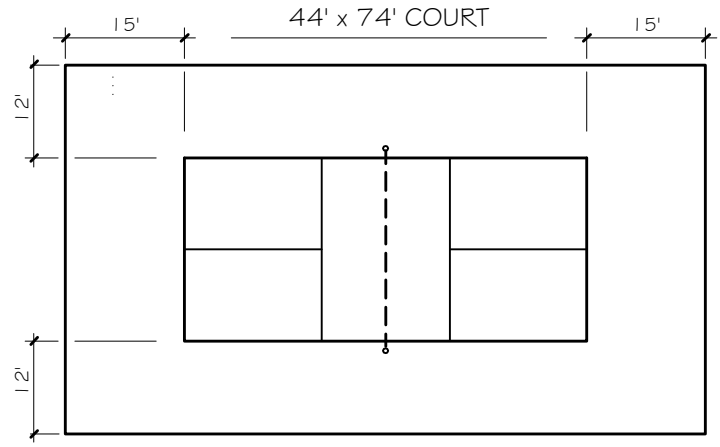
RECOMMENDED PLAYING SURFACE AREA

(NEW CONSTRUCTION)

TYPICAL COURT OVERRUNS

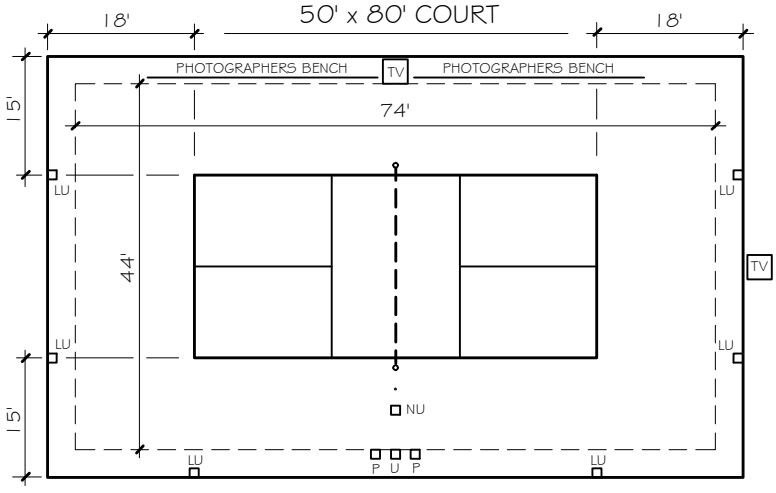
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RECOMMENDED FOR WHEELCHAIR & ELITE PLAY

(COMMONLY, STAND-ALONE & 2-COURT BATTERIES)



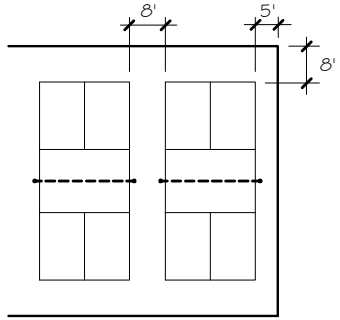
RECOMMENDED FOR STADIUM COURTS

(STAND-ALONE COURT)

ELITE & STADIUM COURT OVERRUNS

NOT TO SCALE

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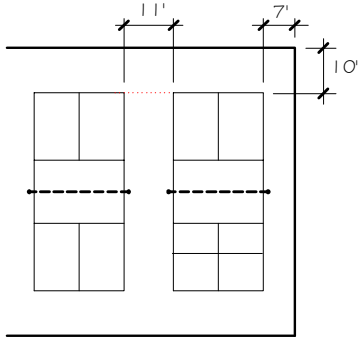


MINIMUM AREAS

FOR CONVERSION COURTS

PLAYING SURFACE AREA DIMENSIONS	
TWO (2) COURT BATTERY	58' x 60'
THREE (3) COURT BATTERY	86' x 60'
FOUR (4) COURT BATTERY	114' x 60'

FOR SHELTER LOCATIONS, SEE DRAWING "SHADE SHELTER LOCATIONS"

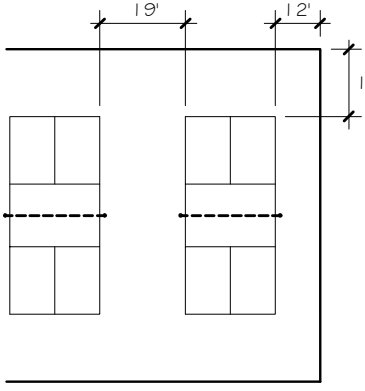


RECOMMENDED AREAS

FOR NEW CONSTRUCTION

PLAYING SURFACE AREA DIMENSIONS	
TWO (2) COURT BATTERY	65' x 64'
THREE (3) COURT BATTERY	96' x 64'
FOUR (4) COURT BATTERY	127' x 64'

COURTS WITH EITHER DIVIDER FENCES OR DIVIDER NETS, SHOULD MAINTAIN THE FULL RECOMMENDED WIDTHS OF OVERRUNS BETWEEN SIDE LINES AND DIVIDER FENCES OR DIVIDER NETS.



WHEELCHAIR & ELITE COURTS

PLAYING SURFACE AREA DIMENSIONS	
TWO (2) COURT BATTERY	83' x 74'
THREE (3) COURT BATTERY	122' x 74'
FOUR (4) COURT BATTERY	161' x 74'

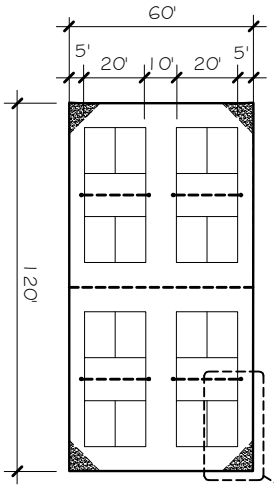
STADIUM COURTS

COURTS ARE STAND-ALONE	50' x 80'

OVERRUNS - MULTI-COURT BATTERIES

WITH UNOBSTRUCTED AREAS BETWEEN COURTS

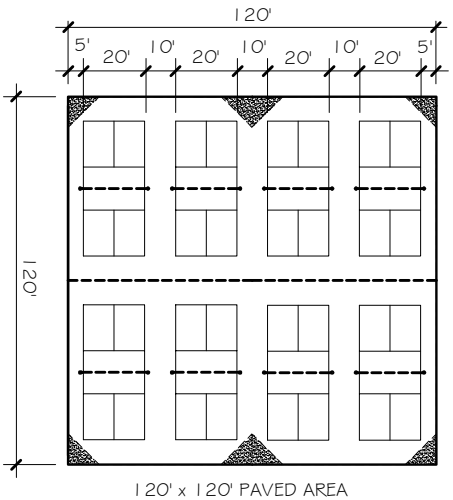
05rBATTERY.SIZES.AVL.23



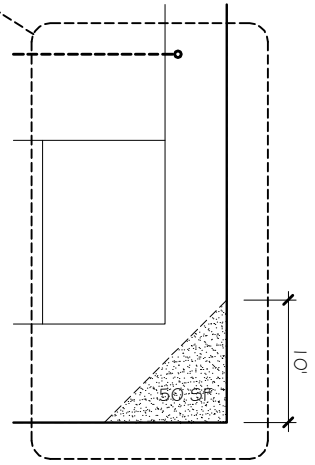
120' x 60' PAVED AREA
WITH 14' DIAGONAL CORNERS

NOTE:

MANY PAVED AREAS WITH DIAGONAL CORNERS (14') CAN BE SQUARED OFF (ADDING 100 SQ. FT. OF PAVEMENT BETWEEN COURTS AND 50 SQ. FT. AT THE CORNERS). THIS CAN MAKE THE USE OF SUCH AREAS MUCH MORE EFFICIENT. THIS IS RECOMMENDED FOR PAVED AREAS TO BE RECONSTRUCTED. SIMPLY ADDING NEW PAVEMENT TO EXISTING MAY RESULT IN CRACKS BETWEEN THE NEW & OLD PAVEMENTS. THIS MODIFICATION IS USEFUL WHEN ONE WOULD LIKE TO PRESERVE THE AREA ADJACENT TO THE PAVEMENT.



120' x 120' PAVED AREA
WITH 14' DIAGONAL CORNERS



PAVEMENT EXPANSION
FOR EFFICIENT PAVEMENT USE

EXISTING PAVEMENT MODIFICATIONS

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Chapter 2

Your Outdoor Pickleball Court or Facility

- Site Considerations—Acoustics
- Budget Considerations
- Safety First
- Choosing a Court Type
- Choosing a Contractor
- Project Delivery Methods
- Other Planning and Budget Considerations
- Tournament Considerations
- Converting/Retrofitting Courts











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Planning Your Outdoor Pickleball Court or Facility

Whether considering building just one pickleball court or a large facility with a number of courts, there are certain steps to take to properly plan for the project. For instance, you'll need to determine how many courts you may need based on current and future demands. You'll have to come up with a budget, pick the right site to develop, create a site plan (generally courts should be oriented north-south, which is preferred, although east-west may be acceptable—see diagram page 19), and choose the court surface, contractor, fencing, amenities and more. You may also need to consider landscaping after the courts are built.

If building a pickleball facility with multiple courts, it may be a good idea to put together a team to help in planning. Consider involving a design professional or consultant, a court builder, and manufacturers and/or suppliers of materials (such as surfacing material, fencing, lighting, etc.).

It's also a good idea to include local players on the planning team, who can provide information on the needs of players, accessories, amenities, programming and more. Will the courts be used primarily for adults or seniors? Will children use them? Different groups of users may have different desires, needs or requirements.

Site Considerations—Acoustics

Site planning needs to consider the acoustic propagation of the venue. We recommend an acoustic site analysis for every greenfield design or asset conversion, and that this be addressed early in the planning process.

Setbacks are driven by many variables, such as local codes/ordinances, elevation relative to nearby residential areas, prevailing winds, existing or potential landscaping, etc. USA Pickleball (facilities@usapickleball.org) can recommend an acoustic specialist to assist in this process.

In addition to site planning, USA Pickleball's "Quiet Category" (see USAPickleball.org) of solutions also includes acoustic panels

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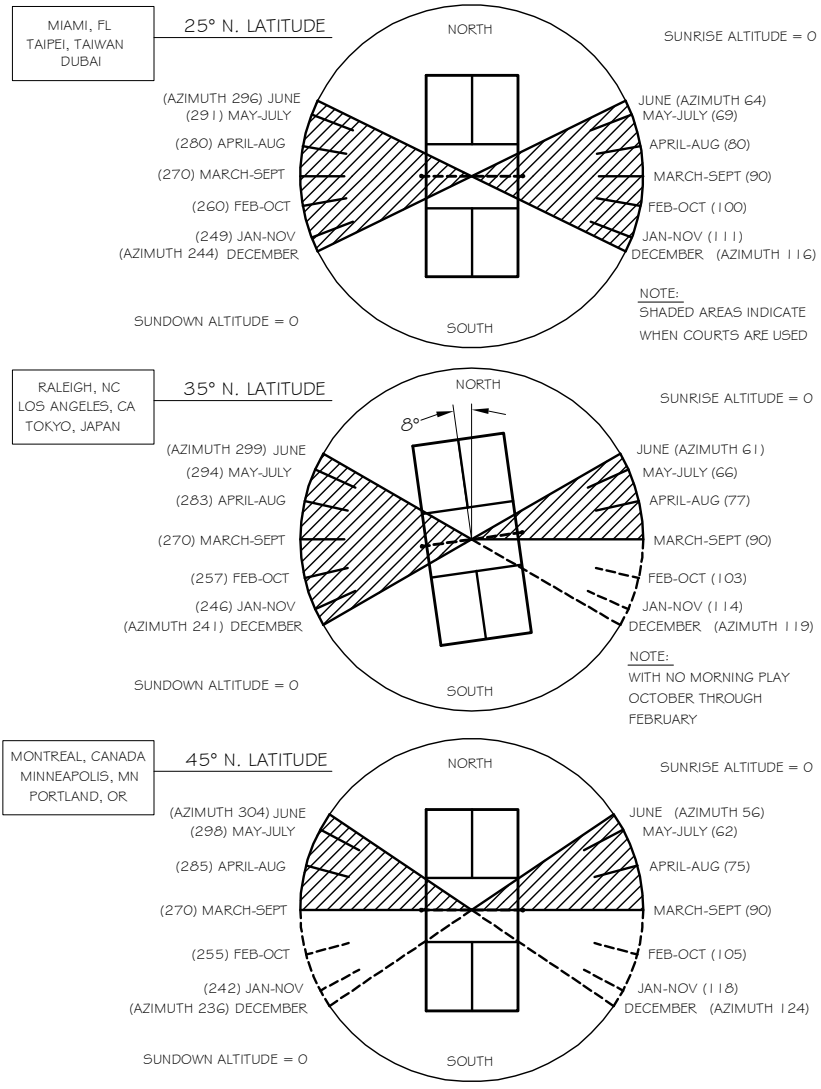
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PICKLEBALL COURT ORIENTATION

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and equipment (paddles and balls) that can help in meeting acoustic targets.

Budget Considerations

Once a workable concept plan is in hand, draw up a budget for the project, considering all costs from planning through construction. Areas to consider for a budget may include: feasibility studies; land acquisition; planning; design; permitting; site preparation, including drainage and grading; court construction; surfacing; fencing and windscreen; lighting; seating; clubhouse or pro shop; landscaping and walkways; and any other amenities for players and spectators.

Be sure to investigate zoning, permitting and compliance requirements for the site being considered before buying the land or breaking ground, including any surveys that may be needed. (This is where the help of a knowledgeable professional or consultant early in the process will save headaches, delays and money later.) Permitting and compliance can be a time-consuming process, so make sure to account for it in the construction schedule.

Also, make sure the plan complies with requirements for the Americans with Disabilities Act (ADA), as well as various state and local codes. The facility and courts may require ramps, curb cuts, accessible parking and other player and spectator amenities. The ADA Standards for Accessible Design are at www.ada.gov.

One of the biggest variables as far as cost is site preparation, grading and drainage. Does the land need to be cleared, or the site blasted? Certain types of soils deemed unstable may require additional preparation or removal and replacement. Drainage, which is critical for outdoor sports surfaces (not to mention how to deal with runoff), also can require additional attention and expense, and may cause delays from the city or county due to necessary reviews or studies, especially if making substantial changes to a site. A knowledgeable professional or contractor can help to navigate through this stage.

Safety First

The highest priority in sports facility design is the safety of all those involved: builders, players, staff, visitors and spectators. Due to the range of activities, sports facilities pose particular challenges to

the designer in minimizing hazardous conditions that could lead to injury.

It is prudent to consider these four well-established practices when addressing hazards:

First, ELIMINATE the hazard. (Example: Remove the column near the playing area.) This is the best solution, but is usually only practical in the Design Phase.

Second, GUARD against hazards. (Example: Partition off the column with a continuous enclosure, such as a fence or guard rail.) This is usually the next best option, and prevents contact with the column.

Third, PROTECT against hazards. (Example: Pad the column.) Instead of preventing contact, padding reduces the impact and therefore reduces the likelihood of serious injury.

Finally, WARN against hazards. (Example: Post a notice, warning the participant of the danger, such as "Floor Slippery When Wet," Or "Wait Until Play Ends Before Crossing Adjacent Court.")

Consider combining these practices to increase the effect. Installing pads on columns that are bright colors serves to both PROTECT and WARN.

Pickleball players are usually facing the opposing side and during play are focused on the ball. They rarely have the opportunity to focus on the surroundings. It is recommended that the designer and facility manager use a high standard of care in treating the perimeter conditions of a court behind the players.

Choosing a Court Type

Another choice to make is what type of surface (and sub-surface) is desired. Although the most common and popular surfaces are hard and constructed of concrete or asphalt, pickleball is finding its way onto wood and synthetic surfaces indoors, and clay and fast-dry surfaces outdoors.

Outdoor Hard Courts

Concrete is an excellent choice for its lower maintenance costs, reduced cracking and uniformity of surface when compared to asphalt. However, post-tensioned concrete is more expensive to install



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than asphalt. Typically, most concrete slabs and asphalt pavement courts include a surface system (such as an acrylic coating), which is installed over the post-tensioned concrete or asphalt sub-surface. Nearly all competitive, tournament and championship courts are hard courts.

Outdoor Clay Courts

On the recreational level, clay and fast-dry courts are growing in popularity. Many are converted tennis courts. If well-maintained, this is a good option for those who prefer a cooler surface than a hard court.

Other Courts

Carpet, gymnasium floors, prefabricated panel flooring systems and rolled out systems are also options to explore depending on the specifics of your project and whether you're seeking to play sanctioned events. Polypropylene tile is also an option, however it is recommended that court owners test the playability of these surfaces on the sub-base first. Many of these surfaces can be installed both indoors and outdoors, either permanently or temporarily.

Choosing a Contractor

The techniques used for building pickleball courts are identical to those for tennis courts, so it makes sense to consult a local tennis court contractor.

One way to find a qualified contractor is to contact the American Sports Builders Association (visit www.sportsbuilders.org). The ASBA is the trade association for tennis court and sports builders and can provide a directory of its member contractors. In addition, the ASBA conducts a Certified Tennis Court Builders program. Court builders who have earned the "CTCB" designation have completed a specified number of projects and passed a certification exam. CTCBs can also add a Pickleball Court Builder Certificate to their credentials.

When choosing a contractor, be sure to consider their knowledge, experience, quality, reliability, ability to stay on schedule, financial responsibility and more. Look for a contractor with specific experience building courts or sports surfaces. Ask for references. Visit other projects they've done and talk to the owners.

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Ask for all proposals in writing, making sure that they meet all specifications and spell out products to be used and methods of construction. Make sure it details exactly what is and is not included in the contract price, including who is responsible for items such as permits, insurance, site prep, electrical power, landscaping, cleanup afterward, etc.

Once a contractor has been chosen, confirm the agreement in writing. Before signing the contract with the contractor, again make sure it's as specific as possible in defining the scope of the work, materials, labor, equipment, deadlines, etc.

Project Delivery Methods

There are a number of ways to deliver a construction project, each with its own advantages and disadvantages. Three of the more popular for sports projects are Design/Bid/Build, Design/Build and Negotiated Agreement.

Design/Bid/Build is the most popular method, and is often mandated in public projects. With this method, a design firm designs the project, including drawings, specs and construction documents, then the project is put out to bid. Generally, the contractor submitting the lowest bid that meets all the requirements is chosen.

Design/Build combines the architectural and engineering design services with construction; the owner contracts with one company that is responsible for both.

Negotiated Contract or Agreement is a contract awarded on the basis of a direct agreement with a contractor, without going through a competitive bidding process. For smaller projects, such as court/facility renovations or resurfacing, this may be the most efficient method.

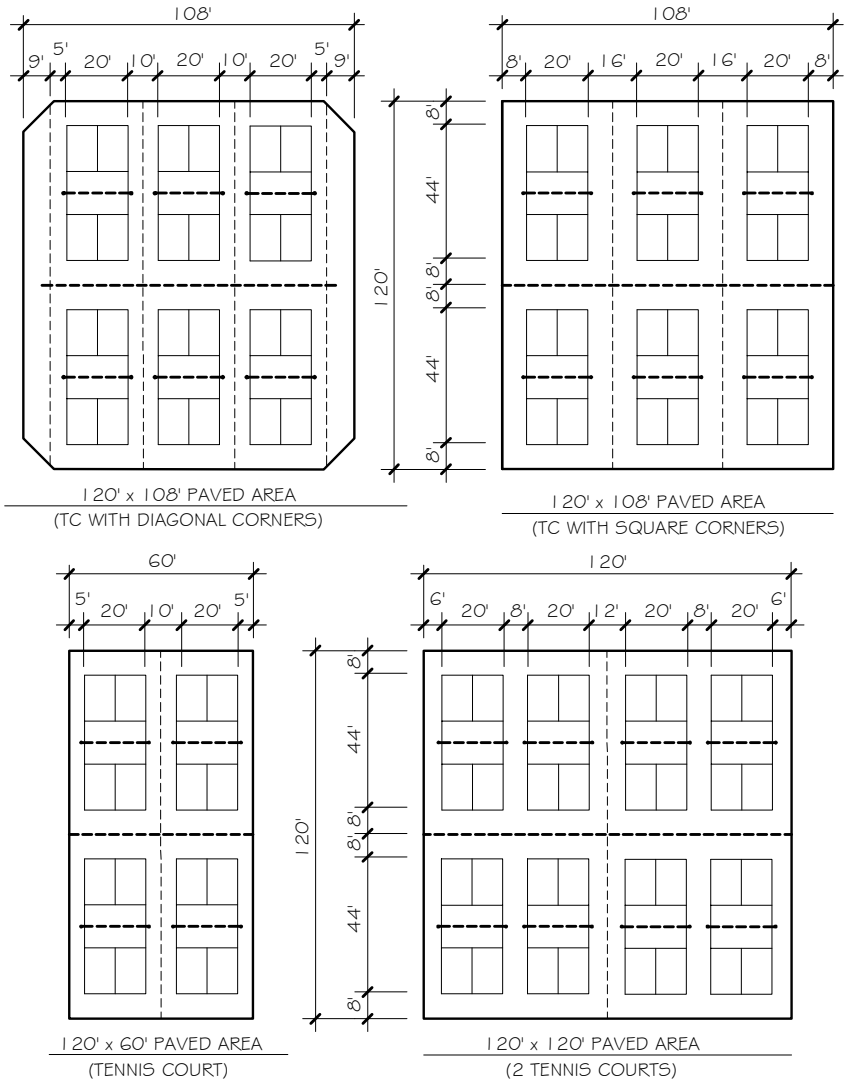
For very large construction projects, owners may want to engage a **Construction Management Firm** to handle design and construction.

Other Planning and Budget Considerations

While there are any number of things you'll need to or want to consider for your pickleball court(s), here are a few questions you should run through that may affect the plan and/or budget. (Many will be discussed in later chapters of this manual.)

- Will there be perimeter fencing? How high?
- Will you need windscreen on the fences?
- Will there be fencing between courts?
- What sort of access will you need for construction vehicles and materials?
- Will there be walkways to and around the courts for players and spectators?
- Does your plan comply with ADA and other relevant state and local requirements?
- Will there be spectator seating and seating for players who are waiting to play?
- Will you be installing lighting? (Evening play is often as popular as play during the day, especially during summer and in hot locales.) If lights aren't in the budget right now, can you prep for it by installing the conduit during initial construction, then add poles and lights later?
- Will you need walkway lights or lighting for the parking lot?
- Will there be shade shelters or cabanas for players, or shade for spectators?
- What sorts of architectural and zoning restrictions are there? Are there other CC&Rs (covenants, conditions and restrictions)?
- Are there easements for water, electric or gas lines?
- Are there setback requirements?
- Are there acoustic concerns regarding play that need to be addressed?
- Will you install water fountains, or will there be water taps for hose hookups to clean the courts?
- Will electricity be needed, such as for court lighting, walkway lighting, court-cleaning equipment, ball machines, etc.?
- Will you want a public address system, or clocks so people know when court time is up?
- What type of emergency systems may be installed, or required? For instance, will you need an automated external defibrillator (AED) or other lifesaving devices? How about emergency phones or fire alarms?
- What type of landscaping, if any, is planned?
- Will proximity to local residences require walls or landscaping for sound attenuation or visual separation?

With proper planning, and by assembling a diverse team to help develop the project, court and facility owners will be able to anticipate and adjust for any problems or delays up front, while also being able to set up for additions and expansions down the road.



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Tournament Considerations

If your facility will host tournaments and other large events, the planning process may need to consider some or all of these areas:

- Championship court, with spectator seating
- Operations room
- Officials' room
- Vendor space
- Hospitality areas
- Food service
- Media room/broadcast booth
- Spectator areas/seating/walkways

Converting/Retrofitting Athletic Courts to Pickleball Courts

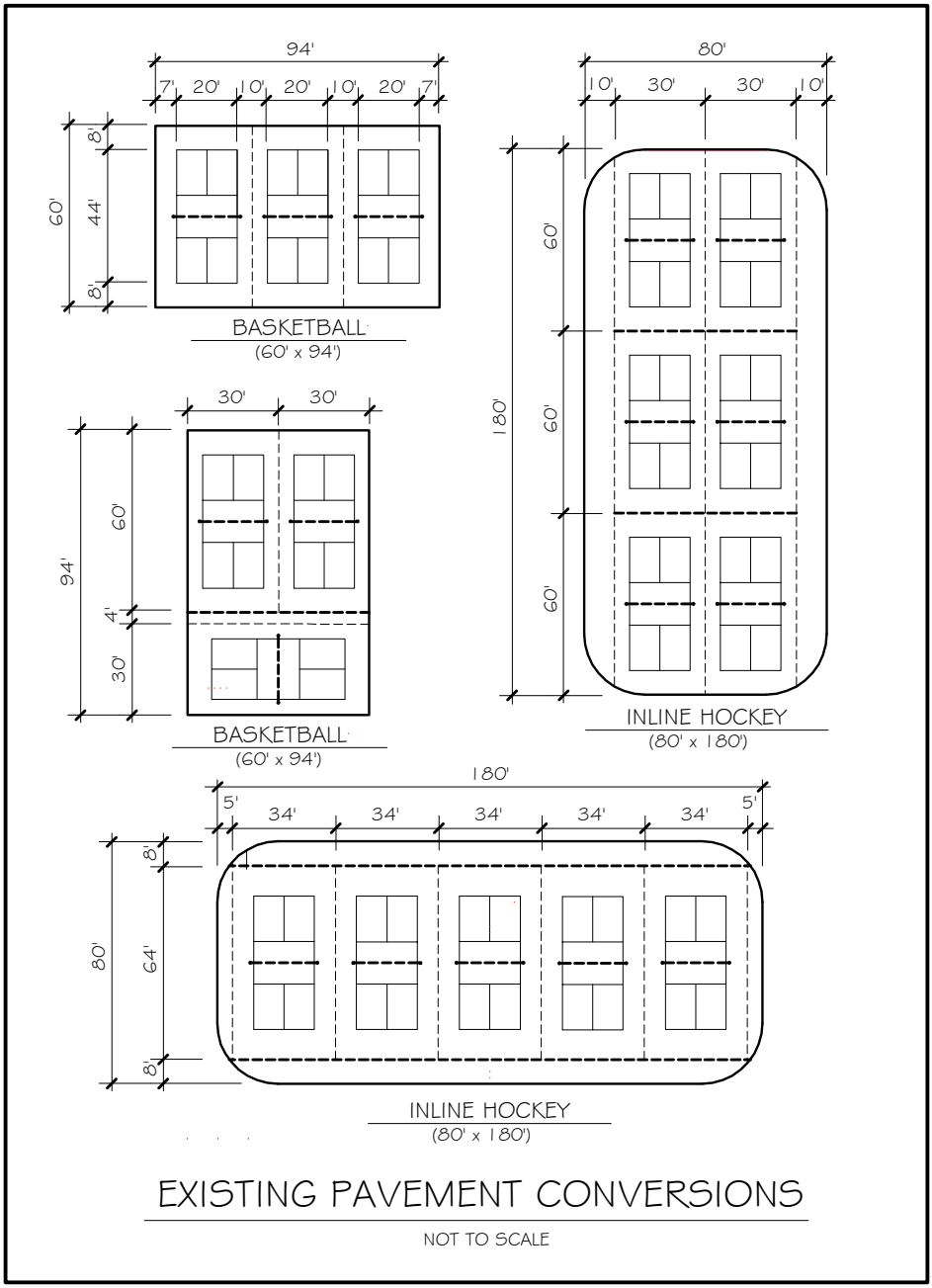
One Pickleball Court Per Tennis Court

The simplest way to create one pickleball court on an existing tennis court is to lower the tennis net to 34" in the center, using the center strap (this may require loosening net tension slightly to achieve this), while also lowering the net at the sidelines to 36". Another option is to install two additional strap anchors in the playing surface 10' from the center strap at the sidelines of the pickleball court. Lines may be taped or painted on the court for pickleball. Because of the size of the court surface, consider a temporary barrier so balls won't stray the full length of the court.

Note: *Temporarily taped or adhered lines may leave residue on the court or may damage the surface when pulled up.*

Two Pickleball Courts Per Tennis Court

A standard tennis court pad is 60' by 120'. The minimum recommended size for a pickleball court is 30' by 60' feet, so it's possible to put four pickleball courts in the space of a tennis court.* But if the tennis court has diagonal corners, four pickleball courts might be tight; two pickleball courts are the best fit. If the conversion is temporary, portable net stands can be used for the pickleball courts. If the tennis net is left in place as a backstop for the two pickleball courts, consider padding the posts.



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** It has been an accepted practice to measure the four pickleball courts that result from a conversion of a tennis court to the center line of the fence enclosure to satisfy the 30' by 60' recommended minimum.*

Four Pickleball Courts Per Tennis Court

Typical conversion projects often involve creating four pickleball courts from one full-size tennis court. Diagonal corners on the original tennis court should be squared off. If the court is a standard 60' by 120', there will be only 5' between the pickleball sidelines and 8' between the pickleball baselines and the surrounding fences. If space and budget allow, add additional overall width, which will give players more room and also allow room for seating on the courts. If the tennis net and posts are left up, consider padding the posts.

