Pre-Installation Manual

Comprehensive Planning Guide

(Standard Length Lanes)

June 2023 / 10-095400-047

Brunswick®

Comprehensive Planning Guide

Reorder Part No. 10-095400-047

Notice: If available, updates to this manual can be found on-line at www.brunswickbowling.com.

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SYMBOLS

Throughout this publication, various symbols may be used to alert the user to instructions or information of special concern. These symbols are defined below. **OBSERVE AND READ THEM CAREFULLY!**

NOTE or IMPORTANT!:Will designate significant informational notes.

WARNING! *Will designate a mechanical or nonelectrical alert which could potentially cause personal injury or death.*

WARNING! *Will designate electrical alerts which could potentially cause personal injury or death.*

CAUTION! *Will designate an alert which could potentially cause product damage.*

Will designate grounding alerts.

Denotes items of special concern for customers within the European Union in order to comply with local, national and European health and safety regulations. Failure to follow these specifications will render the CE Declaration of Conformity and associated warranty null and void.

Denotes items that are primary elements of Brunswick's machine guarding packages and recommended safe systems of work. Customers should consult with local worker's safety experts to consider these specifications when designing a safe system of work required to comply with their national, regional or local regulations.

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COMPREHENSIVE PLANNING GUIDE CONTACT SHEET

PROJECT: _____

CONTRACT #: _____ **DATE:** _____

SALES

Salesman: _____ **Phone:** _____

Email: _____

SERVICE

Service Manager: _____ **Phone:** _____

Email: _____

TECHSUPPORT

Phone: 1-800-YES-BOWL 1-231-725-4966 **Fax:** 1-231-725-4667

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IMPORTANT!

The information in this manual is a guide.

All local codes will need to be considered during the design and building process.

NOTE: *Dimensions in this Guide have metric conversions and are expressed in meters to the third decimal point for any dimension over a meter and are expressed in millimeters for any dimension under a meter.*

CE

NOTE: *Designated specifications within the planning guide are required for customers within the European Union in order to comply with local, national and European health and safety regulations. Failure to follow these specifications will render the CE Declaration of Conformity and associated warranty null and void.*

NOTICE TO CUSTOMERS IN THE EUROPEAN UNION!

Brunswick's Declaration of Conformity to the Machinery Directive is provided subject to adherence to the specifications provided in this Guide.

CE

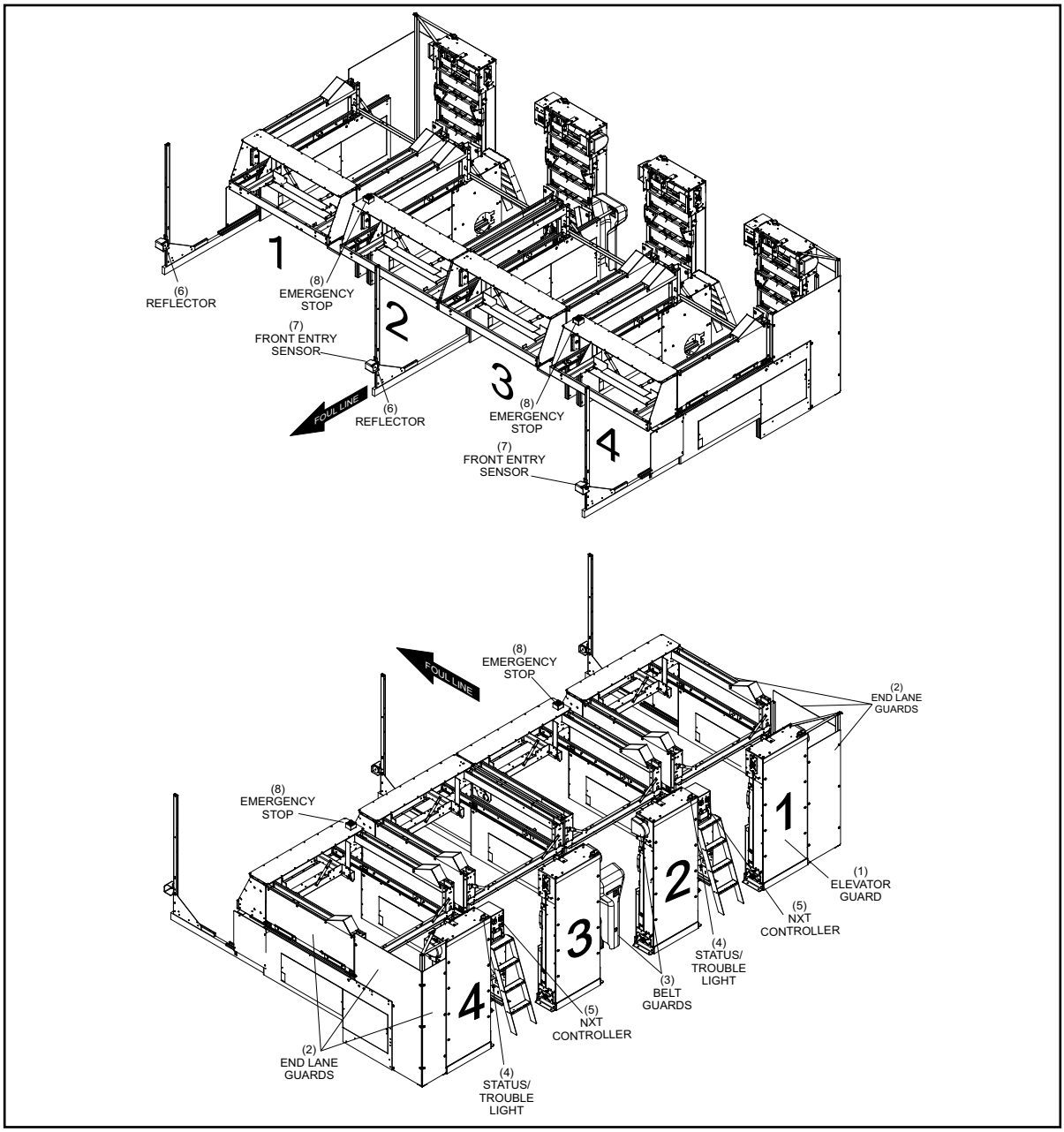
NOTE: *Specifications with the designated CE indicator are required for conformity with the European Union's Machinery Directive and are a prerequisite to Brunswick's provisioning of the Declaration of Conformity and related warranty. Customers who elect to deviate from the designated specifications forfeit Brunswick's warranty in relation to compliance to the Machinery Directive and they take full responsibility for complying with European,national, regional and local regulations. Customers who elect to take these deviations are advised to consult with local worker's health and safety experts before construction.*

PINSETTER GUARDING OPTIONS

GS-NXT

Standard Guarding

The GS NXT pinsetter with Standard guarding incorporates physical barriers and optional electronic monitoring to prevent injury and to limit access to moving parts of the pinsetter. Pinsetters with Standard guarding are equipped with guards along the back and sides of the machine to protect against moving parts. Photo sensors at the front of the pinsetter are used to automatically turn off the pinsetters on the lane pair whenever machine access is attempted.

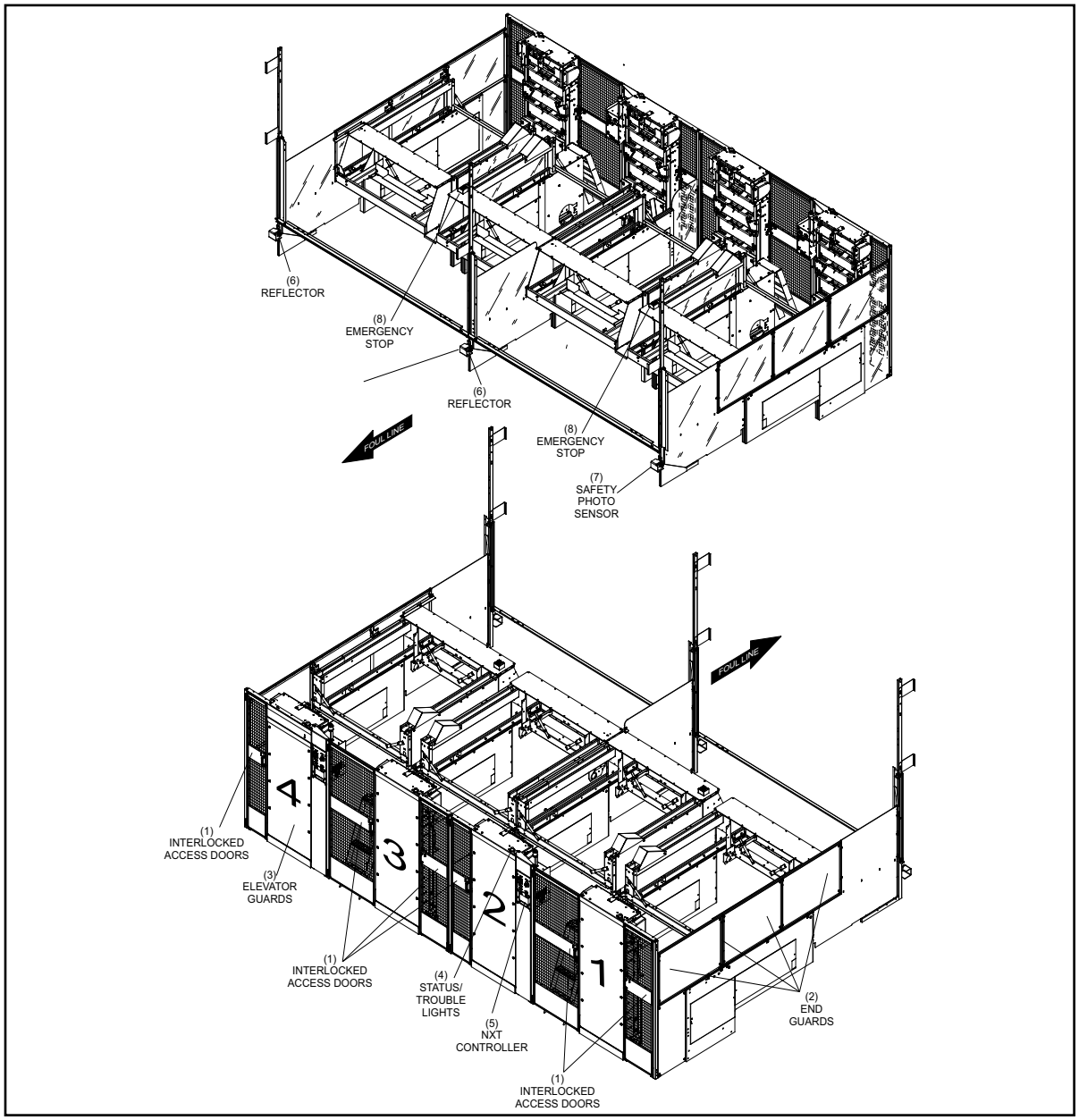


Standard Guarding Package

(1) ELEVATOR GUARD
(2) END LANE GUARDS
(3) BELT GUARDS
(4) STATUS/TROUBLE LIGHT
(5) NXT CONTROLLER
(6) REFLECTOR
(7) FRONT ENTRY SENSOR
(8) EMERGENCY STOP

Premium Guarding

Pinsetters equipped with Premium guarding have guards along the back and sides of the machines to limit access between the lanes of a lane pair. Photo sensors along at the masking unit are used to automatically turn off the pinsetters on the lane pair whenever machine access is attempted from the front of the machines. As an additional safety enhancement, individual magnetic interlocks are mounted to each rear access door and masking unit (if equipped) that automatically turn off the pinsetters on the lane pair whenever any access door is opened.

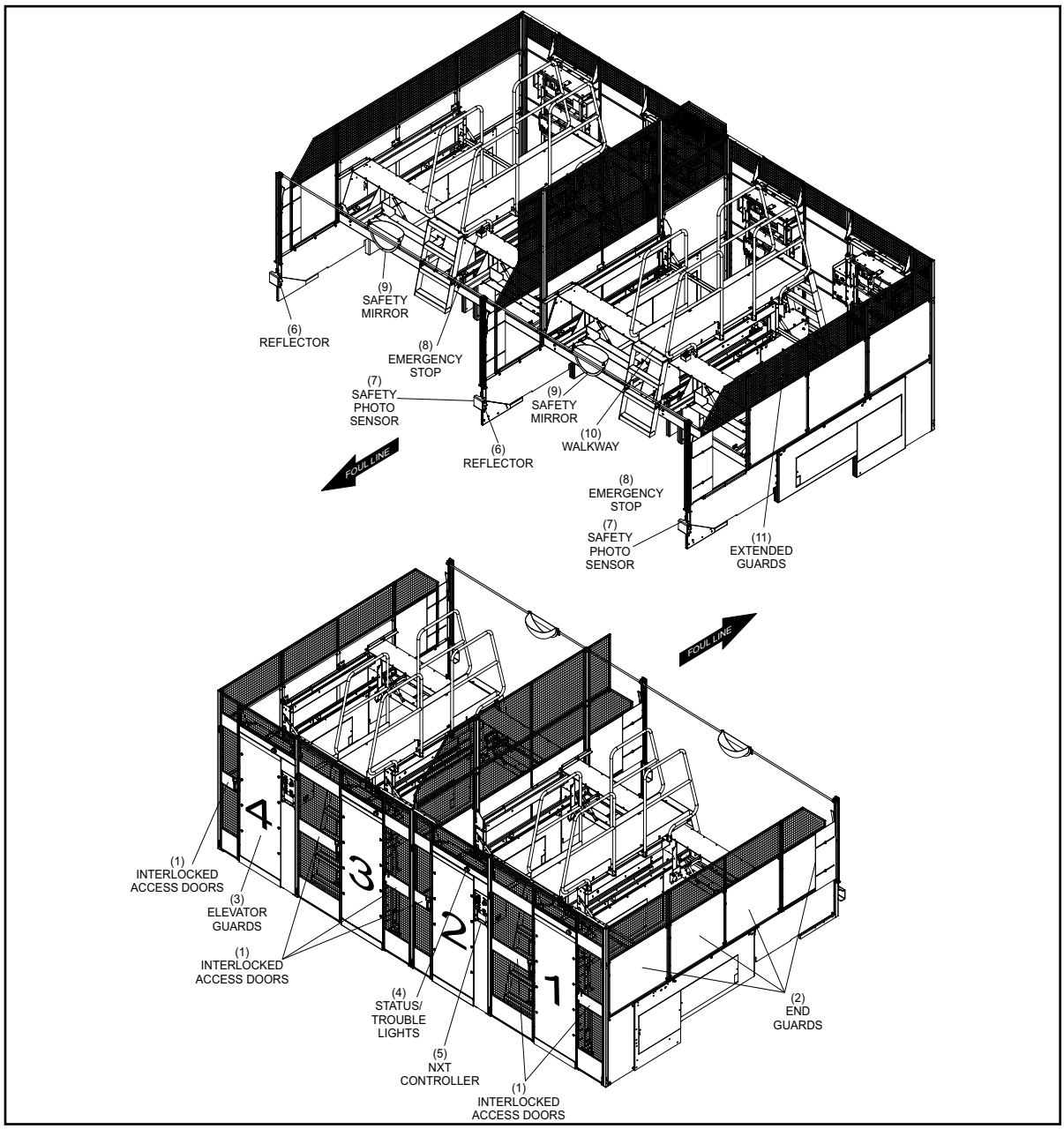


Premium Guarding Package

(1) INTERLOCKED ACCESS DOORS (2) END GUARDS (3) ELEVATOR GUARDS
(4) STATUS/TROUBLE LIGHTS (5) NXT CONTROLLER (6) REFLECTOR
(7) SAFETY PHOTO SENSOR (8) EMERGENCY STOP

CE Guarding

In addition to the safety features that are included with the Premium package, CE guarding is equipped with extended height guards along the back and sides of the machine to further limit access to the machines. Additionally, an enhanced ladder and walkway system is incorporated between the lanes of a lane pair to allow unrestrictive movement between the back and front of the pinsetter.
Photo sensors along at the masking unit are used to automatically turn off the pinsetters on the lane pair whenever machine access is attempted from the front of the machines. As an additional safety enhancement individual magnetic interlocks are mounted to each rear access door and masking unit (if equipped) that automatically turn off the pinsetters on the lane pair whenever any access door is opened.



CE Guarding Package

(1) INTERLOCKED ACCESS DOORS	(2) END GUARDS	(3) ELEVATOR GUARDS
(4) STATUS/TROUBLE LIGHTS	(5) NXT CONTROLLER	(6) REFLECTOR
(7) SAFETY PHOTO SENSOR	(8) EMERGENCY STOP	(9) SAFETY MIRROR
(10) WALKWAY	(11) EXTENDED GUARDS	

Boost ST Pinsetter

WARNING! Do not operate the pinsetter without the guarding in place. Severe injury could result if the pinsetter guarding is not used while the machine is operating.

Standard Guarding

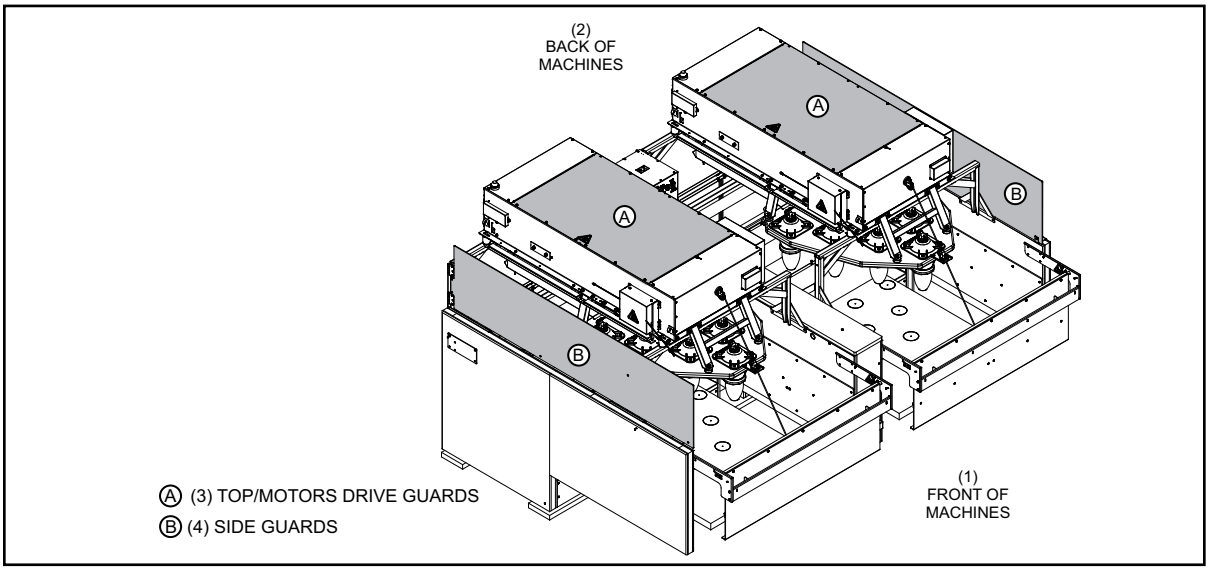


Figure 1. Guarding (Front View)

(1) FRONT OF MACHINE (2) BACK OF MACHINE (3) TOP/MOTOR DRIVE GUARDS
(4) SIDE GUARDS

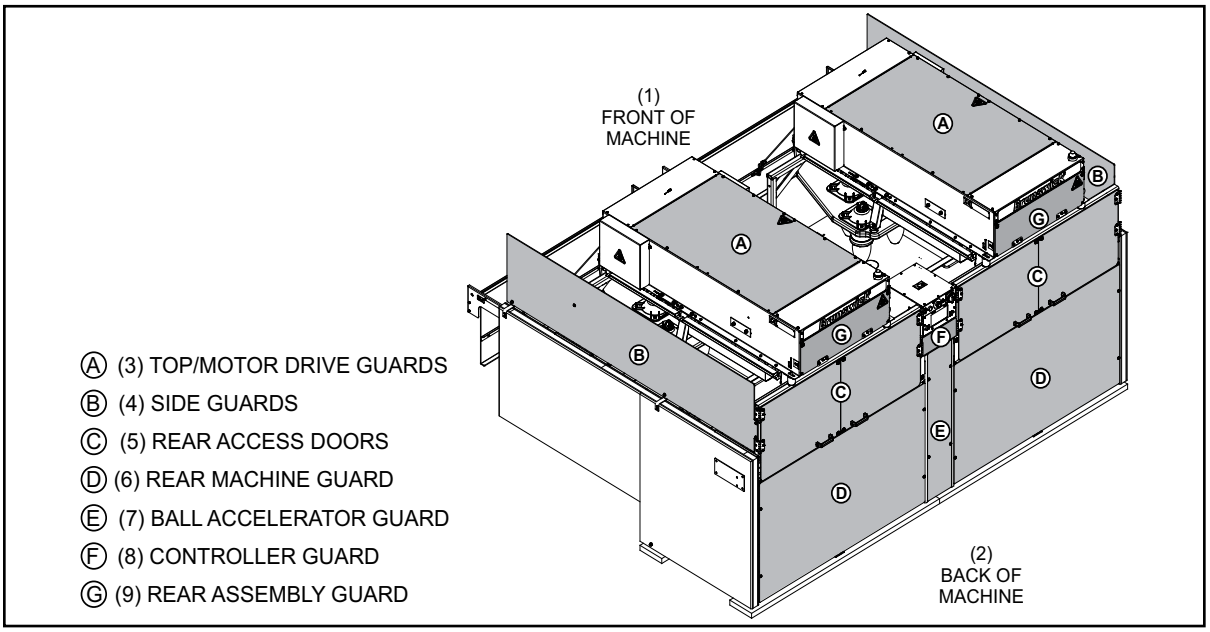


Figure 2. Guarding (Rear View)

(1) FRONT OF MACHINE (2) BACK OF MACHINE (3) TOP/MOTOR DRIVE GUARDS
(4) SIDE GUARDS (5) REAR ACCESS DOORS (6) REAR MACHINE GUARDS
(7) BALL ACCELERATOR GUARD (8) CONTROLLER GUARD (9) REAR ASSEMBLY GUARD

NOTICE CONCERNING WORKER'S SAFETY!