Chapter 3

Building Pickleball Courts

- Site Grading, Slope and Drainage
- Building New Hard Courts
- Surfacing Systems
- Other Surfacing Tips
- Building Clay or Fast-Dry Courts











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Building Pickleball Courts

The first step in breaking ground for a pickleball court or facility is proper grading of the site, which is critical to the quality of the project and is a key to creating a court or facility that endures over the long-term.

This chapter focuses on the construction of acrylic, plastic modular, polymer and other synthetic surfaces applied over concrete and asphalt sub-surfaces. These are the most common outdoor courts and those recommended for competitive, tournament and championship play.

Site Grading, Slope and Drainage

A properly graded site, with a properly sloped playing surface, will allow water to drain from the court surface while not affecting play.

For a hard court, the final court surface should slope between 0.83% (1:120) and 1.00% (1:100). This slope range has been proven to be effective at quickly shedding surface water, while at the same time being as close to flat as possible. Courts built with slopes less than 0.83% run the risk of leaving excessive water on the surface after a rain.

An unbound soft-surface (clay or fast-dry) court should slope more gradually, since a steeper slope may erode the surface material. Not less than 0.28% (1:360) and not more than 0.35% (1:288) is recommended with above-surface irrigation and not less than 0.21% (1:480) and not more than 0.35% (1:288) for courts with subsurface irrigation.

Regardless of the surface, the entire court should be sloped in one plane. Ideally, the court should slope in the shortest direction to allow for water to run off the court. Depending on the number of courts in any given battery, a side-to-side or end-to-end sloping configuration is always best. The third choice for slope would be corner to corner. Never slope a court from the net line toward the baseline or from baseline to the net, or from the centerline to the sides.

Drainage and drains should be placed outside the fenced area or court playing area. Do not put drainage underneath the court surface, since it could lead to settling of the surface. (With a battery of courts in a long line, consider grated trench or channel drains in the out-of-bounds area between courts.)

To help control sub-surface water, consider constructing a French drain, placed between the court or facility and the approaching underground water. A French drain is a trench filled with gravel or rock and containing a perforated pipe that redirects water away from the courts.

The contractor should be knowledgeable in how to properly grade and compact the site (including how much and what type of fill may be needed). Contact a geotechnical engineer if the soils are suspect or unknown. When adding fill, it should be in 8" lifts and compacted thoroughly before the next layer is put down.

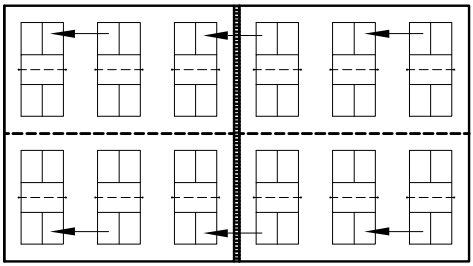
Building New Hard Courts

Whether asphalt or concrete, hard courts generally are fairly low maintenance. While asphalt is more prevalent, mainly because it's less expensive, fairly easy to install and easy to maintain, asphalt will crack as it ages and weathers. Post-tensioned concrete is being used more and more in sports construction and, while generally more expensive than asphalt, it is more resistant to cracking.

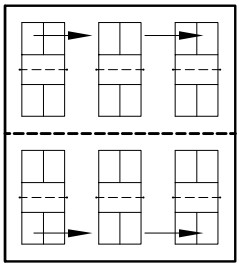
Note: *For new construction, the recommended total playing area is 34' (10.36 m) x 64' (19.51 m).*

Post-tensioned concrete courts have sheathed steel cables, called tendons, that run the length and width of the concrete slab, and once the concrete is poured, those cables are tensioned. Be aware that access to tensioning the cables will require at least 2' of additional space beyond the edge of the slab in all directions.

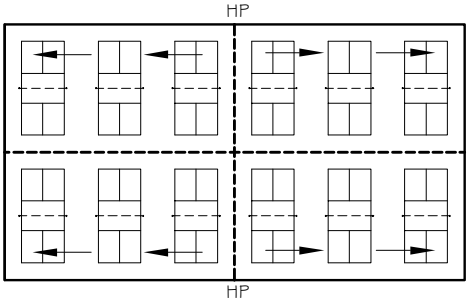
No matter what choice of base, though, before the asphalt or concrete goes down, the subgrade has to be properly shaped, compacted and sloped.



DRAINAGE IN A SINGLE PLANE
(WITH INTERMEDIATE INTERCEPTOR TRENCH DRAIN)



DRAINAGE IN A SINGLE PLANE
(SIDE TO SIDE PREFERRED)

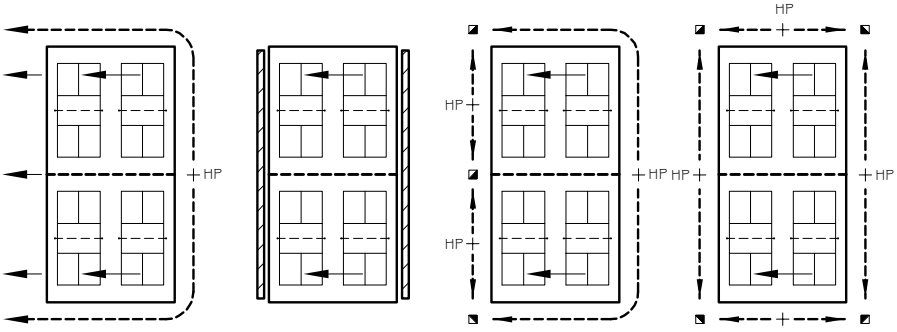


DRAINAGE WITH CENTERED HIGH POINT
(ONLY WITH DIVIDER FENCE)

NOTES:

MAXIMUM RECOMMENDED LENGTH OF SLOPE ACROSS COURT SURFACES IS 180'. LONGER LENGTHS CAN LEAD TO EROSION OF THE SURFACE OR SURROUNDING AREAS.

HP - HIGH POINT
◥- CATCH BASIN



LAWN SWALES

TRENCH OR
INTERCEPTOR DRAINS

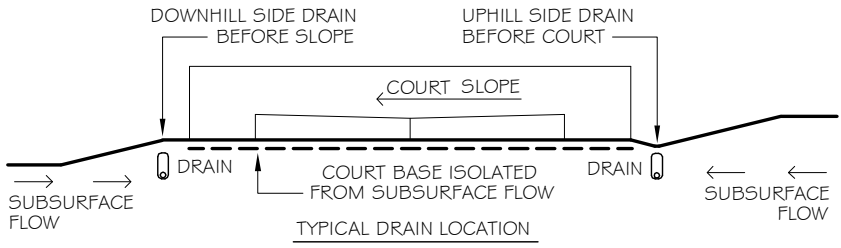
LAWN SWALES &
CATCH BASINS

LAWN SWALES &
CATCH BASINS

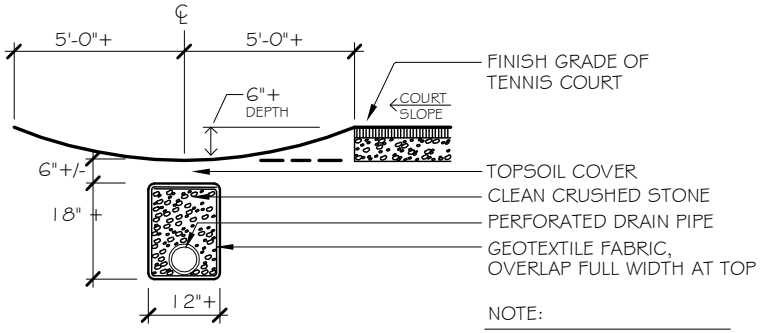
TYPICAL COURTS DRAINAGE PATTERNS

NOT TO SCALE

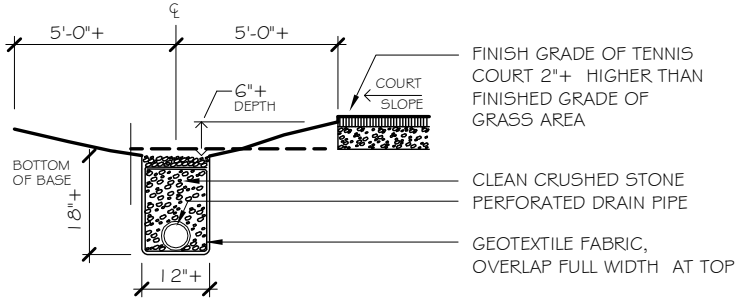
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TYPICAL DRAIN LOCATION



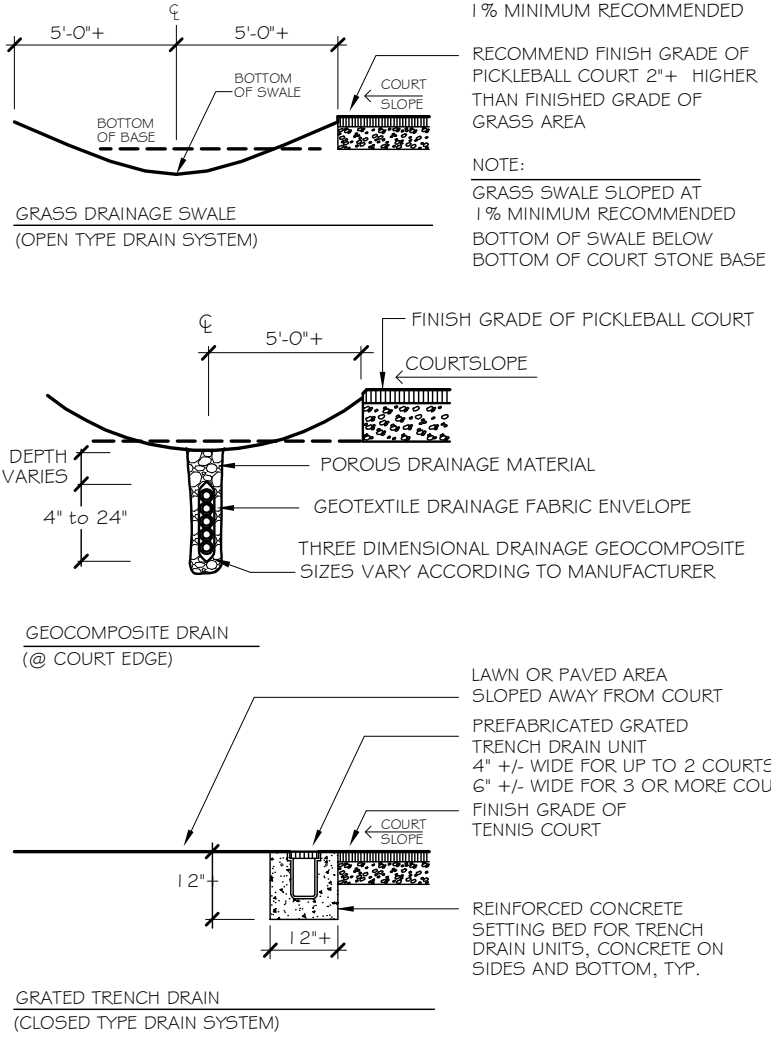
GRAVEL FRENCH DRAIN
(@ EDGE OF COURT)



GRAVEL FRENCH DRAIN
(COMBINATION TYPE DRAIN SYSTEM)

SECTIONS - DRAINAGE @ COURT EDGES 1

1OSDRAIN1.AVL.23



SECTIONS - DRAINAGE @ COURT EDGES 2

11SDRAIN2.AVL.23

Note: There are many steps and details to building an asphalt or post-tensioned concrete base. The descriptions here are an overview of the processes. Please consult a qualified court builder or design engineer.

Asphalt Courts

On top of the properly prepared subgrade, a gravel base is installed, generally 6" to 8" thick (depending on the type of native subsoils and local climatic conditions).

Once the gravel base is compacted, an intermediate course of asphalt is then installed and compacted. This intermediate course may vary in thickness depending on geographic location, but generally it is 2-1/4" to 3" thick.

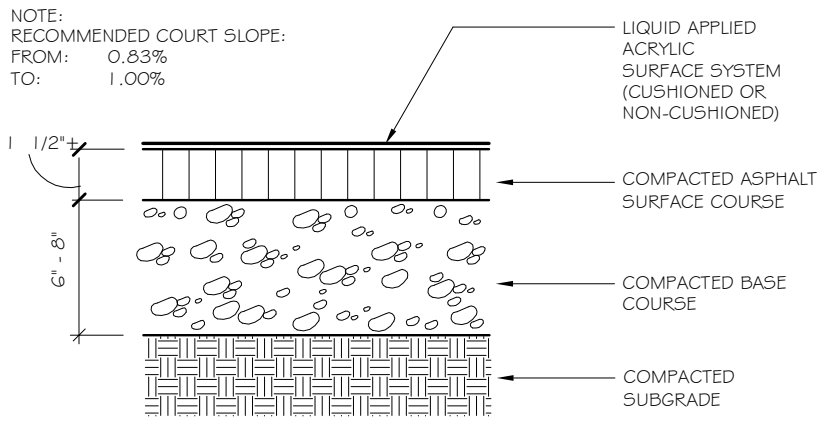
Next, the final surface course of asphalt goes down. Again, the thickness may vary by geographic location, but generally it will be at least 1-1/2". This surface course should be compacted to a uniform density and thickness.

The Asphalt Institute states: "Minimum [asphalt] lift thickness should be at least three times the nominal maximum [pavement] aggregate size to ensure the aggregate can align themselves during compaction to achieve the desired maximum density of the lift."

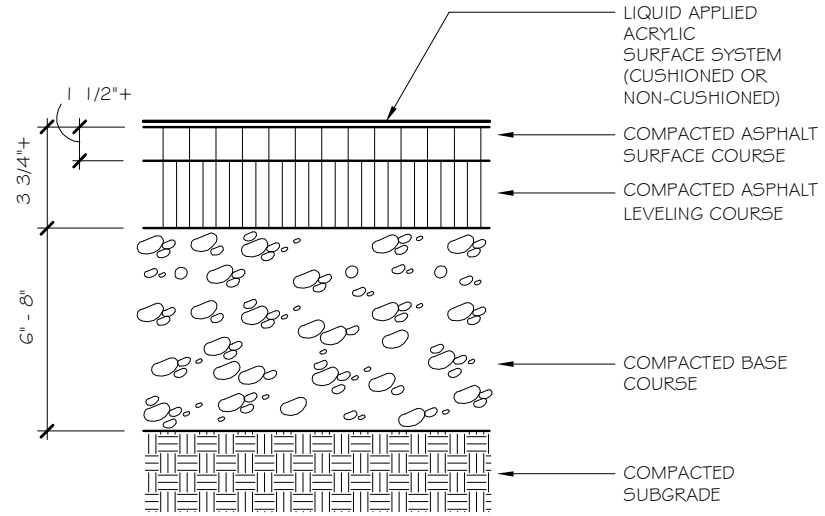
For multiple court batteries, consider placing stress relief joints between the courts.

The use of asphalt mixtures with recycled asphalt pavement (RAP) and/or recycled asphalt shingles (RAS) is not recommended in the surface course of asphalt due to their potential negative impact on pavement longevity and staining of acrylic surfaces. The aggregates used in the mix should be free from mineral pyrites, marcasites, wood particles or other deleterious materials, which may cause staining or discoloration and could interfere with the planarity or aesthetics of the playing surface.

Note: For non-freeze/thaw environments, one layer of asphalt (minimum 1-1/2" thickness) is acceptable. This layer should be composed of the same materials recommended in the final surface layer described above.



ASPHALT COURT FOR NON FREEZE/THAW CLIMATE

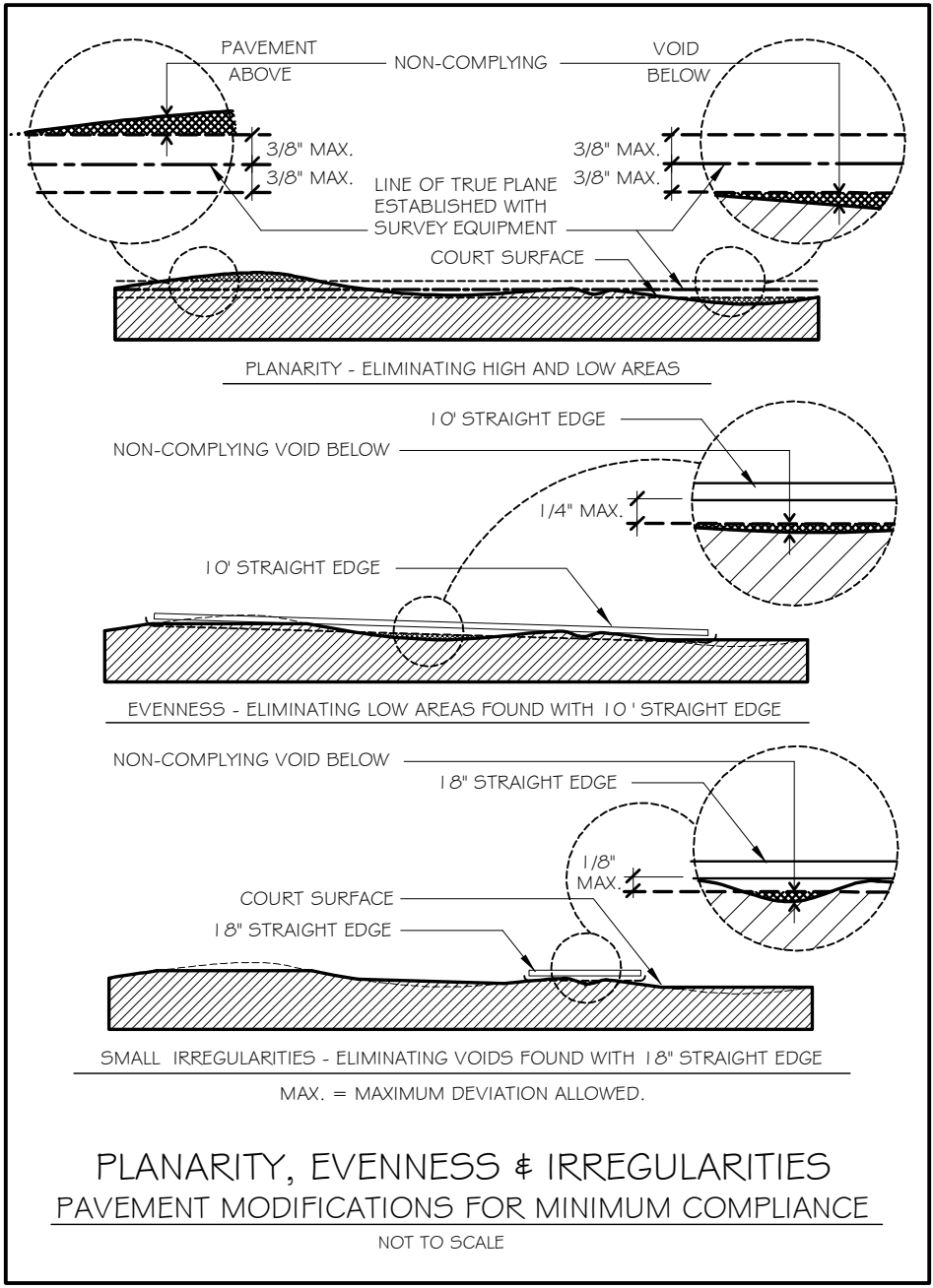


ASPHALT COURT FOR FREEZE/THAW CLIMATE

ASPHALT COURT SECTIONS

NOT TO SCALE

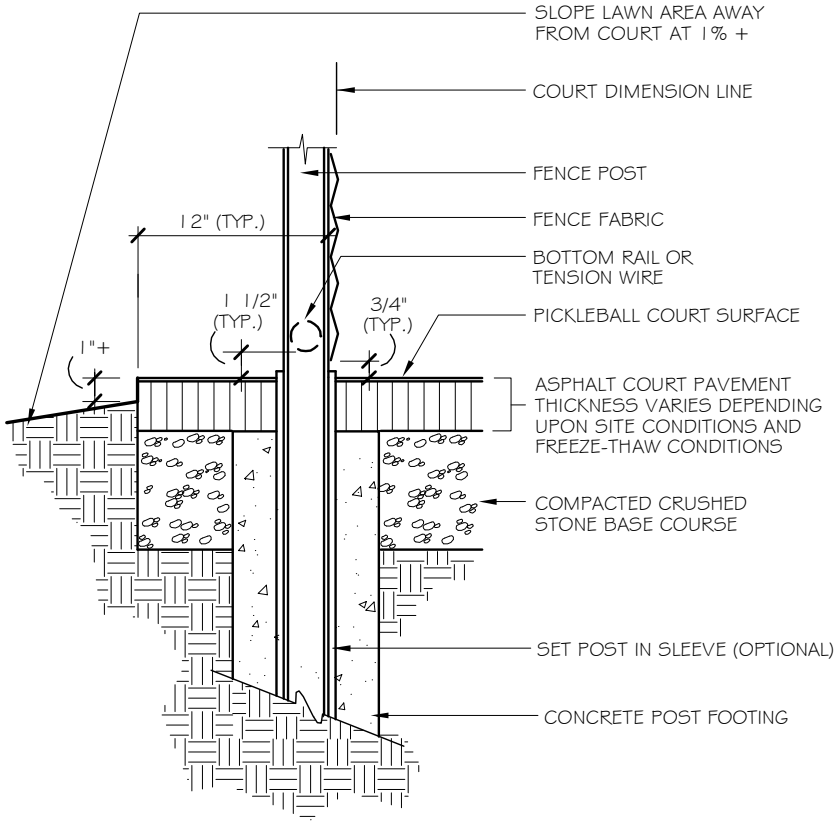
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PLANARITY, EVENNESS & IRREGULARITIES
PAVEMENT MODIFICATIONS FOR MINIMUM COMPLIANCE

NOT TO SCALE

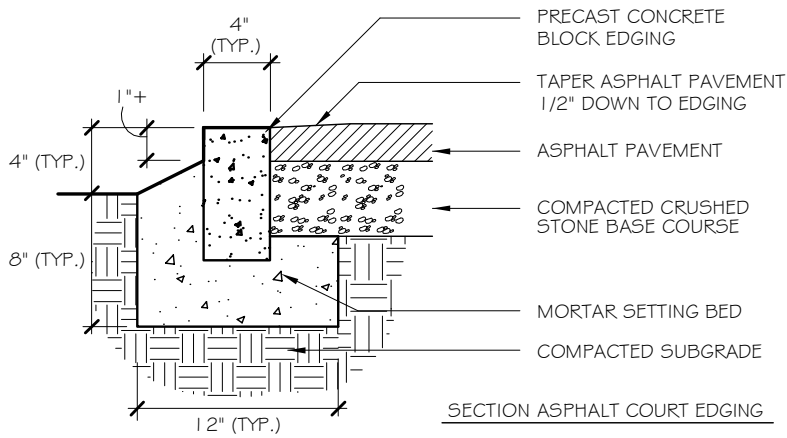
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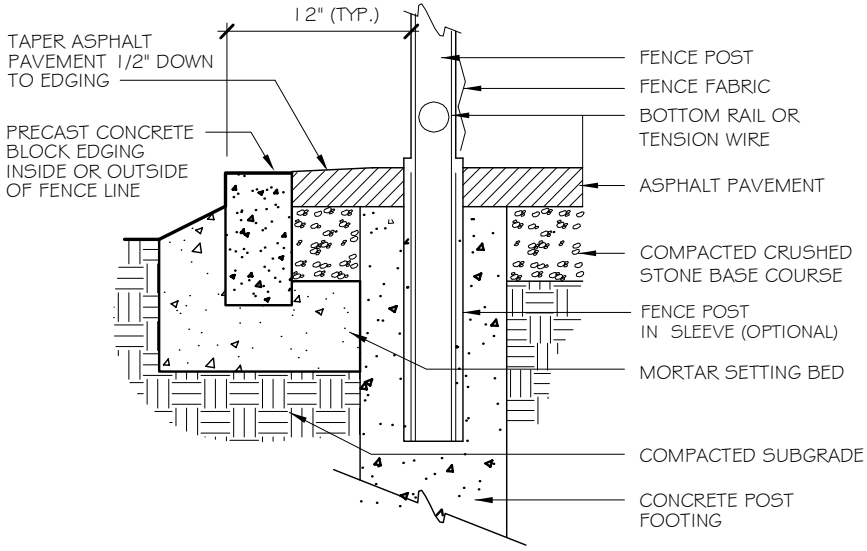
EXTENDED APRON SECTION AT ASPHALT COURT EDGE

NOT TO SCALE

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SECTION ASPHALT COURT EDGING

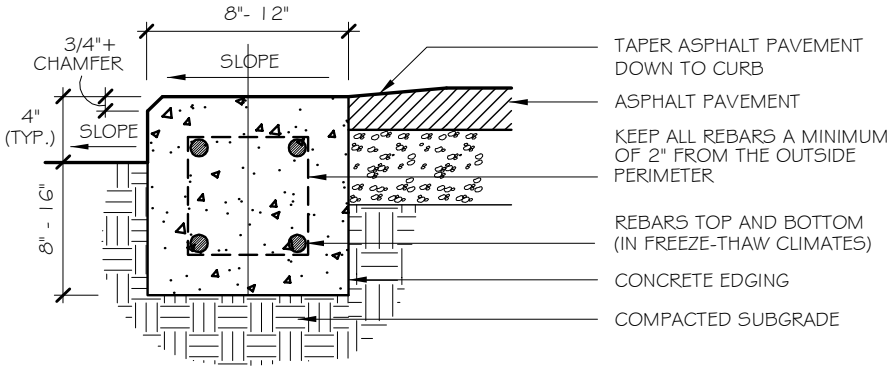


SECTION ASPHALT COURT EDGING AT FENCE POST

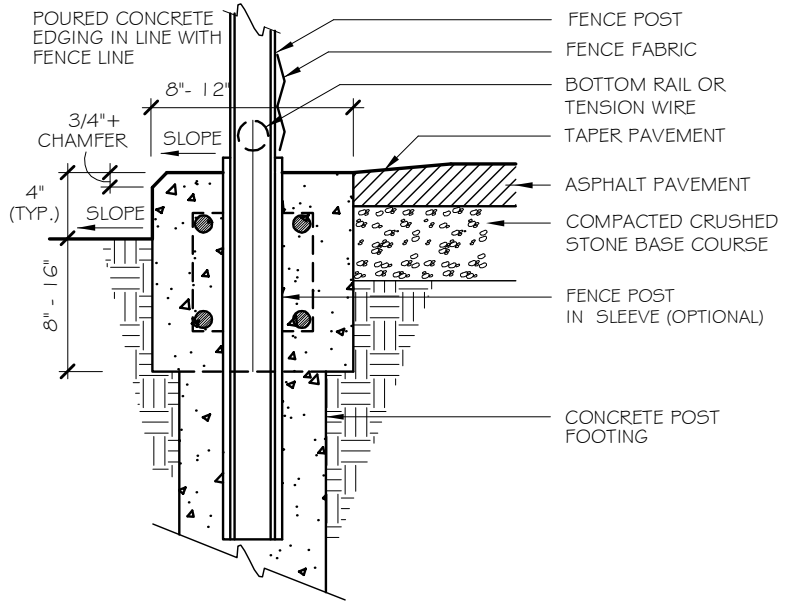
CONCRETE BLOCK EDGING FOR ASPHALT COURT

NOT TO SCALE

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SECTION - CONCRETE COURT EDGING



SECTION CONCRETE EDGING @ FENCE POST

POURED CONCRETE EDGING FOR ASPHALT COURT

NOT TO SCALE

16rEDGE3.AVL.23

Once the asphalt is installed, it needs to cure thoroughly, which could take from two to four weeks, depending on many factors, including site and weather conditions and asphalt composition. If courts are to be color-coated, allowing the asphalt the proper time to cure is essential for the color to bond effectively and evenly. Be sure to check with the manufacturer of the surface coating for any recommendations regarding asphalt curing.

For more on asphalt and asphalt installation, consult the ASBA's "Asphalt Guidelines: Asphalt for Athletic Uses," which is available at www.sportsbuilders.org under "Resources."