Customers may be subject to national, regional and local worker's health and safety regulations.

WARNING!: Specifications with this designated safety indicator are primary elements of Brunswick's machine guarding packages and recommended safe systems of work. Customers should consult with local worker's safety experts to consider these specifications when designing a safe system of work required to comply with their national, regional or local regulations.

INTRODUCTION

For more than a century, Brunswick has been the world leader in new bowling center development working in partnership with investors to build strong and long-lasting business opportunities worldwide. No other single service provider comes close to Brunswick's record for supporting successful new center development projects with our line of products, services, technology and expertise. With Brunswick, you will have everything you need to make your new center competitive, successful and innovative.

The key to starting a successful center lies in the planning and preparation. How well you address the early phases of the development process will be critical in achieving your goals. While many variables can impact the timing of your project, the typical center takes 1-2 years to complete from concept to grand opening. At Brunswick, we work closely with you, your architect and general contractor guiding you through your project.

This Comprehensive Planning Guide takes you step-by-step through the process of designing and building a bowling-focused business. It includes information on all the important factors to consider when planning a bowling center.

Let's get started!

PRE-INSTALLATION REQUIREMENTS CHECKLIST

PROJECT NAME/LOCATION: _____ **CONTRACT:** _____

BRUNSWICK takes great pride in providing the absolute best quality installation of your product. Our pre-installation and installation requirements are intended to ensure that we can do this, and that you will enjoy many years of use from your purchase.

We understand that sometimes project requirements and goals may facilitate the need to move pieces of installation timing around. In cases where this movement supersedes the installation requirements we need, it is important that you understand the impact this will directly have on your project and potentially, to your product and its future warranty.

This document intends to identify Brunswick's pre-installation requirements. A Brunswick service and project manager will review these items during the pre-installation meetings with both customer and contractor so that they will have a full understanding of our expectations.

The following conditions must exist to sustain a Brunswick warranty on lanes and equipment.
*Note: If Brunswick mobilizes and these items are not addressed, re-mobilization fees may apply.

PRE-INSTALLATION REQUIREMENTS:

- ☐ Suitable driveway/parking lot and landing area to receive equipment - typically several 53', 40,000-pound tractor trailers.
- ☐ A secure building with all exterior walls, and a roof.
- ☐ Permanent power must be connected to the building, including all power drops for pinsetters and curtain wall rough in.
- ☐ HVAC is installed and bowling area is climate controlled to maintain temp/humidity requirements.
- ☐ All permanent lighting installed over lanes/seating area - temporary lighting is unacceptable.
- ☐ All overhead work in the bowling area and adjacent seating area must be completed prior to delivery (this is also to include conduits, wire trays or Network run to all POS and Client locations).
- ☐ Sheetrock and paint on curtain wall, adjacent side walls and columns completed.
- ☐ Bowlers seating area, and depressed slab both cleared for material storage & layout (16' min. clear preferred behind the lanes or depressed slab area).
- ☐ Support for overhead monitor truss. (Pipe, Unistrut or 3/8" all thread per. Sync Pre-installation).
- ☐ Dumpster must be provided to discard shipping materials and construction waste.
- ☐ One week prior to the start of bowling installation -send photos of Bowling, Seating and Control desk areas. (send to Brunswick Regional Service Manager).

I, the undersigned have read and understand the Brunswick Pre-Delivery requirements.

_____		_____	
Owner or General Contractor	Date	Brunswick Representative	Date
_____		_____	
Printed Name		Printed Name	

Brunswick® Experience is Everything

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Section 1: Choose Your Center Type

The business of bowling is comprised of four types of business models. It is critical in today's business to understand the business models in the industry and what the key components and drivers are of each.

TRADITIONAL BOWLING CENTERS

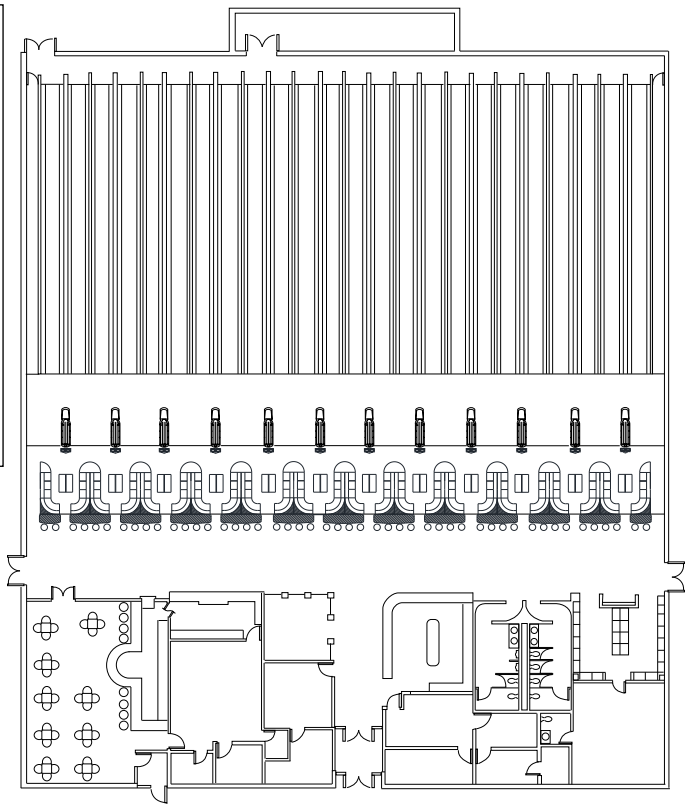
Primarily focused on bowling, these centers typically include a limited number of entertainment venues including game room, billiards, pro shop and bar. Beverages play a strong role and food is usually limited to snack bar options. Construction of this traditional business model has dropped over the years in favor of more upscale, entertainment focused venues.

Focus

- League and open play bowling
- Targets all ages
- Limited food & beverage

Additional Venues

- Pro Shop
- Lounge Area
- Snack Bar
- Billiards
- Small Game Room



FAMILY ENTERTAINMENT CENTERS

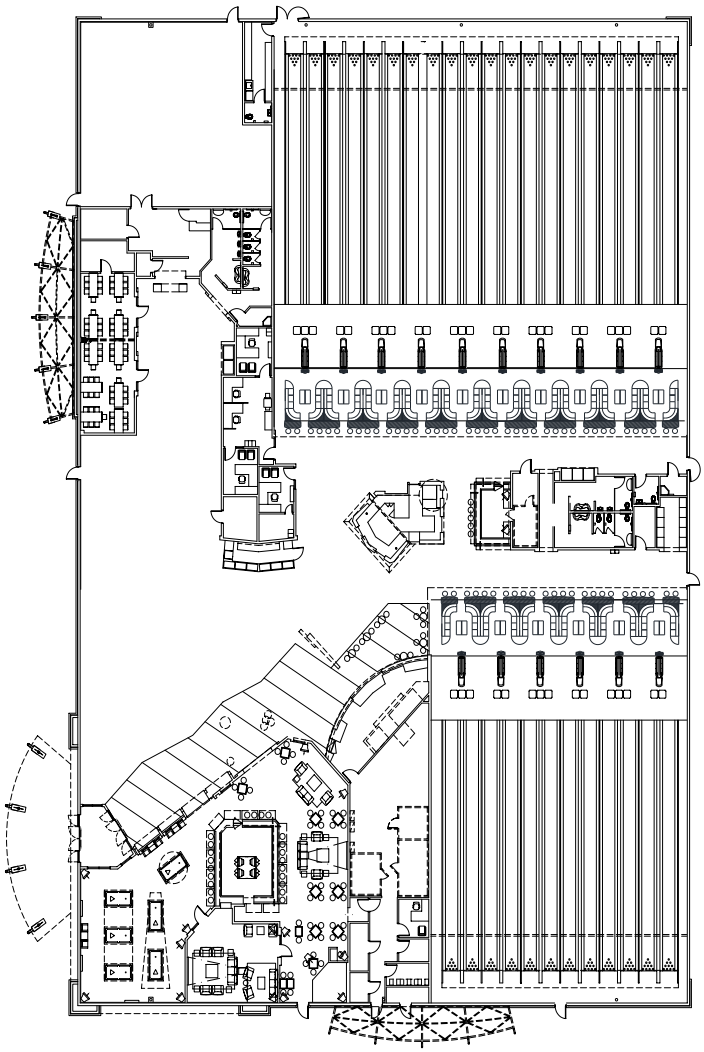
Family Entertainment Centers (FEC's) are designed to provide entertainment in the form of bowling and other venues such as arcades, laser tag, go-carts, bumper cars, and party rooms in addition to the venues found at traditional centers. The food offerings at FEC's are enhanced to match the atmosphere and beverage service plays a strong role. Typical offerings include snack bar, food court and branded concepts.

Focus

- Family entertainment – parties, events
- Bowling is a component
- Targets families & all age groups
- Multiple food & beverage offerings

Additional Venues

- Redemption Arcade
- Party Rooms
- Laser Tag
- Miniature Golf
- Bumper Cars
- Go-Karts
- Billiards



BOUTIQUE CENTERS

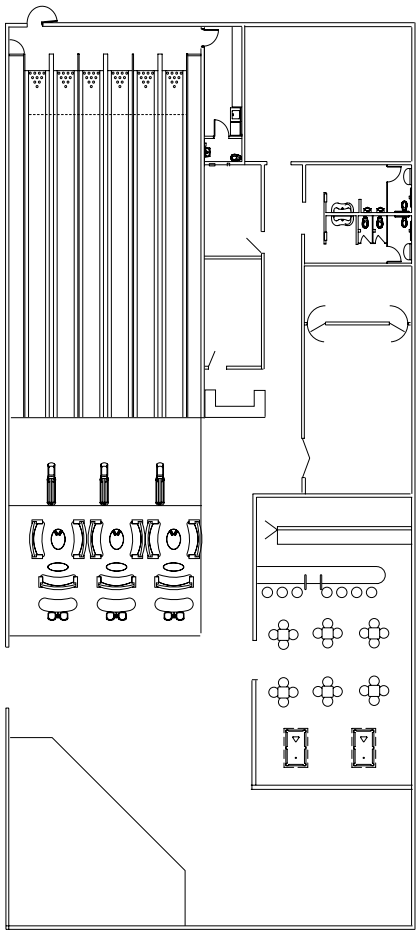
Boutique centers are focused primarily on entertainment and socialization with full service, upscale food and beverage offerings. Bowling is the primary form of entertainment, but is a smaller component of the business and is set in a contemporary, social atmosphere. Ancillary entertainment options are available such as live music, billiards, virtual/cyber gaming, and bocce as additional sources of revenue.

Focus

- Food & beverage – groups, parties
- Bowling is for entertainment
- Adult-oriented, "night club" environment
- Majority of business Thursday – Sunday evenings

Additional Venues

- Billiards
- Live Entertainment
- Limited Games



HYBRID CENTERS

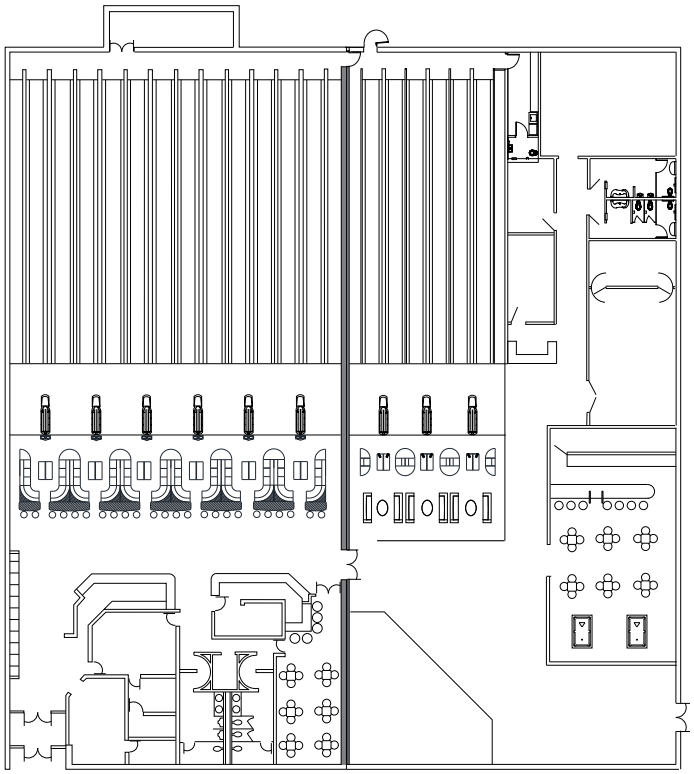
Hybrid centers combine two distinct bowling venues (family entertainment and boutique bowling) with a multitude of complimentary entertainment venues that range from arcades, indoor attractions to laser tag arenas. Marked by an enhanced food and beverage service and a more sophisticated service model, Hybrids are designed to cater to both families and an active adult market through the use of two different environments under one roof. Hybrid centers are currently the fastest growth segment for new center construction along with boutiques.

Focus

- Family & adult entertainment – parties, events
- Two distinct bowling areas – "boutique" & family
- Targets families & adults
- Multiple food & beverage offerings

Additional Venues

- Redemption Arcade
- Laser Tag
- Miniature Golf
- Bumper Cars
- Go-Karts
- Billiards



Section 2: Building Considerations

Your bowling center's location on a parcel of property merits intensive study. The future long-range planning for the surrounding area, including zoning changes involving buildings, future road construction, or anything which could alter the present character of the property should be considered. Consider the following before buying:

1. Locations containing restaurants, theaters, taverns, and other entertainment venues near residential areas are a good choice. Good visibility, easy access, and high traffic count all lend themselves to effective locations.

2. Zoning of land restricting commercial business or parking. Zoning can be a deciding factor in your bowling center location. Consider building expansion and additional services as well. Be aware of any ordinances that could affect your future plans.

3. Nearby churches or school buildings restricting traffic or sale of alcoholic beverages.

4. Your desired center size (lane quantity) and supporting services will dictate the size of your property. Keep in mind future expansion.

5. Drainage requirements, location of sanitary and storm sewer lines, public utilities.

6. Maximum visibility of building from street, i.e., obstructing location of buildings, railroad overpasses, trees, signs, etc., in line of sight.

7. Local sound ordinances.

8. Sign location and local codes regarding size.

9. Availability of parking requirements for maximum number of lanes.

10. Distance from bulk of parking to entrance. (This often dictates location of lanes and layout of public area facilities, i.e., reception center, bar, etc., as they relate to traffic patterns within the building.)

11. Traffic flow restrictions to entrances and exits from property.

12. Certified test borings to determine if ground can support the weight of a suitable building for bowling.

EXISTING BUILDING VERSUS NEW BUILDING CONSIDERATIONS

Almost any type of permanent building is adaptable to a bowling center if it is large enough and approved for such use under local building and public codes. Ideally, it should have a clear span in the bowling equipment area and a ceiling height of at least 10' (3048 mm) however, it is common to work with locations that have post rows. Any type of construction should be considered in relation to the insurability of the structure and on the contents of the building. Check with your insurance agent before initiating construction plans.

There may be existing structures that can be adapted to the needs of a bowling facility. Just be sure to consider the costs of bringing an existing building up to local regulations and compare those costs to new construction. For example, an existing building may require the following renovations: second floor facility elevator, handicap access, proper water pressure, proper sprinkler system, electrical power accommodating the building size, roof inspections for leaks and wear, HVAC operation, sufficient ceiling height, and **sufficient spacing for lanes between post rows.**

Bowling centers require specific heating, cooling, humidity, and electrical control systems. Discuss these requirements and their costs with the proper professionals before making your decision on an existing facility.

BUILDING EXTERIOR CONSIDERATIONS

Roof

Brunswick recommends a solid bondable roof of the highest quality practical be installed over your building. Insulation should be considered thoroughly as it affects air conditioning, heating, and humidity within. Reflective finish materials can also save you money related to air conditioning.

Parking

The parking area should be well lit, paved, drained, and provided with wheel bumpers. Blacktop surface is preferable, which should be sealed annually. Stone or gravel surfaces will increase dirt and other abrasive particles in the center.

It is advisable to locate water connections on the outside of the building. This allows hosing down the area, which reduces dirt being tracked into the center itself.

Consult your architect for actual parking layout and local code requirements.

BUILDING INTERIOR CONSIDERATIONS

Ceiling Considerations

Clear Span Ceiling

A clear span ceiling is the ideal type for bowling installations although interior support structures are not uncommon. Run roof trusses the full length of the lanes rather than the width. This offers ease of future expansion while still providing a clear span. A catwalk should be installed over the lanes to facilitate maintenance of ceiling and roof, plus electrical wiring inspection. It is necessary to ventilate the truss area between ceiling and roof to prevent mold and discoloration from dampness. Fire barriers between the ceiling and the roof deck will often reflect savings in insurance costs. Be sure to conform to venting requirements in the space between the ceiling and the roof.

For security purposes, rest room and storage area ceilings should be "fixed" rather than suspended.

NOTE: *Ceiling is optional over bowling lanes and concourse. If no ceiling is desired, acoustical considerations should be taken.*

Ceiling Height

This height generally ranges from 10' to 20' (3048 mm to 6096 mm) above the approach and lane surface. A 12' (3658 mm) ceiling is recommended for installations to accommodate overhead scoring equipment, special effects lighting, and sound systems in the bowler's area. The height of the ceiling can have an effect on both the type and placement of your lighting fixtures as well.