Concrete Courts: Post-Tensioned Concrete

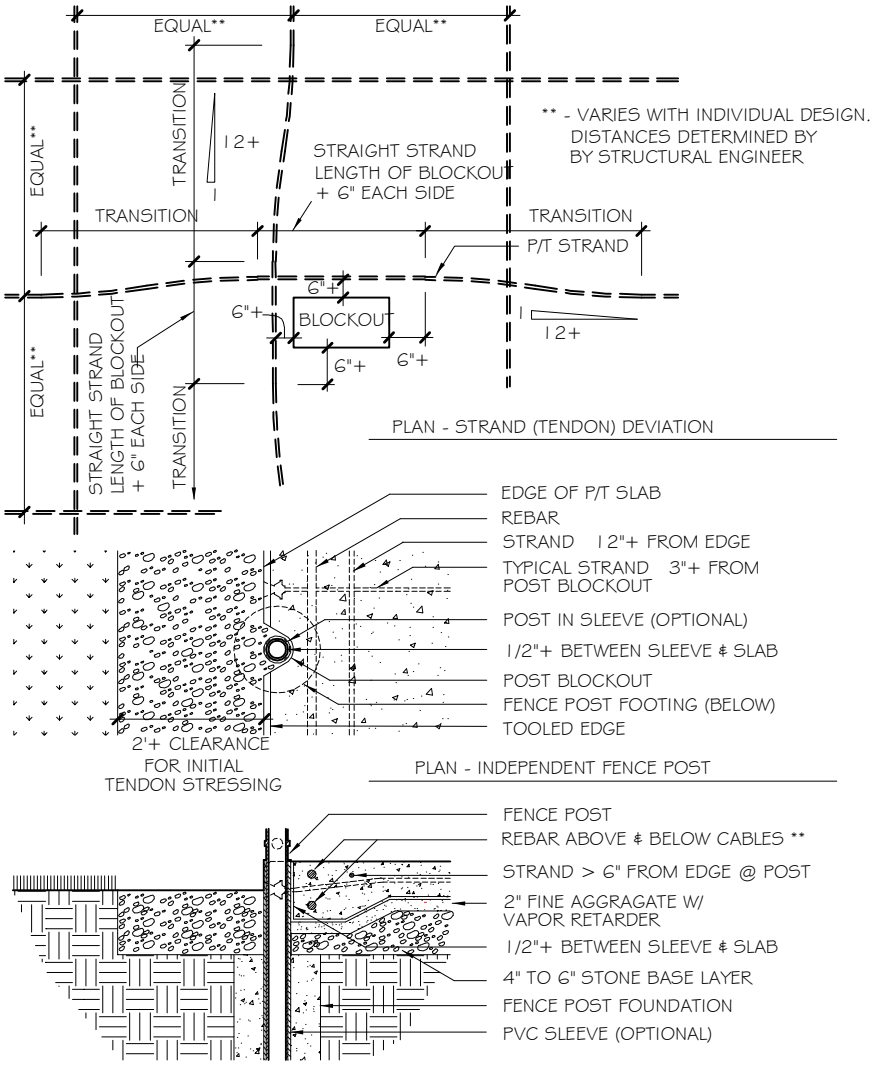
After the sub-grade is finished, a 4" to 6" drainage layer of aggregate is put down. This helps to prevent ground water from moving up to the concrete and also helps to minimize friction between the slab and the base, which is important when the slab tendons are tensioned.

Next, a vapor retarder should be installed, generally consisting of a minimum of two layers of 6 mil polyethylene sheeting laid in opposite directions. The vapor retarder joints should be overlapped and taped. Take care not to puncture the polyethylene sheeting during installation of the tendons and pouring of the concrete.

Note: *These systems are site-specific and should be specified by the project design professional. For additional information about the installation of vapor barrier/retarder systems, consult industry sources such as ASTM E1745, Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs, or ACI 302.2R, Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.*

After the form work and vapor retarder have been properly installed, the tendons for the post-tensioning system are installed on cable chairs, which ensure the tendons are properly positioned in the middle of the concrete slab. Tendons are generally uniformly spaced in grids; the spacing will depend on a number of factors, including slab design, length, thickness, weight, etc.

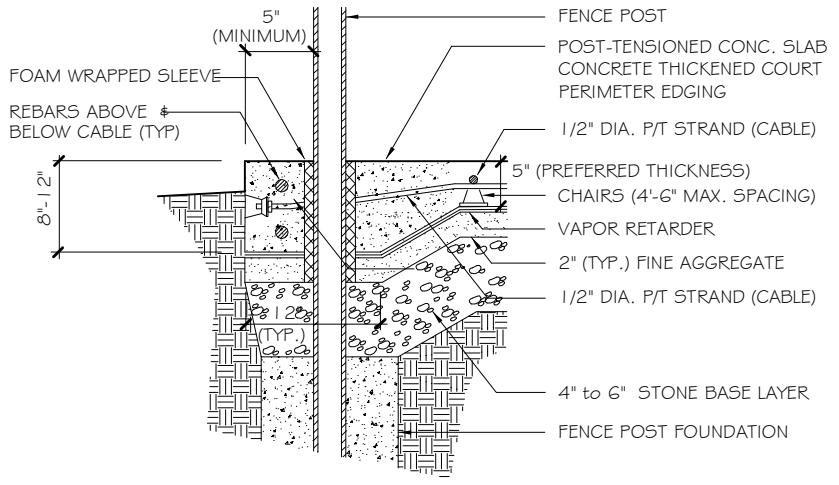
Prior to pouring the concrete, all fence posts, light poles, net posts or sleeves, and center anchors that have independent foundations or footings should be installed and wrapped with foam material to allow for shrinkage and compression of the concrete slab. Fence



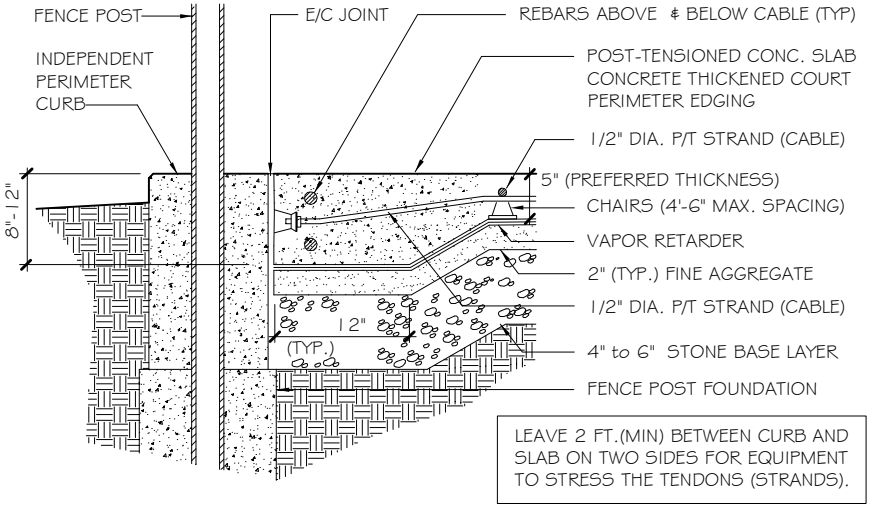
DETAILS OF POST-TENSIONED CONCRETE COURT PAVEMENT

NOT TO SCALE

17PTCONC1.AVL.23



SECTION 1 - THICKENED PT SLAB EDGE WITH INTEGRATED FENCE POSTS



SECTION 2 - THICKENED PT SLAB EDGE WITH INDEPENDENT CURB & FENCE POSTS

EDGE SECTIONS OF POST-TENSIONED CONCRETE COURT PAVEMENT

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1988 - 2018: Australian Open - Rebound Ace/Plexipave
1978 - 2019: US Open - DecoTurf

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posts can be wet set directly into the perimeter-grade beam if the slab is engineered properly to allow for movement and will not affect restraint to shortening. Please consult with your design professional for guidance.

Next, concrete should be poured in accordance to industry standards. The typical post-tensioned concrete slab is 5" thick, with slightly thicker edges to cover the PT anchors and prevent subgrade erosion. Finishing can include screeding, vibration, power-floating and troweling. For proper adhesion of an acrylic surface system to the concrete, a medium-broom finish is strongly recommended.

Partial tensioning at 18 to 24 hours may help prevent initial shrinkage cracks, but consult a design engineer.

The new concrete slab will need to cure, which generally means keeping it moist for about seven days by covering it with burlap, a polyethylene sheet or other curing paper, then allowing it to cure for an additional 21 to 38 days. Liquid curing agents are not recommended and should be used only if they are compatible with acrylic color and manufacturer recommendations.

The tendons should be fully tensioned when the slab reaches the compressive strength specified by the project engineer or design professional. Typically, that compressive strength is 2,000 psi.

Note: *Tensioning the tendons is a job for properly trained experts. We suggest builders working with post-tensioned concrete be trained and certified by the Post-Tensioning Institute.*

The slab will continue to cure after tensioning until it reaches full compressive strength, which generally is a minimum of 3,000 psi. The slab must be dry so that vapor emissions will not affect adherence of a surfacing system to the concrete. The manufacturer of synthetic surfacing systems will have specs, requirements and test methods to determine when the slab is ready to be surfaced.

For more information on post-tensioned concrete courts, refer to the Post-Tensioning Institute's Design and Construction of Post-Tensioned Concrete Sport Courts, 2006 edition, and the Post-Tensioning Institute's Construction and Maintenance Procedures for Slab-On-Ground Construction.

Concrete Courts: Reinforced Concrete

Slabs for court construction have for many years been made with reinforced concrete, a composite material that includes reinforcement within the concrete to improve tensile strength and ductility. The reinforcement is usually with steel reinforcing bars (rebar), which are embedded in the concrete before the concrete sets.

It is recommended that a vapor retarder be installed on top of the graded and compacted sub-grade even if an acrylic surface is not going to be installed initially. This will give the end user the option of installing acrylic coatings at a later date should they ever want to change the surface.

Surfacing Systems

Color Coating

Color coating the asphalt or concrete base creates a uniform playing surface and helps the pavement resist weathering. The manufacturer will provide instructions for mixing and applying its surfacing material. Consider selecting high-contrast colors; darker blues and greens provide the best contrast to optic yellow balls.

The first step to applying a color coating is to clean the pavement thoroughly. Then, the pavement is flooded with water to check for planarity and to identify low areas (“birdbaths), which are areas where standing water is at least 1/16” thick (the thickness of a nickel). With a string line, check to see whether the birdbaths are truly low spots or are formed by surrounding high areas. Low areas need to be patched and leveled; high areas can be leveled by scraping or grinding.

To correct these minor surface irregularities, apply a patching compound, which may consist of an acrylic binder mixed with Portland cement and a sand aggregate. Make sure the weather and temperature (at least 55 degrees F and no precipitation in the immediate forecast) will cooperate with the application schedule. One or more layers of patching compound may be applied. The patching compound coats should be compatible with the color surface supplier.

The next step is to apply textured filler coats, which are generally applied with a squeegee. Allow each coat to dry thoroughly before applying subsequent layers.

The color finish coats go down next, and are also applied with a squeegee. Generally, the court will have two or three coats of coloring material, applied smoothly and to a uniform thickness over the entire surface. Each coat must dry completely before the next coat is applied; follow the manufacturer's recommendations.

When the color coating is dry, the court should be lined with one or two coats of textured line paint as recommended by the color-coating manufacturer. Generally, allow at least 72 hours for an acrylic surface to cure completely before playing on the court.

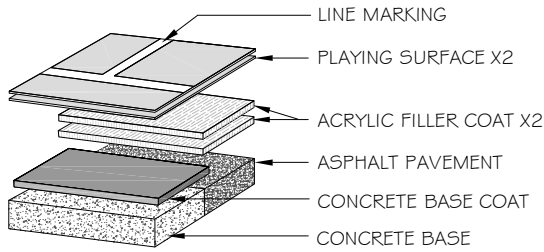
Cushioned Surfaces

Depending on the players at a particular facility, owners may want a cushioned hard court. The three most common acrylic cushion surfaces are:

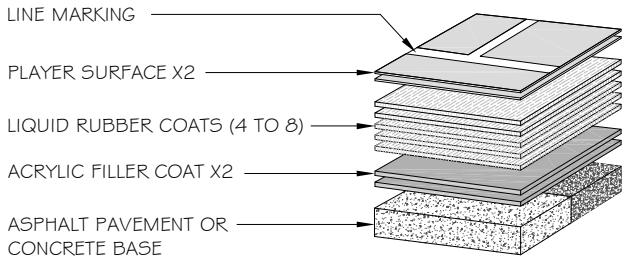
- Liquid Applied: "Liquid-applied" cushioning systems are installed in a series of thin layers, by squeegee or sprayed on. Typically, the system consists of four to eight coats of a latex-bound rubber-granule mixture applied to the asphalt or concrete base. The more layers applied, the higher the resiliency level that can be realized.
- Acrylic-Coated Shock Pad: These systems consist of a pre-manufactured rubber shock pad or multi-layered membranes that can be either free-floating or permanently adhered to the entire surface. These systems tend to vary in thickness from 4mm to 8mm, and can provide force reduction ratings up to 30% on a player's body without negatively impacting ball bounce during play.
- Poured-In-Place and Paved Base Mat Systems: These installations are created by mixing on-site a polyurethane binder with rubber granules and applying the mixture to the substrate, generally in thicknesses of 4mm to 12mm.

Once the desired cushioning is achieved, these systems are topped off with multiple layers of acrylic color coating. The color coating may be mixed with sand to achieve a specific texture over the entire cushioning system.

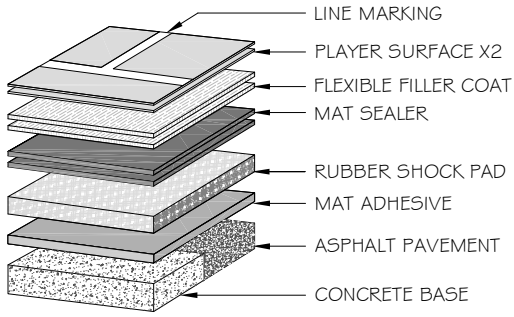
Note: *It is recommended that acrylic cushioned surfaces be adhered to the substrate. Floating systems may negatively impact ball bounce.*



BASIC ACRYLIC SURFACE



CUSHIONED ACRYLIC SURFACE

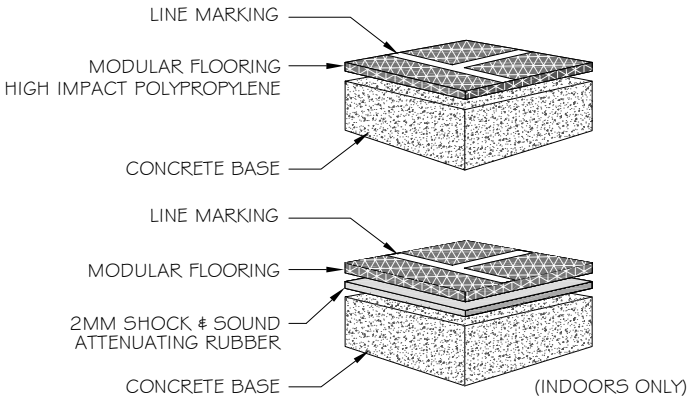


ACRYLIC COATED SHOCK PAD

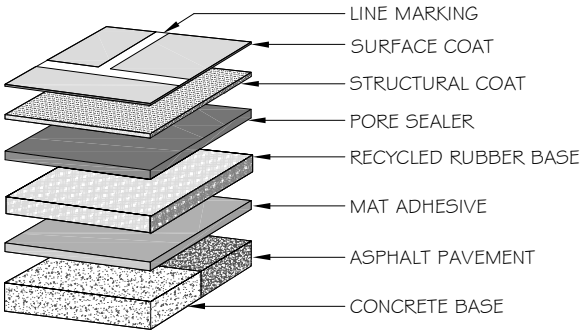
ACRYLIC COURT SURFACE SYSTEMS

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19.1 SURFACES1.B&W.DAL.23



MODULAR TILE SURFACES

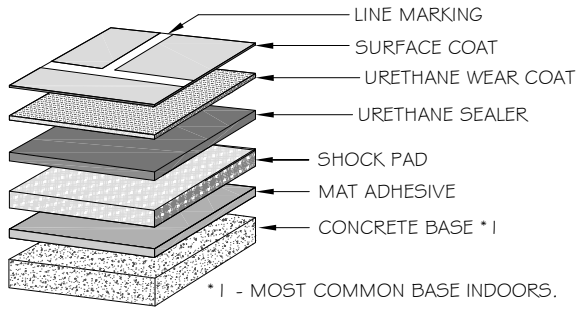


POURED URETHANE SURFACE

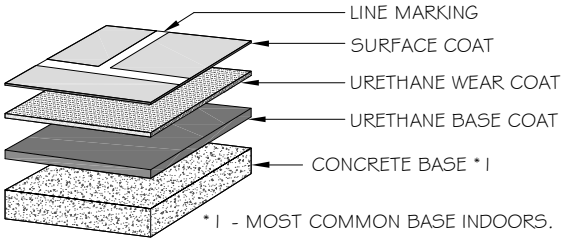
OTHER COURT SURFACE SYSTEMS

NOT TO SCALE

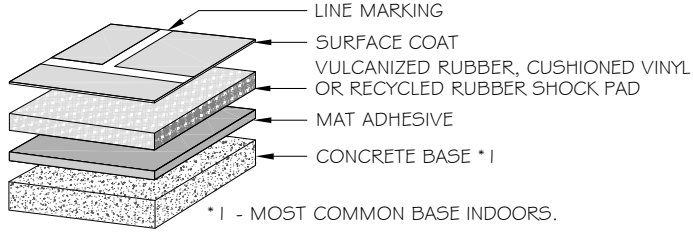
19.2SURFACES2.B&W.DAL.23



URETHANE SANDWICH SURFACE



FULL POURED URETHANE SURFACE



PREFABRICATED SHEET / ROLL GOOD SURFACE

OTHER INDOOR COURT SURFACE SYSTEMS

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No matter the cushioning system chosen, cushioned hard courts will generally allow players to play more frequently by lessening the physical impact their bodies experience while playing.

Modular Surfaces

Modular court surfaces are made up of interlocking tiles that are generally 10" to 12" square and made of polymer, plastic or other synthetic. They can be installed over new or existing asphalt and concrete bases, and may be a suitable alternative to reconstructing a deteriorating court.

Tiles are durable and easily cleaned, and damaged tiles can generally be easily removed and replaced. The open-grid design allows water to drain through.

Check with the modular tile manufacturer for the proper surface slope required and any other requirements.

Roll Goods or Sheet Surfaces

These types of surfacing systems for asphalt or concrete consist of a multi-layer membrane or rubber-cushioned mat. The membrane should be fully adhered over the entire court surface. The membrane system is applied to the base in strips and seamed together.

Developments with these surfaces have been significant using conventional acrylic and silicate finishes. When placed on a relatively smooth substrate, this can deliver an experience similar to that of an outdoor court.

Other Surfacing Systems

Other systems include textile or carpet, which when used indoors can provide excellent sound absorption. Textile surfaces require minimal maintenance. Again, though, for best results a textile material should be adhered to the substrate, not left free-floating.

Other Surfacing Tips

- The easiest type of surfacing system application is a single color for the entire court. For aesthetic reasons, owners might want to consider a contrasting color for the out-of-bounds area and/or the Non-Volley Zone ("kitchen").
- While very fine cracks may be covered by recoating the courts, most cracks require the attention of an approved court installer. Care should be taken in the materials and

methods used to fill and/or overlay cracks. Crack repair materials used for driveways and parking lots generally are not recommended because they tend to have performance issues and long-term risks.

- For dedicated pickleball courts, white textured lines are the best. In installations where other sports may be played on the same court surface, "tone on tone" or "blended" lines in the same color family as the court itself should be used. These lines should stop 3" before all white playing lines. Other colors can be used as an alternative on multi-use facilities.

Building Clay or Fast-Dry Courts

Standard Base

In constructing a clay or fast-dry court, a base course of processed stone is installed over a stable and properly prepared subbase. The thickness of the base course may vary depending on local soil and climatic conditions, but should be not less than 3" (76mm) after compaction.

Note: For new construction, the recommended total playing area is 34' (10.36 m) x 64' (19.51 m).

Aggregate used in construction of the base should be dense graded aggregate (DGA), a mixture of stone of various sizes from 3/4" down to fine aggregate (fines). The proportion of various sizes will differ from one supplier to another. Local stone is often used. Granite or a similar type of stone makes an excellent base because, when crushed, it yields angular particles which grip each other, creating a stable base that holds water well. Other materials including limestone screenings can be used under extenuating circumstances.

The base material should be porous enough to allow water to penetrate after compaction, but not so porous that the water drains completely through. Water should be retained in the base until the court surface begins to dry. Capillary action then pulls the moisture back into the court surface. To ensure adequate moisture retention, the base material should have a certain percentage of very small particles, called "fines." Bases with excessive variation in gradation of stone between layers may interfere with capillary action or water retention.

The base should be stable enough not to shift under the weight of a roller.

Some possible base materials, when combined with water and compacted, become too solid and lose porosity. For example, some limestone materials become so hard and dense that no water will penetrate at all. For this reason, all base materials should be non-water soluble.

In areas of freeze-thaw activity, lightweight materials may heave and should be avoided. The most commonly used material is screenings, which is stable, porous and has excellent material size distribution.

After the base course is completed, a leveling course of screenings, a mixture of aggregate from 1/4" down to dust, is installed. That course should be not less than 1" (923mm) thick after compaction and graded to the finished slope of not less than 0.28% (1:360) and not more than 0.35% (1:288) for courts with above ground irrigation and not less than 0.21% (1:480) and not more than 0.35% (1:288) for courts with subsurface irrigation.

Modified Base

In areas with little freeze-thaw activity, a modified base is constructed consisting of a single course 3" (76mm) to 4" (102mm) thick. Following construction of the base course, a layer of surfacing material is spread over the top. For natural clay courts, the surfacing material consists of clay blended with sand and silt. The natural clay should be not less than 25% or more than 50%, with the remaining material sand and silt in proportions determined by local conditions.

The mixture should be thoroughly blended to a uniform consistency. Its finished plasticity should be not less than 12% nor more than 20%. The surface course should be compacted to a thickness of not less than 3" (76mm) for natural clay, 2" (51mm) for blended material and 1" (25mm) for fast dry. Note: Fast-dry surfacing, material consists of crushed stone, brick or tile, screened and, sometimes, mixed with a chemical binder. Several name brands are available in the marketplace.

Irrigation

Both clay and fast-dry systems require regular irrigation to saturate the surface; this can be done either through the use of a

sprinkler system installed in and around the court, or by a subsurface irrigation system.

Drainage

A newly constructed fast-dry court will hold more water and drain more slowly through the first winter. This is due in part to the binder included in the fast-dry material. As the court weathers, the binder leaches out and the court drains more quickly. Another reason the court drains more slowly at first is because it is somewhat less dense. No matter how well the court is compacted during construction, it is only through weathering that the particles settle and lock together, creating a surface that allows water to run off. A new fast-dry court, then, drains almost entirely down through the court; after the first season, most of the water will run off the surface of the court.

Curbs

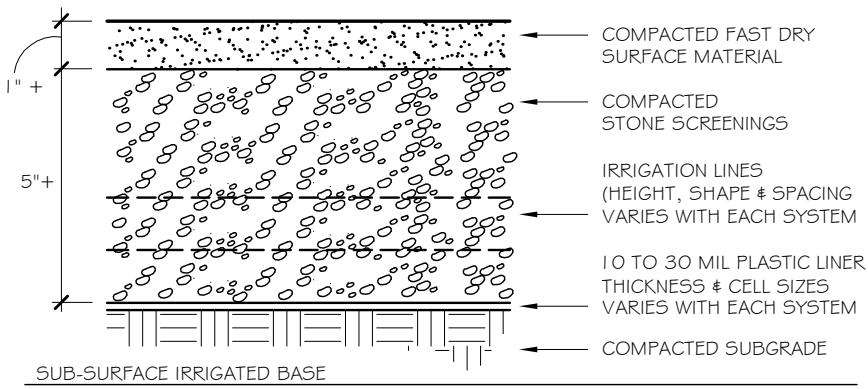
A curb of standard brick or block set in cement mortar, treated wood timbers or concrete is installed around the court perimeter to contain the loose surfacing material. The curb elevation should be 1/2" (13mm) below the finished court surface and the court surface should be tapered from approximately 2' (610mm) out to meet the curb.

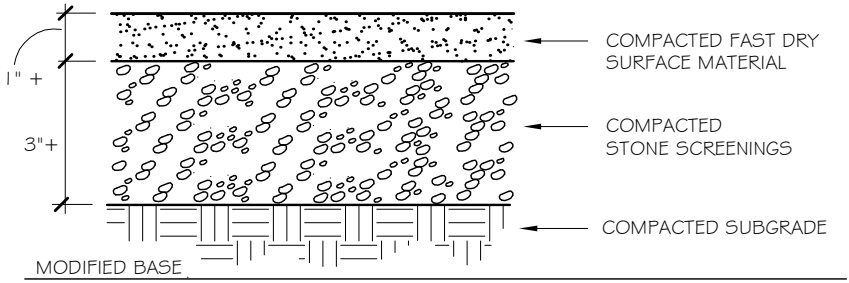
Lines

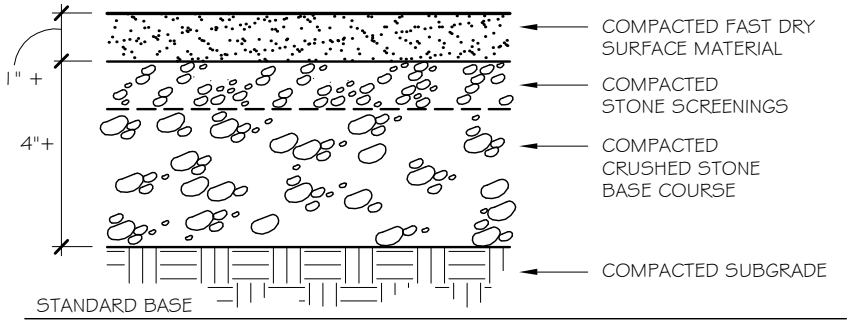
Line markings on clay or fast-dry courts are either painted daily or installed for more permanent use with plastic or fabric tapes anchored to the court surface with nails. See Chapter 7 for more information on clay and fast-dry court accessories.

Maintenance

See Chapter 9, "Care & Maintenance," for information on maintaining clay and fast-dry courts.







FAST DRY COURT SECTIONS

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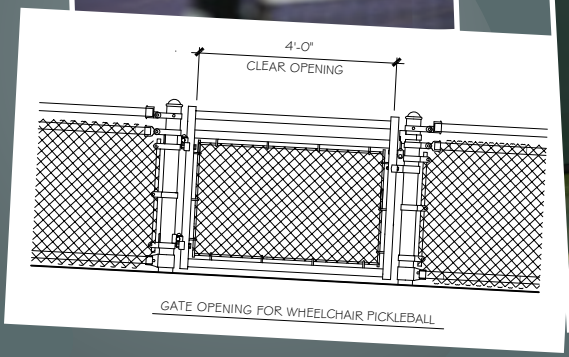
Chapter 4

Adaptive/Wheelchair Pickleball



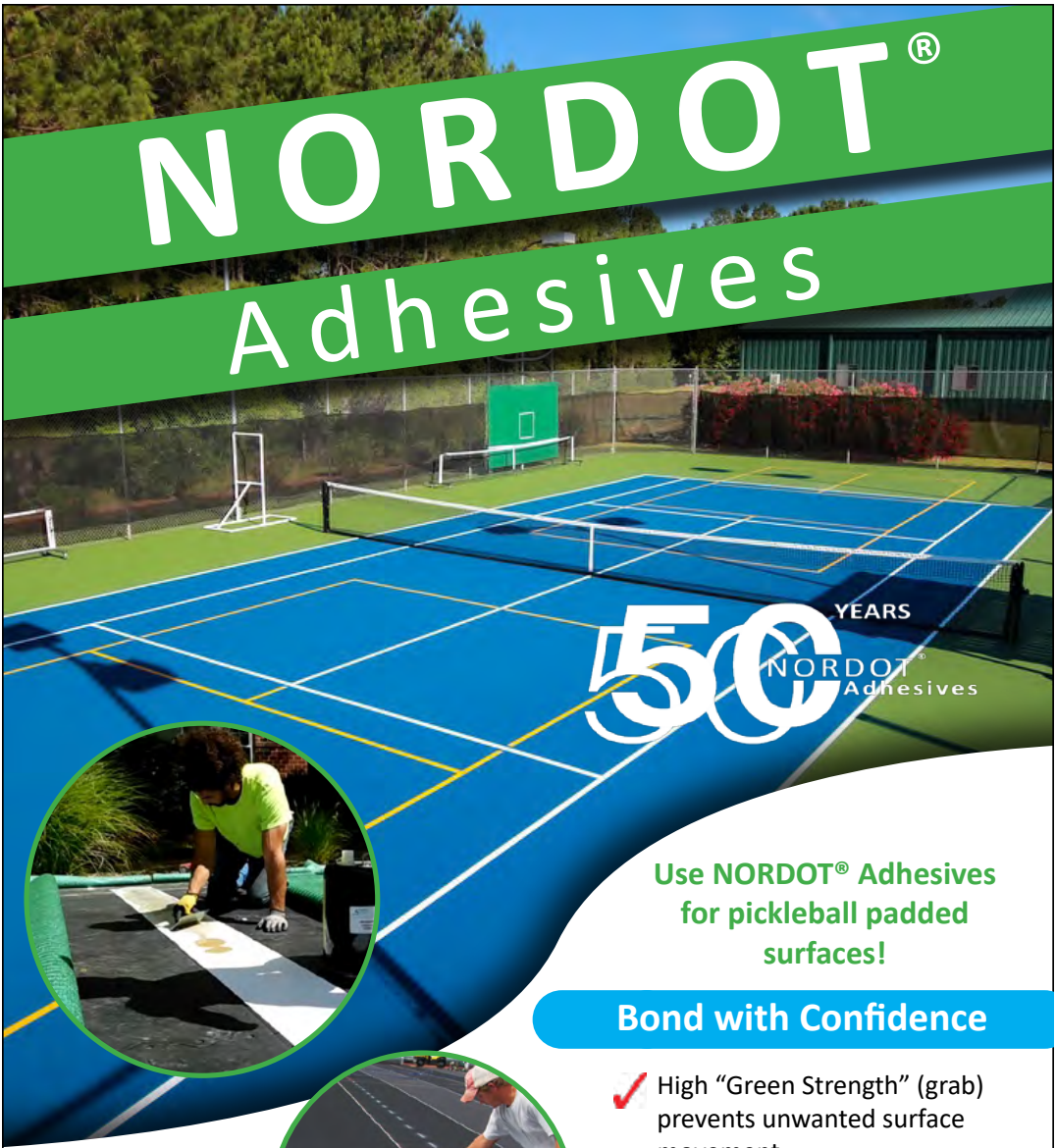






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Adaptive/Wheelchair Pickleball

Pickleball is an ideal sport for wheelchair athletes. The size of the pickleball court and bounce of the ball helps to make pickleball one of the few sports in which wheelchair athletes can compete with and against both other wheelchair players as well as ambulatory players. For wheelchair players, pickleball is played following nearly the same rules as for standing players, with the main difference that wheelchair players are allowed two bounces of the ball (the second bounce can be inside or outside of the court).

To allow adequate space for wheelchair players to maneuver, consider the following recommended dimensions for overrun areas for new or renovated pickleball courts suitable for wheelchair play (see diagram "Details for Wheelchair Pickleball"):

- Sideline to fence, or benches/seating area: 12'
- Baseline to fence, or benches/seating area: 15'
- Between courts if no fencing (sideline to sideline): 12'

Playing pickleball in a wheelchair will not harm a hard court surface. In most cases, lightweight sport wheelchairs have soft pneumatic or polyurethane tires. (Note, however, that some cushioned surfaces may create extra friction for wheelchair tires and may make maneuvering difficult.)

For new and renovated construction, be sure to follow guidelines in the Americans with Disabilities Act (ADA) as well as state and local codes.

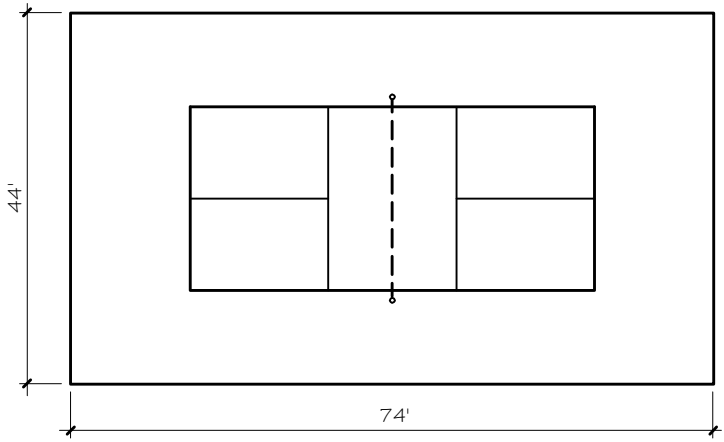
Note: *The ADA Standards for Accessible Design are at www.ada.gov.*

Public facilities must be accessible to both players and spectators in wheelchairs, so curb cuts, ramps, accessible parking and restrooms, and other amenities will be necessary.

Ideally, while all pickleball courts should be accessible, facilities must have at least one court fully accessible. However, check all codes; in some instances, larger facilities will require more courts to be fully accessible. For facilities with specific accessible courts, wheelchair players should be given priority for use of those courts.

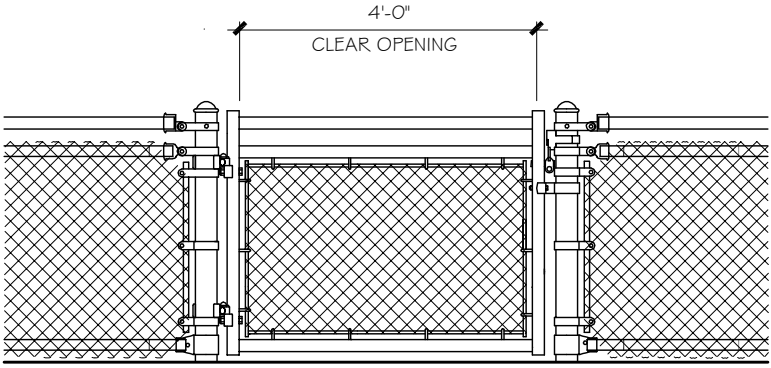
Make sure pathways to and from the courts can accommodate wheelchairs. Wheelchairs normally need 36" wide door spaces, but sport wheelchairs have canted wheels, making them much wider than everyday wheelchairs. The recommended width for paths is at least 48", with possibly wider areas for turning and passing. The path surface should be firm and non-slip and with minimal slope as defined by the ADA. Gates into the courts should be a recommended minimum 48" wide. Doorways into restrooms, spectator areas, team seating areas and other enclosures should also be wide enough to accommodate wheelchairs. Team seating areas should have designated sitting areas for wheelchair athletes.

For facilities that may be used for wheelchair pickleball tournaments, keep in mind that many athletes will bring both a sport wheelchair and their regular wheelchair, so a temporary storage area (preferably tented) may be necessary for chairs not in use. Also, plan for a large number of wheelchair spectators, which may mean more wide paths, a larger than average number of wheelchair accessible parking spaces, restrooms, accessible hydration stations, service animal areas, etc.



44' x 74' COURT

RECOMMENDED FOR WHEELCHAIR PLAY



GATE OPENING FOR WHEELCHAIR PICKLEBALL

RECOMMENDED

DETAILS FOR WHEELCHAIR PICKLEBALL

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Chapter 5

Fencing

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Fencing

Fencing is designed to keep balls within the pickleball court during play. Depending on location, facility type and court layout, fencing for a pickleball court or facility can vary in height and may not need to surround the entire court.

Fence Height & Layout

The height of the fencing required often will depend on the court location. A 7' to 8' high fence is commonly used for most courts. Rooftop courts or courts that have limited to no access beyond the fence line may require a higher fence or may require extending netting above the fence. When determining the height of the fence, municipal and city codes might define how to enclose activity areas.

When specifying fencing for pickleball play, there are many layouts to consider. Most pickleball courts require fencing across the back of the court and along each sideline from the corner posts to a recommended minimum of 16' up the sidelines. The remaining distance on either side of the net can be left open, or a lower fence height of 3'-6" can be used to contain rolling balls.

These open designs save money on fencing, while also providing enough fencing to keep balls within the court. It also allows better visibility for spectators. Where multiple courts are to be built in a battery, leaving additional open area between the playing surfaces of the courts provides room for the installation of accessories such as shade shelters and benches.

Chain-Link Fabric & Frame

The standard chain-link mesh size for pickleball courts is a 2" diamond-shaped chain-link fabric. The most commonly used chain-link fence fabric is 9-gauge, which is more durable and less likely to deform over the long term. The chain-link fence fabric should be attached to the court-facing side of the perimeter fence posts for best performance and ease of attaching windscreens.

Most fencing comes either in a vinyl, polyester or polyolefin coated framework with similarly coated chain-link fence fabric. Vinyl or coated fencing is typically more expensive than galvanized

steel fencing, but it provides numerous long-term benefits and is aesthetically more desirable. Consider coated fence materials in areas with a high level of pollution or close to salt water, where exposure to these conditions is hard on fencing materials.

If budgets are tight, facilities may utilize a galvanized chain-link frame and fabric. Another cost-saving method is to attach a vinyl-coated chain-link fabric to a galvanized framework. The galvanized fence framework can be painted to match the vinyl-coated fabric.

(Another option might be lightweight netting supported by tensioned cables. Also, short, temporary, triangular barriers surrounding courts may be adequate for ball containment, allow flexibility for competitive events and allow for branding.)

If windscreens will be installed to the framework, the fencing should be engineered for wind loads by a professional engineer. An excellent guide to research this is the *Chain Link Fence Wind Load Guide for the Selection of Line Posts and Line Post Spacing*, published by the Chain Link Fence Manufacturers Institute. This is a great reference for selecting fence-post diameter and to determine spacing between posts.

Pickleball fences should be selvaged (knuckled) at the top and bottom of the chain-link fabric as a safety consideration and also to limit debris from collecting against the side of the fence. Typically, the chain-link fence fabric is attached to each line post with tie wires every 12" and each horizontal rail every 15".

Fence Posts, Rails & Gates

Fence posts should be set in round concrete foundations not less than four times the diameter of the post and typically to a depth of 6" below the local frost line. Most foundations are excavated to a depth of 3' unless incorporated into the perimeter edge of a post-tensioned concrete slab. The depth of the footing depends on soil conditions at the site, the wind loads exerted on the fence as defined by construction codes, and the amount of freeze-thaw activity in the area where the court is to be constructed.

If acoustic barriers are to be installed, the weight and wind load on them must also be considered.

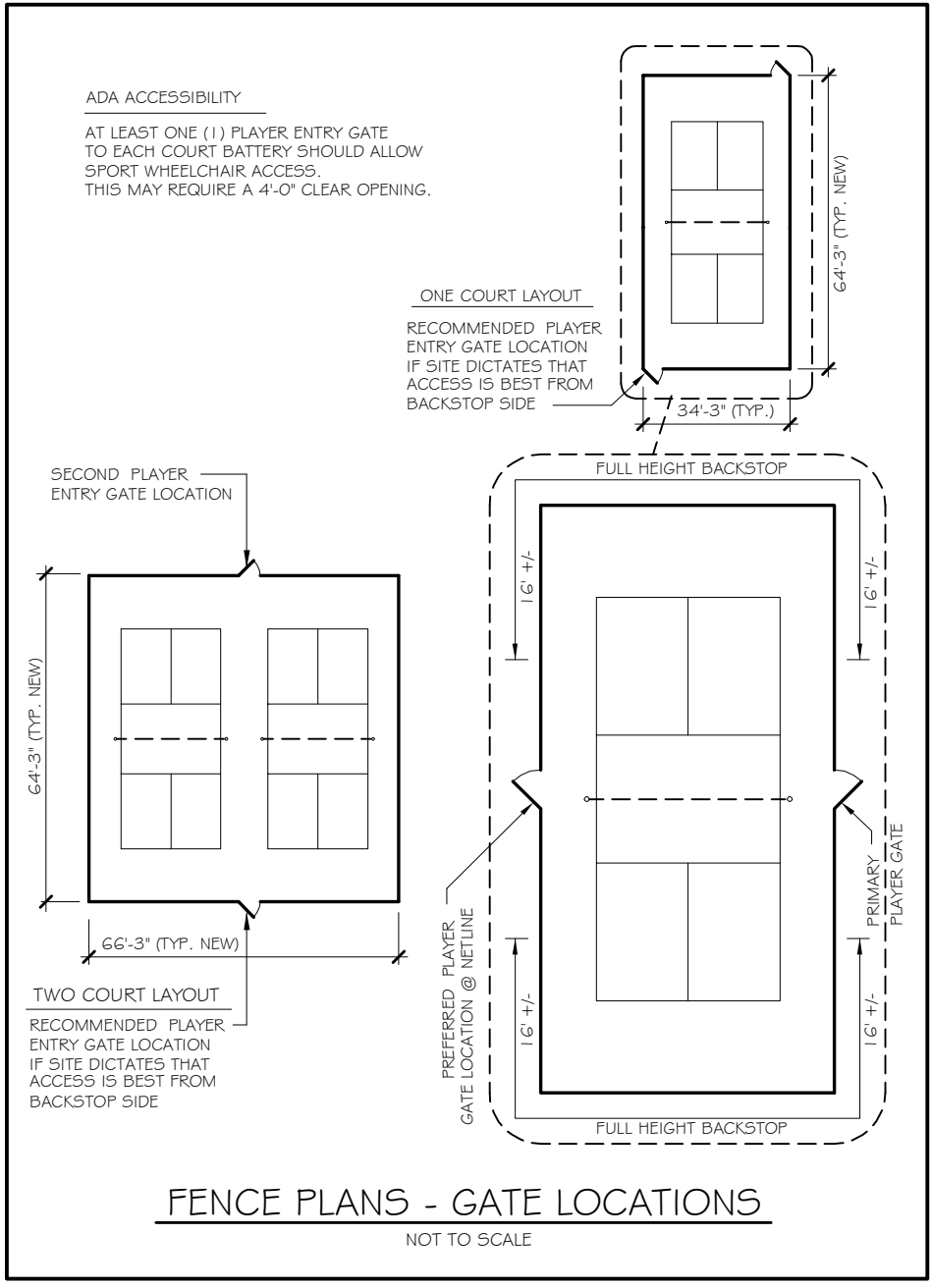
Top rail pipes are typically installed on all chain-link fencing and are 1-5/8" diameter pipes, which pass through loop caps or eye tops

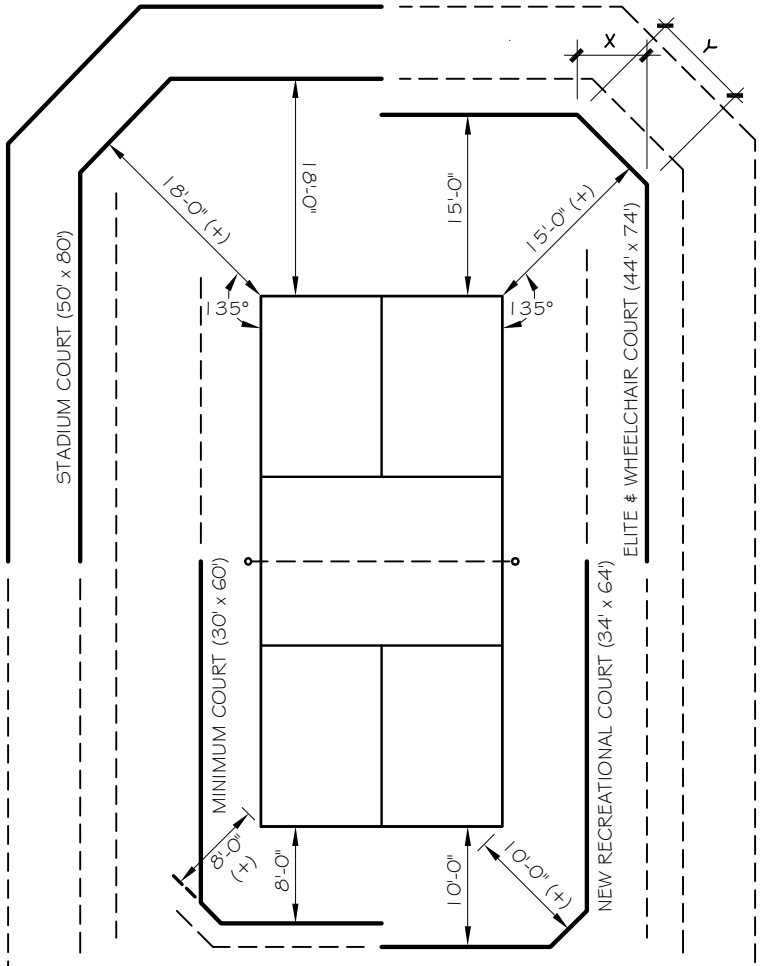
installed on top of each line post. They are usually sleeved together by couplings and the chain-link fence fabric is attached to the top rail pipe with tie wire every 12" to 18".

Bottom rails are also recommended since they help keep the bottom of the chain-link fabric from curling up, help prevent player injury from sliding under the fence, and give a finished look to the court. Bottom rails are typically 1-5/8" diameter pipes and are attached to each post with line rail clamps. As a cost-saving alternative, a bottom tension wire can be used instead of rail pipes. Tension wire should be attached to each line post with tie wire and attached to the bottom of the fabric with hog rings.

Mid-rail pipes are sometimes specified, but they can be a potential hazard if players run into the fence during play. For stability, rather than mid-rails, consider strengthening line and terminal posts or reducing the spacing. When mid-rails are called for, such as on a 12'-high fence, install them at a height of 7' to avoid player contact.

Gates should typically be 4' wide and 7' tall, with an adequate number to allow access to each court without interrupting play. Gates that are 4' wide allow wheelchair access and meet most ADA requirements, but be sure to check your local codes. Gates located at opposite corners allow for easy ball retrieval for balls that go over the fence.


ADA ACCESSIBILITY
AT LEAST ONE (1) PLAYER ENTRY GATE TO EACH COURT BATTERY SHOULD ALLOW SPORT WHEELCHAIR ACCESS. THIS MAY REQUIRE A 4'-0" CLEAR OPENING.
ONE COURT LAYOUT
RECOMMENDED PLAYER ENTRY GATE LOCATION IF SITE DICTATES THAT ACCESS IS BEST FROM BACKSTOP SIDE
64'-3" (TYP. NEW)
34'-3" (TYP.)
SECOND PLAYER ENTRY GATE LOCATION
64'-3" (TYP. NEW)
66'-3" (TYP. NEW)
TWO COURT LAYOUT
RECOMMENDED PLAYER ENTRY GATE LOCATION IF SITE DICTATES THAT ACCESS IS BEST FROM BACKSTOP SIDE
FULL HEIGHT BACKSTOP
16' +/-
16' +/-
PREFERRED PLAYER GATE LOCATION @ NETLINE
PRIMARY PLAYER GATE
16' +/-
16' +/-
FULL HEIGHT BACKSTOP
FENCE PLANS - GATE LOCATIONS
NOT TO SCALE
22FENCGA.AVL.23



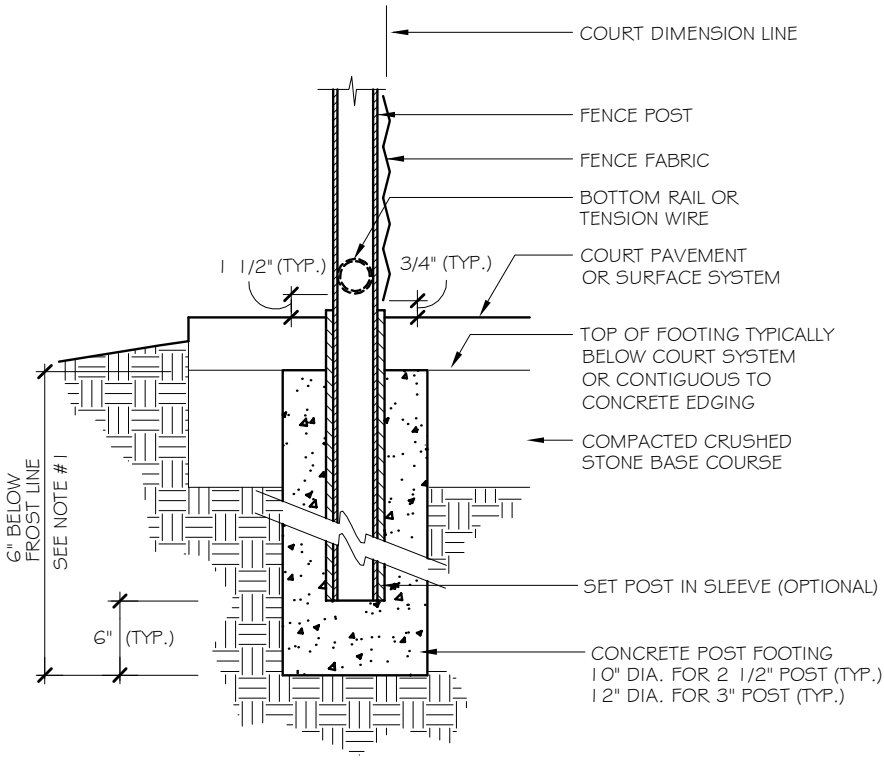
PREFERRED DISTANCE TO DIAGONAL FENCE TO MATCH OR EXCEED DISTANCE FROM BASE LINE TO BASE LINE FENCE

COURT SIZE	X (Maximum)	Y (Maximum)
30' x 60'	1'-10"	2'-5 3/4"
34' x 64'	3'-0"	4'-1 3/4"
44' x 74'	5'-10 3/4"	8'-4"
50' x 80'	7'-6 1/2"	10'-10"

FENCE PLANS - DIAGONAL CORNER

NOT TO SCALE

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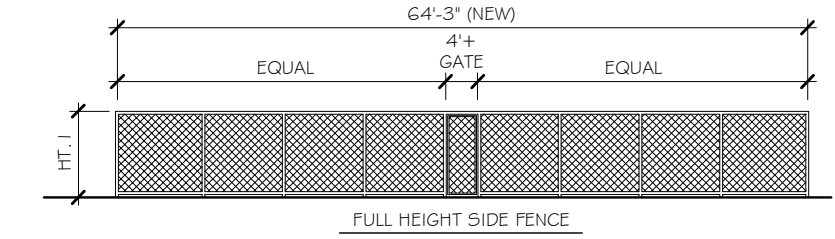


NOTE #1:
FOUNDATION DEPTH MAY VARY WITH SOIL TYPE. POST SIZE, WIND LOADS, WOOD TYPE, SPACING, HEIGHT, OPENNESS & FABRIC SELECTION.

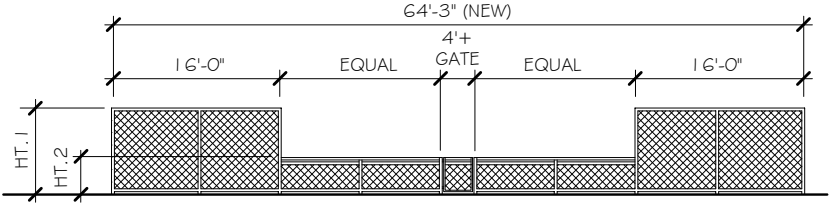
FENCE POST SECTIONS - TYPICAL CLF

NOT TO SCALE

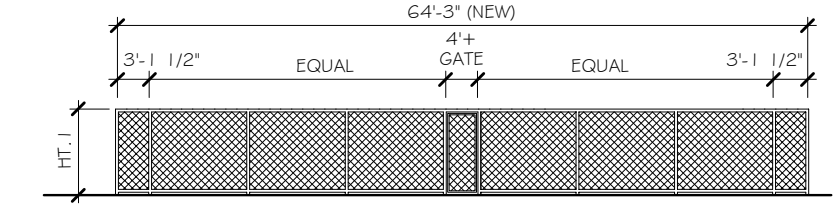
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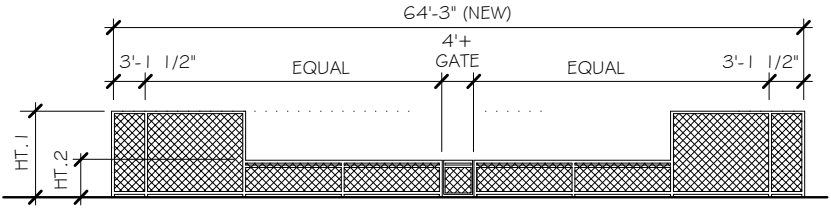
FULL HEIGHT SIDE FENCE



LOW SIDE FENCE



FULL HEIGHT SIDE FENCE - W/ DIAGONAL CORNERS



LOW SIDE FENCE - W/ DIAGONAL CORNERS

HT. 1 - HIGH FENCES MAY VARY FROM 7' TO 20'+; 7'-8' HIGH IS MOST COMMON.
HT. 2 - LOW FENCES ARE COMMONLY 3'-6".
THE IDEAL HEIGHT OF ANY FENCE SHALL BE BASED ON PARTICULAR PLAYER AND SPECTATOR NEEDS AND THE THE SPECIFIC SITE CONDITIONS.
FENCE HEIGHTS AT CONVERSIONS MAY BE DICTATED BY EXISTING FENCES.

SIDE FENCE ELEVATIONS

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Chapter 6

Lighting

- Quantity of Light
- Recommended Illumination
- Quality of Light
- Sources of Light for Outdoor Courts
- Wiring for Lighting Systems
- Light Poles
- Lighting for Indoor Pickleball Courts
- Renovating for LED Lighting
- Lighting Controls











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Lighting

In choosing lighting for pickleball courts, whether outdoors or indoors, there are many factors to consider, such as light output, lumens per watt (efficacy), lamp life, color and degree of control. Initial cost, cost of operation, frequency of use and maintenance costs and needs also must be considered.

Quantity of Light

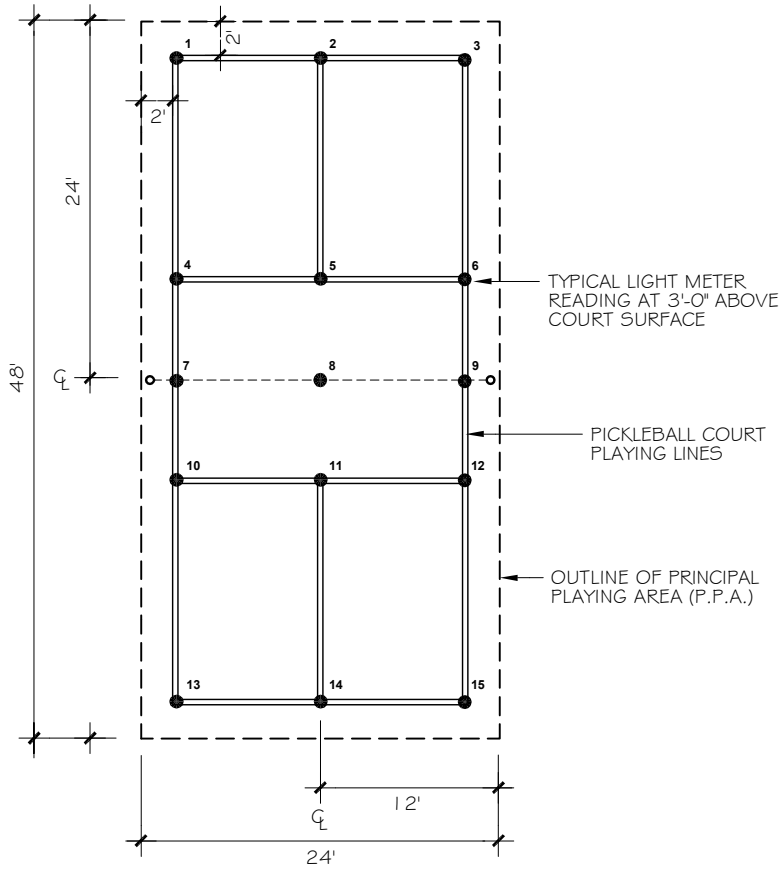
Pickleball is a fast sport, requiring players and spectators to view the fast-moving ball from many directions and react quickly. And while players of all ages play pickleball, as people get older, they require higher levels of light. So, determining the quantity of light required for your courts is an important decision for your players. Ideally, when considering adding lighting to pickleball courts, you should strive to get as much light as you can afford.

On a lighting plan for a pickleball court, the level of illumination should be the average "maintained" illumination, rather than initial illumination. Over time, the level of illumination produced by a new lamp depreciates (called the "light loss factor," or LLF), which can be caused by a number of factors, such as climatic conditions, dust and dirt, voltage variations and luminaire design and maintenance.

Horizontal illumination is measured 3' above the court surface. Lighting manufacturers or suppliers often can produce a computer diagram showing illumination levels in foot-candles or lux, taking into account the lamp, fixture and lighting plan. Illumination levels also can be measured with a light meter. (See "Light Meter Reading Location Diagram" on page 80, which shows where best to measure light levels on a pickleball court.)

Vertical illumination indicates the amount of light on the surface of the ball in any given location. Factors affecting vertical illumination levels include the type of lamp, mounting height of the fixture, and beam spread and aiming of the fixture.

The ASBA and USA Pickleball recommend maintained average levels of horizontal and vertical illumination as follows:



LIGHT METER READING LOCATION DIAGRAM

NOT TO SCALE

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Typical Facility Classifications		
Category I	**Category II**	**Category III**
Pickleball Clubs	Pickleball Clubs	Pickleball Clubs
Parks/Recreational	Parks/Recreational	Parks/Recreational
Residential	Residential	Residential
Tournament Venues	Indoor Clubs	
Indoor Clubs	Tournament Venues	

Note: *Tournament venues with broadcast-quality television lighting will generally have 125+ average maintained horizontal foot-candles (1250 lux) within the PPA, with minimum maintained horizontal foot-candles of 100 (1000 lux). These facilities generally will include permanent spectator accommodations.*

Some facility types appear in multiple categories. Illumination levels for a specific facility should be chosen based on the highest skill level, or spectator and television requirements that will take place. Facilities with older average player ages should be designed for higher levels of light.

Recommended Illumination for Pickleball Facilities

Recommended Horizontal Illumination			
Performance Criteria	**Category I**	**Category II**	**Category III**
Average Maintained Horizontal Foot-candles within PPA (1,2,4)	75 (750 lux)	50 (500 lux)	30 (300 lux)
Minimum Maintained Horizontal Foot-candles within PPA (2,4)	60 (600 lux)	35 (350 lux)	20 (200 lux)
Maximum Uniformity Ratio (3)	1.7	2.0	2.0

Note: *The diagram "Cut-Off (Low Mast) Lighting" shows typical lighting layouts for the three categories of lighting. Contact lighting manufacturers for specific details.*

Recommended Vertical Illumination			
Performance Criteria	**Category I**	**Category II**	**Category III**
Average Maintained Vertical Foot-candles within PPA (1,2,4)	50 (500 lux)	30 (300 lux)	20 (200 lux)
Maximum Uniformity Ratio (3)	2.0	2.5	3.0

Notes:

1. Maintained foot-candles is determined by applying a light loss factor (LLF) to the initial or measured foot-candles. LLF is dependent upon lamp characteristics, fixture maintenance, voltage variations, and atmospheric conditions. It normally varies between 0.6 and 0.9. Consult the fixture manufacturer for proper LLF values.

2. Average maintained and minimum maintained foot-candles should be calculated within the Primary Playing Area (PPA) with the foot-candle values multiplied by the appropriate LLF.