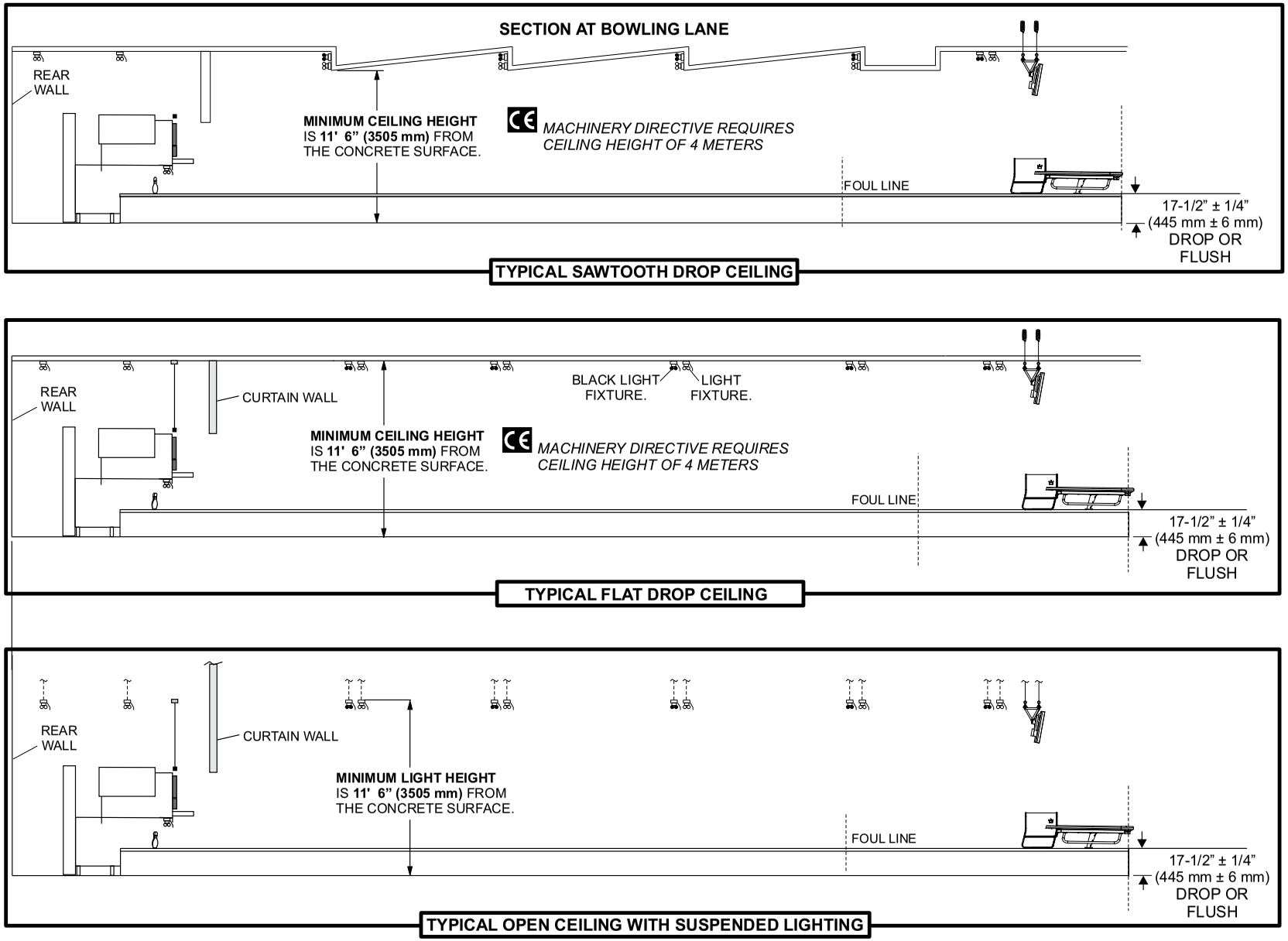
NOTE: *A minimum ceiling height of 4000 mm (13' 2") in the machine room is required for compliance with the Machinery Directive.*

Warning!: Customers deviating from this specification are advised to consult with local safety experts and inspectors.

Structural Requirements

Regardless of the type of ceiling material selected, a provision should be made for supporting Brunswick scorer overhead equipment. For further information, refer to the Brunswick Scoring Pre-Installation Manual for your scoring equipment. Refer to Section 6 of this Guide for the proper structural certificate.

Typical Ceiling Construction



Upper Floor Installation Considerations

NOTE: *Placement of the curtain wall as specified is required for customers in the European union. Customers deviating from this specification should gain pre-approval from their local inspectors regarding the suitable placement of mirrors and reset switches required to safely start the pinsetters.*

If lanes are to be installed on the second floor or higher, you must provide a floor strong enough to carry the load of the bowling equipment and public occupancy with the proper safety factors. Of equal importance to consider is the transmission of noise to spaces below the lanes. Your floor must be constructed to isolate and inhibit noise and vibration transmission. The Brunswick Floor Loading Certificate in Section 6 must be signed and certified by your architect or engineer.

NOTE: *Additional charges for upper floor installations, including labor and equipment such as reach lifts and cranes, need to be considered and are the customer's responsibility.*

Heating and Ventilation Considerations

The importance of heating, cooling and ventilation cannot be overstated, as a controlled atmosphere is vital to running a successful bowling business. The selection of heating and air conditioning systems should be made in light of the three costs of each system. They are as follows:

- The initial costs of equipment and installation involves controls, duct work, insulation, and installation. It also involves the cost of checking and balancing the entire system under load conditions so it functions as it was designed. Also, add the cost of any special structural requirements needed to accommodate the system.

- Operating costs involve fuel and power costs, water charges, licenses, or fees. Also consider the cost of chemicals, filter, etc., which would be required in the normal operation of the system. Proper design of the system can frequently reduce operating cost.

- Cost of maintenance and repairs to perform regular recommended maintenance procedures set forth by the manufacturer's guarantee or warranty. Consider the cost of labor and materials, and the availability of such materials at a later date, necessary to replace working parts of the system.

Lighting Considerations

IMPORTANT!: *Failure to comply with lighting specifications may adversely affect the performance of your electronic equipment.*

NOTE: *The lighting specifications below are required for compliance with the Machinery Directive*

WARNING!: Customers deviating from this specification are advised to consult with local safety experts and inspectors.

Lighting is another important detail to be carefully considered when designing your bowling center. Each installation has individual issues and is worthy of considerable study. It is recommended that time be taken to review the following lighting recommendations carefully.

- Correlate the light plan with the reflected acoustic ceiling plan and also with the layout of air conditioning ducts, louvers, grills, and thermostats.
- Electrical conduit or raceways of adequate size should be imbedded in the concrete to provide for high voltage and low voltage cabling for bowling and other required cabling/wiring.
- Factors to consider: location, height, placement by type. Types of fixtures: florescent, incandescent, LED, black light.
- It is desirable to control lane lighting longitudinally in bays of four lanes per switch at the Control Desk. A more compact panel board can be planned if the electrician uses low voltage from the Control Desk to activators at the light panel. Brunswick suggests tamper-proof switches for lighting in the public areas, or switching public area lighting from circuit breaker panels.
- When designing lane lighting, the need for even light intensity is paramount. Over the high reflective playing surface, extreme care must be taken to avoid “hot spots” of illumination. In addition to careful planning of the spacing of lights, if “hot spots” do occur, they can usually be washed out by tilting or shimming the light fixtures before they are permanently fastened.
- The general approach of the above recommendations is a gradual increase of light level from low in the seating area to high on the pins, which should have the bowler’s attention.
- Air conditioning heat load is also a factor in planning the lights. Each watt hour of light introduces 3.4 BTU of heat which must be taken into consideration for the air conditioning equipment. Excessive high humidity can also unfavorably affect the operation of some fluorescent lamps.
- There may be lighting requirements over the pinsetter area that must be followed per local, state or federal laws.
- When installing darker, ColorFull lanes, it may be advised to use decorative pendant or spot lights in place of black lights. Consult with your sales representative or interior designer.

Acoustics Considerations

All bowling centers should be designed with careful consideration given to acoustics. It may be necessary to hire an acoustical engineer when lanes are to be installed on a floor where the space above, below or adjacent to the lanes is to be occupied for any use that would be sensitive to sound. A careful study of the space should be made BEFORE the installation on the floor. The following facts are to be considered:

- It is the customer's responsibility to provide a floor of the proper floor loading capacity to support the weight of the installation without undue vibration.
- Because solid mass enhances sound penetration through the floor, special considerations should be taken for the acoustical treatment of the area below the bowling space.
- There should be ample clearance between lanes and vertical structural members of the building to prevent transmission of noise through the building.
- Pay particular attention to the location of pipes and ducts which will conduct noise unless they are properly isolated and insulated.
- In open ceiling areas over the lanes, it may be necessary to use acoustical panels to absorb unwanted noise.
- Take into consideration adjacent building areas that may be affected by sound, such as residential, restaurants, theaters and other such businesses.
- Employee exposure to sound should be minimized. Offices should be isolated from the pinsetter area.

CE

NOTE: *Warning signs requiring the use of hearing protective equipment before entering the machine room are required to comply with the Machinery Directive.*

WARNING!: Customers should consult with local health and safety experts regarding required machine room sound isolation, required hearing protective equipment and the placement of warning signs and placards

Building Material Selection Considerations

Exterior Walls

The use of glass at the main entrance is urged to provide an inviting view into the building and to display the activity within the building. However, the elimination of windows in the bowling area improves the lighting, cuts heat loss and air conditioning loads and also eliminates a dust and dirt problem.

Regardless of the material used (glass, brick, block, metal, or wood), strict attention should be paid to the transmission of heat, moisture, and humidity through the wall.

Interior Walls

In many instances, architects are eliminating solid confining walls around such areas as the snack bar, the bar, the pro shop, and billiard rooms by installing divider panels for maintenance and pleasant surroundings. Due to the problems of continued maintenance and insurance, they are reducing areas of plate glass and substituting other translucent materials in spaces where "borrowed light" partitions are desirable.

The side walls may be furnished as the operator chooses, however, consideration should be given to using noise reduction material in this area and in the mechanic's area as well.

It is generally recommended, and frequently required by law, that the walls of public rest rooms be of moisture repellent material, such as tile and/or block with a glazed ceramic face, metal tile, plastic tile, terrazzo, carrara glass, or marble.

Floor Coverings and Entry Mats

Entry mats make an excellent choice for helping to reduce the migration of dirt and other abrasives into the center.

Carpeted concourse flooring removes the dirt and abrasives from customers' shoes and prevents tracking and damage to the approach and lane surfaces. Lack of carpeting will significantly impact the condition of the approaches and possibly the warranty.

Energy Management Considerations

In today's environment, energy conservation has a direct effect on your bottom line profit. It is suggested you consider installing an energy management system when you construct your new bowling center. There are many control systems now available for heating, air conditioning, and lighting. You should discuss all possibilities of energy management with your architect.

BUILDING LAYOUT AND COMPANION CONSIDERATIONS

The design of companion accommodations may include items such as the following:

Bowling Management Areas

Events Office

Many new bowling centers include a staffed events office to assist customers with reservations and help direct them to various parts of the center.

Reception Desk

The reception desk, bar and snack bar should be proportioned to handle capacity lane conditions and be easily accessible from any part of the lanes. Should billiards be part of your building plans, the control desk should be positioned within view of both bowling and billiards (or game room) to avoid the need for a separate reception desk for both.

Office(s) for Owner/Manager and Other Key Staff

This office should be able to supervise the reception desk nearby. Larger centers will require office space for computer rooms, telephone solicitation, etc.

IT Room

You may want to have a central room to house all servers and AV equipment to be used in the center. This provides a central location for all communication/cabling to route through. Consult an IT specialist for these needs.

Concourse

The concourse, which is in back of the spectator seating, may vary in width. The clear width should be able to accommodate at least a peak load of 10-15 people per lane. The maximum milling area is generally located around the control counter, snack bar, restaurant, and entrance lobby. Vending machines, ball cleaners, etc., are usually located on the concourse, preferably recessed. Concourse tables and chairs can help turn this area into an income-producing area. Adequate wall area should be provided for bulletin boards, score sheets, and other announcement boards. House ball storage racks will also be necessary.

Food and Beverage Areas

Lounge/Bar

The location of a lounge/bar within the bowling center is of prime importance and is related to local laws, traffic flow, and local area drinking habits. Should bowlers enjoy alcoholic beverages while bowling, for example, perhaps only a quick service bar is required. This could be used on the concourse area as well as the lounge itself. Normally, some food service should be available - often quickly accomplished by having the bar and snack bar in adjoining areas with a common quick-service counter.

Size in terms of seating capacity may be governed by local or state ordinances. State and municipal ordinances also govern the construction of walls and entrances for places where alcoholic beverages are sold and/or consumed.

Be certain to provide for storage areas for supplies. Liquor storage should be locked. Beer requires storage, pre-cooling, and empty bottle storage and sorting areas. Easy access from the street is also necessary for deliveries. A common kitchen area could accommodate both the cocktail lounge and food and beverage to save space.

Snack Bar and/or Restaurant

Generally, this serves as a counter-carry out for food to be taken to spectator seating area tables. Air conditioning and exhaust of cooking odors require careful planning. Automatic fire extinguishing systems should be installed over grills and deep fat fryers and in hood/duct assemblies. Maximum safety is extremely important. Walls and floors should be readily cleanable - materials such as ceramic tile and plastic laminate should be considered.

Banquet Facilities / Meeting Rooms / Party Rooms

Meeting rooms and party rooms are often combined to perform dual purposes. Scheduling then becomes important in order to avoid overlap. You should also consider what is required for this room - storage closets, rest room facilities, AV hookups and equipment, and secondary exit.

Activity Areas

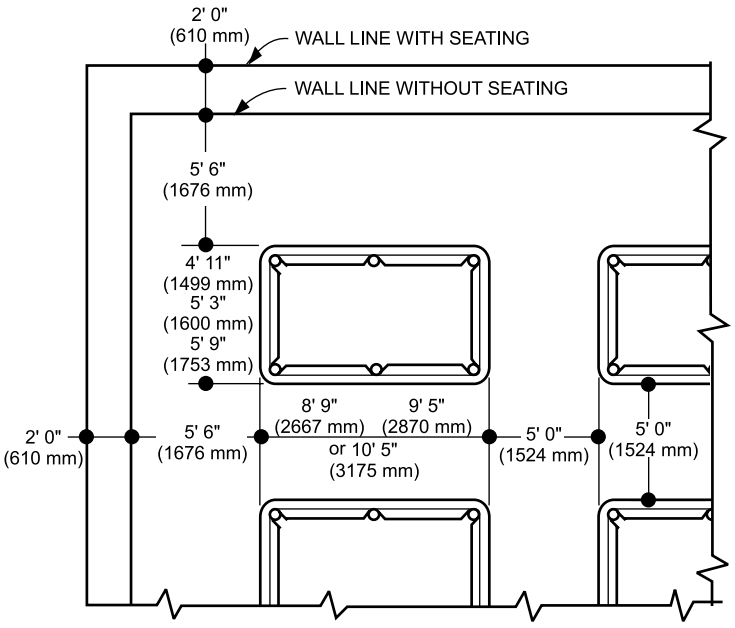
Game room

Game rooms in which video, pinball, and other electronic and mechanical games are presented in a proper environment can add much to the success of the center. Care should be exercised in locating the game area so employees are able to supervise the area from the control desk.

Billiards Room or Area

Normally, pocket tables of professional size or the small coin operated tables are used, isolated from the bowling lane area, but within close proximity to the reception center for the convenience of the control desk personnel.

Some communities have ordinances governing public billiard rooms. Therefore, it is advisable to investigate local laws in your pre-planning stages.



Pro Shop

Pro shops are not just another source of revenue. Bowling Centers that have a pro shop have better bowling retention rates. Bowlers with new products tend to bowl more often and continue coming back. The pro shop should have enough space for a sales counter, display walls, a drilling room and storage. The pro shop can be owned and operated as part of the center, or can also be a leased space to a qualified operator.

Locker Area

For centers with high league bowling, locker areas may be appropriate. Locker areas should be located in the concourse, in close proximity to rest rooms. These areas can accommodate both men and women to conserve space and provide for family use of one locker. It is not advisable to have the locker area as part of the rest room area, or to be enclosed. Lockers should run perpendicular to the control counter for security purposes.

Bowling Maintenance Areas

Bowling Mechanic's Area

An area should be set aside for the center mechanic to store tools, parts, manuals and other maintenance supplies. The area should include a work bench. Ideal location is a room behind pinsetters near the center of the lanes. Size is dependent on number of lanes and amount of spare parts. A center with 12 lanes or less should plan for a 9' x 12' (2.743 m x 3.658 m) (approximate) room.

Maintenance Equipment Storage Area

The maintenance equipment storage area is best located at the front of the lanes, usually off of the concourse. It should be ventilated to the outside and contain a deep sink and storage area for general clean up supplies.

This is also the storage area where the Lane Machine is stored. Lane Machine dimensions are 57" x 45" x 18" (1.448 m x 1.143 m x 457 mm). The minimum size recommended is 4' 6" x 6' 8"(1.372 m x 2.032 m). This area should include a locking door that is labeled "Authorized Personnel Only". Depending on the lane machine type, a power outlet may be needed for battery charging.

COMMON PLANNING MISTAKES

Avoid these common errors in planning:

1. Columns in the lane or bowler's area may change the lane layout and spacing considerations.
2. Distracting activity alongside lanes.
3. Inadequate, excessive, or uneven lighting or glare.
4. Noise of uncomfortable quantity or quality.
5. Inefficient air conditioning, heating, cooling, humidity control, or ventilation.
6. Poorly planned rest rooms, locker rooms, and lounges.
7. Inadequate children's activities center.
8. Poor use of space in high traffic area.
9. Lack of entrance mats to remove abrasives and contaminates transferred from outside sources (ie: sand, glass, water, oil, etc.).
10. Inadequate or insufficient carpeting to reduce dirt and contaminates from damaging the approach and lane surfaces.

NOTE: *Poor housekeeping and slow or inefficient service are operational problems often traced to improper size or location of facilities in the original planning.*

Section 3 - Building Requirements & Specifications

DOOR SIZE FOR BUILDING ACCESS

An entrance or an opening is required to bring the pinsetters into the building. The dimensions required follow below.