3. Uniformity ratio is defined as the ratio of the maximum foot-candles divided by the minimum foot-candles.

4. Primary Playing Area (PPA) is defined as the area that includes 2' beyond the sidelines and 2' behind the baseline.

Quality of Light

Several factors affect the quality of illumination, including uniformity, glare, contrast, modeling and spill.

Uniformity concerns the difference in illumination levels between the darkest and lightest spots on the court. A large difference means it will be more difficult to follow the ball. A ratio of 2:1 means the brightest spot on the court is twice as bright as the darkest spot.

Color Rendering Index (CRI) is a number between 1 and 100 used to describe the ability of a light source to accurately render colors. A higher CRI rating is an indication that the light source has good color properties. For court lighting, it is recommended that the light source have a CRI rating between 65 and 80.

Correlated Color Temperature (CCT) describes the overall color appearance of a light source, whether it is metal halide or LED. CCT is measured in Kelvins (K). Color temperature is used to describe the overall color tone of a white light source. Warmer light sources will have a lower Kelvin temperature and cooler light sources will have a higher Kelvin temperature. It is recommended that light sources for court lighting have a color temperature range from 3800K to 5000K. Light sources with a color temperature exceeding 3000K will have a "bluish" tint and should not be used for court lighting. Warmer color temperatures (4000K or lower) are generally preferable for indoor applications.

Glare is harsh, bright, dazzling light, and can vary from person to person. On the court, glare can affect a player's ability to follow the flight of the ball. Glare can be caused by the fixtures themselves or by reflective surfaces.

Contrast is the relative difference between light and dark areas, achieved by using colors that reflect different quantities of light. For instance, a white ball will have a high "reflectance" against the low reflectance of a dark court color and dark windscreens.

Modeling is the ability of the light to reveal the three-dimensional image of an object, such as a ball in flight. "Flat" lighting, as opposed to "directional" lighting, produces no shadows, making it difficult to see the spin or direction of the ball.

Spill, also called light pollution, is the amount of light that falls outside the area where it is intended. Factors affecting light spill may include the type of lamp, fixture, mounting height, use of reflectors or shields on the fixture, and aiming angles. Communities often have regulations regarding how much light may be "spilled."

Sources of Light for Outdoor Courts

LED lighting is being used more and more for sports facility and court lighting (both high- and low-mast). LED, which stands for Light-Emitting Diode, produces light through an array of diodes and provides good color rendering, excellent fixture life and can be dimmed. LED lighting can also last up to 100,000 hours. Because of the lower wattage fixtures, LED lighting is energy efficient. In addition, electrical system costs are typically less. LED lighting doesn't depreciate over time, requires lower maintenance, offers instant-on and can be used with dimmers.

While the majority of new lighting will be LED, there still are a great number of LED fixtures that offer a wide variety of lighting options, so it is important to contact a lighting consultant to determine the specifications of the lighting you need.

Regarding renovations, many existing courts still use metal halide, fluorescent or other types of lighting. It would be wise to transition to LED before lamps and replacement parts become unavailable.

Some tournaments and events rent light towers that run off of generators when evening play is anticipated and permanent lighting isn't available at the venue. Two types of commercial-grade light rental towers are those run by gas-powered generators and solar-powered generators.

Towers powered by gas generators are generally less expensive to rent than solar-powered and provide good light. However, they produce fumes and can be noisy. If using a gas-powered generator/light tower, take care to position the exhaust away from players and spectators. Also, if livestreaming or broadcasting, consider positioning the broadcasters and court cameras as far as possible from the generator, to reduce or eliminate noise during the broadcast. Lights powered by solar generators may not be as bright as lights with gas generators, so tournament owners may need to rent more of these solar-powered towers to provide the same light coverage. Solar generators are silent and there are no fumes.

Wiring for Lighting Systems

It is recommended that all wiring be underground, outside of the court area. Wiring should comply with the National Electrical Code and state and local codes. For smaller installations, a 120/208-volt single-phase system is common; for larger installations, a 277/480-volt three-phase system is common.

Consider wiring multiple court facilities so that lights for each court, or each bank, can be operated individually. Also, installing a duplex outlet at the base of light poles may be useful for maintenance, ball machines and other equipment.

When planning a lighting system, make sure to consider both short-term and long-term costs, including costs of initial installation, costs to maintain and replace lamps, and costs to run the lighting system.

Light Poles

Light poles are considered fixed objects; a minimum clearance of 5' from the sideline to a fixed object, such as a light pole, is recommended. For new construction or renovation, light poles should be centered on or immediately outside the fence or court. If laying out pickleball courts at existing facilities that have light poles not meeting recommended minimums, consider using appropriate padding. Freestanding poles located between adjacent courts should be flanked by fencing (and padding where appropriate).

The most common type of light poles are steel. Some manufacturers offer poles with baked-on polyester or vinyl finishes, which provides protection from weathering and allows the poles to be color-coordinated with net posts and fencing. Check with local codes regarding necessary wind loads for the light poles.

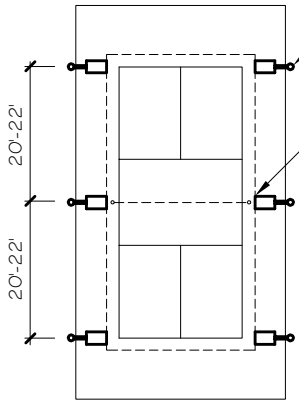
Note: *Light poles should not be used as fence posts.*

The most common mounting heights for "cut-off" lighting fixtures (also called "low-mast" lighting) generally are 22' to 30' above the court surface. Lighting layouts for common pickleball configurations are shown in the diagrams "Cut-Off (Low Mast) Lighting" and "Flood (High Mast) Lighting."

Floodlighting (also called "high-mast" lighting) is typically mounted from poles that are 35' to 60' high, depending on the application and the area to be lighted. The bigger the area, the higher the pole needs to be.

Poles are either anchor-bolt base plate or direct burial. Anchor-bolt base plate poles have a base plate attached to anchor bolts installed in the pole footing. Direct burial poles have extended shafts set directly into concrete footings. Direct burial models might be less expensive, but there are advantages to the anchor-bolt system: Base plates make it easier to adjust and straighten the poles; replacing the poles, if needed, can be done without replacing their foundations; and once the footings and anchor bolts have been installed, construction can continue even if the poles/fixtures have not been delivered yet.

USA Pickleball and ASBA recommend that light fixtures do not extend over the lines of the court. The fixtures may, however, extend over the Primary Playing Area (PPA) that extends 2' beyond the sidelines and 2' behind the baseline.

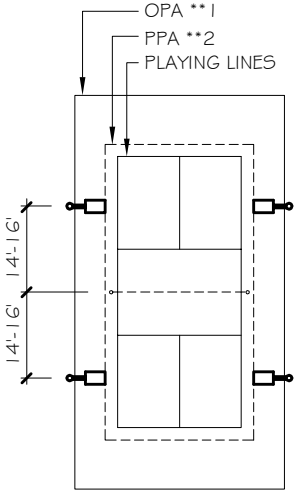


LAYOUT B

6-POLE / 6-FIXTURE

**1 OVERALL PLAYING AREA MAY BE AS LITTLE AS 30' x 60' OR AS MUCH AS 44' x 74'.

**2 PRINCIPAL PLAYING AREA IS 24' x 48' (2' BEYOND COURT PLAYING LINES)



LAYOUT A

4-POLE / 4-FIXTURE

BEST LIGHTING LAYOUT FOR COURT TYPE

COURT SIZES	LIGHTING CLASS I 75 fc	LIGHTING CLASS II 50 fc	LIGHTING CLASS III 30 fc
30' x 60'	A	A	A
34' x 64'	A**3	A	A
44' x 74'	B	A	A

**3 - FOR 100 fc USE LAYOUT B.

MOUNTING HEIGHTS

COURT SIZES	LIGHTING CLASS I	LIGHTING CLASS II	LIGHTING CLASS III
30' x 60'	22' - 26'	20' - 24'	18' - 22'
34' x 64'	22' - 26'	20' - 24'	20' - 24'
44' x 74'	22' - 26'	22' - 26'	20' - 24'

NOTE 1: THE HIGHER THE MOUNTING HEIGHT THE BETTER THE UNIFORMITY & THE GREATER THE VERTICAL ILLUMINATION.

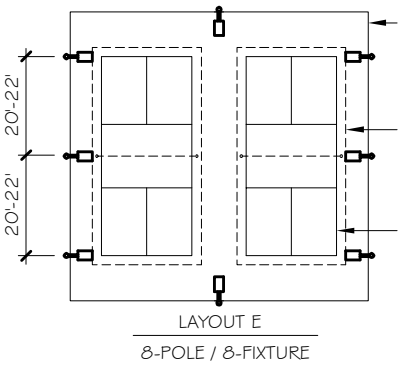
NOTE 2: THE HIGHER THE MOUNTING HEIGHT THE MORE LIGHT SPILL-OVER OUTSIDE THE OVERALL PLAYING AREA (OPA).

SINGLE COURT LAYOUTS

CUT-OFF (LOW MAST) LIGHTING 1

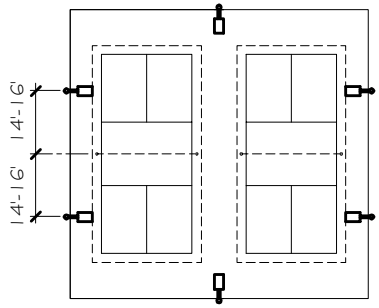
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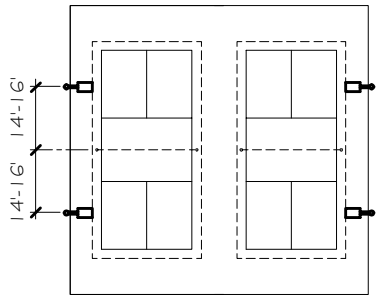
LAYOUT E

8-POLE / 8-FIXTURE



LAYOUT D

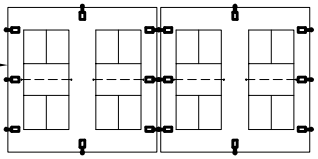
6-POLE / 6-FIXTURE



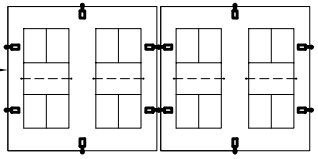
LAYOUT C

4-POLE / 4-FIXTURE

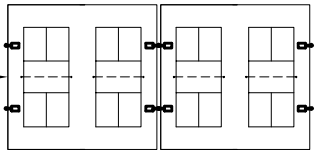
SAMPLE 4-COURT BATTERIES LIGHTING LAYOUTS



LAYOUT E(x2)



LAYOUT D(x2)



LAYOUT C(x2)

BEST LIGHTING LAYOUT FOR COURT TYPE

COURT SIZES	LIGHTING CLASS I 75 fc	LIGHTING CLASS II 50 fc	LIGHTING CLASS III 30 fc
60' x 60'	D	D	C
66' x 64'	D**4	D	C
78' x 74'	E	D	C

**3 - FOR 100 fc USE LAYOUT E.

MOUNTING HEIGHTS

COURT SIZES	LIGHTING CLASS I	LIGHTING CLASS II	LIGHTING CLASS III
60' x 60'	22' - 26'	20' - 24'	18' - 22'
66' x 64'	22' - 26'	20' - 24'	20' - 24'
78' x 74'	22' - 26'	22' - 26'	22' - 26'

NOTE 3: GROUPING COURTS IN TWOs IS MORE EFFICIENT FOR LOW-MAST LIGHTING.

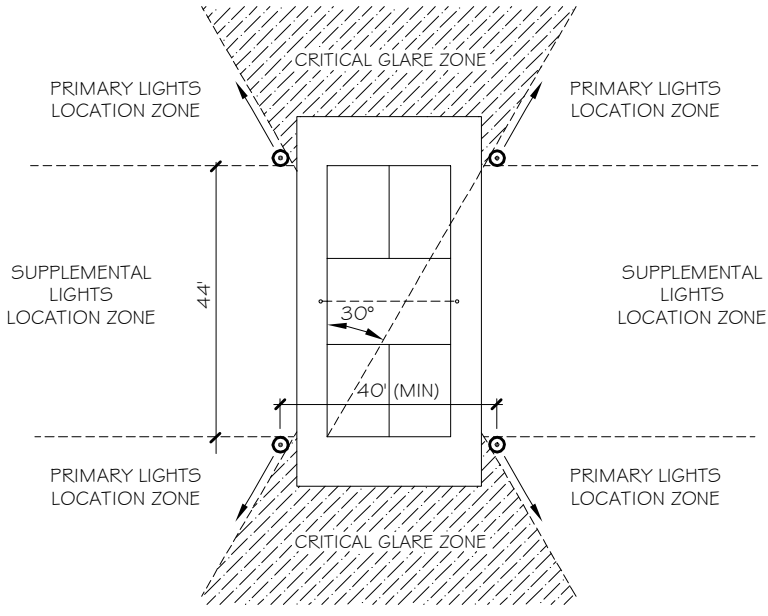
NOTE 4: CONSIDER USING MEDIUM-MAST OR HIGH-MAST LIGHTING FOR BATTERIES OF THREE COURTS.

MULTI-COURT LAYOUTS

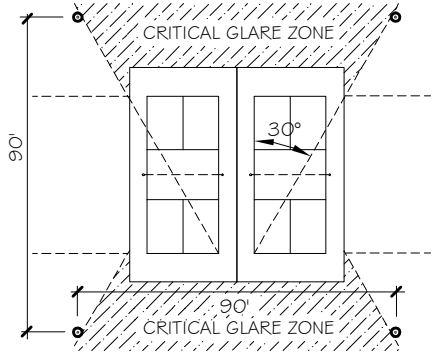
CUT-OFF (LOW MAST) LIGHTING 2

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SINGLE PICKLEBALL COURT



TWO PICKLEBALL COURTS

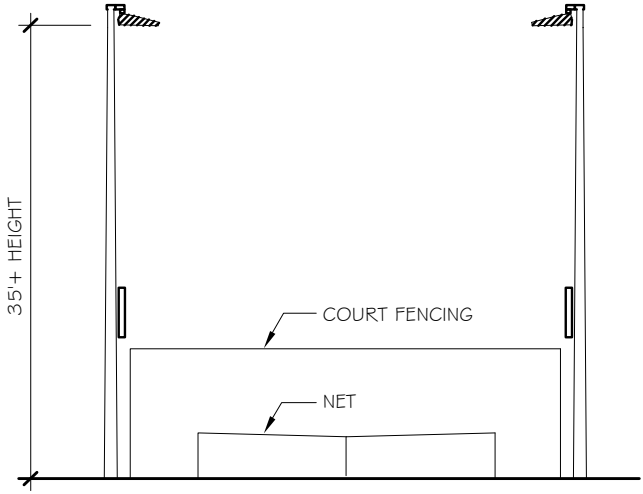
NOTE - LIGHT FIXTURE HEIGHTS SHOULD BE 35'+ TO MINIMUMIZE GLARE IN PLAYERS' EYES.

AS DISTANCE FROM THE COURT INCREASES THE HEIGHT OF THE LIGHT POLES SHALL INCREASE.

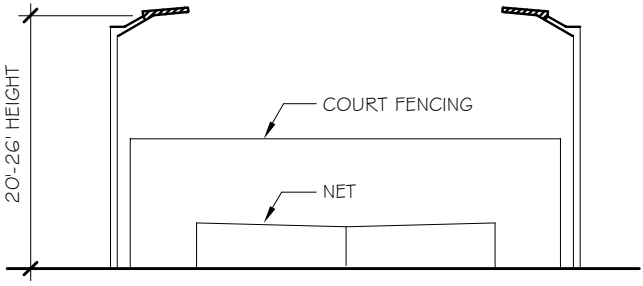
FLOOD (HIGH MAST) LIGHTING LAYOUTS

NOT TO SCALE

29LIGHT.HM.AVL.23



FLOOD (HIGH-MAST) LIGHTING



CUT-OFF (LOW-MAST) LIGHTING

COURT LIGHTING SECTIONS

NOT TO SCALE

30LIGHT1 .AVL.23

Lighting for Indoor Pickleball Courts

Since the ball in pickleball travels fast in a small area, having the proper lighting—and enough lighting—is essential, especially for indoor pickleball courts. For new or renovated indoor facilities, court lighting can be either direct, indirect or a combination of both. Indirect lighting generally requires ceiling heights of no lower than 24' and a ceiling surface reflectance value of 80% or more to be effective. At ceiling heights below 24', a direct lighting system is the better choice.

Direct lighting systems direct the light downward onto the court surface. While direct lighting produces better 3-D definition (modeling), it has greater potential to create glare, so care must be taken in locating and shielding these fixtures so players don't look into them during play.

Indirect lighting systems have fixtures aimed upward at a highly reflective ceiling. This produces uniform illumination and provides the least amount of glare, but since it is essentially "shadowless," it provides little modeling, which might make it difficult for players to detect spin or the direction of the ball.

A combination direct/indirect system may provide the best set of lighting characteristics for indoor facilities. Generally, aim for 30% to 40% of total light distribution from the indirect component, which will make the facility appear spacious and open. The direct component will improve modeling and ball definition.

For indoor courts, there are many options for quality of lights and type of fixtures. Owners should discuss lamp technologies with a lighting specifier to see what will work best, including maintenance that will be required.

USA Pickleball and ASBA recommend a 30' height above the court for light fixtures, with a minimum height of 20'. USA Pickleball and ASBA also recommend that light fixtures do not extend over the lines of the court. The fixtures may, however, extend over the Primary Playing Area (PPA) that extends 2' beyond the sidelines and 2' behind the baseline.

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Renovating for LED Lighting

Although LED lighting is now preferred in new indoor sports facilities, when renovating existing facilities with fluorescent or metal halide lighting systems, owners and operators need to consider their options. Fluorescent lighting that turns on instantly, has good color rendering, is low in glare and has lamps that last up to 40,000 hours might be worth keeping. Metal halide, which is slow to turn on, eats up more power, and has lamps that last only about a quarter of the lifetime of fluorescent lamps. It may well be worth replacing metal halide lights with new LED lights.

Lighting Controls

The transition and adoption of LED lighting for sports facilities allows for greater ability to control the lighting fixtures. Wired and wireless control systems are available that can provide scheduling, dimming, zoning, special effects and on/off switching capabilities. Some control systems are capable of controlling a lighting system remotely from the facility location. Control functions are generally accessed from a PC, tablet or mobile phone.

Chapter 7

Pickleball Court Accessories & Amenities

- Nets, Posts, Center Straps
- Windscreens
- Divider Netting & Other Netting
- Padding
- Court Benches
- Shade Shelters
- Power & Water
- Spectator Seating
- Organizers & Ball Holders
- On-Court Video
- First Aid/AEDs

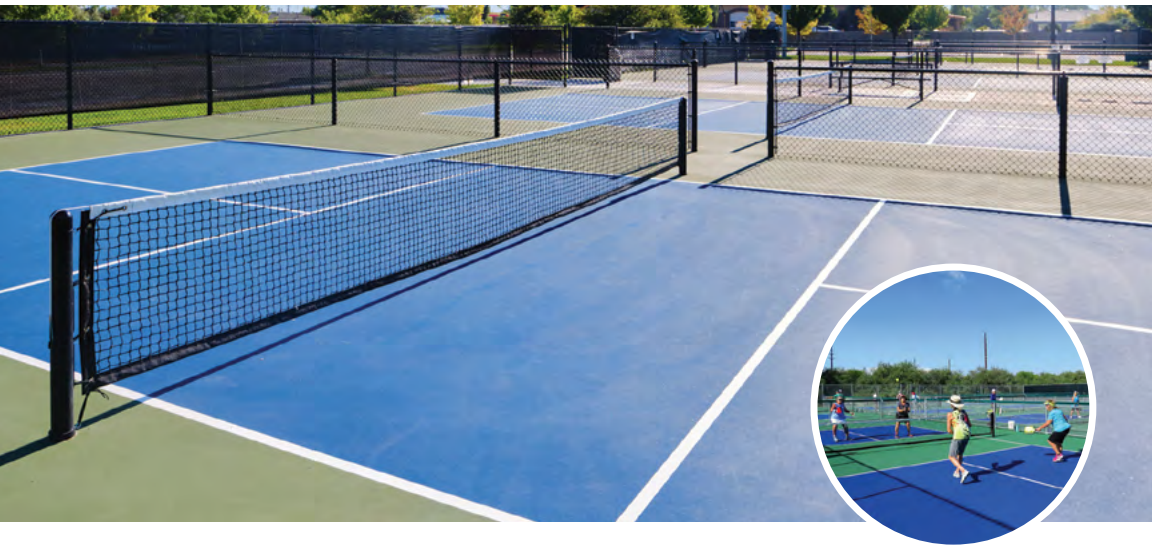








TUFFY® WORLD-CLASS WINDSCREENS



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A windscreen is appreciated by everyone who plays on a pickleball court. Choosing the right screen not only makes for a more enjoyable playing experience, but also improves the overall look and feel of a court.

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Pickleball Court Accessories & Amenities

For pickleball court and facility owners and managers, choosing the right accessories and amenities will depend on a number of factors. Budget, of course, will play a large role, but so will player preference, location, climate and more.

Movable furniture, such as benches and water coolers, should be located outside of the playing area. If space is not available outside the courts, and the courts have sideline overruns 7' wide or wider, furnishings should be located along the fence line within 10' on either side of the net line. That location is most visible to players during play. At least 5' of open area should be left between the sidelines and furnishings.

Nets, Posts, Center Straps

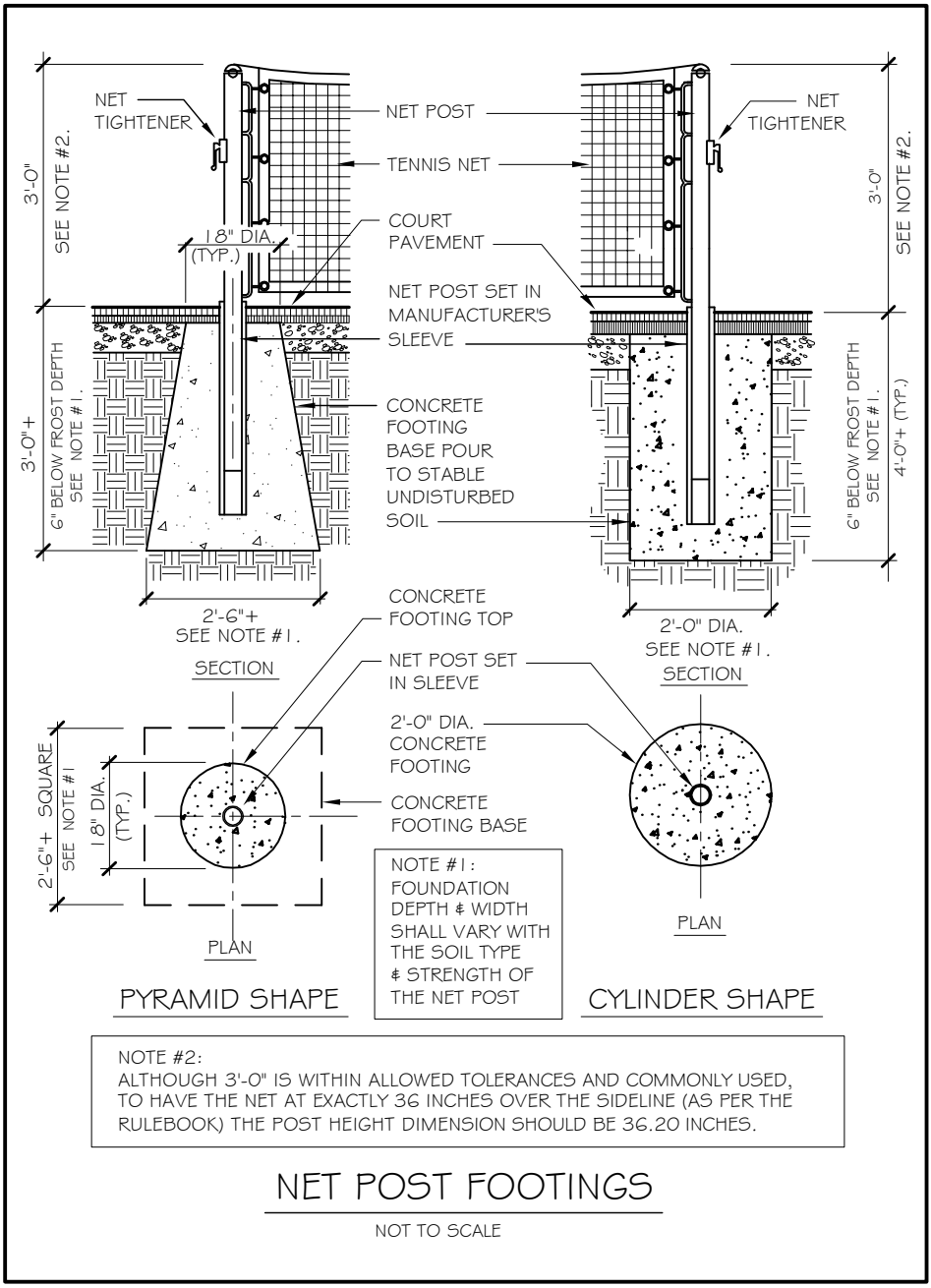
A net, of course, is a necessity, not an accessory, but there are some choices owners and managers will need to make regarding the type of net and posts.

For net dimensions, see Chapter 1. The top of the net is suspended 36" high at the sidelines, but since pickleball players often prefer to leave a gap of about 6" above the court surface so balls can be passed under the net between points, the net width (or height) can vary from 36" to 30". When ordering nets or building courts, owners should specify a specific width from 30" to 36".

Traditional nets are made of synthetic materials such as polyethylene, polyester and nylon, and are generally black in color. Polyethylene is most common, as it resists fading due to ultraviolet light and holds up well when it comes to weathering.

Net posts should be high enough so the net is 36" high at the sidelines. Net posts are most commonly made of steel, although a few manufacturers make posts of aluminum to resist rusting. Net posts must be strong enough to allow safe tensioning of the net, while not deforming.

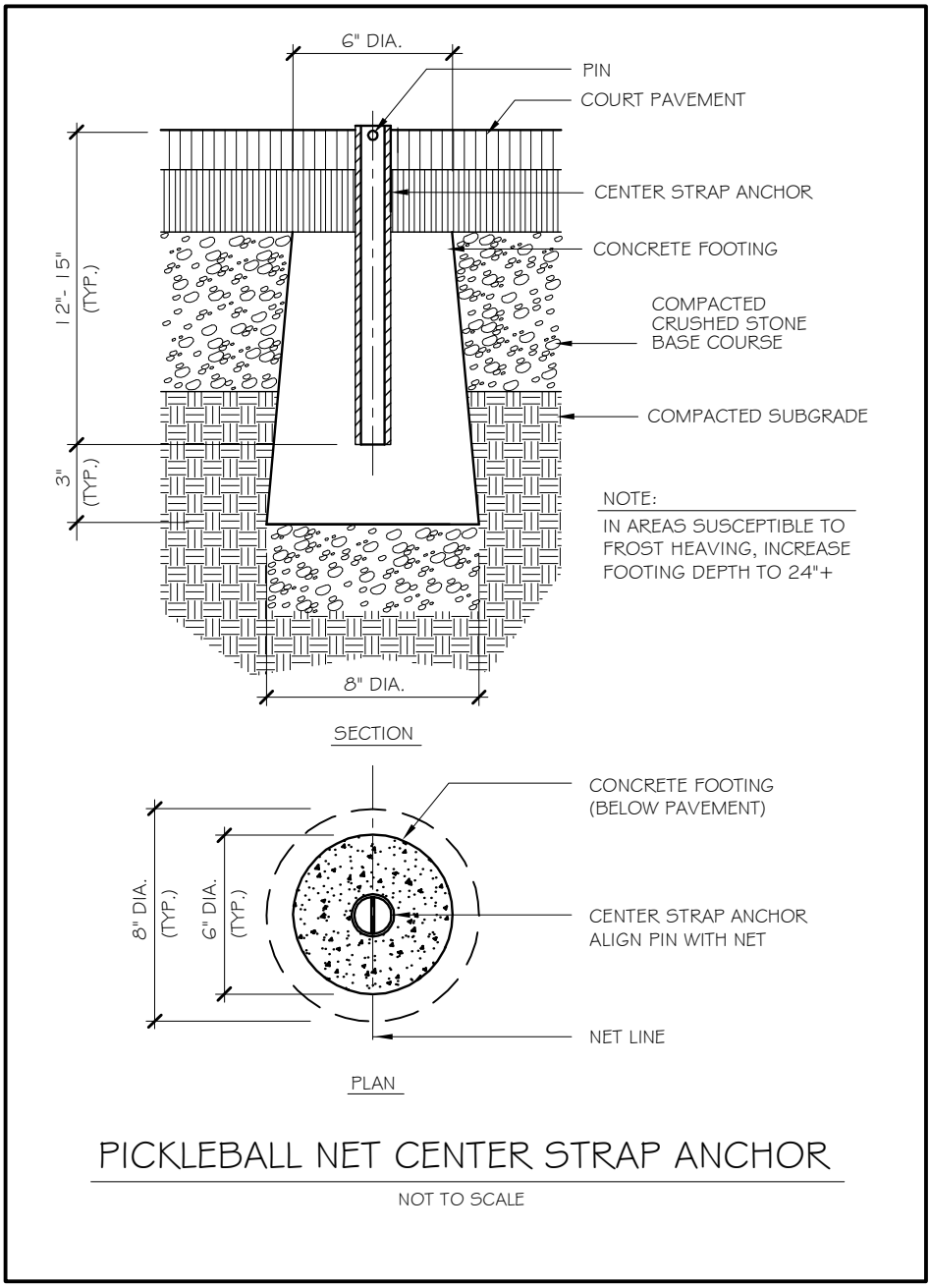
Net tensions of 75 to 150 lbs. should be used for installations without a center strap and 175 to 250 lbs. with a center strap.



NET POST FOOTINGS

NOT TO SCALE

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32rCSTRAP.AVL.23

Regulating net tension allows for consistency of play from court to court and venue to venue.

To tighten the net, the posts will have either a screw-type, worm-gear or ratchet-type internal or external winding mechanism. The winding mechanism on all posts should have handles that can either be removed or otherwise secured, or which can be set parallel to the post so it won't be a hazard to players. Internal wind posts cost more than external wind posts, but they are safer.

Net posts may be permanently installed or set in sleeves so they are removable. Posts are easier to replace if they're in sleeves, and the court is easier to resurface and maintain. Sleeves are commonly galvanized steel, stainless steel, aluminum or PVC (although hot asphalt may melt PVC sleeves).

Footings for posts may be round or square, or round at the top tapering to a square bottom. Round footings should be dug deeper to provide the same stability as footings with a square or tapered square bottom. If the net post foundation goes from top of asphalt down, it should be round, not square.

We recommend that a center strap be used on permanent courts to ensure that at the center of the court, the net is pulled down to 34" above the playing surface. Without a center strap, proper tension cannot be placed on the net cord and consistency in net tension from one court to another may be compromised. Straps are white, and generally made of 2" wide polyester or nylon with a steel swivel hook at the bottom. The center strap is attached to an anchor set in a concrete footer, generally measuring 12" in diameter. The anchor is fitted with a cross pin below the court surface.

In some cases, portable net systems may be required. The latest generation use cable-tensioned nets and include products that can be set up and moved daily, weighing less than 10 pounds to heavy, pro-grade nets that rest atop the court surface, yet have wheels to roll off the court as necessary.

Windscreens

Windscreens (also called background curtains) offer a number of benefits, including providing visual contrast so players and spectators can see the ball better. Windscreens reduce and deflect the wind, reduce sun glare off chain-link fencing and posts, provide privacy, and

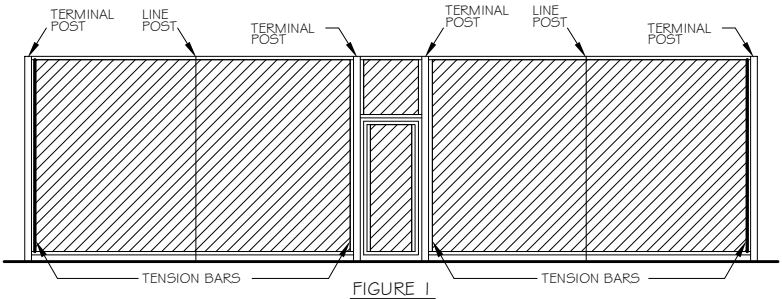


FIGURE 1

1. MAKE SURE THAT YOU BEGIN MEASUREMENT AT A TERMINAL (CORNER) POST AND CONTINUE TO THE NEXT TERMINAL POST. (SEE FIGURE 1) DO NOT HOLD THE MEASURING TAPE UP TO THE FENCE. THIS WILL CREATE SLACK WHICH COULD CAUSE MEASUREMENTS TO BE TOO LONG.
2. MEASURE WINDSCREEN LENGTH FROM INSIDE TENSION BAR TO INSIDE TENSION BAR. YOU MAY DISREGARD LINE POSTS UNLESS THEY ARE ON THE COURT SIDE OF THE FENCE. FOR EASE OF HANDLING, WINDSCREENS SHOULD NOT EXCEED 64' LENGTH.
3. MEASURE WINDSCREEN HEIGHT FROM BOTTOM OF THE TOP RAIL TO THE TOP OF BOTTOM RAIL YOU MAY WANT TO TAKE INTO CONSIDERATION THAT WINDSCREEN IS GENERALLY INSTALLED ONE OR MORE FEET FROM THE TOP AND BOTTOM OF THE FENCE.
4. MARK EACH MEASUREMENT ON A DIAGRAM OF EACH COURT. SEND A COPY OF THIS DIAGRAM TO THE WINDSCREEN MANUFACTURER WHEN YOU PLACE YOUR ORDER SO THAT EACH WINDSCREEN WILL BE PROPERLY LABELED WHEN IT IS SHIPPED TO YOU. ALSO BE SURE TO TAG EACH PANEL BEFORE YOU REMOVE YOUR WINDSCREEN FOR STORAGE EACH YEAR.
5. EXACT MEASUREMENTS ARE NECESSARY (INCLUDING FEET AND INCHES). DO NOT GUESS OR ROUND OFF DIMENSIONS. NO TWO FENCES ARE IDENTICAL.

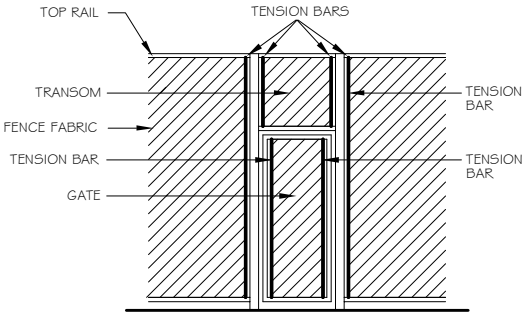


FIGURE 2

1. THE WIDTH OF THE GATE (SEE FIGURE 2) SHOULD BE MEASURED FROM INSIDE TENSION BAR TO INSIDE TENSION BAR. THE HEIGHT OF THE GATE SHOULD BE MEASURED FROM THE BOTTOM OF THE TOP RAIL TO THE TOP OF THE BOTTOM RAIL. YOU MAY WANT TO TAKE INTO CONSIDERATION THAT WINDSCREEN IS GENERALLY INSTALLED ONE OR MORE FEET FROM THE BOTTOM OF THE FENCE.
2. THE WIDTH OF THE TRANSOM (SEE FIGURE 2) SHOULD BE MEASURED FROM INSIDE TENSION BAR TO INSIDE TENSION BAR. THE HEIGHT SHOULD BE MEASURED FROM THE BOTTOM OF THE TOP RAIL TO THE TOP OF THE RAIL OVER THE GATE OPENING.

WINDSCREEN MEASUREMENT DIAGRAM

NOT TO SCALE

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screen out possible distractions, such as traffic or passersby. They can also help contain artificial light at night. Windscreens also can provide a professional, "finished" look to courts.

For the best ball visibility, the darker the windscreen, the better, so black, dark green or dark blue are preferred. Standard heights for windscreen are 6' and 9', but custom sizes are available.

Most windscreens are made of synthetics, generally polypropylene, vinyl-coated polyester or polyethylene—and each have their own advantages and disadvantages. In heavier grades, polypropylene offers effective wind resistance and a dense background at reasonable cost, however, it will shrink, stretch and fade. Vinyl-coated polyester windscreens are less prone to shrinking, stretching or fading, but they are more expensive and offer less wind resistance. Because both polypropylene and vinyl-coated polyester are fabricated into windscreen, they come hemmed on the edges and have grommets for mounting to the fence.

Polyethylene windscreen is available as fabricated or unfabricated. Unfabricated polyethylene windscreen is sold on rolls, cut by the consumer, and hung on the fence using button holes in the woven edge. This type of windscreen is inexpensive and easy to patch or replace. It provides modest wind resistance and doesn't fade, but it will stretch.

For wind reduction, the size and density of the mesh is important. "Open mesh" windscreen generally is less expensive than "closed mesh" and in many situations will provide adequate background contrast, windbreak and ventilation on the court. Closed mesh will provide a darker background and will more completely screen out distractions and reduce wind.

Windscreens will greatly increase the stress on fencing during windstorms and severe weather. If pickleball courts are located in areas prone to heavy winds, consider 6' windscreens and open mesh, which generally should provide enough wind flow to minimize the stress on fencing and fence posts. If considering adding windscreens to fencing, though, the fencing should be engineered by a professional engineer. (See Chapter 5 for more on fencing.)

For additional court signage and as a possible source for branding and marketing revenue, consider integrating logos onto windscreens. If printing logos on windscreens, dark, solid windscreen colors are best, with white-only logos preferred, which provides a clean,

consistent, professional look. (Avoid full-color logos/messaging on windscreens—especially behind the baselines—which can be distracting for players and spectators.)

Windscreens on lower height ball-containment fencing (such as 3'-6" high fencing) can also add a professional look to courts. However, if spectators will be seated behind the lower-height fence, consider using a 2' tall windscreen so as not to block spectator viewing. Also, if printing logos on windscreen for a low fence, consider adding screens to both sides of the fence so logos and branding are visible from all sides.

Note: Acoustic barriers/panel also will function as a windscreen, while providing noise attenuation.

_____ Divider Netting & Other Netting_____

Divider netting is sometimes used to separate one or more courts in a battery of courts to better control the flight of balls during more intense uses such as drills or training programs. Divider nets are not intended as a people barrier. If a divider net is introduced, the design of the court battery may need to allow for adequately sized divider net posts in the fence line, or beyond the overall playing area.

Divider netting is generally made from man-made fibers such as polyethylene, HDPE, polypropylene, polyester and nylon. Each material has different performance characteristics for shrinking, fading, weathering and wearing. The shape and open nature of netting allows it to move freely. For this reason, it is suspended from the top, most commonly from a horizontal, tensioned steel cable.

If suspended from a cable, it is recommended that the cable is a minimum of 7' above the playing surface to prevent players from having direct contact with the tensioned cable. The bottom of the netting is most commonly left hanging, just above the playing surface. Often, the net includes a weighted base that reduces the net's movement side-to-side. It is not recommended that a divider net be anchored to the court surface.

A cost-effective way to extend the height of permanent fencing is to add divider netting above it, which requires less structure and is an effective ball stop. Windscreen material is sometimes used as an alternative divider between courts. It is less permanent than a divider fence, but sturdier than a divider net. It may be anchored to a frame similar to a chain-link fence, or attached to steel cables that stretch

from the net line to the baseline fence line. In such cases, a guard or cap is recommended over the top cable to distribute any impact with the cable.

Padding

Padding is a valuable accessory for pickleball courts. It is recommended that fixed objects that exist in areas where there is no continuous perimeter fence, and are within 3' of the overall playing area or within 3' of a divider net, should be padded beginning flush with the court surface and to a minimum height of 7'.

Pickleball net posts and light poles at the net line do not usually require padding. From a safety standpoint, however, consider padding more than is recommended. Periodically, review the USA Pickleball recommendations and refer to federal, state and local regulations for padding requirements.

Court Benches

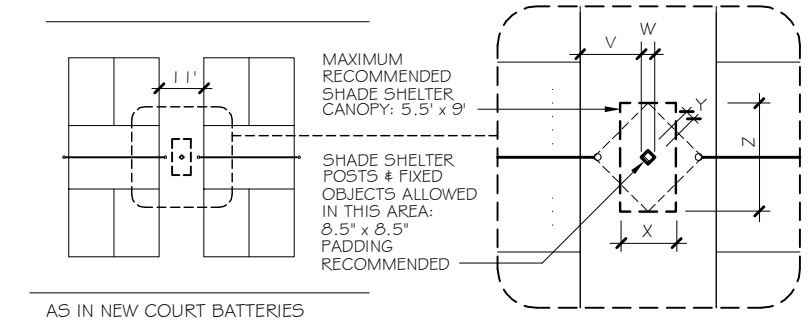
Player seating beside the court or between courts is a nice benefit for players and provides a place to store bags, warm-ups, water bottles and other belongings. Benches should be placed at the net line, and should be at least 5' from the sideline, which is the minimum clearance to a fixed object. It is preferred that no furnishings are placed inside the 34' x 64' playing area.

Benches should be made of a suitable material that is resistant to weather and degradation from ultraviolet light. Benches generally are 40" to 72" long and may or may not have backs. Keep in mind that some benches may leave indentations in the court surface, so consider their locations carefully and consider protecting the surface.

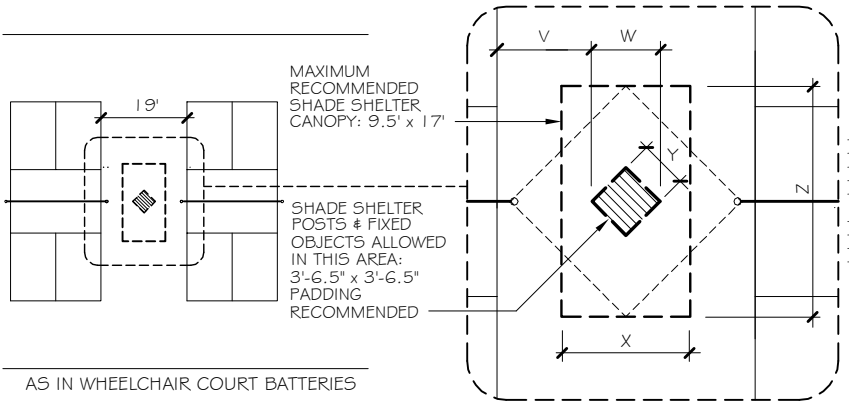
Shade Shelters

Shade shelters adjacent to courts are a nice benefit for players and can provide an area to rest, shelter from the hot sun and socialize for players and spectators. Shelters can vary greatly in size, configuration and construction.

Smaller court-side shelters serve individual courts or are sometimes shared by two courts, while larger shelters serve as gathering places for groups, especially useful for tournaments and league play. The court-side shelters are most useful if they shade the



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OVERRUN	V	W	X	Y	Z
11'	5.00'	1.0'	5.5'	8.5"	9'
12'	5.25'	1.5'	6.0'	1.06'	10'
13'	5.50'	2.0'	6.5'	1.42'	11'
14'	5.75'	2.5'	7.0'	1.76'	12'
15'	6.00'	3.0'	7.5'	2.12'	13'
16'	6.25'	3.5'	8.0'	2.47'	14'
17'	6.50'	4.0'	8.5'	2.83'	15'
18'	6.75'	4.5'	9.0'	3.18'	16'
19'	7.00'	5.0'	9.5'	3.54'	17'

ALL FIXED STRUCTURES TO BE SMOOTH AND WITHOUT PROJECTIONS SUCH AS HOOKS, FROM THE PLAYING SURFACE TO A HEIGHT OF 7'-0".

THE SURFACE UNDER THE SHELTER SHOULD ALIGN WITH THE PLAYING AREA AND BE A SIMILAR TEXTURE AND SLIP RESISTANCE QUALITIES.

SHADE SHELTER LOCATIONS

AND OTHER FIXED OBSTRUCTION BETWEEN COURTS

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intended rest area at the times of day the players are on the court. The smaller the shelter, the more attention needs to be given to analyzing the footprint of the shadow.

Many large shelters are built in many shapes with permanent roofs of durable material. Most smaller shelters are pre-fabricated with steel frames and fabric canopies. Many have quick-release canopies that can be removed in seconds; very handy for locations that have violent thunderstorms or occasional hurricanes. In the north, to extend the life of the fabric, canopies should be removed and stored in the winter.

Most shelters are supported by posts—from one central post on the smallest, umbrella-like shelter, to eight posts on the larger shelters, like the octagon-shaped gazebos. It is recommended that the posts are beyond the playing area of the court, except where a post is located between and aligned with two adjacent pickleball net posts. The canopy should also be located beyond the playing area to avoid obstructing or interfering with play.

The shelter pad may be the court pavement or slab itself, or a pad made from a different material, such as brick, pavers or concrete. It is recommended that the shelter pad be flush with the playing surface if not divided by a fence or other fixed partition.

Power & Water

For convenience, 110V outlets are recommended, which can be used for cleaning equipment, ball machines, sound systems, etc.

Players, and spectators, will appreciate a source of drinking water located near the courts. To prevent the pavement from heating the water during the summer, the pipe supplying the water should be buried at least 48" deep. Also, the ADA requires that all drinking fountains be fully accessible.

If a permanent water connection is not available, or feasible, consider portable water cooler stands for individual-sized water bottles, which may also include a cup holder and trash can.

Spectator Seating

If spectator seating such as bleachers are anticipated, the design should include siting and circulation so it does not intrude into the

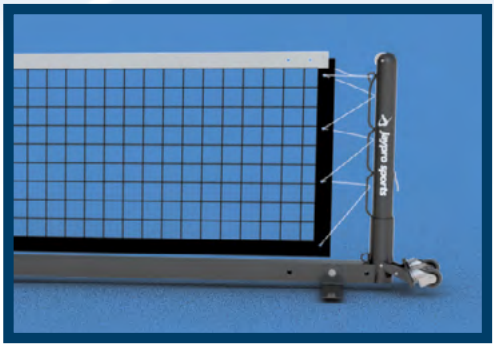
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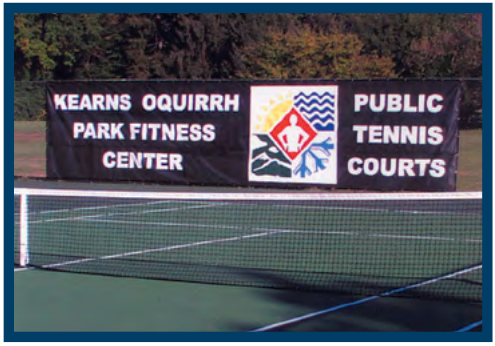
• Portable Systems



• Posts & Nets



• Benches & Bleachers



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overrun area. Make sure to check ADA and state and local codes for accommodating spectators in wheelchairs.

Organizers & Ball Holders

Caddies are convenient for holding keys, cups, phones, balls, etc. Also available are baskets for balls that hang on a net post or fence, and racks for holding balls on top of each other. Make sure such equipment is durable, weather-resistant and placed where it won't impact play.

On-Court Video

Embedded video recording can provide revenue potential for replays, video analytics and for use as a teaching aid. During layout and planning, consider planning for Cat6 cabling to service IP cameras using Power Over Ethernet (POE).

First Aid/AEDs

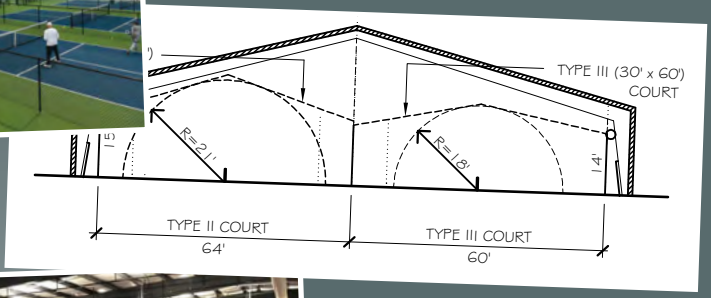
It's a good idea to have a first aid kit handy in case of an accident. Also, an increasing number of sports facilities now have an Automated External Defibrillator (AED) on hand. Make sure your staff and even your players are trained in its use. Check with state or municipal codes about whether AEDs are required.

Chapter 8

Indoor Pickleball Courts

- Getting Started
- Planning & Design Considerations
- Choosing a Surface
- Installation of Indoor Sports Flooring
- Care & Maintenance
- Repairs, Renovation, Replacement









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Indoor Pickleball Courts

Getting Started

Planning is the first step. While any indoor facility necessarily includes a building, the scope of this chapter is limited to planning considerations and details about the sport surface. With that limitation, the process involves considering the planning issues, selecting a pickleball or multi-use sport surface, developing specifications, choosing sport-specific equipment such as net posts, and deciding on accessories and amenities, including lighting and bleachers.

In addition to focusing specifically on the pickleball and multi-use surfaces, this chapter is limited to acrylic and synthetic sports surfaces. Clay courts are not addressed here because they are preferred outdoors and rarely used indoors.

Budgeting

Since what you might wish to have indoors often is more than what financing allows, you may have to make some concessions. In order to make informed choices, you need to determine priorities.

Planning & Construction Team

Special care should be taken in choosing all the participants in the project. In particular, the design professionals should completely understand pickleball rules and the rules of the other sports if the surface is to be multi-use. Someone on the design team should be qualified to assist in evaluating surfaces and in reconciling the needs of one sport or activity versus the requirements of pickleball.

Equally important in planning, and especially in choosing sports surfacing systems, is the involvement of facility managers, players and maintenance personnel. Users can contribute vital information about player preferences and programming needs. Involving personnel who will ultimately be responsible for maintaining the facility is also beneficial in that they can help ensure the facility will operate smoothly and the surfaces will last a long time.

A general contractor (GC) coordinates all aspects of a construction project, employing specialty contractors as necessary. The installers

of sports surfacing systems will be specialty contractors. In some cases, material suppliers may serve as specialty contractors by handling on-site installation to ensure their product is installed in accordance with its specifications. It may be prudent to reach out to court contractors and surface-system manufacturers when getting started. Choosing the right sports surface installer can determine the ultimate success of your facility.

Planning & Design Considerations

Each project is unique. In planning an indoor pickleball facility, many factors should be considered.

Intended Use

The most important aspect of planning is developing a thorough understanding of how the facility will be used. What sports or activities will take place in the facility? Is this indoor area dedicated to pickleball alone or is it a multi-use floor that has to serve other sports and/or activities? The specific sports to be played will determine the appropriate performance characteristics for the flooring system, the necessary equipment to be included, the size and orientation of various courts or play areas, the amount and location of spectator seating, and numerous other aspects of the design. But, indoor facility planners still need to "keep their eye on the ball"—how the ball interacts with the court surface is key.

Other Design Considerations

- **Site Conditions**, including location of the water table, likelihood of flooding, soil conditions, etc.
- **Parking**
- **Size of Building Footprint**. Keep in mind, an indoor enclosure needs to be larger than a fence enclosure for an outdoor facility. Factors that might affect the size of an indoor building include the types of players to be accommodated, for instance, children may have different needs and space requirements (on court and off) than do adults and competitive players.
- **Compatibility**. Which sports will share which areas? For other sports, it is a good practice to visit an installation of the surface system being considered and to play on it. Does it perform?
- **Playing Area & Height**. The length and width of courts indoors do not differ from that outdoors. The unobstructed

recommended minimum height (for new construction) should be 18'.

- **Lighting**. The choice of lighting may be affected by the frequency of use, type of use, the players and spectators, and other factors. Electric lighting variables include light intensity, uniformity, hot spots, efficacy, lamp life, color, degree of control, fixture protection, initial cost, long-term cost and maintenance needs. If considering natural lighting, make sure windows, clerestories, skylights and other fenestration locations don't cause glare or shadows on the playing area, or make following the flight of the ball difficult. Light level classifications do not differ from outside standards, but uniformity indoors is typically much better. (See Category I and Category II in the illumination charts on pages 81 and 82.)
- **Padding of Fixed Objects** (as defined in the Glossary). Where they exist and are within 3' of the overall playing area or within 3' of an opaque backdrop curtain or divider net, support columns or other fixed objects should be padded from the floor to a minimum height of 7'. Continuous surfaces such as walls that run parallel to the court lines and are within 1' of an opaque curtain, divider net or an open overall playing area should also be padded in a similar manner. From a safety standpoint, however, consider padding more than is recommended. Periodically review the USA Pickleball recommendations and refer to federal, state and local regulations for padding requirements.
- **Uniformity at Perimeter**. Consistency and uniformity at the perimeter of the court is preferred to a perimeter condition that has many free-standing fixed objects, changes in elevation and/or varying distances to the edge of the playing surface. This is particularly important for the sections of the perimeter that are behind the players.
- **Access**. Refer to federal, state and local regulations and construction codes regarding access into and out of the building, including guidelines in the Americans with Disabilities Act (ADA). (See Chapter 4.)
- **HVAC**. Moisture control indoors is important to prevent slippery surfaces and mold/mildew buildup.
- **Amenities**. To provide more comfort for players and spectators, the planning process should consider seating, restrooms, lockers, vending machines, drinking fountains, etc.
- **Accessories**. Consider items such as pickleball net posts and nets, divider net partitions, backdrop curtains, scoreboards,

video recording equipment, broadcasting equipment, storage rooms and staff facilities.

- **Intensity of Use**. How much traffic will the floor receive? All elements must be considered from a traffic and durability standpoint.
- **International Standards**. Organizations such as ASTM International, DIN, ACI and EN have established guidelines that might be considered.

Drafting Specifications

A design professional, with the help of consultants, will draft specifications for indoor sport surfaces and support features to satisfy the demands of the intended use, programming plans and performance goals.

Choosing a Surface

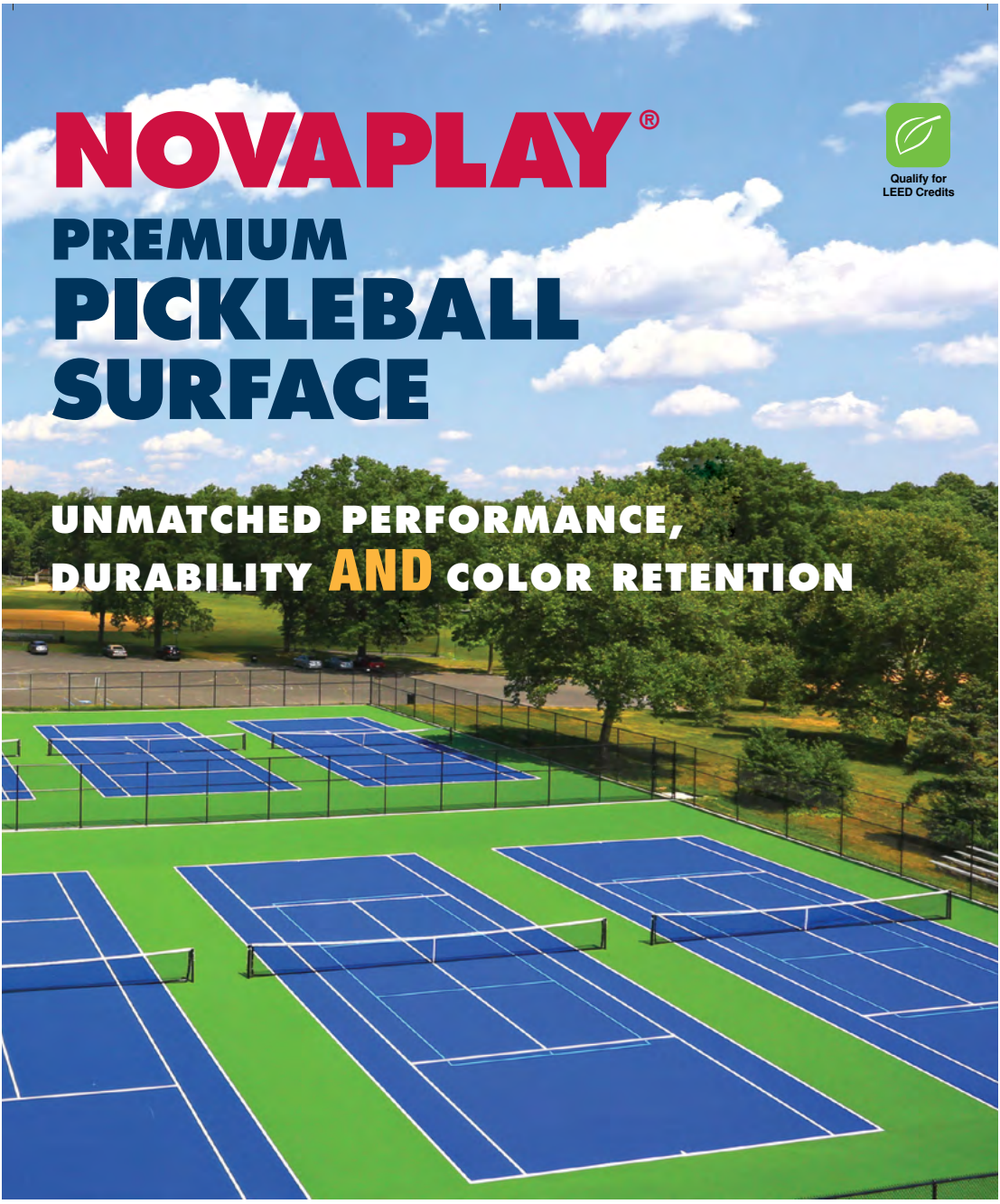
One of the most important decisions to be made in planning an indoor sports facility is the selection of a surface. After all, the purpose of such a project is to provide a sports venue; a quality, high-performance sports floor is an important aspect of that venue. Unfortunately, too often the budget is consumed by other aspects of construction.

Advice and counsel should be sought from those with specific knowledge and experience in sports surfacing. This might include architects and engineers who specialize in sports facilities, sports flooring manufacturer's representatives and sports flooring installation contractors. End users and operations staff also may be included in the selection process.

Pickleball-Only Courts

If indoor pickleball is sharing time with tennis, a popular choice is an acrylic surface on asphalt pavement or a concrete slab. Clay and fast-dry courts are not popular for indoor use; they tend to experience excessive hardness issues and an elevated humidity level in the building due to irrigation. (See Chapter 3 for other surface options and considerations.) Indoor courts will differ from their outdoor cousin in slope—indoors, the courts, whether asphalt pavement or concrete, need not be sloped at all.