Front Entrance (First Choice):

Minimum Clear Opening	8’ 0” (2.438 m) high x 6’ 0” (1.829 m) wide
Minimum Clear Unobstructed Passage to Pit Area	8’ 0” (2.438 m) high x 6’ 0” (1.829 m) wide

Rear or Side of Service Aisle (Second Choice):

Minimum Clear Opening	8’ 0” (2.438 m) high x 6’ 0” (1.829 m) wide
Minimum Clear Unobstructed Passage to Pit Area	8’ 0” (2.438 m) high x 6’ 0” (1.829 m) wide

Hole in the Wall Access:

Minimum Clear Opening	8’ 0” (2.438 m) high x 8’ 0” (2.438 m) wide
Minimum Clear Unobstructed Passage to Pit Area	8’ 0” (2.438 m) high x 8’ 0” (2.438 m) wide

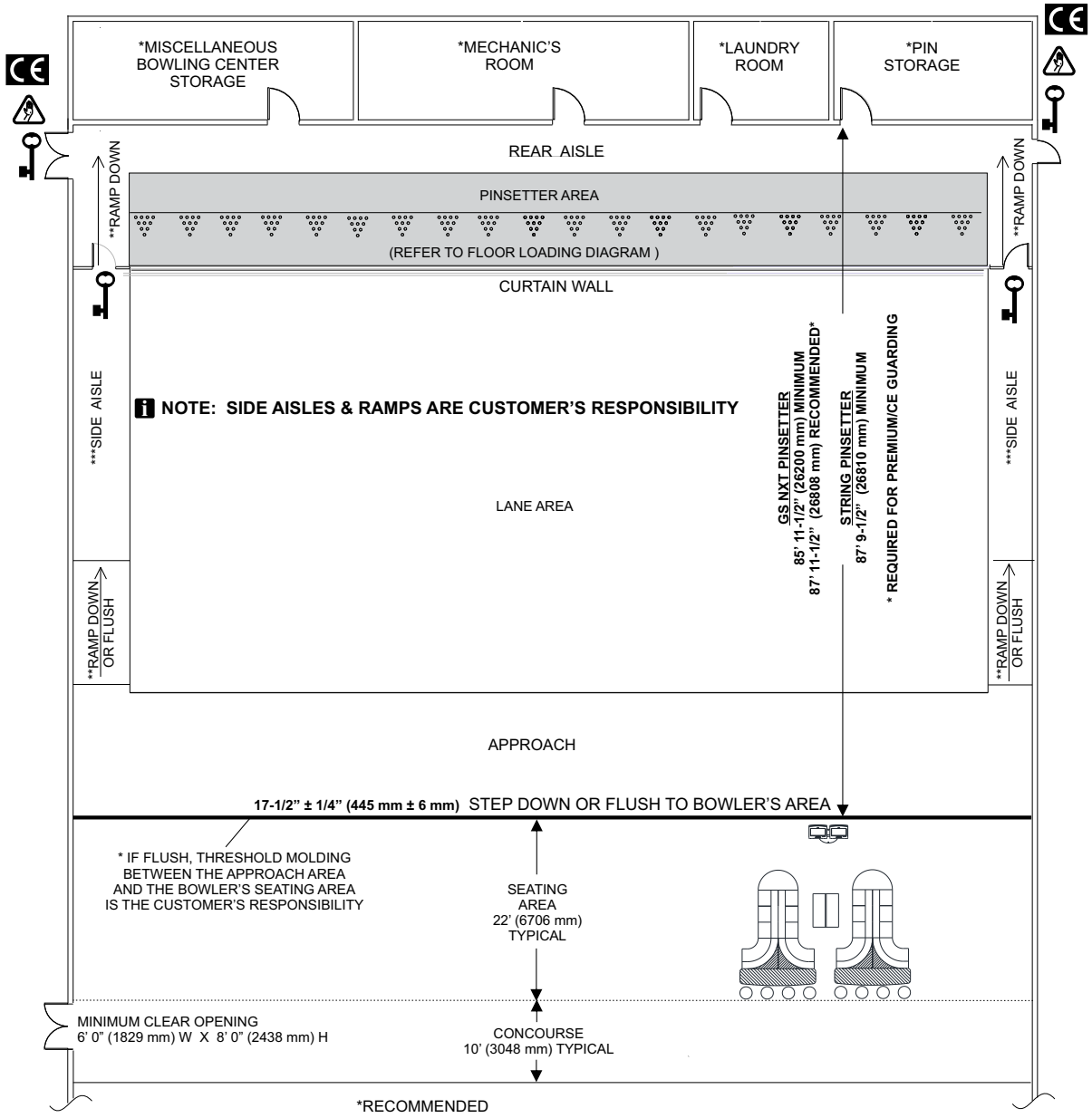
2nd Floor Access:

Minimum Clear Opening	8’ 0” (2.438 m) high x 8’ 0” (2.438 m) wide
Minimum Clear Unobstructed Passage to Pit Area	8’ 0” (2.438 m) high x 8’ 0” (2.438 m) wide

NOTE: *Additional charges for upper floor installations, including labor and equipment such as reach lifts and cranes, need to be considered and are the customer’s responsibility.*

KEY BUILDING DIMENSIONS

General Building Layout



*RECOMMENDED

SIDE AISLE RAMPS ARE BUILT OF WOOD AND CAN BE LOCATED AT THE FOUL LINE **OR BEHIND THE CURTAIN WALL

***SIDE AISLES & RAMPS ARE CUSTOMER'S RESPONSIBILITIES

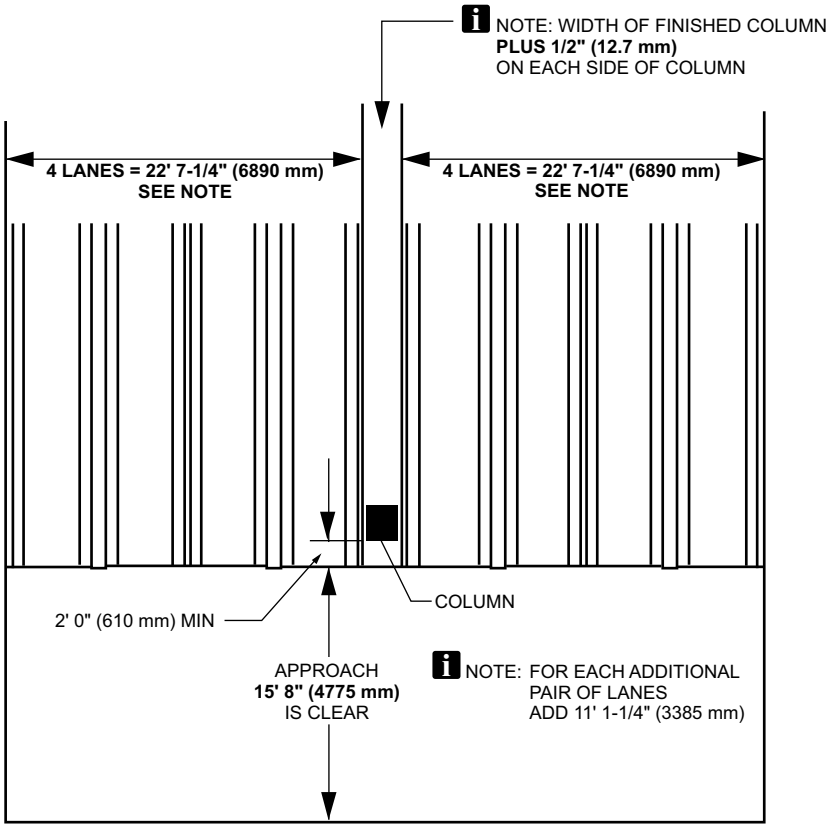
LOCKED DOOR REQUIRING MECHANICAL OR ELECTRONIC PASS CODE TO ENTER

SECURE ACCESS TO THE MACHINE ROOM IS REQUIRED FOR THE MACHINERY DIRECTIVE AND MAY BE REQUIRED TO COMPLY WITH OTHER REGIONAL OR LOCAL REGULATIONS

Column Spacing

Ideally, a clear span is preferred. However, where supports for the structure above the lane are necessary or existing, it is desirable to use a minimum lateral spacing between columns of 22’ 7-1/4” (6890 mm) per four lane bays plus 1” (25 mm) for clearance to reduce transmission of noise.

Longitudinally, the fewer columns the better. The 15’ 8” (4775 mm) approach area and at least 2’ (610 mm) beyond the foul line should be kept free of columns if possible.



Equipment Length

The total length of the bowling area is determined by using a recommended 5’ (1524 mm) clear service passage behind the GS NXT pinsetters or 3’ (914.4 mm) passage behind String pinsetters and the combined length of the pinsetter, lane and approach of 82’ 11-1/2” (25286 mm) for GS NXT pinsetters or 84’ 9-1/2” (25845 mm) for String pinsetters. To these dimensions, add an area for the bowlers’ seating, based on seating configuration. Refer to “Key Bowling Lane Dimensions” graphic which follows.

CE

NOTE!: *Brunswick CE end-lane guarding kits are required for each column in order to comply with the Machinery Directive.*

WARNING!: Brunswick end-lane guarding kits are highly recommended for each column break. Customers should consult with local safety experts to determine the requirements in their local area.

Bowling Lane Width

Refer to the "Bowling Lane Widths" Chart in Section 5 of this Guide.

Pinsetter Access

The width of side aisles is determined by the economical width of the building. It serves as a convenient indoor route for personnel to the pinsetters and storage areas. A side aisle width of 3' (914 mm) is suggested with a ramp down at the foul line or behind curtain wall. If no side aisle is provided, at least 1' (305 mm) should be allowed from the outside edge of the gutter to the wall to give the bowlers freedom on the approach and for installation tolerance during construction.

Side aisles should include a locking door at masking units to prevent unauthorized access to the pinsetter area. A sign noting "Authorized Personnel Only" should be mounted on or above the door. All areas specific to center mechanical or maintenance personnel should be locked and clearly marked "Authorized Personnel Only" to prevent access by unauthorized or untrained personnel.

NOTE: *Clear passage behind, as well as access and signage may have local, state and federal requirements beyond those recommended here. These should be researched by your architect.*

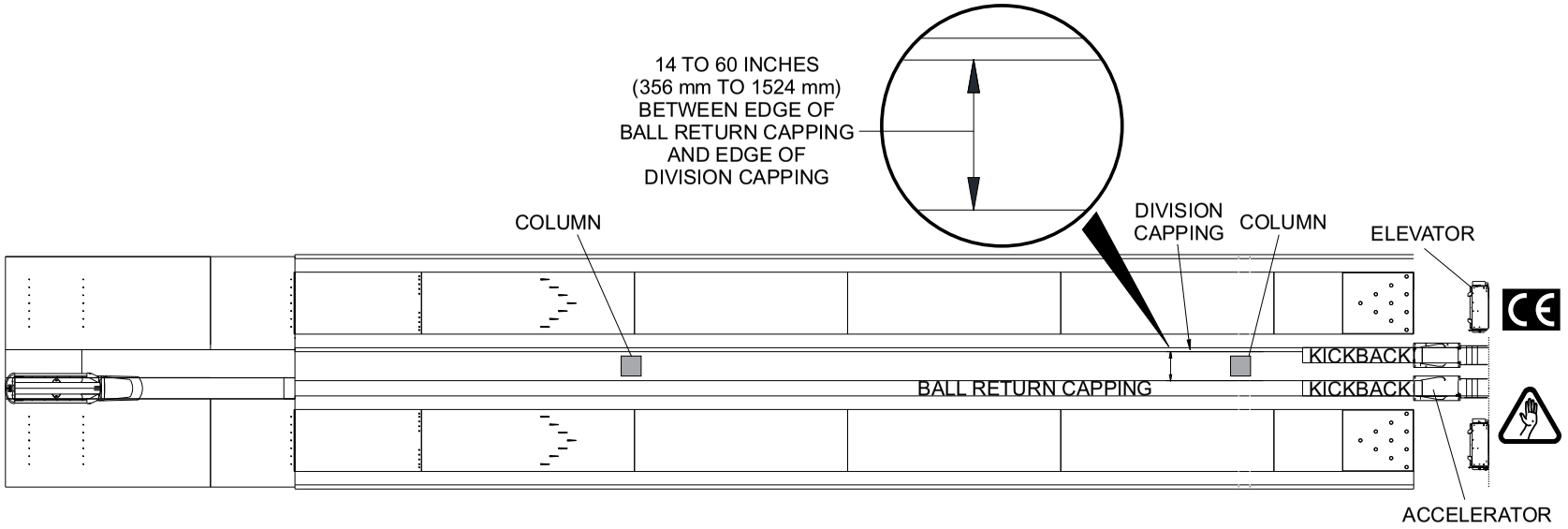
NOTE!: *Brunswick CE Certified end-lane guarding kits are required for each column in order to comply with the Machinery Directive.*

WARNING!: Clear passage between the back of the pinsetter and the back machine room wall may be governed by national, regional or local regulations. Customers should consult with local safety experts to determine the requirements in their local area.

WARNING!: Clear passage from any obstruction to electrical subpanels may be governed by national, regional or local regulations. Customers should consult with local safety experts to determine the requirements in their local area. In the absence of specific regulations, a minimal distance of at least 3' (914.4 mm) is suggested.

Separated Lane Pair/Unnatural Lane Break

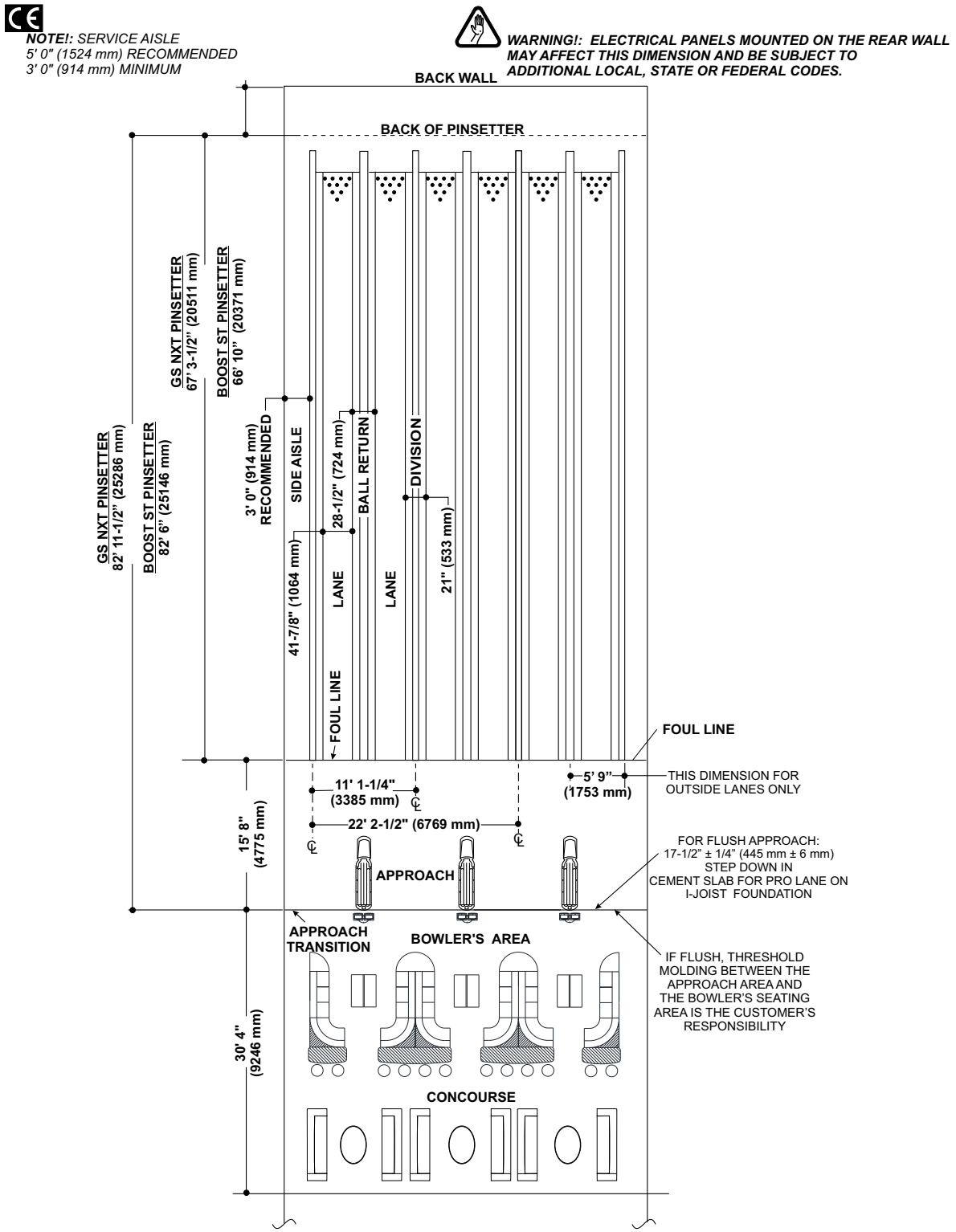
In some cases it may be advantageous to work around a post row by installing a separated lane pair or unnatural lane break. This will need to be addressed early in the planning process to determine if it is feasible.



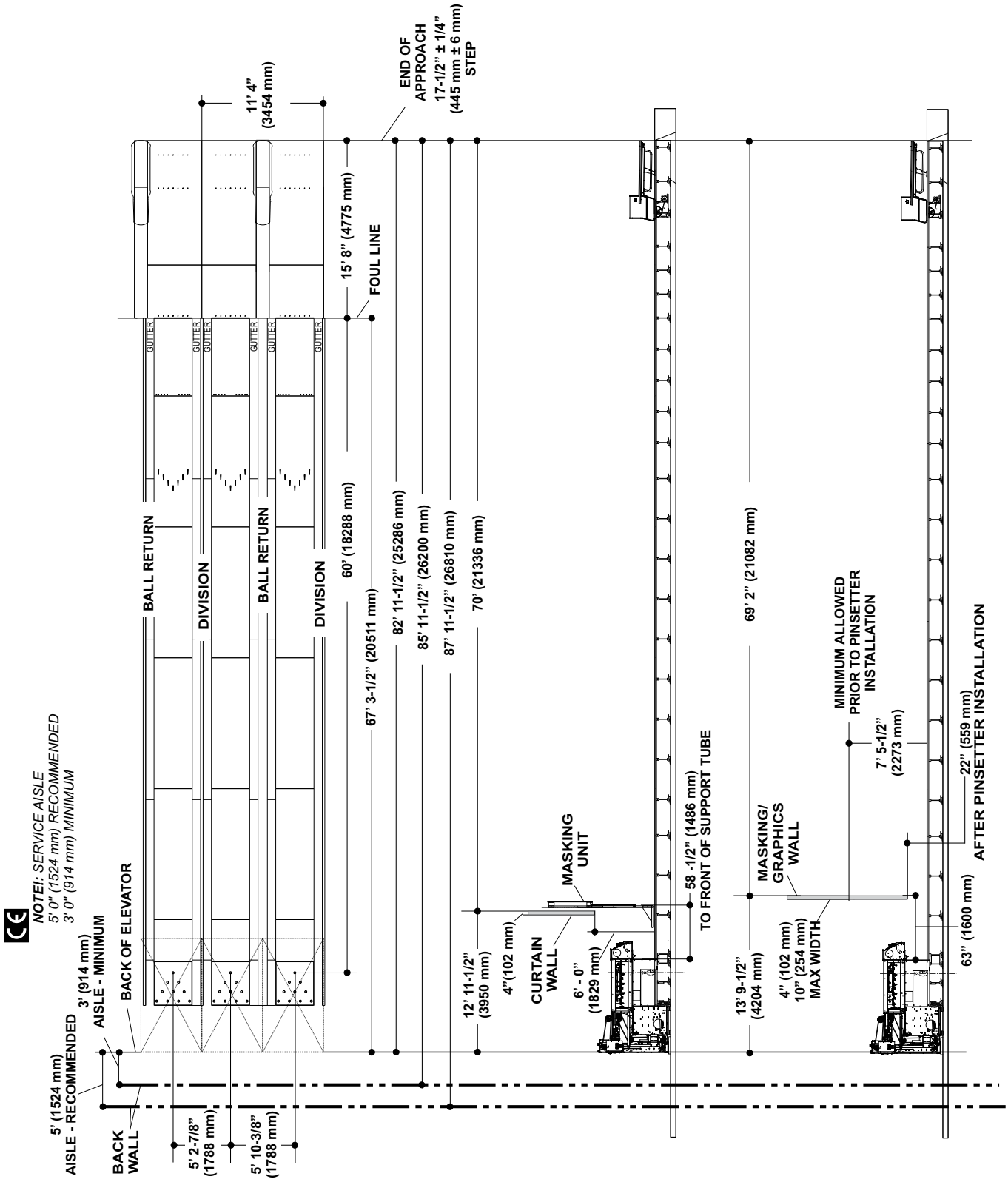
NOTE!: *BRUNSWICK SEPARATED LANE PACKAGE MUST BE INSTALLED AS INSTRUCTED TO COMPLY WITH THE MACHINERY DIRECTIVE*