If asphalt pavement is chosen, its specification should be similar to that of an outdoor court in a non-freeze-thaw climate. Outdoors,



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asphalt needs to cure over 14 to 30 days. Indoors, since there is no ultraviolet light or rainwater to aid in curing, expect curing to take the entire 30 days. Otherwise, refer to the guidance on asphalt pavement in Chapter 3.

Unlike concrete slabs that can be poured indoors once the building shell is enclosed, asphalt pavement is best installed before the exterior walls are assembled and definitely before the HVAC equipment is activated. The asphalt paving process is a dirty business and the smoke and fumes during paving need to be vented out (with construction fans, not the building's HVAC system) to avoid coating the interior with an oily, difficult-to-remove layer of petroleum-based residue. The acrylic surface system bonds well to a cured asphalt pavement.

Concrete slabs indoors will also be similar to outdoor slabs (but also without a slope). Concrete cures through two different processes: strength curing and moisture curing. Strength curing occurs between 21 and 45 days. Moisture curing is dependent upon specific conditions and is hard to gauge, so it is usually determined by testing. For guaranteeing a proper bonding of the acrylic to the concrete, it is necessary to use a bonding agent offered by the acrylic manufacturers.

Multi-Use Sports Surfaces–Performance Characteristics

The performance characteristics of surfaces are sport-specific. What is considered optimum footing—friction, traction, slide and protection against foot-lock—will vary from one sport to another. Ball bounce and "speed" will need to be considered. Ideal ball/surface interaction also may vary. For example, in pickleball, the rougher the texture of the court, the more the surface will grip the ball and the slower the surface will play; too smooth a surface may be uncomfortably fast.

A performance characteristic related to pickleball, which describes ball/surface interaction, is Vertical Ball Rebound, also called VCOR (Vertical Coefficient of Restitution). This characteristic is important to ball games such as pickleball.

Whatever its performance characteristics, a new sports surface should be consistent in all properties, over its entire surface.

Types of Synthetic Systems

Synthetic systems are versatile, economical and suited for multi-sport use. Numerous patterns, colors, textures, reflectance, etc. are possible to provide the desired aesthetics. Synthetic flooring systems also can accommodate a wide range of non-sport activities, including food service. They are resistant to spills and easily cleaned. Synthetic systems also tolerate varied temperature and humidity conditions and are comparatively easy and inexpensive to maintain.

Synthetic surfaces are divided between those installed on-site and pre-fabricated systems.

- Poured-in-Place Systems (PIP). The poured-in-place system is sometimes called cast-in-place, full pour or full depth polyurethane.
- Full depth polyurethane (PU) systems may be installed over new substrates, including asphalt, concrete or wood, or over old substrates, including vinyl composition tile (VCT), acrylic coatings and existing polyurethane floors.
- Sandwich Systems—Like cast-in-place floors, sandwich systems may be installed over new substrates or over existing flooring systems.
- Pre-Fabricated Systems
- Polyvinyl Chloride (PVC) Sheet Systems (also called Roll Goods)—PVC sheet flooring is available in varying thicknesses and cushioned forms appropriate for sports.
- Polypropylene Tile Systems
- Vulcanized Rubber Sheet Flooring—This is an extremely adaptable material that can be engineered for specific performance characteristics.

Finishes

Coatings or treatments are used to provide desired performance characteristics, appearance and/or durability. Textured finishes are used for track, tennis and pickleball.

Installation of Indoor Sports Flooring

Evaluating Site Conditions

Before a sports surface is installed, the owner must ensure that the jobsite conditions are suitable. These conditions may vary

from one type of surface to another, but in general, the following requirements will apply:

- The building should be fully enclosed and weatherproof.
- All roofing should be completed, including flashing and guttering.
- All masonry, plastering, tile and similar work should be completed.
- All painting and other coatings should be finished and dry.
- All overhead HVAC, lighting and sport equipment should be installed and operating.
- All interior and exterior doors, thresholds and in-ground equipment should be installed.
- The area to be surfaced should be free of obstructions.
- A moderate room temperature (above 65°F) and a relative humidity of between 50% and 75% should be maintained one week prior to, during and one week after installation (or according to the manufacturer's specifications).

Concrete Slab Construction

Most indoor acrylic and synthetic sports surfaces will be installed over a concrete substrate. The long-term success of the installation hinge on controlling moisture, stabilizing the slab and including properly spaced and detailed joints.

Most sport surface manufacturers require specific surface tolerances; typically, the slab should be flat with a variation of no more than 1/8" in a 10' radius. Whether or not a finished concrete substrate will be able to meet this tolerance is a direct result of its design and construction. Surface flatness can be tested with a simple 10' straightedge. Particular attention should be given to verify all construction/control joints for curling. Leveling, if required, should be done by grinding down the high areas and filling the low areas with an approved patching material. The compressive strength of the patch material should be equal to or greater than that of the concrete.

Concrete should have been poured and in place a minimum of 60 days (though a longer time may be necessary) and should be tested and found to be below the manufacturers' recommended percentage for moisture content/vapor emission. The concrete should have a broom or steel-troweled finish, depending on the surface manufacturer's specifications. The concrete should be clean, dry and free of all bond-breakers including dust, dirt, grease, oil, paint, alkali

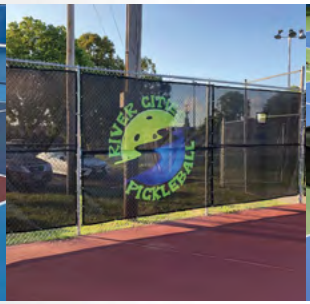
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and other foreign substances that will interfere with the adhesion of the flooring system. Sealers should not be used, as they may be incompatible with a resilient athletic flooring system.

Surface Construction Schedule

The time required to build a sports floor, the methods employed and whether or not the process will necessitate closure of the facility to activities in adjacent areas will vary from surface to surface.

Game Lines and Event Markings

The final step in constructing a multi-sports surface is painting game lines and event markings. One color should be painted at a time. As soon as painting is completed, the tape should be removed. Custom colors may take as much as six to 12 weeks for production.

Renovation

When renovating, it is important to know that some older flooring systems may include hazardous materials, which could include:

- Vinyl Asbestos Tile (VAT), which is a predecessor to Vinyl Composition Tile (VCT).
- Some older sheet vinyl included asbestos in the felt backing.
- Adhesives also sometimes contained asbestos. These were black asphalt-based adhesives.
- Heavy metal compounds such as mercury and lead have been used in sport floors.
- Older polyurethane material could create friable particles that may be dangerous.

Where hazardous materials exist, owners need to decide whether to encapsulate or remove the material before starting other work.

Volatile Organic Compounds

Volatile Organic Compounds (VOCs) are chemicals that are in vapor form at normal temperatures and pressures, and in high levels can cause dizziness, drowsiness, nausea, headaches, nervousness, depression and asthma. Be aware that items such as paint, varnish, plywood, wall coverings, floor coverings, siding, roofing, cabinetry, furniture, plumbing and cleaning supplies may emit VOCs, especially during installation. (A small number of VOCs are classified as carcinogenic, mutagenic or reprotoxic (CMR) and should not be used in sports-related materials.)

Care & Maintenance

To maximize the useful life of a sports floor, the owner should develop and implement a schedule of maintenance. Most manufacturers will provide a detailed operations and maintenance manual.

Regular inspection, cleaning, removal of stains, recoating and repair of minor irregularities, where indicated, will help to keep the surface looking good and will extend its life. For more information and details, see Chapter 9, Care & Maintenance.

Repairs, Renovation, Replacement

Repairs

Spot repairs to surfacing may be required from time to time due to wear in selected high-stress areas or as a result of accidental damage or vandalism. Some multi-sport systems are easily repaired and fully restorable; others are not.

Owners should retain leftover materials for future repairs, but should not expect that, if it becomes necessary to use them, they will match exactly. New material should be placed so that the finish elevation is level to the existing surface. The surface texture of new and existing materials must be as similar as possible.

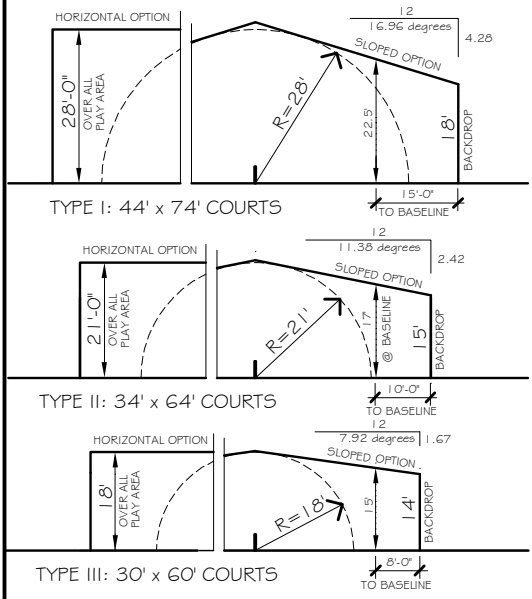
Resurfacing

As with repairs, the need for and the ability to resurface acrylic and synthetic multi-sport surfaces varies from one system to another. Consult the manufacturer or installer of your specific acrylic or synthetic multi-sport system for recommendations regarding resurfacing. With acrylic systems, it is possible to resurface a court more than once. It is recommended that courts be resurfaced every 5 to 7 years, but with areas of heavy play, resurfacing every 3 to 5 years may be optimal. After multiple resurfacings, the courts may need to be stripped of coatings before surfacing again to avoid vapor locking and potential bubbling.

Surface Replacement

Surface replacement involves removing (or overlaying) the existing surface and the installation of a new surface system, whether the same kind of surface system or a different surface. Often, sport

surfaces are replaced because of damage or changes in performance requirements. (When the surface is to be replaced, the architect and owner will need to decide whether to remove the old flooring.)



SLOPED CEILING HEIGHTS:

30' X 60' (TYPE III) COURT:
Open Radius From Net Line: 18'-0"
Height Above Backdrop: 14'-0"

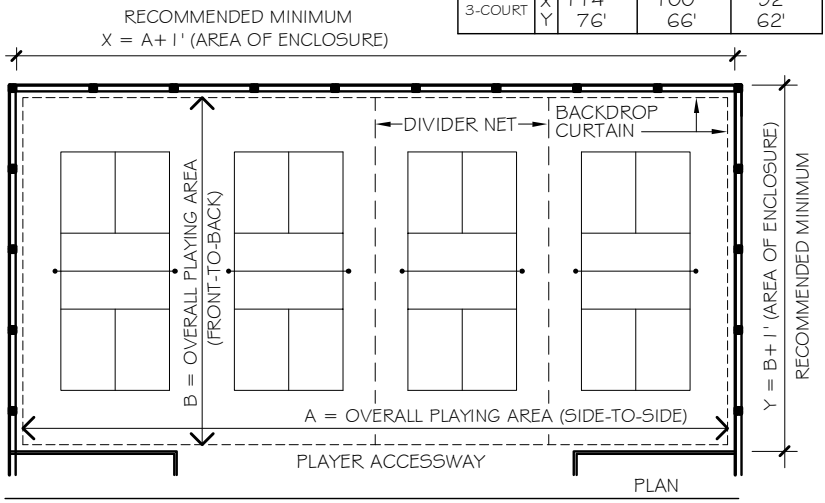
34' X 64' (TYPE II) COURT:
Open Radius From Net Line: 21'-0"
Height Above Backdrop: 15'-0"

44' X 74' (TYPE I) COURT:
Open Radius From Net Line: 28'-0"
Height Above Backdrop: 18'-0"

HORIZONTAL CEILING HEIGHTS:

30' X 60' (TYPE III) COURT: 18'-0"
34' X 64' (TYPE II) COURT: 21'-0"
44' X 74' (TYPE I) COURT: 28'-0"

AREA OF ENCLOSURE (NET)				
		TYPE I	TYPE II	TYPE III
2-COURT	X	80'	68'	62'
	Y	76'	66'	62'
3-COURT	X	114'	100'	92'
	Y	76'	66'	62'



INDOOR - NEW ENCLOSURE

(PICKLEBALL COURT ENCLOSURE ONLY)

35INDOOR.N.AVL.23

RECOMMENDED CEILING HEIGHTS @ NET LINE:

30' X 60' (TYPE III) COURT: EIGHTEEN FEET (18') ** 1
34' X 64' (TYPE II) COURT: TWENTY ONE FEET (21') ** 1
44' X 74' (TYPE I) COURT: TWENTY EIGHT FEET (28') ** 1

RECOMMENDED CEILING HEIGHTS @ BACKDROP:

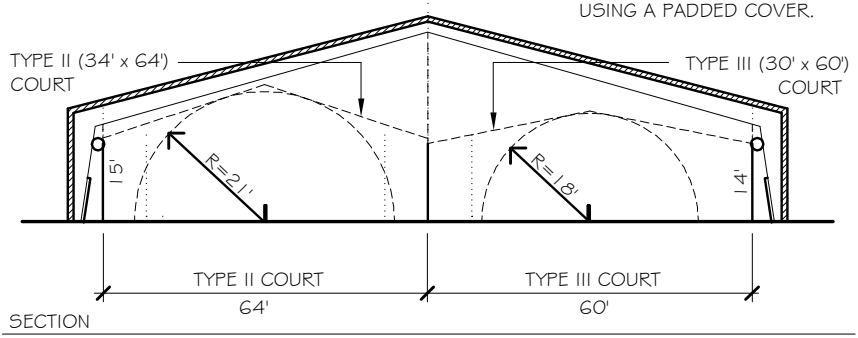
30' X 60' (TYPE III) COURT: FOURTEEN FEET (14') ** 1
34' X 64' (TYPE II) COURT: FIFTEEN FEET (15') ** 1
44' X 74' (TYPE I) COURT: EIGHTEEN FEET (18') ** 1

** 1 - HORIZONTAL CEILINGS SHOULD BE AT THE NET LINE HEIGHTS (ABOVE).

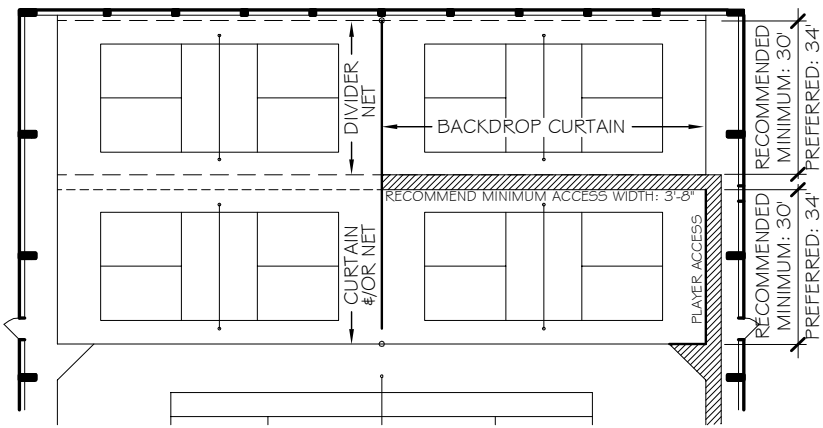
RECOMMENDED 1'-0" MIN. BETWEEN ANY CURTAIN & FIXED OR MOVEABLE OBJECTS.

RECOMMEND 7'-0" HIGH PADS ON FLAT, FIXED SURFACES (WALLS) WITHIN 2'-0" OF CURTAINS & WITHIN 4'-0" FOR IRREGULAR-SHAPED, FREE-STANDING, FIXED OBJECTS (COLUMNS, ETC)

IF STORING OBJECTS WITHIN 4'-0" OF A CURTAIN, CONSIDER USING A PADDED COVER.



SECTION



PLAN

INDOOR - CONVERSION

(FROM TENNIS TO PICKLEBALL)

36INDOOR.C.AVL.23

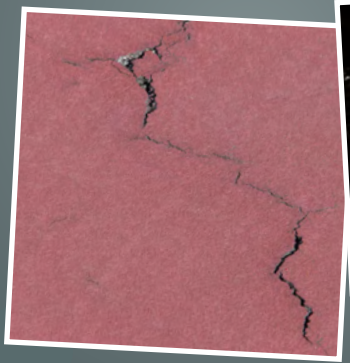
Chapter 9

Care & Maintenance

- General Maintenance
- Hard-Court Maintenance
- Crack Repair
- Fast-Dry Court Maintenance
- Drainage Maintenance
- Net Maintenance
- Net-Post Maintenance
- Fence Maintenance
- Windscreen Maintenance
- Lighting Maintenance
- Landscape Maintenance
- Storm Preparedness
- General Safety











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Care & Maintenance

General Maintenance

To get the most out of pickleball courts and facilities, owners and managers should follow a maintenance schedule. Start by regularly inspecting the courts and repairing any minor irregularities—a much more palatable and cost-effective method than allowing courts to deteriorate to the point where major repairs or reconstruction are required. Even with regular maintenance, though, all courts eventually will need some repair.

One of the most important steps in maintaining any type of court surface is to keep it clean, so remove debris immediately and spot-clean any spills as soon as they occur. It might be advisable to prohibit food and beverages—except for water—in the court area, and make the courts no-smoking zones. To encourage players and spectators to keep the area clean, make sure wastebaskets are easily accessible.

If located in a climate where courts shut down for the winter, inspect all court equipment at the end of the playing season and order replacement parts so repairs can take place during the off-season. If looking to purchase new equipment, the end of the season might be a good time to find some bargains.

A number of factors will help determine the amount of maintenance required for a particular pickleball facility, including the geographic location, amount and type of use, and any alternative use of the facility or courts. In any case, owners/managers should develop an appropriate plan to ensure that maintenance is performed at timely intervals. Keep records of maintenance procedures and any conditions or problems. If excessive maintenance is required, it may indicate more serious, underlying problems.

Hard Court Maintenance

Hard courts, made of asphalt or concrete, are generally considered fairly low maintenance. For pickleball, asphalt or concrete courts may or may not be surfaced with an acrylic coating.

Pre-Season Maintenance

Clear all debris from the court surface with a soft-bristle broom or leaf blower. Stubborn dirt may require a rotary pressure washer.

Note: *Use caution with a rotary pressure washer; if pressure is too high, it can damage the court surface.*

To remove stains from leaves, grass, twigs, etc., first use a mild cold-water detergent solution with a soft brush, and be sure to rinse it off—don't leave detergent on the court. If that doesn't work, try a rotary pressure washer. If still unsuccessful, contact the court contractor or surface manufacturer for a recommendation.

Note: *Don't try a stronger cleaning solution without first consulting the contractor or coating manufacturer.*

Try to remove tree sap, fruit, dead insects and bird droppings as quickly as possible, since once hardened, it becomes difficult if not impossible to remove these stains. Do not allow trees to overhang the courts.

If mold, mildew or algae appear in shaded areas, a rotary pressure washer should be able to remove them. Decaying matter, including food and drink spills that have not been cleaned up, often lead to mold or mildew.

If a stain has been allowed to remain on the court surface for a period of time, there's a good chance bleaching of the court's color coating may have occurred. Unfortunately, there is no way to correct this. For severe staining or bleaching, the entire court may need to be recoated to restore a pleasing appearance. Since all courts will fade over time, the new material will be darker than the rest of the court surface, leaving a patchy appearance.

Remember, some wear is normal. In addition to normal fading of color coatings, the color will also show some wear, especially in the high-traffic areas of the court. Under normal use, court shoes will leave scuff marks on a newly surfaced court, which should not be a major concern to owners; the severity of these marks will decrease over time.

Asphalt courts may show divots caused by paddles hitting the surface. Slight chipping of the acrylic surface may become visible

around footings for net posts, fence posts and light poles, due to the different expansion rates between the concrete footings and an asphalt court. To aid in establishing an appropriate maintenance schedule, note and keep track of the wear on each court from year to year.

Regular Maintenance

To prevent staining, remove all debris on a court as soon as possible. Spot-clean spills as soon as they occur, following the recommendations from the surface maker. Sweep the court occasionally with a soft brush, not a stiff bristle broom. Hose down the court every now and then using normal water pressure. (If rainwater runoff leaves areas of silt or dirt on the court, hose this off so it won't stain or damage the surface.)

To prevent dirt, mud, sand or other abrasive materials from being tracked onto the courts, provide a mat at the entrance to the court for players to wipe their shoes.

If cracks appear in asphalt courts, keep track of their size and note any changes. All courts will crack eventually, but some cracks may be a sign of more serious problems. Don't let weeds grow through cracks; they'll only accelerate the expansion. Use an approved herbicide to keep weeds from coming back.

Court contractors are experienced in determining the types of cracks and appropriate methods of repair; to save time and money in the long run—and to prevent further harm to the courts—it's best to consult a court contractor for anything to do with cracks and crack repair.

Use only crack-repair materials specifically designed for your courts—not all-purpose fillers such as those used for driveways. Make sure whatever fillers you use are compatible with the coating system. Once a crack appears, however, no matter how well it is repaired, it will reappear over time.

Take note of any bubbles, surface wear, peeling and flaking. In general, minor surface blemishes may be repaired by patching, but it will eventually lead to a speckled appearance.

Winterizing

If closing a hard-surface court for winter, remove all leaves and other debris to prevent stains. If possible, periodically remove debris over the course of the winter.

Walk through the facility and note any cracks, and if possible, repair them before winter. If water enters the crack and freezes, it will enlarge the crack.

Shoveling snow from the court is not recommended, as it may damage the surface coating. If you must remove snow, use a broom or plastic shovel and shovel carefully. A properly constructed court will not be damaged by snow left on it, and in fact, the snow may help to protect the court. If ice forms on the court, wait for the ice to melt naturally—do not apply salt or attempt to chip it off.

Maintenance Equipment for Hard Courts

Water Removal—After a cleaning or rain, remove water using foam sponge rollers, rubber squeegees or water-absorbent drums. A foam sponge roller may be easier on the court surface than a rubber squeegee. Power blowers are sometimes used to remove water, leaves and snow. Wet vacuums also can be used for drying courts.

Cleaning Equipment—Remove leaves and other debris from the court with large push brooms with soft bristles. Power blowers, wet/dry vacs and jet spray cleaners (water brooms) can also be used. Power equipment may require a 110V outlet, and jet sprayers will require a hose connection. Sprayers may be used for cleaning windscreens and divider curtains as well as court surfaces, but use care to avoid damage.

Crack Repair

All courts will crack eventually, however some cracks may be a sign of more serious problems. If cracks appear, keep track of their size and note any changes, and call in a court contractor to assess the situation and determine an appropriate remedy. Repairing cracks will depend on the type and size of the crack, any underlying problems, and the budget available. Keep in mind, though, once cracks appear and are repaired, they will eventually reappear.

There are a number of reasons a court might crack, such as poor sub-base conditions, improper asphalt or concrete design, improper

asphalt or concrete placement, poor drainage, improper net and fence post placement and/or tension, lack of maintenance and age of the courts. Asphalt has a natural tendency to shrink as it weathers, ages and oxidizes, and asphalt loses it flexibility and becomes more brittle as it ages.

One way to delay or deter cracks in asphalt pavement is to install control joints where the asphalt may be its weakest. During construction, the pavement is saw-cut two-thirds to three-quarters its thickness under the net and between courts (in a multi-court battery), which provides a place for movement and shrinkage of the asphalt pavement. The cut is then filled with an elastomeric crack sealant.

Note: *The sealant in a control joint will degenerate over time due to expansion and contraction of the cracks and due to UV degradation, so it will require supplemental work every few years.*

With more than one court, a control joint between courts could also prevent the crack from traveling to the adjacent court.

Types of Cracks

There are many types of asphalt cracks, and an experienced court contractor or design professional can help determine the specific type of crack and its possible causes, and can recommend a repair. Types of cracks include:

Structural cracks penetrate the asphalt pavement. They may result from the natural aging and shrinking of asphalt pavement, lack of proper sub-grade preparation, improper or lack of drainage, or non-uniform base or asphalt thickness/compaction. Often structural cracks appear as straight parallel lines running lengthwise on the court. Such structural cracks are almost always in the vicinity of the paving joints.

Shrinkage, or stress, cracks are a random pattern of interconnected cracks with irregular angles and sharp corners. They are small cracks, usually 1/16" or less. Shrinkage cracks may be caused by the weathering of the asphalt, by improper mix design or by issues with the acrylic or its application.

Alligator cracking is a pattern of interlocking cracks over the surface, resembling an alligator hide. Such cracking may vary in depth

from a very faint surface pattern to full-depth cracking. Alligator cracking may be a sign of an inadequately prepared sub-grade or of rolling a court when the asphalt is too thin or with a roller that is too heavy.

Hairline cracks are small irregular cracks present over large areas of the court. They do not affect the play of the game. Such cracks may be caused by natural weathering or aging, by foreign matter in the asphalt or coating material, by improper application of coating, by improper asphalt mix design, or by stripping. If untreated, hairline cracks will develop into more serious types of cracks and will require more extensive repair.

Radial cracks appear where the asphalt court pavement meets the concrete footings for net posts, light poles or fence posts. Radial cracks are due to the different rates of expansion and contraction between the asphalt court material and the concrete footing material. Using round post footings and recessing the footings below the asphalt courses may help to eliminate or minimize radial cracks.

Reflection cracks occur in asphalt surface overlays and mirror a crack pattern in the old pavement underneath. They are caused by movement in the pavement beneath the overlay or in the sub-grade or, if present in an asphalt overlay of a concrete court, they may follow the joints or cracks in the original concrete slab.

Repairing Courts with Cracks

Small cracks are often treated with a crack filler appropriate for the surface and according to manufacturer instructions. In general, the crack is first routed and cleaned, then a tack coat may be applied (follow the manufacturer's instructions for mixing and drying). Next, the filler is worked into the crack with a putty knife or similar tool. Be sure to fill, not just cover, the crack. Apply pressure on the filler in all directions to fill all the spaces. When completely filled, remove excess crack filler material on the surface. Once the filler has dried, smooth the surface of the filled crack. Touch up or fully color coat the entire playing surface.

Another method of crack repair is to use a fabric or membrane system to bridge the crack. There are several proprietary systems for this type of repair, which is then covered with a color-coat system. The crack in the court still remains, underneath the repair, and may continue to expand, but the fabric or membrane generally is designed to flex and stretch as the pavement moves.

Another way to repair courts with cracks is to install a composite overlay over the entire court, covering over the worn acrylic color coating. With this method, the cracks are first thoroughly cleaned and filled. Next, the composite overlay is installed over the court, then the color-coat system is applied to the surface.

Concrete Pavement Problems

With concrete courts, most cracks will be structural in nature, running through the vertical profile of the slab, although this type of cracking is more common in reinforced concrete courts rather than in post-tensioned concrete courts.

Post-tensioned concrete courts require little maintenance or repair and are relatively unaffected by temperatures, even extreme freeze-thaw cycles. Some initial shrinkage cracking may occur, but the tension on the tendons will hold the cracks together.

The methods for repairing concrete court cracks are similar to those of repairing asphalt cracks. In the concrete industry, epoxies and urethanes are often used to repair cracks. Pressure-injection of epoxies and urethanes can effectively fill small cracks in concrete courts.

Fast-Dry Court Maintenance

Any new court should play uniformly. Over time, as the court becomes worn in areas of heavy use (such as the baseline and service boxes) the surface may play slightly differently. Usually only an experienced player will note these minor differences in play.

Clay and fast-dry courts require more maintenance than hard courts. After each match or after three to four hours of play, a court should be dragged with a broom to smooth the surface, and the play lines should be brushed clean. Periodically, depending on the amount of use and the degree of compaction, the court should be rolled to make sure the surface is evenly compacted to ensure uniform ball response.

Because freezing conditions, high winds, snow and ice will make this type of court unplayable, it may be closed after the first frost in cold climates. In the North, the services of a tennis court contractor may be required to close the facility for the winter and open it again as the weather warms. Spring conditioning will require the removal of old, "dead" material from the court surface, its replacement with

1-1/2 to 4 tons (1361-3628kg) of new material per court, and additional rolling and brooming.

Pre-Season Maintenance

It is recommended that fast-dry courts be top-dressed annually. In freeze-thaw areas, the courts should be patched and top-dressed in the beginning of the playing season. In warm climates, top-dressing the courts may be required twice or more. Applying a new layer of fast-dry material by top dressing replaces the surfacing lost during the season.

Remove and discard all excess loose material. It should not be reused since it no longer contains adequate fines to facilitate bonding. When the court is dry, scarify each depressed area. New fast-dry material should be spread and compacted while dry, then leveled to the proper grade. Water the patch thoroughly. When the area is firm, roll it. If time permits, allow an additional 24 hours to water and roll before continuing top dressing.

Apply the top dressing in two applications. Water each coat with a fine spray and then roll. Repeat this process with the second application. If possible, allow 48 hours after the final rolling before permitting play.

Activate the irrigation system and check the condition of the lines. If worn, replace them. If using old line tapes, remove the nails before reinstalling. If old tapes were not removed for top dressing, check the nails holding them down, replacing any that are missing and realign the tapes that may have shifted during the down time. Check that the lines are level with the court surface.

Regular Maintenance

Daily maintenance includes brooming, watering and sometimes rolling. The purpose of daily maintenance is to keep the fast-dry material evenly distributed, to keep the air-water cycle going and to keep the court compacted enough for uniform play.

Broom courts in a continuous pattern to evenly distribute the material. Pulling a soft bristle brush is recommended for fewest problems, and finish by sweeping the lines. Regular brooming helps to distribute fines over the court.

Many fast-dry courts have subsurface irrigation, which keeps the courts consistently moist. This also greatly reduces the need to

roll. The firmer the court is maintained, the faster it will play and the less erosion will occur from extended play, wind or heavy rain. Calcium chloride or other conditioners are sometimes added to fast-dry material every 10 to 14 days to help the material retain moisture. Contact the manufacturer of your specific surfacing material for additional guidance in maintaining your fast-dry courts.

Winterizing

No winterizing work is required for a fast-dry surface. The surface will need to be patched, leveled and top-dressed in the spring. Court accessories and equipment, however, do need post-season care.

In cold climates, if the line tapes are in good condition, they should be removed when the courts are shut down for the winter then reinstalled during the reconditioning process in the spring. In warmer locations, the lines can be left in place over the winter, but line tape and nail repair should be done before the spring reconditioning process.

All water lines should be drained except those below the frost line. Rollers should be cleaned and lubricated.

Drainage Maintenance

Proper surface and sub-surface drainage is essential for any pickleball facility, and drainage systems must be maintained to ensure their continued effectiveness.

Swales and French drains can become clogged by vegetation and silt, so keep vegetation properly trimmed, neutralizing roots or using root barriers. Drainage systems may occasionally be cleaned with a pressure hose. Catch basins should have cleanouts, which facilitate regular maintenance.

If clogs cannot be cleared with a hose, it may be necessary to locate then excavate the area. Most obstructions occur where there is a change in direction or elevation.

Net Maintenance

Repair tears as soon as they occur, or they'll just get bigger. The net headband can be cleaned with a mild household cleaner. If needed, replacement net cables and headbands are available.

In areas where there is an occasional mild day in winter that may draw players outside for a match, consider just loosening the net cable and center strap. Then players will only need to tension the net to play.

In areas with extremely cold winter weather, remove the net, as well as the posts if they are installed in sleeves, and put them into storage.

Net-Post Maintenance

Do not over-tension the net cable, or it will eventually deform the net posts and footings. Net posts with winding mechanisms that have removable handles may help in ensuring only those who understand proper tensioning will tighten the cable.

Keep net posts clean. To prevent rust, touch-up nicks and scratches on coated posts as soon as they occur. Use lubricating oil on the winding gear mechanism and sheaves. Consider a lithium-based gear lubricant, which can last the entire season.

If an external winding mechanism is broken, it can generally be replaced easily. Malfunctioning internal mechanisms usually require replacement of the entire gear assembly.

Bent net posts should be replaced. If the posts are in sleeves, this is easy. If the posts are permanently fixed in footings, the entire post footing will need to be excavated and reinstalled along with the new posts.

Posts set in sleeves can be removed, painted and stored for winter. Cover the empty sleeve with a cap to keep it clean and keep out water.

If using portable net systems, be aware that the metal can rust and can scratch the court surface. If the portable net systems are left on the court, the rust may stain the court surface. Make sure rubber feet or pads on the bottom of the metal areas that contact the court surface are intact.

Fence Maintenance

Check chain-link fence fabric regularly for any damage, and touch up nicks and scratches in vinyl or other coatings. To keep players safe, ensure that all sharp edges and protruding wires are bent back or removed.

Inspect all cable ties and hog rings to ensure they are securely fastened. If necessary, re-secure them to the fence system. Check all post caps, hardware and fasteners and repair or replace as needed.

Check all gates, hinges and latches, and clean and lubricate them so the gate swings easily and the latch operates smoothly. If the gate is out of plumb, adjust it.

Examine all fence posts at the footings to check for deterioration in any coatings and patch where necessary.

Windscreen Maintenance

Windscreens should be hosed down occasionally. Replace broken fasteners immediately—a loose section of windscreen will whip in the wind, causing stress on remaining grommets and possibly tearing the windscreen.

In areas with harsh winters, it's best to remove windscreens for storage indoors, which will greatly prolong their life. Hose down windscreens and allow them to dry thoroughly before removing them, and tag each section of windscreen and draw a diagram of the courts, indicating where each section goes. Roll the screens (don't fold them) and store them in order, either in boxes or large plastic garbage bags.

In areas with milder winters, windscreens may be detached from the bottom and sides and rolled up on the fence.

Lighting Maintenance

The transition from older lighting technology to LED lighting fixtures has many advantages to facility owners, especially in regards to energy savings, life expectancy, instant-on and the reduction of lighting system maintenance costs. Older lighting technologies, due to their nature, would typically experience significant depreciation in light output over time and usage. Because of this, a regular and more frequent maintenance schedule was required to keep light levels at relatively constant intensity. LED lighting fixtures will require less maintenance, but they are not "install and forget" light sources.

LED fixtures will occasionally experience premature component failures related to drivers or light engines. This will be indicated by fixtures that are partially or fully out. The components should be replaced to make the fixtures fully functional.

LED fixtures will also incur some degree of dirt accumulation over time, and will need to be occasionally cleaned to maintain optimum light output. Without a cleaning schedule, the light output of LED fixtures will continue to depreciate. The amount of depreciation will depend on how clean or dirty the facility environment is, and how prone the particular fixture is to dirt accumulation.

Light levels over the court surface should be measured once per year, which will help determine when fixtures should be cleaned. Average light output that has depreciated more than 20% is an indication that a cleaning is needed. When cleaning fixtures, use a damp cloth dipped in a cleaning solution to wipe lenses, louvers and fixtures, then rinse them with a damp cloth dipped in water. To avoid streaking, allow the fixtures to dry without wiping. Consult the lighting manufacturer for proper cleaning procedures.

Older HID lighting systems will require more frequent maintenance. Depending on usage, HID lamps (bulbs) should be changed out every three to four years. Without scheduled maintenance, the light output of the HID lamps will continue to depreciate over time. It is recommended that the HID fixtures should be cleaned at the same time the re-lamping is performed. The most cost-efficient maintenance plan for HID lighting systems is to re-lamp and clean all of the fixtures at the same time. See the cleaning procedure described in the previous paragraph.

Landscape Maintenance

Walk through the facility regularly and take note of plants that aren't doing well. Prune trees and shrubs in the fall.

Lawn fertilizers may burn, discolor or damage acrylic coatings and other surfaces, so avoid fertilizing lawns close to the court surface and keep fertilizer from washing onto the court.

Grass should be trimmed and kept below the court surface, which will aid in draining rainwater from the court. Take care when using string trimmers around the court perimeter so as not to damage court surfaces, light posts and fences.

Do not let landscaping or weeds grow through the fence. Use a commercial herbicide or hand-pull weeds. Remove leaves, pine cones, sap and needles from court surfaces as soon as possible. Tree roots that go under courts should be neutralized or removed. If removal isn't possible, a root barrier may be used.

Landscapers should strive to anticipate and accommodate for the future growth of grass and other plantings around the courts. It is recommended that landscaping end 3" to 4" below the grade of the court, to aid in water runoff from the court surface.

Where new landscape materials are required, use native plants if possible, and avoid invasive species.

Using mulch on plantings will conserve moisture, minimize weed growth, reduce maintenance, restore fertility and reduce the need for fertilizers.

In areas with hard water, the high mineral content can cause staining on court surfaces. Make sure to control landscape maintenance, including irrigation systems, so there is no overspray or flooding onto courts.

Storm Preparedness

All areas of the country are subjected at times to severe weather. For pickleball facilities, preparing before a storm hits is a key to getting the courts up and running quickly.

Make sure chairs and movable benches and tables are able to be either secured or removed and placed in a protected, weatherproof building or shed.

Depending on the severity of the storm expected, particularly wind anticipated, it may be advisable to remove fabric or canopies on shade shelters, or even to take down and store the shade shelter framework until the storm passes. It also may be advisable to take down nets, and any court signage, too.

If left up during a severe windstorm, windscreens (or signage on fencing) can rip, but more importantly, they can cause costly damage to fences due to the increased wind load. Take the time to take down all windscreens (and signage) and store them safely indoors. If weather is less severe, some facility managers may decide to roll up windscreens from the bottom, making sure they are well-secured in the rolled-up position.

If heavy rain is anticipated, inspect and clean out all drains. After the storm, make sure to eliminate any standing water immediately.

General Safety

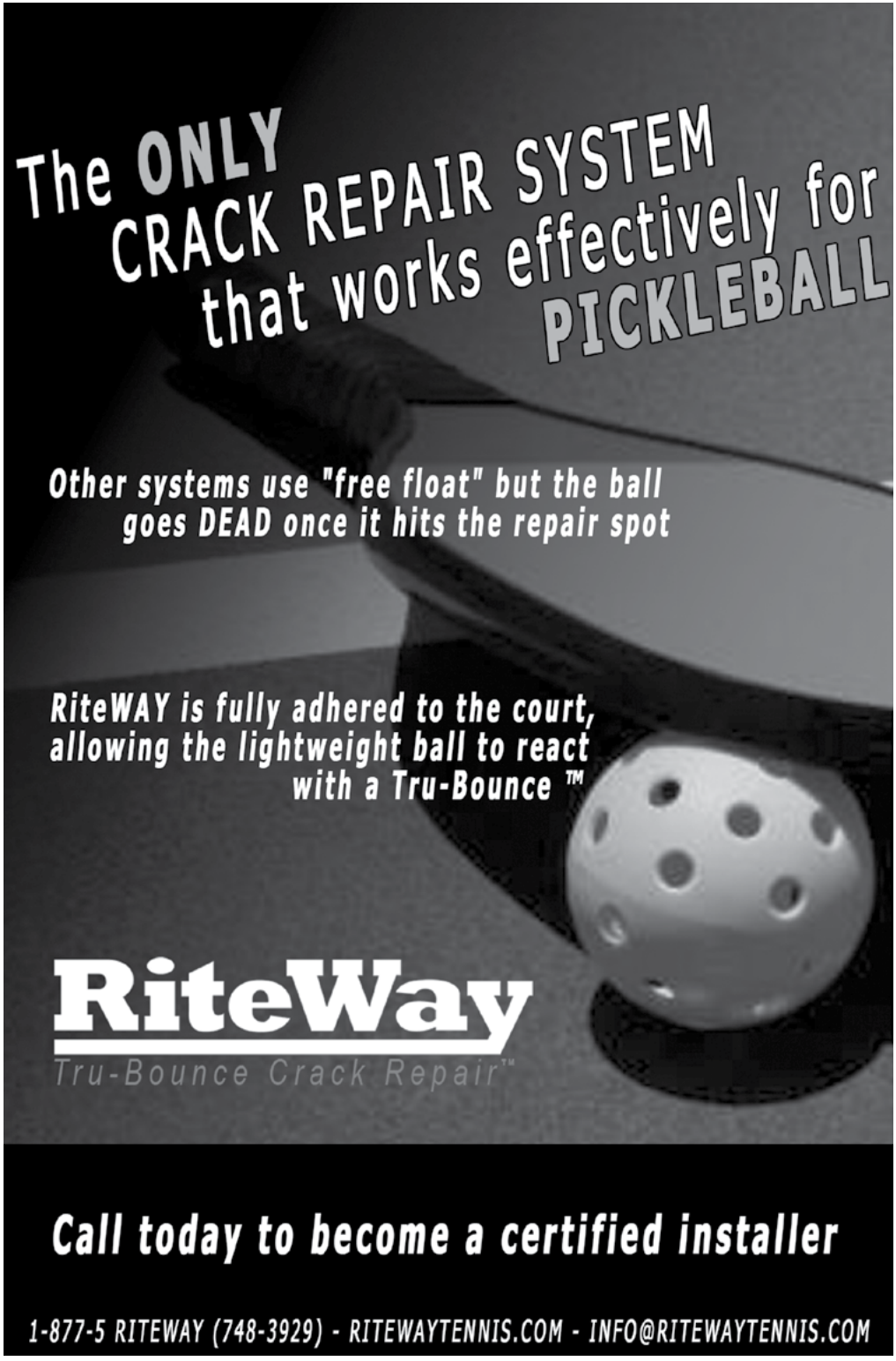
First Aid and AEDs—It's a good idea to have a first aid kit handy in case of an accident. Also, an increasing number of sports facilities now have an Automated External Defibrillator (AED) on hand. Make sure the staff and even players are trained in its use. Check with state or municipal codes about whether AEDs are required.

Closing Time—When the facility and courts are closed, gates should be locked to reduce the chance of unsupervised use.

Lighting—Lighting around the facility (on walkways and areas for egress) can increase a sense of security among users. Generally, a well-lit area is less likely to be a magnet for those who want to loiter or cause trouble after hours. Walk through the facility at night every week or so and look for lights that might be out, or dark areas that may need lighting, and address those issues immediately. Also, encourage players report any lights that are out and replace them immediately. For facilities open at night, lights can be set to operate on a timer. Also consider motion-activated lights.

Restrooms—Consider locking restrooms at night. Even if users complain, it may be safer for all if restrooms are only open during hours of high traffic.

Equipment—Lock away all equipment if the facility will be used after business hours and when the courts are unsupervised.



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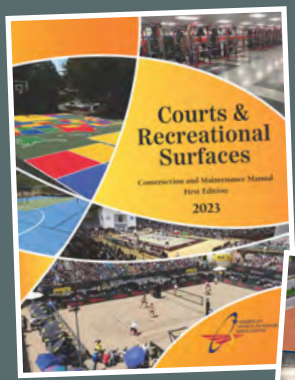
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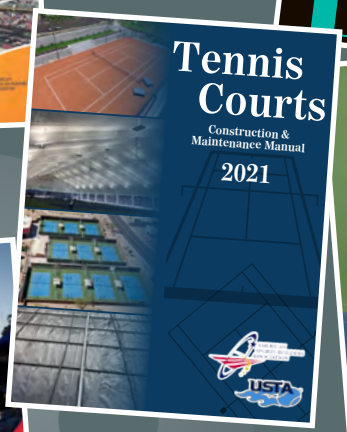
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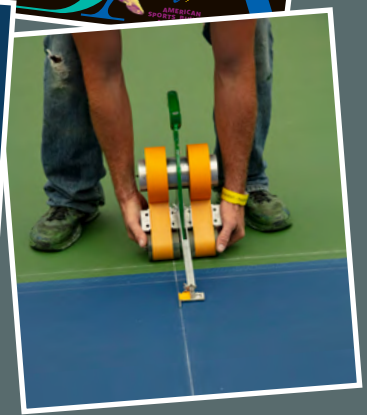
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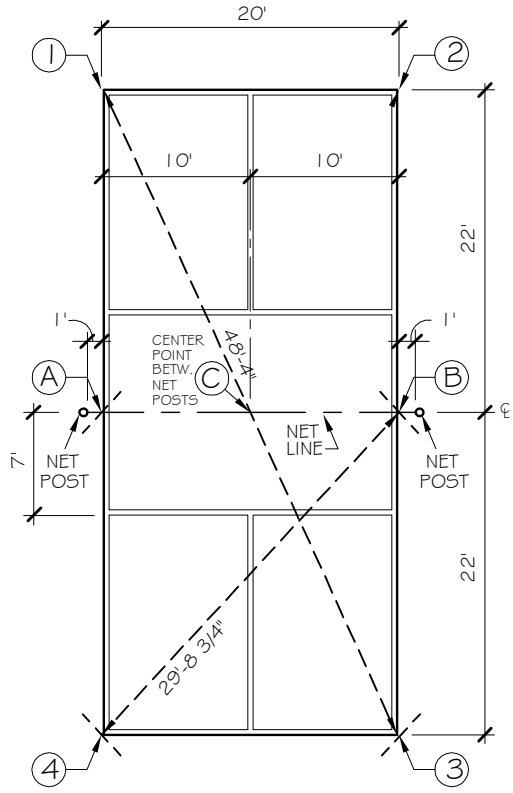
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How to Establish Pickleball Court Playing Lines

1. In laying out court dimensions, first establish the center line between the net posts and locate the center point, C. Locate points A and B, 10' on either side of Point C. (See diagram on page 120.)
2. From Point A, swing an arc 22' to Points 1 and 4. From Point A, swing an arc 29'-8 3/4" to Points 2 and 3.
3. From Point B, swing an arc 22' to Points 2 and 3. From Point B, swing an arc 29'-8 3/4" to Points 1 and 4.
4. The points formed by the intersection of the arcs at 1, 2, 3, and 4 are the outside corners of the playing lines for a pickleball court.
5. From these points, the sidelines, baselines and the interior lines can be established according to standard pickleball court dimensions. (See diagram.)
6. All measurements are to the outside of the playing lines except for the center service line and the center mark.
7. All lines shall be 2" in width, except the baseline, which may be up to 4" in width.
8. As a means of checking the accuracy of the lines, the distance from Point 1 to Point 2 and from Point 3 to Point 4 should be exactly 20' and the distance from Point 1 to Point 3 and from Point 2 to Point 4 should be 48'-4".



ESTABLISHING PLAYING LINES FOR A PICKLEBALL COURT

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Sources of Information

Reference Books

Official Tournament Rulebook, USA Pickleball (usapickleball.org)

Tennis Courts: Construction & Maintenance Manual, American Sports Builders Association (www.sportsbuilders.org)

Membership Directory, American Sports Builders Association (www.sportsbuilders.org)

Sports Lighting, Illuminating Engineering Society of North America (www.ies.org)

Organizations/Trade Associations

American Concrete Institute
38800 Country Club Drive
Farmington Hills, MI 48331
248-848-3700
www.concrete.org

American Sports Builders Association
2331 Rock Spring Rd.
Forest Hill, MD 21050
443-640-1042
www.sportsbuilders.org

The Asphalt Institute
2696 Research Park Drive
Lexington, KY 40511-8480
859-288-4960
www.asphaltinstitute.org

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428
610-832-9500
www.astm.org

International Federation of Pickleball (IFP)
www.ifpickleball.org

National Asphalt Pavement Association
NAPA Building
5100 Forbes Blvd.
Lanham, MD 20706-4407
301-731-4748
www.hotmix.org

National Recreation & Parks Association
22377 Belmont Ridge Road
Ashburn, VA 20148
703-858-0784
www.nrpa.org

Post-Tensioning Institute
38800 Country Club Drive
Farmington Hills, MI 48331
248-848-3180
www.post-tensioning.org

Sports & Fitness Industry Association
8505 Fenton St., Suite 211
Silver Spring, MD 20910
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www.nspe.org

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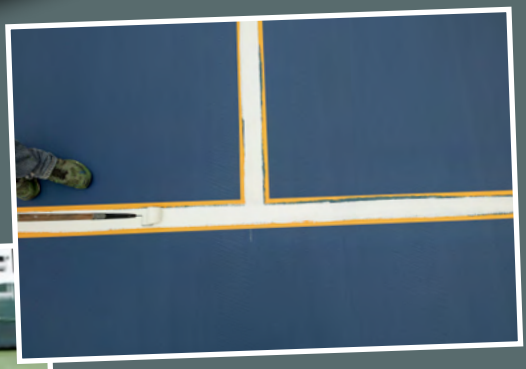
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Glossary

accessory
An item that is not part of the actual court surface construction, but which is necessary or desirable, such as benches, windscreen and divider curtains, etc.

acrylic coating
Polymers derived from acrylic acid, a liquid chemical compound (synthetic latex) used as a wear and color coat on non-porous courts.

aggregate
Mixed stone, which may include stone of various sizes, shapes and/or types.

alligator cracking
A pattern of interlocking cracks over the surface of the court resembling an alligator hide.

amenity
Items that make a facility comfortable and pleasurable to use; i.e., benches, drinking fountains, shade shelters, seating.

Americans with Disabilities Act (ADA)
Federal legislation that requires all facilities be accessible to players and spectators in wheelchairs and to those with other disabilities.

asphalt or asphaltic concrete
A mixture of asphalt binder, a liquid material refined from petroleum, and mineral aggregate that is compacted and cured to form a semi-hard pavement.

ASTM
American Society for Testing and Materials

average maintained illumination
The level of illumination of a new luminaire minus the light loss factor (LLF) specified by the manufacturer.

baselines
The lines parallel to the net at each end of the court.

birdbath
An area on the court where standing water more than 1/16" deep (commonly measured using a nickel) remains after drainage of the area has ceased or after one hour at 70 degrees F. or above in sunlight.

brooming
The process of evenly distributing crushed stone or granular material with a broom on a surface.

cable chair
A device used in post-tensioned concrete construction to space and support cables during concrete placement.

centerline
The line on each side of the net bisecting the area between the non-volley line and the baseline.

center strap
A 2" wide band placed over the net at its midpoint to ensure the height of the net at 34".

channel drain
Type of gutter with a grate on the top to prevent debris from entering.

compactible soil
Soils that can be densely packed; usually inorganic soils such as sand and gravel, sandy loam and sandy clay. They often drain and dry quickly as well.

Competitive/Tournament Court—Recommended
Recommended total playing area for competitive and tournament play is 34' wide by 64' long.

concrete
A mixture of cement, sand, aggregate and water, which cures to form a rigid pavement.

court enclosure
The structures, such as fences, backstops and sidestops, walls, grandstands or other fixed barriers that are intended to contain the activity on the tennis court and within the overruns.

cushion or cushioned course
A layer or layers of resilient material that provides shock-absorbing characteristics.

efficacy
A measure of the relative amount of power required to give off a certain amount of illumination.

elastomeric material
A synthetic material having the properties of natural rubber, used to fill cracks or to create a shock-absorbing surface.

expansive soil
Soil, often containing organic material, that expands significantly when the moisture content is increased.

fixed object
An improvement that is not continuous and consistent with the court surface, that is either fixed to the ground permanently or temporarily, or that is of such weight and quantity that it performs as a fixed item when normal force is applied to it; i.e., grandstands are often movable but with the weight of spectators, they perform like an item that is fixed to the ground and, therefore, similar results can be expected when a player interacts with them.

foot candle
The English unit of illumination equivalent to that produced by a standard candle at the distance of 1 foot.

French drain
A covered trench serving as a barrier between a structure and approaching subsurface water.

gutter
An open, paved drainage channel.

hairline cracks
Small, irregular cracks, sometimes present over large areas of the court.

hard courts
Courts made of asphalt and concrete, often surfaced with acrylic coatings or covered with roll or sheet goods or modular surfaces, generally non-porous.

hog rings
Rings used to fasten a tension wire or windscreens to a fence.

kitchen
See “non-volley zone.”

LED (light-emitting diode)
A semiconductor diode that emits light when conducting current.

LLF (light loss factor)
The measure of the loss of foot-candles or light produced by a lamp over time.

lux
The metric standard measurement of illumination (one foot-candle equals 10.76 lux).

non-porous court (impervious)
A court that does not permit water to permeate through the surface.

non-volley line
The line on each side of the net between the sidelines and parallel to the net. These lines are located 7' from the net.

non-volley zone
Commonly referred to as the "kitchen," it is the area of the court bounded by the two sidelines, the non-volley line and the net. The non-volley line and the sidelines are included in the non-volley zone.

O.D.
outside diameter

overall playing area
The clear area provided for play, which includes the court, sideline overruns and baseline overruns.

overrun
The area beyond the baselines and sidelines of the court that is left clear of accessories and amenities other than those along the net line.

peeling
Coatings separating from the pavement in thin strips or small pieces; usually from coatings that fail to bond properly or lose adhesion.

pickleball court
As defined by the USA Pickleball *Official Rulebook*, a rectangle 20' wide and 44' long, for both singles and doubles.

planarity
In one plane; flat.

polyolefin
A synthetic hydrocarbon coating used to protect metal fence and to enhance its appearance.

polyvinylchloride (PVC) surface system
Usually a prefabricated, thin rubber-like material that is seamed and either totally adhered, perimeter adhered or laid as a loose blanket.

porous court (pervious)
A court that permits some water to permeate through the surface.

post-tensioned concrete
Concrete reinforced with sheathed steel cables within the concrete slab. After the concrete begins to set, the cables are tightened and held under stress.

PPA (primary playing area)
USA Pickleball and the ASBA define the Primary Playing Area as that area which includes the court, plus 2' beyond the sidelines and 2' behind the baseline.

radial crack
Cracks generated from the corners of concrete foundations or other irregularities in the court pavement.

Recreational Court—Recommended
Courts that are the minimum recommended width and length (30' x 60').

reflection crack
Cracks in surface overlays that mirror a crack pattern in old pavement underneath.

reinforced concrete
Concrete strengthened by the inclusion of steel mesh, reinforcing steel (rebar) or reinforcing fiber within the slab.

service courts
The areas on either side of the centerline, bounded by the non-volley line, the baseline and the sideline.

shrinkage cracks (stress cracks)
A random pattern of small, interconnected cracks with irregular angles and sharp corners.

sidelines
The lines perpendicular to the net on each side of the court.

spill (in lighting)
The amount of light that falls outside the area where it is intended to fall.

Stadium Court—Recommended
Recommended total playing area for a stadium court is 50' wide by 80' long. (Note: These are recommended minimum dimensions.)

Standard Court—Recommended
Recommended total playing area for new construction is 34' wide by 64' long. (Note: These are recommended minimum dimensions.)

structural cracks
Large cracks that penetrate the pavement down to the base material.

subbase
The course immediately below the base course (crushed stone or slag, gravel and sand, or combinations of these).

subgrade
The soil prepared to support the pavement system.

swale
A natural drainage channel covered with vegetation, usually grass.

tack coat
A dilute mixture of liquid asphalt spread over a surface to make the material being applied adhere to the surface.

uniformity ratio (in lighting)
Ratio of the maximum illumination to the minimum illumination measured at a specified distance above the court surface.

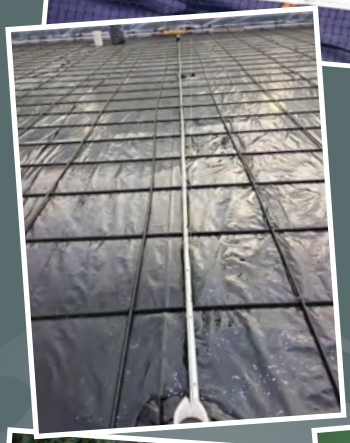
vapor barrier
A polyethylene plastic sheet designed to prevent moisture transmission between the subbase and the base.

Wheelchair Pickleball Court—Recommended
Recommended total playing area for a court used for wheelchair play is 44' wide by 74' long (Note: These are recommended minimum dimensions.)

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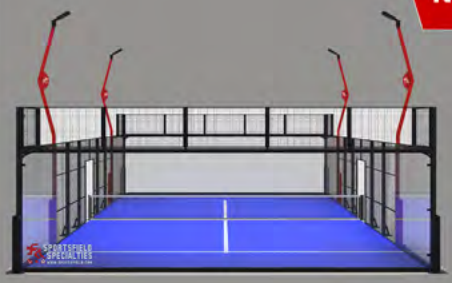
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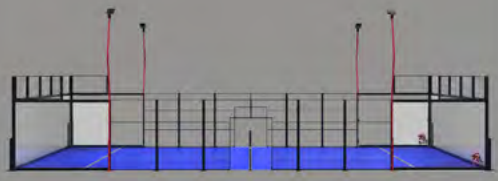
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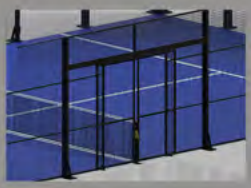
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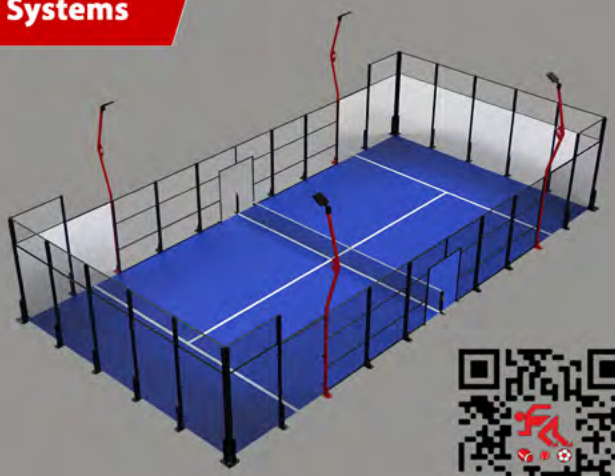




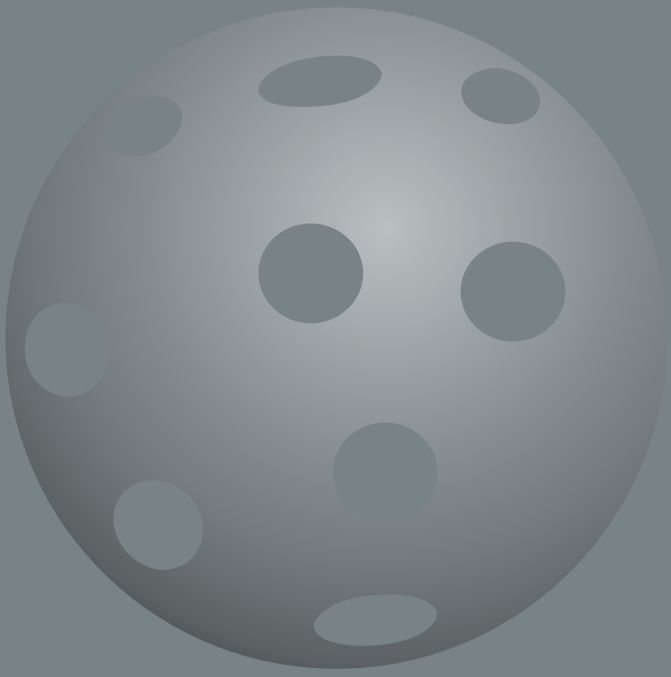
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