WARNING!: ***CUSTOMERS SHOULD CONSULT WITH LOCAL SAFETY EXPERTS TO CONFIRM THE APPLICATION OF GUARDS FOR SEPARATED LANE PAIRS.***

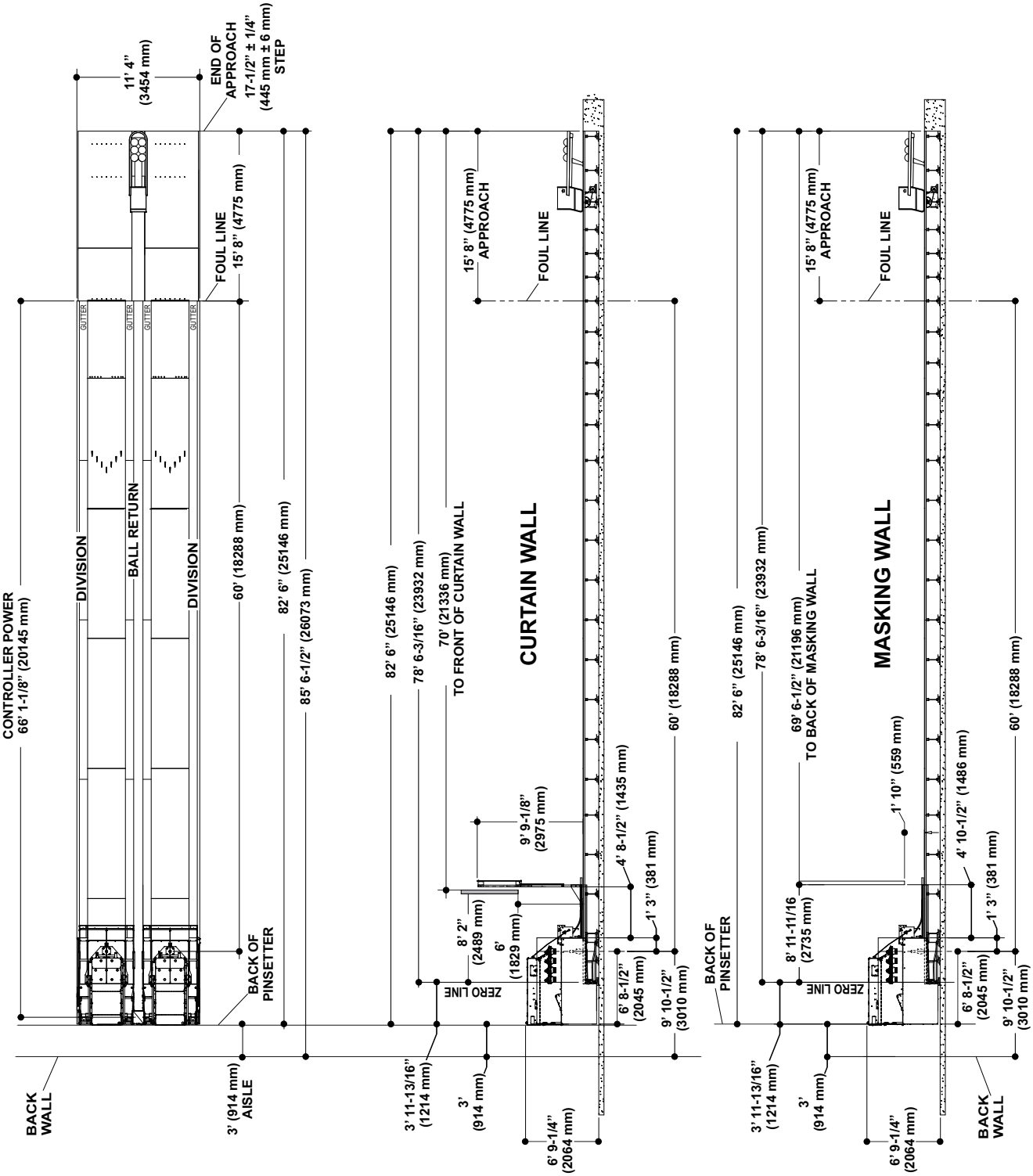
Key Bowling Lane Dimensions



GS NXT Pinsetter Lane Dimensions



Boost ST Pinsetter Lane Dimensions



CONCRETE FLOOR

Bowling lanes are installed on a waterproof, reinforced concrete slab poured over compacted fill. In the pit and lane area, a minimum of 4" (102 mm) thick concrete is required. In the lane area, the surface must be power-troweled and level to within 1/2" (13 mm). Care must be exercised to maintain a close tolerance (1/2" or 13 mm) on levels to avoid excessive shimming on lane foundations. Due to size, these floors are usually poured in strips rather than in one pour. Be sure to "key" the concrete to insure the flatness quality and to avoid "heaving" at a later date.

The need for, type, and location of expansion joints must be determined by the architect. Your architect or engineer must certify on the floor loading certificate, provided by Brunswick, that the floor will meet our requirements in this area.

IMPORTANT!: *Concrete in bowlers' seating area should be thick enough to accept a 2-1/2" (64 mm) anchor for seating and other related equipment.*

Vapor Barrier

Brunswick REQUIRES the concrete floor be poured over a properly installed vapor barrier. Polyethylene materials can be used for this in most cases. Extra care is needed in placing the concrete to prevent the barrier from being torn or punctured. It should also be placed so it will not be punctured when bowling equipment is fastened to the floor.

NOTE: *The customer will be responsible for any additional material if the floor does not have a vapor barrier, for example, treated lumber between Brunswick I-joist and concrete.*

Termite Proofing

In some areas where the problem exists, the soil beneath the building should be treated to prevent termite penetration. Consult your local pest control authority.

Pipes, Drains, etc.

Pipes, drains, or ducts which could break or require replacement should never be placed in or below the concrete in the lane area.

Before pouring concrete, all conduit or wireways must be securely placed and checked for accuracy of location.

NOTE: *Refer to the appropriate Pre-Installation manuals for proper placement of conduits. As always, the Brunswick Service department is available for clarification.*

Drying Time

Since concrete drying time can vary, allow 45 days and up to 60 days drying time. Wood products can be greatly affected by excess moisture, therefore it is imperative the concrete has fully dried prior to installation. Consult your architect and cement contractor to insure cement is completely dry. As the concrete dries, the flatness will change, so adequate drying time is crucial for maintaining lane flatness and levelness.

NOTE: *Brunswick requires a minimum of 30 days cure time for concrete prior to our installation. Failure to allow sufficient drying time can result in shifting, warping and twisting of the wood foundation materials or swelling and warping of the top laminate surface.*

Hardening and Dust-Proofing

The pinsetter area and service aisles should be power-troweled, hardened, and dust-proofed concrete for reasons of maintenance. All concrete not covered with tile or floor covering should also be permanently sealed.

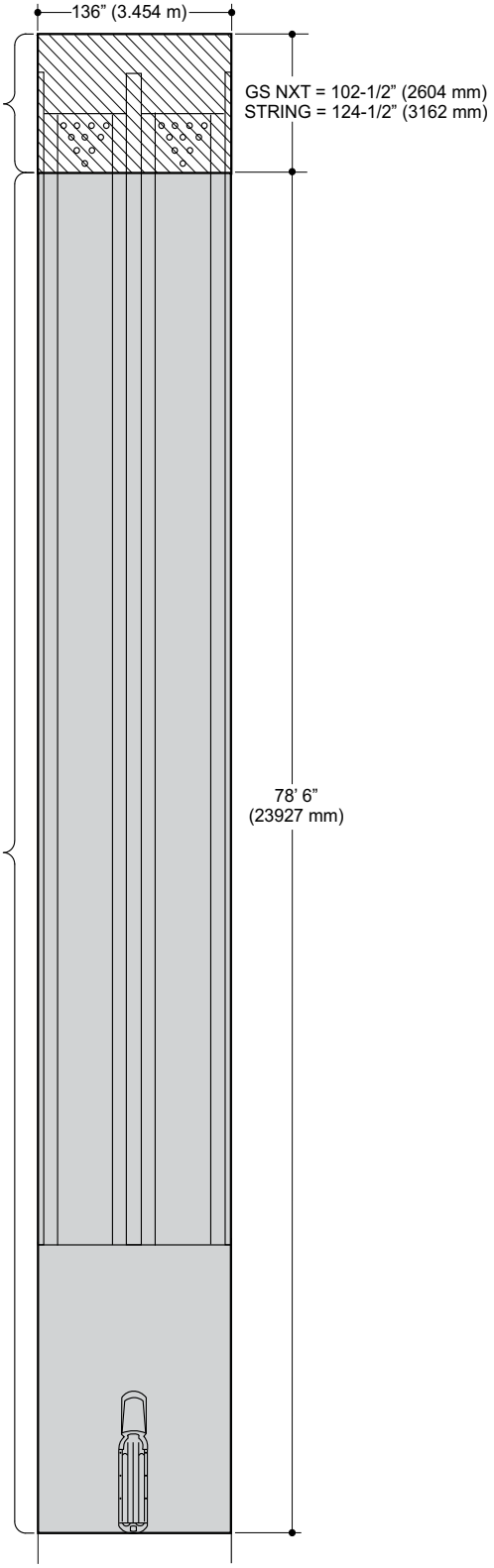
FLOOR LOADING

Pinsetter Area and Lane & Approach Area

STRING PINSETTER AREA
MATERIALS WEIGHT
PER LANE PAIR
2960 lb (1343 KG)
AVERAGE WEIGHT LOAD
28.5 lb/ft 2 (139 kg/m2)

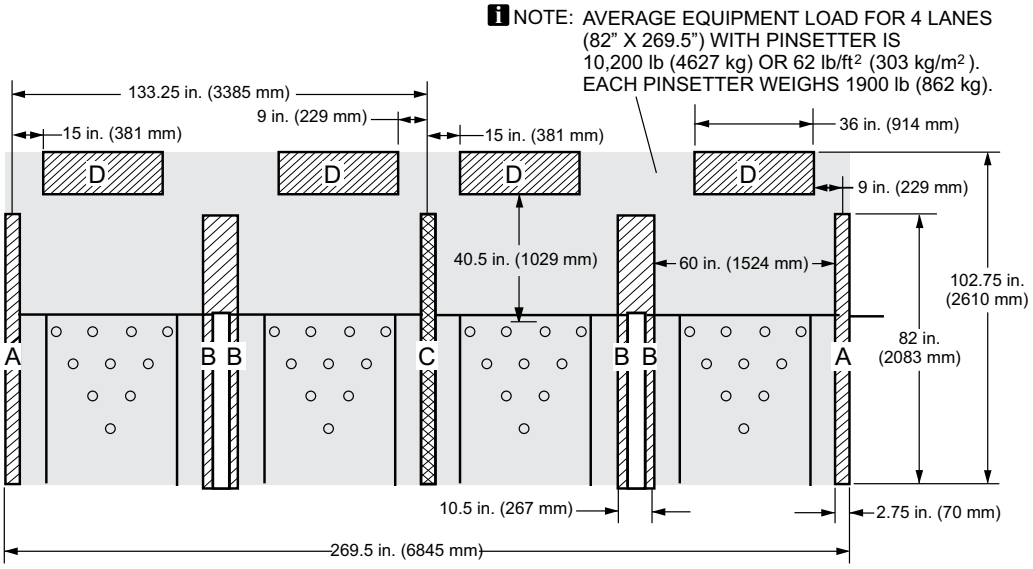
GS NXT PINSETTER AREA
MATERIALS WEIGHT
PER LANE PAIR
5100 lb (2313 kg)
AVERAGE WEIGHT LOAD =
62 lb/ft2 (303 kg/m2)

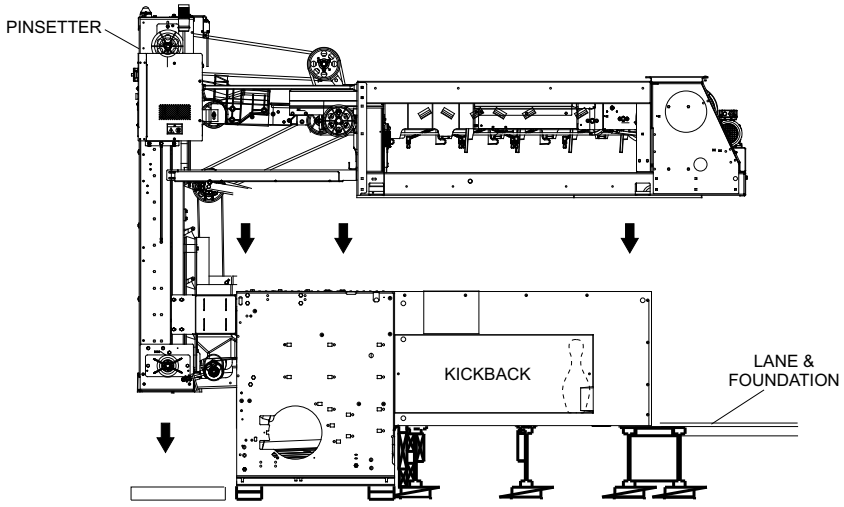
NOTE*!: CUSTOMERS IN THE EUROPEAN UNION MUST PROVIDE THE SPECIFIED SERVICE AISLE CLEARANCE CUSTOMERS DEVIATING FROM THE SPECIFICATION SHOULD GAIN PRE APPROVAL FROM THEIR LOCAL INSPECTORS*



LANES & APPROACH
MATERIALS WEIGHT
PER LANE PAIR
(WITHOUT PINSETTERS)
6858 lb (3111 kg)
AVERAGE WEIGHT LOAD =
7.36 lb/ft2 (36 kg/m2)

GS NXT Pinsetter Area





SIDE VIEW - PINSETTER ABOVE KICKBACKS

LEGEND:

"A" END DIVISION KICKBACK - LOADING OF 1150 POUNDS (522 kg)

"B" BALL ACCELERATOR KICKBACK - LOADING OF 1950 POUNDS (885 kg)

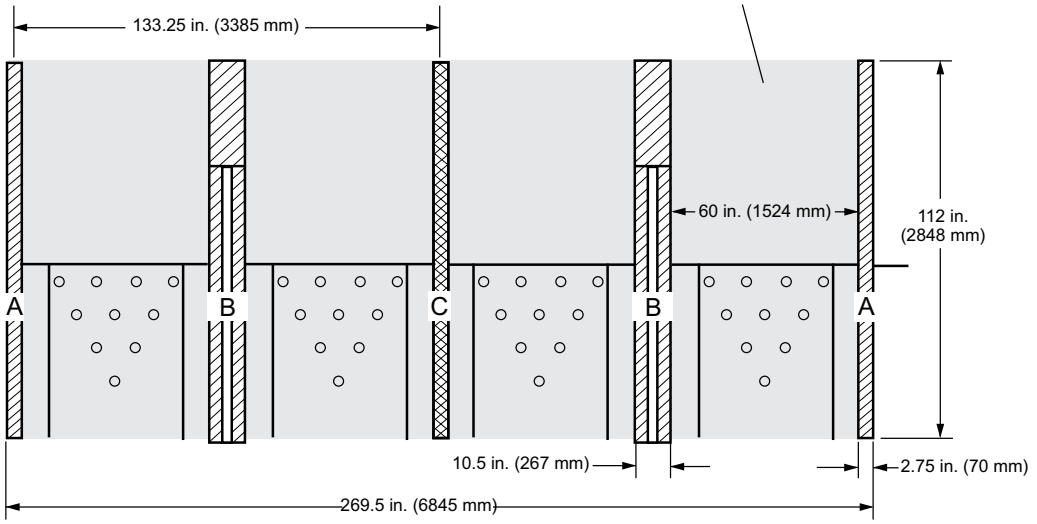
"C" SHARE DIVISION KICKBACK - LOADING OF 2150 POUNDS (975 kg)

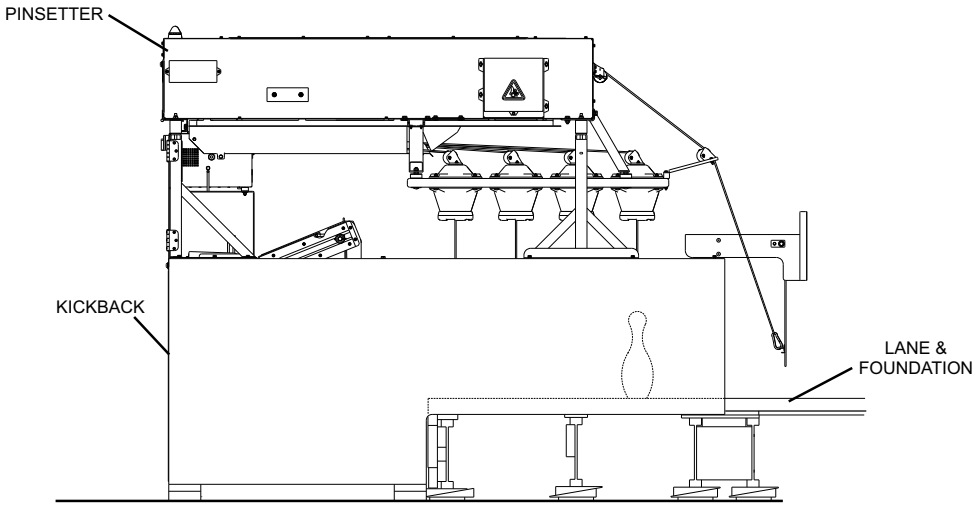
"D" ELEVATOR - LOADING OF 220 POUNDS (100 kg)

NOTE: WEIGHT BEARING CAPACITY OF THE FLOOR WILL BE THE RESPONSIBILITY OF THE CUSTOMER. CUSTOMER MUST SECURE CERTIFICATION BY A REGISTERED ARCHITECT THAT THE BUILDING STRUCTURE IS ADEQUATE TO SUPPORT THE MACHINES.

Boost ST Pinsetter Area

NOTE: AVERAGE EQUIPMENT LOAD FOR 4 LANES INCLUDING PIN DECKS WITH PINSETTER (112" X 269.5") IS 5920 lb (2685.3 kg) OR 28.5 lb/ft² (139 kg/m²).





SIDE VIEW - PINSETTER ON KICKBACKS

LEGEND:

"**A**" END DIVISION KICKBACK - LOADING OF 678 POUNDS (307 kg)

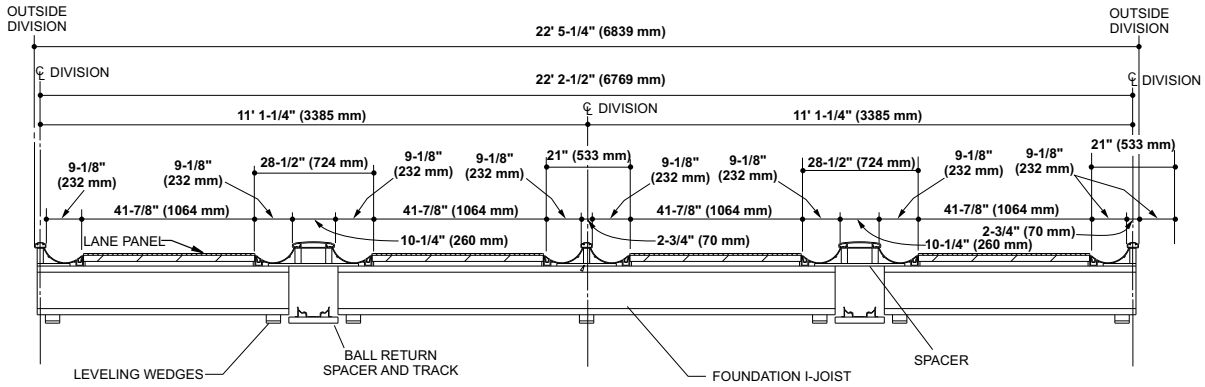
"**B**" BALL ACCELERATOR KICKBACK - LOADING OF 1600 POUNDS (725 kg)

"**C**" SHARED DIVISION KICKBACK - LOADING OF 1365 POUNDS (620 kg)

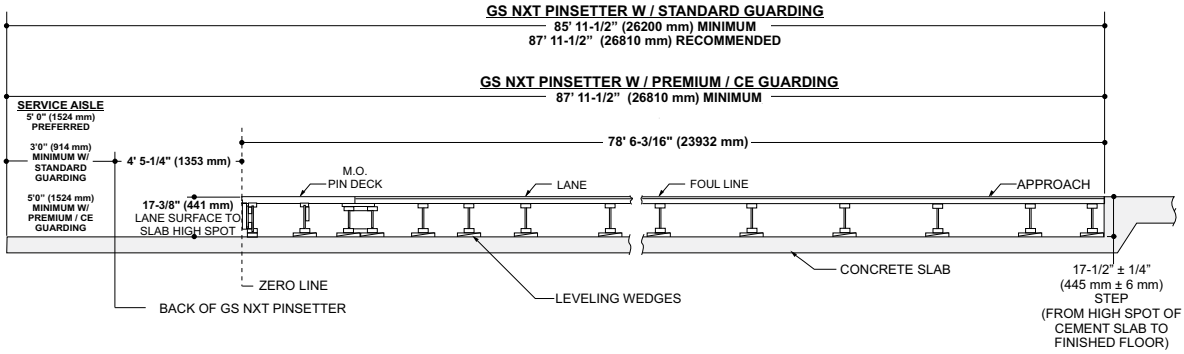
NOTE: WEIGHT BEARING CAPACITY OF THE FLOOR WILL BE THE RESPONSIBILITY OF THE CUSTOMER. CUSTOMER MUST SECURE CERTIFICATION BY A REGISTERED ARCHITECT THAT THE BUILDING STRUCTURE IS ADEQUATE TO SUPPORT THE MACHINES.

BOWLING FOUNDATION CONSTRUCTION

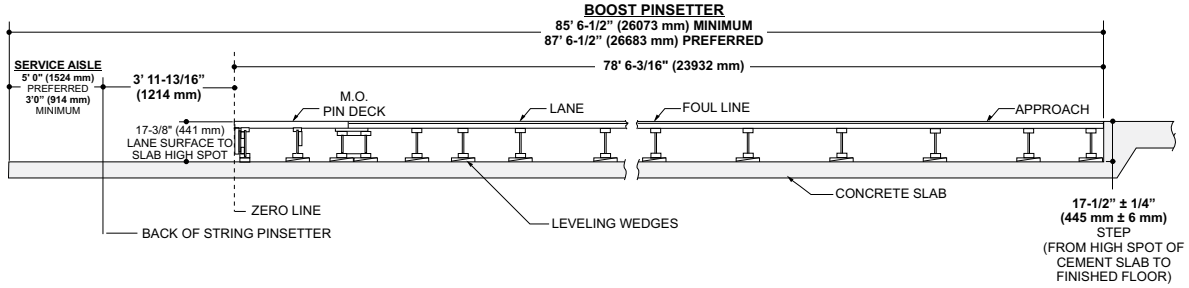
Lane Foundation Dimensions



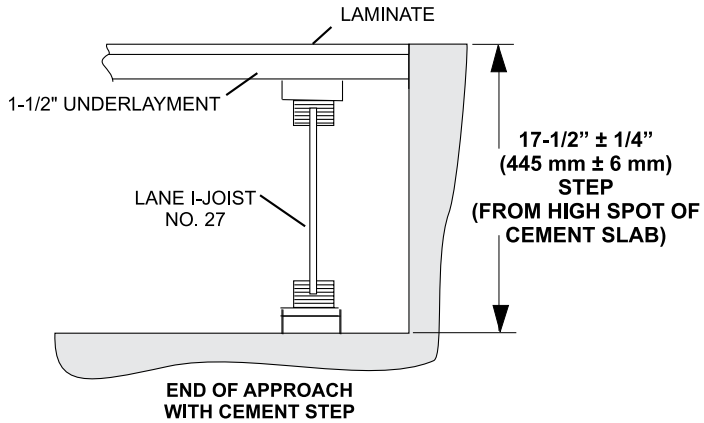
End View



Side View - GS-NXT Pinsetter



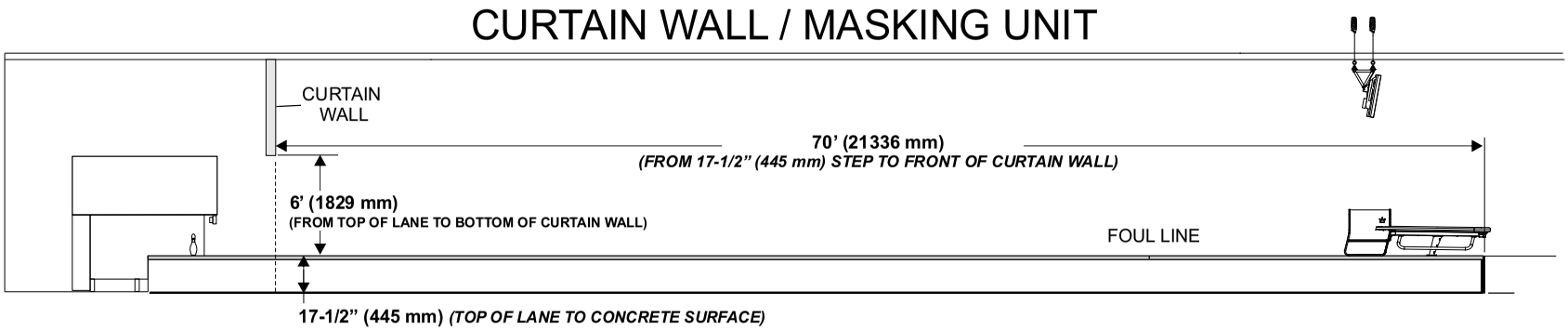
Side View - Boost ST Pinsetter



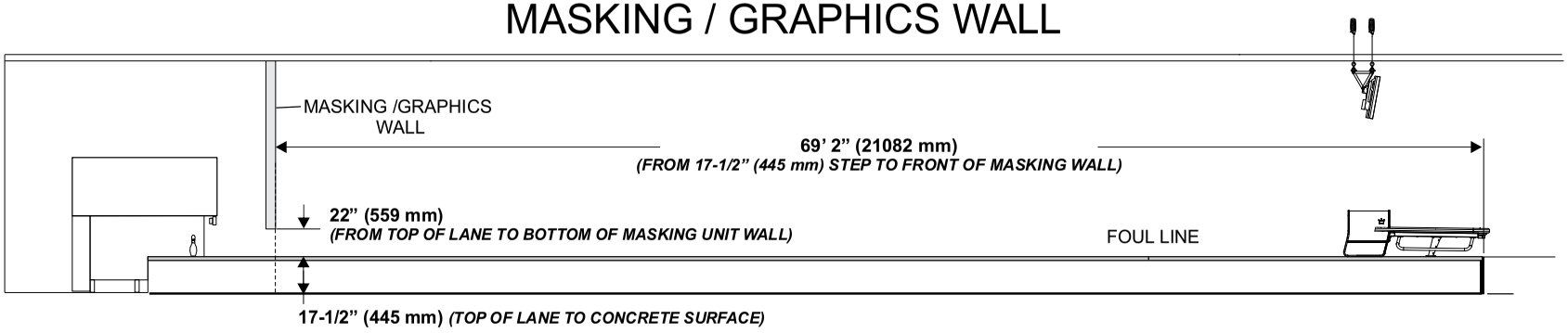
Flush Approach Detail

Masking Unit / Graphics Wall

A curtain wall / masking unit combination is traditionally used as a barrier between the pinsetter area and the lane area. Alternatively, a masking / graphic wall can be used instead of a curtain wall / masking unit. The masking/graphics wall is constructed as specified in the "*Curtain Wall Structure Certificate*".



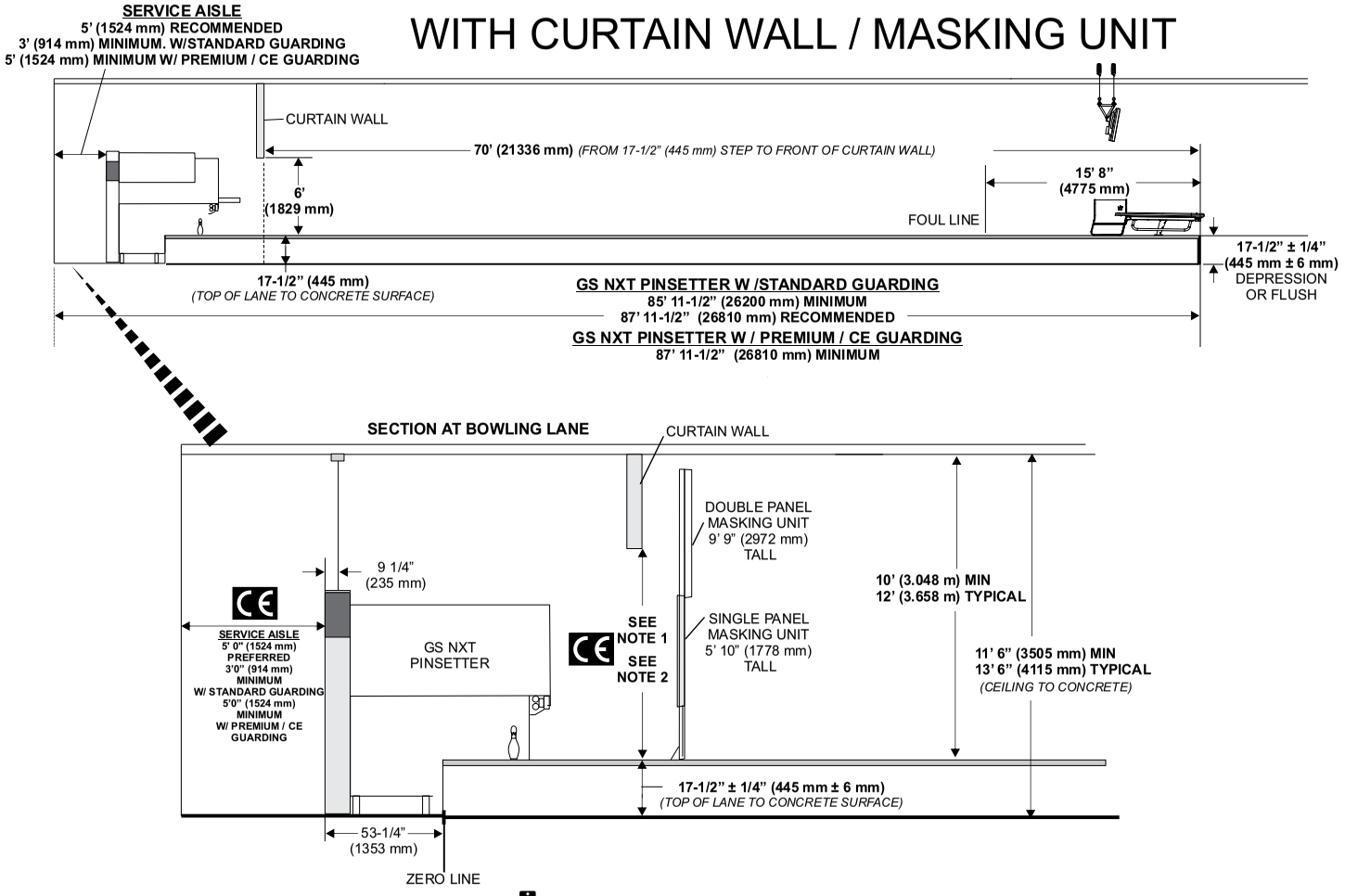
SIDE VIEW OF BOWLING LANE



SIDE VIEW OF BOWLING LANE

IMPORTANT!: Masking / Graphics wall cannot be fully installed until AFTER the pinsetters are installed.

GS NXT Pinsetter Foundation Dimensions

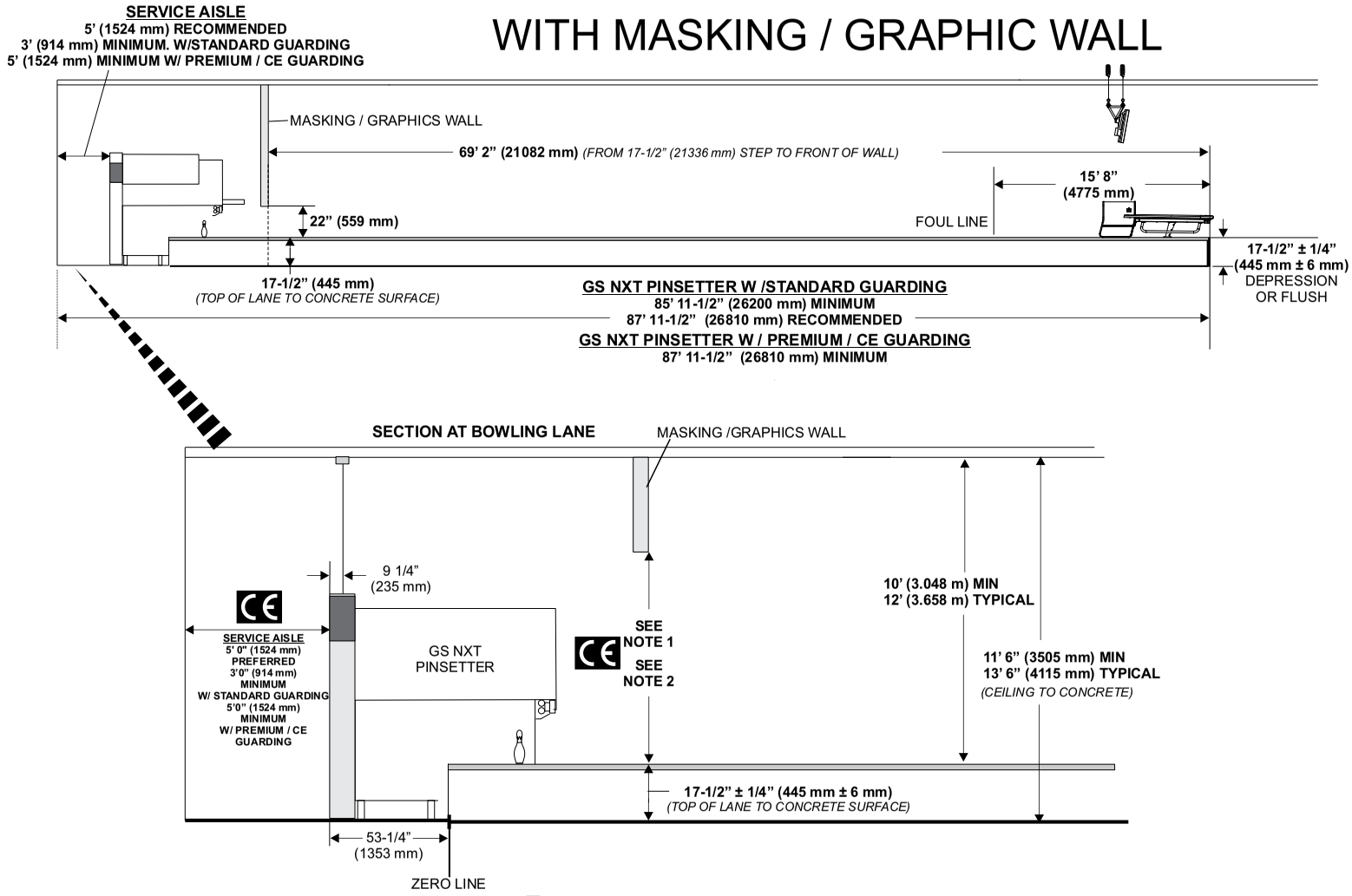


***NOTE!**: CUSTOMERS IN THE EUROPEAN UNION MUST PROVIDE THE SPECIFIED SERVICE AISLE CLEARANCE CUSTOMERS DEVIATING FROM THE SPECIFICATION SHOULD GAIN PRE APPROVAL FROM THEIR LOCAL INSPECTORS*

NOTE 1: DOUBLE, 2 PANEL MASKING UNIT = 6' (1829 mm).
SINGLE, ONE PANEL MASKING UNIT = 5' 7" (1702 mm)
IMPORTANT!: CURTAIN/MASKING WALL MUST BE CONSTRUCTED AFTER PINSETTERS ARE INSTALLED. PINSETTERS CANNOT BE INSTALLED WITH CURTAIN WALL HEIGHT OF 5' 7" (1702 mm) FROM LANE SURFACE.

NOTE 2: IF MASKING UNITS ARE NOT USED, THE MASKING WALL MUST BE BROUGHT DOWN TO A MINIMUM HEIGHT OF 22" (559 mm) FROM THE LANE SURFACE, WHEN CONSTRUCTED IN THE MASKING UNIT LOCATION.

WITH MASKING / GRAPHIC WALL



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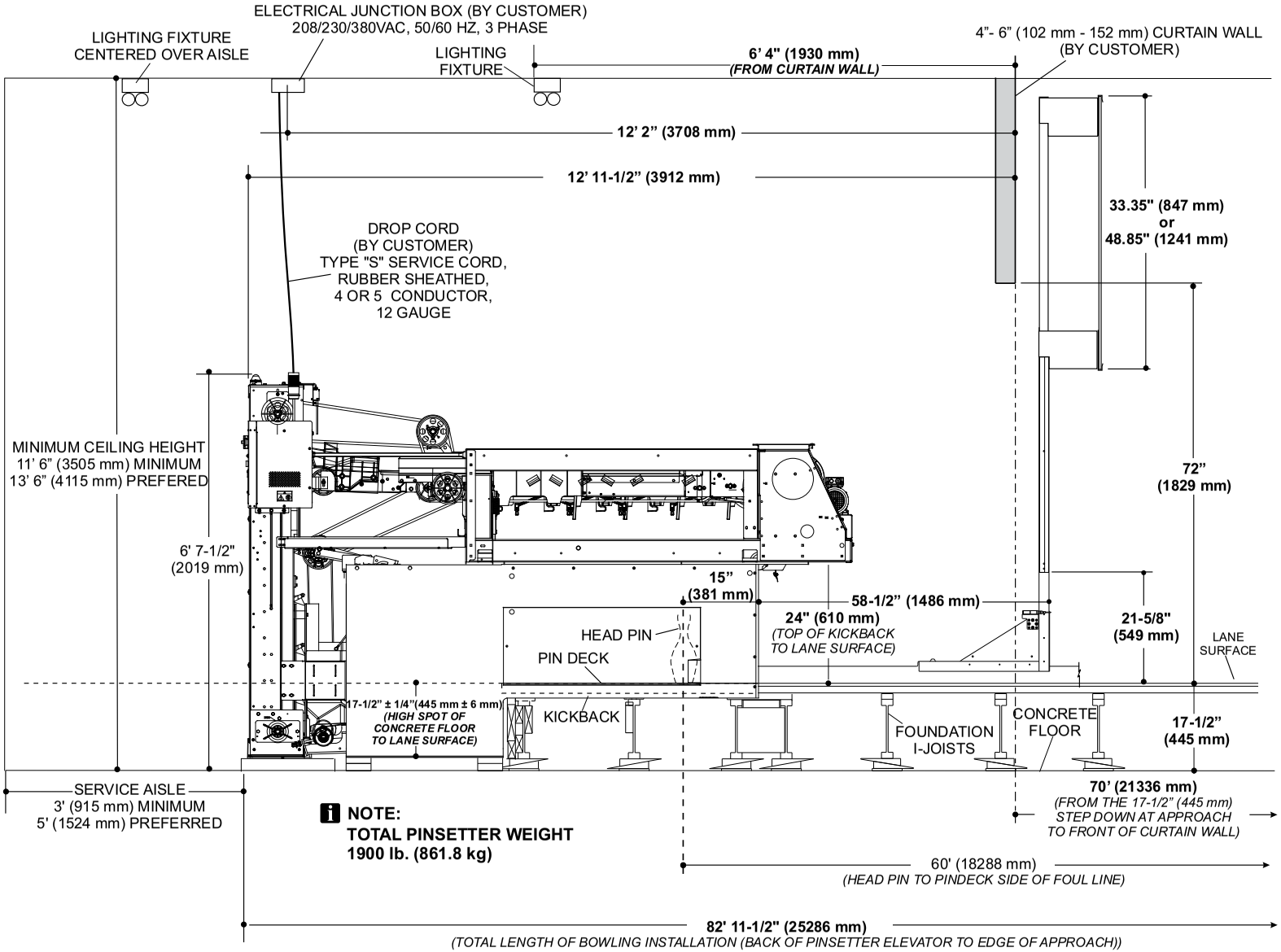
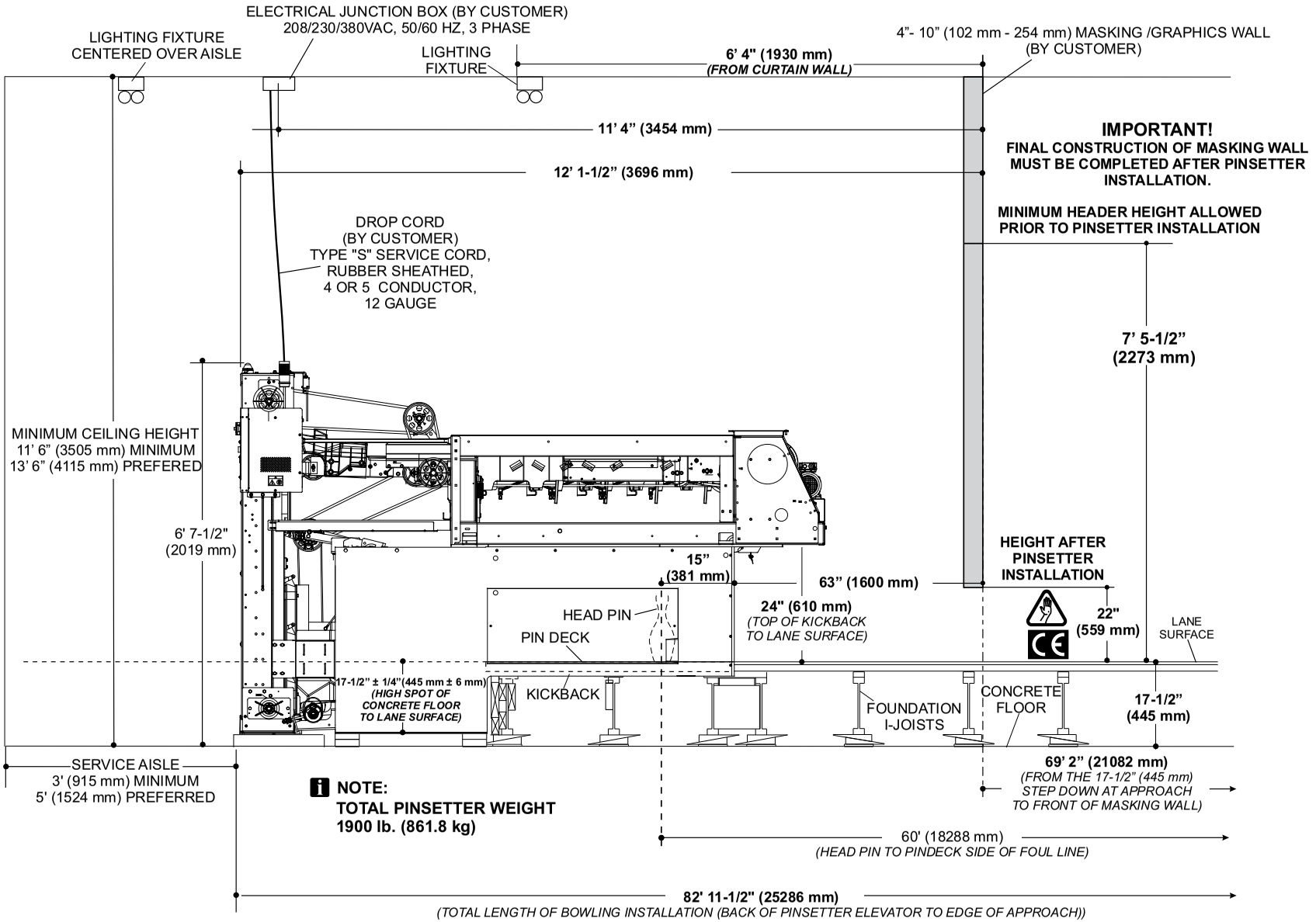
NOTE 1: IMPORTANT!: MASKING WALL MUST BE CONSTRUCTED AFTER PINSETTERS ARE INSTALLED.

NOTE 2: THE MASKING WALL MUST BE BROUGHT DOWN TO A MINIMUM HEIGHT OF 22" (559 mm) FROM THE LANE SURFACE, WHEN CONSTRUCTED IN THE MASKING UNIT LOCATION.

WITH CURTAIN WALL / MASKING UNIT



WITH MASKING / GRAPHICS WALL



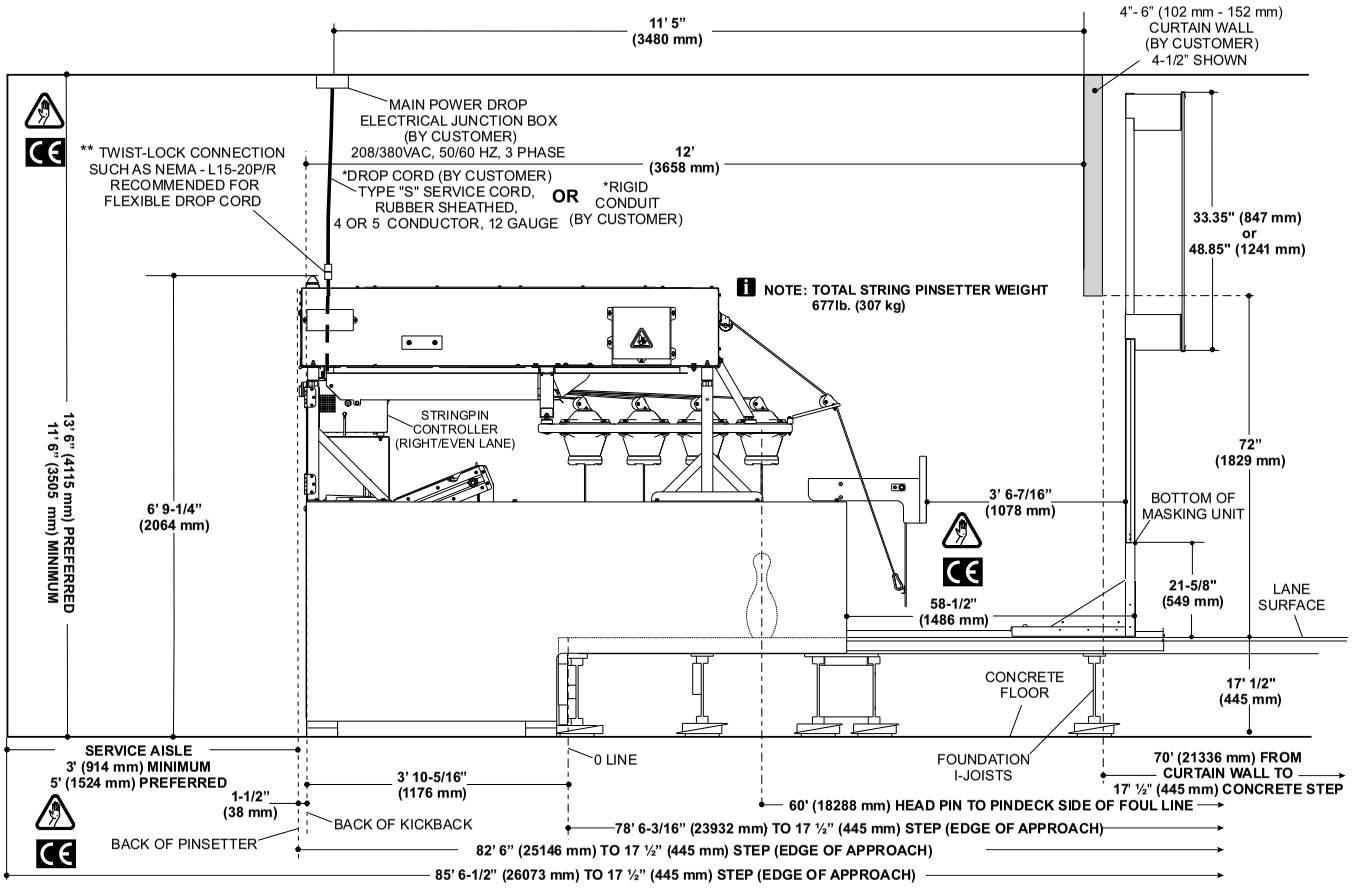
WITH CURTAIN WALL / MASKING UNIT

ONE (1) STRING PIN CONTROLLER IS USED PER PAIR OF LANES AND WHEN LOCATED TO THE BACK OF THE MACHINE, IS MOUNTED TO THE BALL RETURN SIDE OF THE EVEN (RIGHT) LANE

* ELECTRICIAN TO WIRE POWER CABLE INTO STRINGPIN CONTROLLER USING FLEXIBLE DROP CORD OR RIGID CONDUIT PER LOCAL CODE.

THE STRINGPIN CONTROLLER BOX(ES) MUST BE CONNECTED TO A GROUNDED, METAL, PERMANENT WIRING SYSTEM; OR AN EQUIPMENT-GROUNDING CONDUCTOR MUST BE RUN WITH THE CIRCUIT CONDUCTORS AND CONNECTED TO THE EQUIPMENT-GROUNDING TERMINAL ON THE CONTROL BOX.

** ALL ELECTRICAL CONNECTIONS MUST COMPLY WITH LOCAL CODE OF THE AREA IN WHICH THE PINSETTER IS BEING INSTALLED.



***NOTE!**: Adherence to the designated specifications are required for compliance with the Machinery Directive.*

***WARNING!**: CUSTOMERS SHOULD VALIDATE THAT THE SPECIFICATIONS OR ANY DEVIATIONS FROM THESE SPECIFICATIONS COMPLY WITH LOCAL REGULATIONS.*

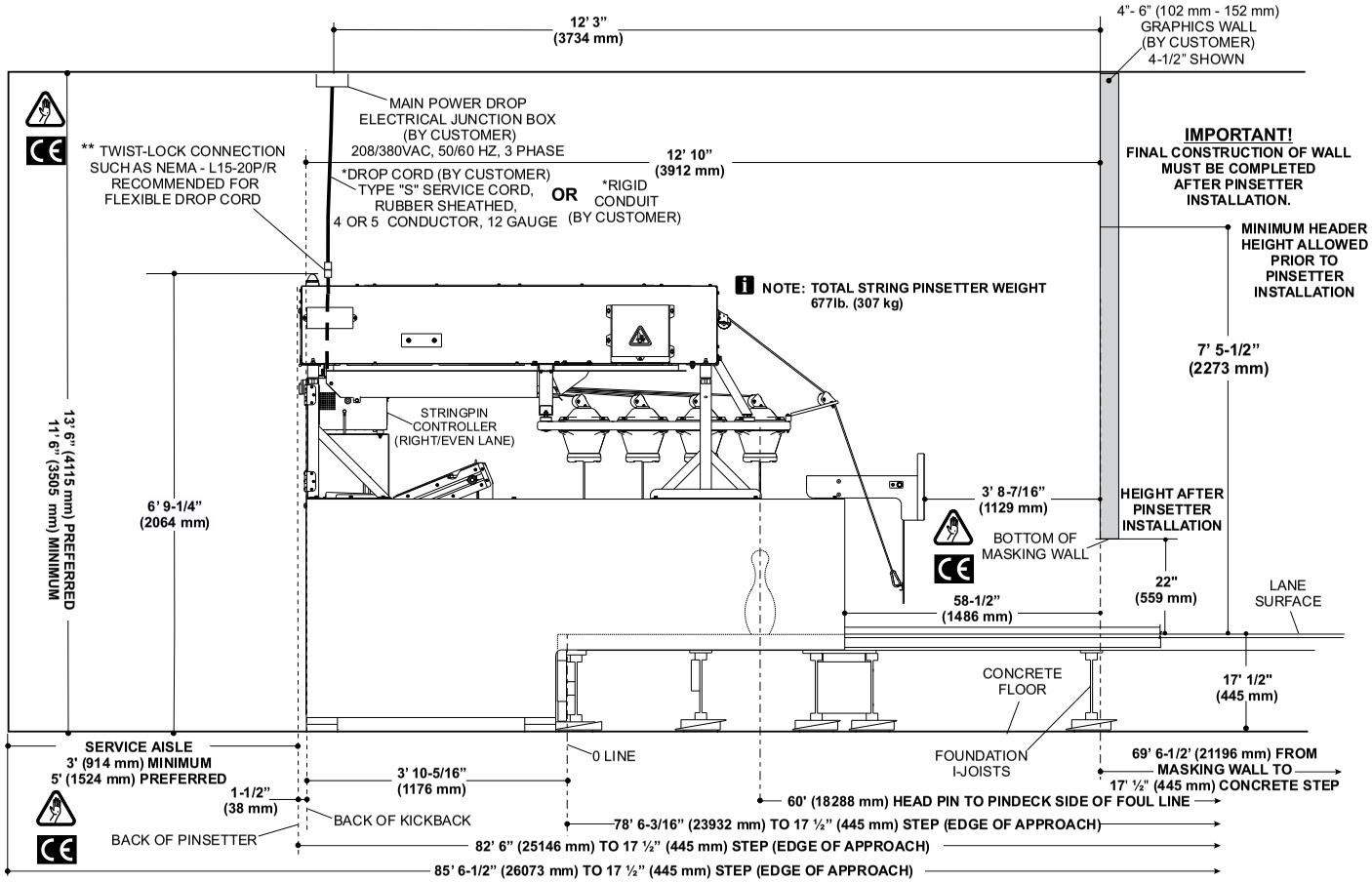
WITH MASKING / GRAPHIC WALL

ONE (1) STRING PIN CONTROLLER IS USED PER PAIR OF LANES AND WHEN LOCATED TO THE BACK OF THE MACHINE, IS MOUNTED TO THE BALL RETURN SIDE OF THE EVEN (RIGHT) LANE

* ELECTRICIAN TO WIRE POWER CABLE INTO STRINGPIN CONTROLLER USING FLEXIBLE DROP CORD OR RIGID CONDUIT PER LOCAL CODE.

THE STRINGPIN CONTROLLER BOX(ES) MUST BE CONNECTED TO A GROUNDED, METAL, PERMANENT WIRING SYSTEM; OR AN EQUIPMENT-GROUNDING CONDUCTOR MUST BE RUN WITH THE CIRCUIT CONDUCTORS AND CONNECTED TO THE EQUIPMENT-GROUNDING TERMINAL ON THE CONTROL BOX.

** ALL ELECTRICAL CONNECTIONS MUST COMPLY WITH LOCAL CODE OF THE AREA IN WHICH THE PINSETTER IS BEING INSTALLED.



***NOTE!**: Adherence to the designated specifications are required for compliance with the Machinery Directive.*

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FIREBLOCKING

The "Fire Resistant Construction Form", which can be found in Section 6 of this Guide, must be submitted to Brunswick prior to construction.

Local building codes vary from area to area. Based on your local code it may be necessary to install fireblocking under the lanes.

The Brunswick lane foundation consists of high pressure laminate mechanically fastened to a wooden underlayment of engineered strand board. The underlayment is spaced above the floor by engineered lumber I-joists. These components do not meet requirements of non-combustible material. **It is the responsibility of the proprietor and proprietor's architect to investigate and comply with local building codes. If additional labor and/or materials need to be added to Brunswick's standard installation in order to comply with local codes, it must be done at expense of the proprietor.**

The following information is taken from the 2015 Edition of the "International Building Code" written by International Code Council and may be helpful to your architect in complying with local codes.

The International Code Council consists of representatives from Building Officials and Code Administrators International, the International Conference of Building Officials and, the Southern Building Code Congress International. The intent of this code was to draft a comprehensive set of regulations for building systems consistent with and inclusive of the scope of their existing model codes. The requirements for bowling lane construction can be interpreted many ways. This code makes clear reference to bowling lane construction.

Section 603 of the 2015 Edition of the International Building Code states:

Section 603 - COMBUSTIBLE MATERIAL IN TYPES I AND II CONSTRUCTION

603.1 Allowable materials. Combustible materials shall be permitted in buildings of type I or II construction in the following applications and in accordance with sections 603.1.1 through 603.1.3:

10. Finish flooring installed in accordance with section 805.

Section 805 – COMBUSTIBLE MATERIALS IN TYPES I AND II CONSTRUCTION

805.1 Application. Combustible materials installed on or embedded in floors of buildings of Type I or II construction shall comply with sections 805.11 through 805.1.3.

805.1.1 Subfloor construction. Floor sleepers, bucks, and nailing blocks shall not be constructed of combustible materials, unless the space between the fire-resistance rated floor assembly and the flooring is either solidly filled with noncombustible materials or fireblocked in accordance with section 718, and provided that such open spaces shall not extend under or through permanent partitions or walls.

Section 718 - CONCEALED SPACES

718.2.7 Concealed sleeper spaces. Where wood sleepers are used for laying wood flooring on masonry or concrete fire-resistance-rated floors, the space between the floor slab and the underside of the wood flooring shall be filled with an approved material to resist the free passage of flame and products of combustion or fireblocked in such a manner that there will be no open spaces under the flooring that will exceed 100 square feet (9.3m□) in area and such space shall be filled solidly under permanent partitions so that there is no communication under the flooring between adjoining rooms.

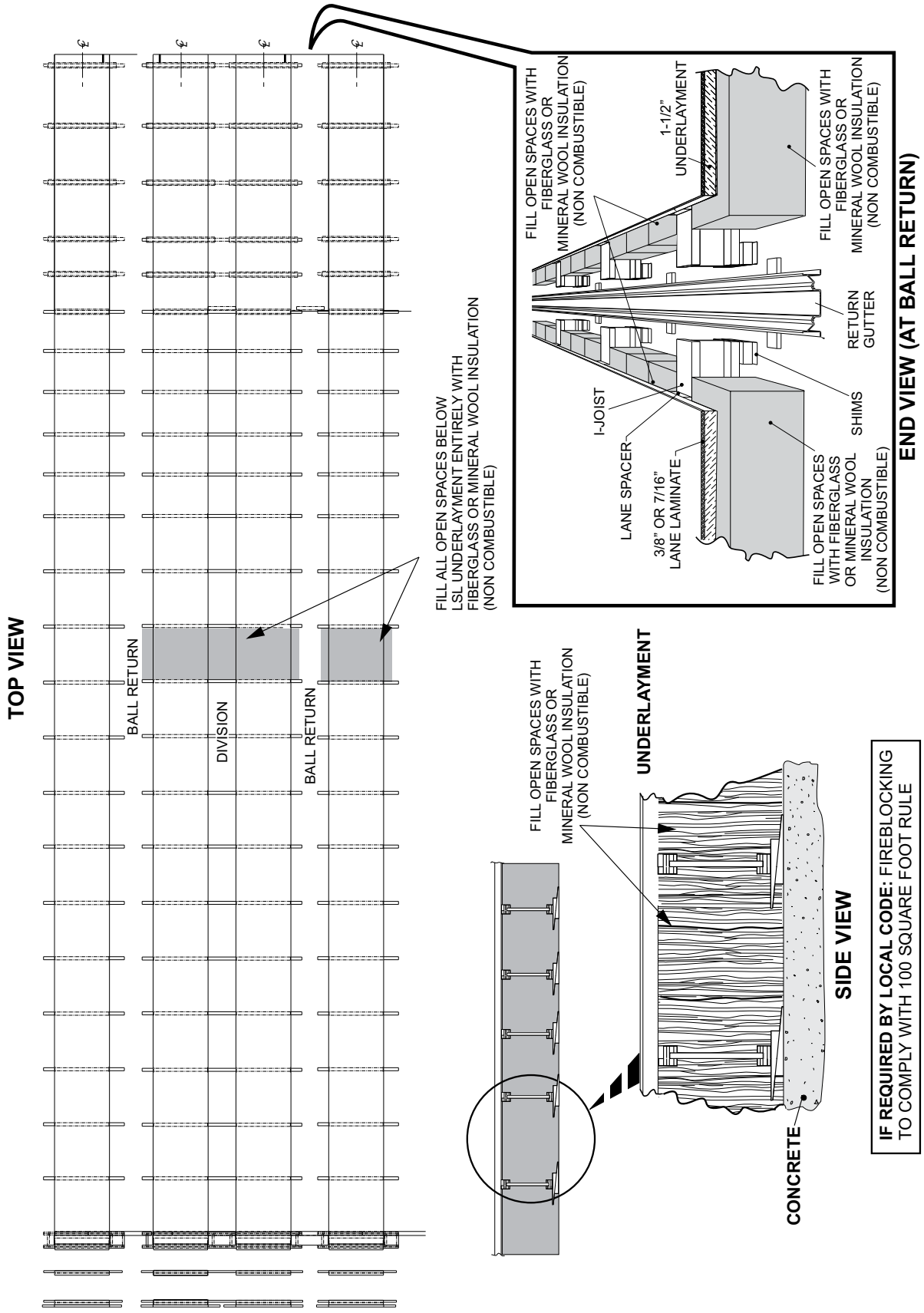
Exceptions:

2. Fireblocking is required only at the juncture of each alternate lane and at the ends of each lane in a bowling facility.

Brunswick has installed many bowling centers where the proprietor's contractor installed mineral wool or fiberglass batt insulation (non combustible) fireblocking as specified above. However, by signing the "Fire Resistant Construction Form", the proprietor acknowledges that it is the sole responsibility of the proprietor to investigate and comply with local building codes and to secure appropriate methods, and seek code approval for the fire-resistance-rated construction if required prior to the start of installation, and pay for all associated material and labor.

Refer to the Fireblocking Overview and detail diagrams which follow.

Fireblocking Overview



CEILING

Selection of Materials

Although they are not necessarily listed in order of their importance, the following considerations are offered to assist in the selection of finished ceiling materials.

1. The coefficient of noise reduction.
2. The flame resistant qualities of the materials as related to fire insurance and local ordinances governing places of public assembly.
3. The weight of the material and required method of erection as related to the structure of the roof or truss.
4. Ability to clean or refinish the material without impairing the acoustic quality of the material.
5. Ability to replace defective or damaged materials long after the original installation. Also, the ability to match the existing material at a later date if the lanes are expanded.
6. Resistance to vermin, fungus, mold, and dust.
7. Light reflecting ability.
8. Resistance to fallout over the lanes and machines.

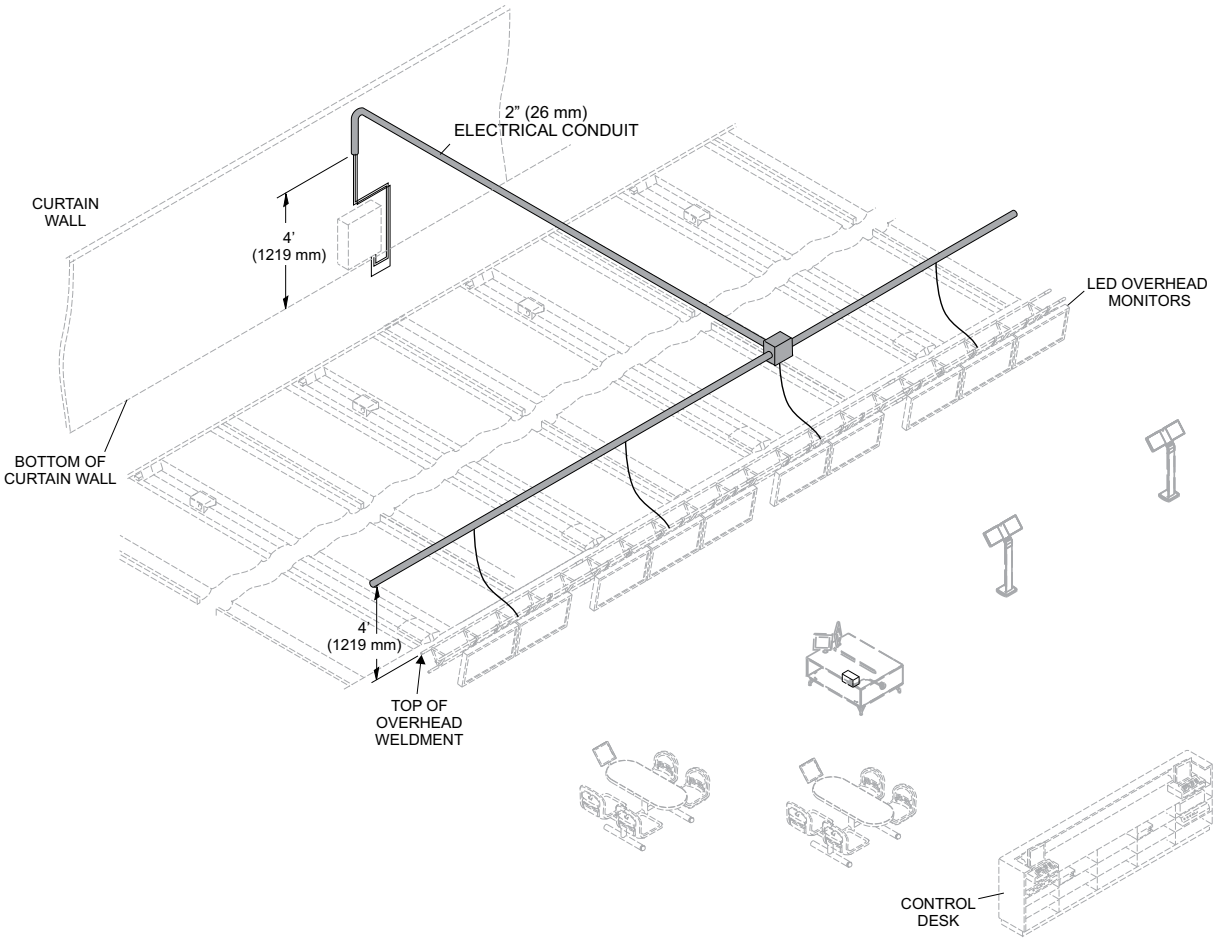
CE

NOTE!: *Customers in the European Union must provide the specified clearances and lighting specification. Customers deviating from this specification should gain pre approval from their local inspectors.*

Open and Closed Ceiling

Sufficient support and concealment will need to be provided for cabling in open ceiling construction. Conduits, centered on the divisions, are recommended for cables from the scoring computer to the overheads. 2” (51 mm) minimum conduit should be provided.

NOTE: *All Brunswick low voltage cabling is plenum rated and may not require conduit, based on local codes*



Correlated Ceiling Plan

It is strongly recommended the architect prepare a study of the reflected ceiling plan of the lane to correlate the location of light units, air conditioning grills or anemostats as well as communication systems, loud speakers, and curtain walls at the masking units.

SOUND / VIBRATION

Sound

NOTE: *Sound reductions are the responsibility of an acoustical engineer. Brunswick will not provide information for sound reduction.*

Noise Reduction Coefficients

The general rule of thumb is for a noise reduction coefficient (NRC) of .70 to .85 in the pinsetter area and a NRC of .50 to .65 for the balance of the lane area. Hearing protection equipment is required in the pinsetter area. The bar and cocktail lounge is generally based on a NRC of .65 to .75.

Frequencies

The noise reduction coefficients of varying acoustical materials can be arrived at by considering 125 cycles as being the frequency 20 db for rolling bowling balls, 250 cycles for the frequency 60 db of human voices, and 500 cycles for the frequency 90 db of the pinsetter area, including machine noise and pin clatter. These evaluations are only approximated since noise often reaches across 2 or 3 frequencies for a brief moment.

Noise Levels at the Pinsetter

When working in the pinsetter area while machines are in operation, ear protection should be worn. Sound levels greater than 83 db can be experienced within 1.6 m of operating machines.

Most sustained measurements from WITHIN the machine (not where one would be standing) measure between 75-95 db, but can peak at 110-112 db during ball strikes (measured right at the head pin).

The highest sound measurements come from:

- Initial ball impact on the lane
- Ball Strike or impact with the pins

Other significant sound measurements:

- Sweep of standing pins
- Pin drop as pins transition from distributor to table

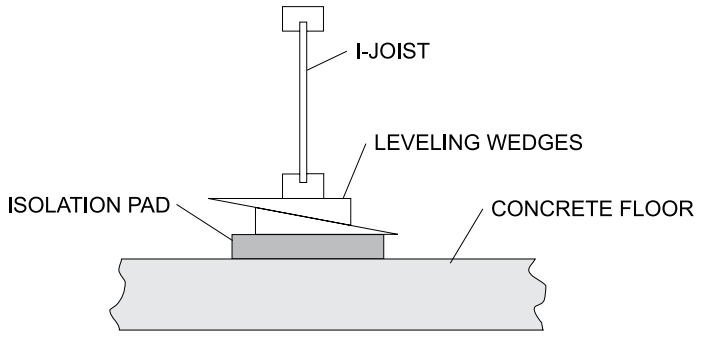
Vibration

Upper Floor

Areas sensitive to noise and vibration such as upper floor installations may require additional material for the installation. Following is an example of isolation pads which reduce the vibration of the bowling lanes.

These isolation pads are to be installed at all points where the bowling foundation is in contact with the cement floor throughout the pinsetter and lane area.

The proprietor will need to contact their architect for further information.



NOTE: *Isolation pad specifications are the responsibility of the architect. Brunswick can provide isolation pad installation based on your architect's plans.*

IMPORTANT: *Use of isolation pads may change the depressed slab dimension from 17-1/2" (445 mm) to 18-1/4" (464 mm). Make sure to include any flooring when planning for this dimension.*

HEATING AND VENTILATION OBJECTIVES

NOTE: *Customer is to provide a fully operational and functional HVAC system BEFORE Brunswick installation begins. Significant changes in temperature and humidity between the installation conditions and the end use conditions WILL result in undesirable movement of the lane/approach products.* ***This requirement is for the stability of the product, not the comfort of the installer.***

It is important to maintain a conditioned atmosphere over the entire bowling center to maintain uniform playing conditions and proper function of the equipment. It is also necessary to control and reduce static electricity conditions and to minimize problems of airborne particles, such as smoke, dust, and lint.

Experience has established the need to extend the conditioned atmosphere over the lanes, pinsetter area, and service aisle area. This conditioned atmosphere should be extended to the storage and shop area of the service aisle for the protection of pins and equipment stored there.

NOTE: *The BTU of a pinsetter is 293 watts/1000 BTU/hr.*

- No heating or air conditioning equipment should be suspended below the ceiling above the playing surface of the lanes.
- Any heating or air conditioning over the approaches should direct air flow from the foul line toward the bowler's area and to the left and right.
- Avoid the concentrated flow of either heated or cooled air on any single area of the bowling center. This may produce excessive moisture which could result in damage to equipment or sticking/ sliding issues on the approaches.

The use of a properly designed air distribution system to deliver the correct amount of conditioned air to all of the public occupancy areas and to the bowling and service areas is important. The functions and characteristics of these areas must be studied by the engineer to accurately determine the correct distribution. Air must be delivered in each area so it is thoroughly mixed and brought to required room conditions before it comes in contact with the public, playing surfaces, or equipment. It is by correct control at these points that the life of the materials and surfaces can be extended and maintenance problems reduced.

Humidity

Bowling is a "round-the-clock," all season sport. Therefore, controlled temperature and humidity are prerequisites for a successful bowling establishment. Conditions of 70 - 74 F (21 - 23 C) and 40% - 50% relative humidity are recommended.

Research has proven that lack of proper humidity control can result in damage to bowling equipment such as pinsetters, kickbacks, pins, and lanes. Proper humidity control will improve pin action, pin life, condition, and appearance of lanes and approaches. Proper humidity control will also reduce static electricity which causes severe dirt and maintenance problems, and contributes to poor sliding conditions.

Indoor humidity is a factor in lane conditions and the sliding characteristics of approaches. High relative humidity (moisture content in the air) tends to make the lane conditioner evaporate slower and may cause sticky approaches. Low relative humidity will allow the lane conditioner to evaporate faster and may result in slippery approaches.

IMPORTANT!: A RELATIVE HUMIDITY LEVEL OF 40% - 50% MUST BE MAINTAINED to obtain the many benefits of humidity control. Equipment requirements vary according to geographic location, building size, type of construction, etc. It is recommended that a competent air conditioning engineer, with full knowledge of the requirements, determine the exact requirements for proper humidity control.

Recommendation for a Control System that has the capability to:

1. Record temperatures in all areas served.

2. Record supply air temperatures of all HVAC units.

3. Record the humidity in various locations of the center.

4. Computer programmable to allow alternate controls that could include:

    - Computer accesses to retrieve the temperature, humidity and hours of operation history.
    - De-Humidifying operation of the HVAC equipment
    - Programmable Zone temperature set points
    - Time of day operation, HVAC units, lighting, and exhaust fans
    - Economizer operation for energy savings, controlled by a weather station

The circulation of air is equally important to bowling conditions and comfort. Placement of supply and return vents should move air away from the bowlers' area and toward the concourse. This creates an "air wall" which prevents smoke and humidity from being blown onto the approach area.

Insulation

The engineer should specify to the architect his requirements for duct insulation and his recommendations for roof insulation and reflective roofing, since these considerations can do much to reduce HVAC equipment size and continued operation and maintenance expenses.

Design Conditions

All load conditions for both summer and winter operations must be based on design conditions which are (1) based on local weather and business factors, and (2) based on providing satisfactory indoor conditions for bowlers, spectators, bowling lanes, and other equipment.

1. For external conditions in practically all United States communities, the engineer can refer to the National Heating, Ventilating, and Air Conditioning Guide for accurate design conditions.

2. Year round humidity should be maintained at 40% - 50% also, however, it may become necessary for short periods of time to automatically lower this in proportion to dropping outdoor temperatures in areas where severe conditions occur. This can vary in accordance with the construction of the building.

NOTE: *Refer to Electronic Pre-Installation Guides for computer room requirements.*

LIGHTING

NOTE: *Customer is responsible for paying for temporary lighting and additional labor if a fully operational and functional center lighting system is not complete in the bowling area before Brunswick installation.*

NOTE: *Lux (lx) and Footcandles (fc) are the industry standards for measuring light intensity.*

Concourse Lighting (Suggested 110-320 Lux, 10-30 Footcandles)

Concourse, spectator area, or other public space illumination intensity is optional, but the location and type of fixture and intensity must be subject to the restriction of not impacting the bowler's, approach and lane surface areas. Illumination of 110-320 lux (10-30 footcandles) from flush-mounted or recessed ceiling fixtures is recommended. There should be no direct exposure of light sources into the seating and approach areas.

Bowlers' Area (Suggested 110-160 Lux, 10-15 Footcandles)

General lighting intensity in the bowlers' seating area should be 110-160 lux (10-15 footcandles). Use of recessed ceiling fixtures (fluorescent single lamp) will provide the recommended zone light levels.

Special consideration should be given to the color treatment of walls and ceiling, and to the use of low-reflective carpet or tile in the seating area.

Approach (Suggested 55-110 Lux, 5-10 Footcandles)

Approach lighting intensity should be 55-110 lux (5-10 footcandles). This level can be obtained through incidental light from the seating area and lane surface. If additional approach lighting is used, it should be separately switched from the Control Desk or on dimmer controls.

Lane Surface (Suggested 160-215 Lux, 15-20 Footcandles)

Lane surface illumination level should be 160-215 lux (15-20 footcandles) of even diffused lighting measured at floor level. The amount of incident light directly illuminating the masking units should be 110-160 lux (10-15 footcandles).

Pinsetter Area (Suggested 320-430 Lux, 30-40 Footcandles)

While proper pin lighting is installed on the automatic pinsetter, general lighting in the pinsetter area should be about 374 lux (35 footcandles) of even illumination over the machines and the service aisle.

Mechanic's Work Area (Suggested 810-1075 Lux, 75-100 Footcandles)

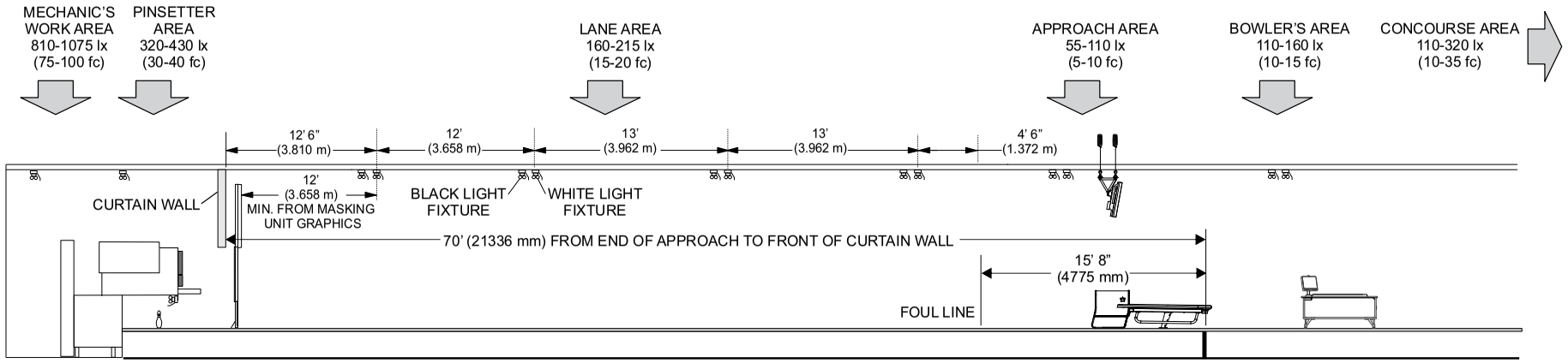
The mechanic's work area should have 810-1075 lux (75-100 footcandles) in the bench area.

CE

NOTE!: *Customers in the European Union must provide the specified lighting. Customers deviating from this specification should gain pre-approval from their local inspectors.*

Typical Lighting Layout

lx = LUX
fc = FOOTCANDLES



SIDE VIEW OF BOWLING LANE

Ultra-Violet (UV) or Black Light Bulbs

Ultra-violet light is measured differently than white light. Ultra-violet light releases very little visible light to the human eye. Instead, an ultra-violet light emits mostly ultra-violet (UV), which cannot be seen and blocks the visible light that can be seen.

Ultra-violet light is measured in nanometers. A high quality effective ultra-violet light for bowling centers to have a "glowing" in the environment is long wave, 315 to 380 nanometers. Ultra-violet light bulbs are typically made using mercury vapor lamps or specially designed LED lights

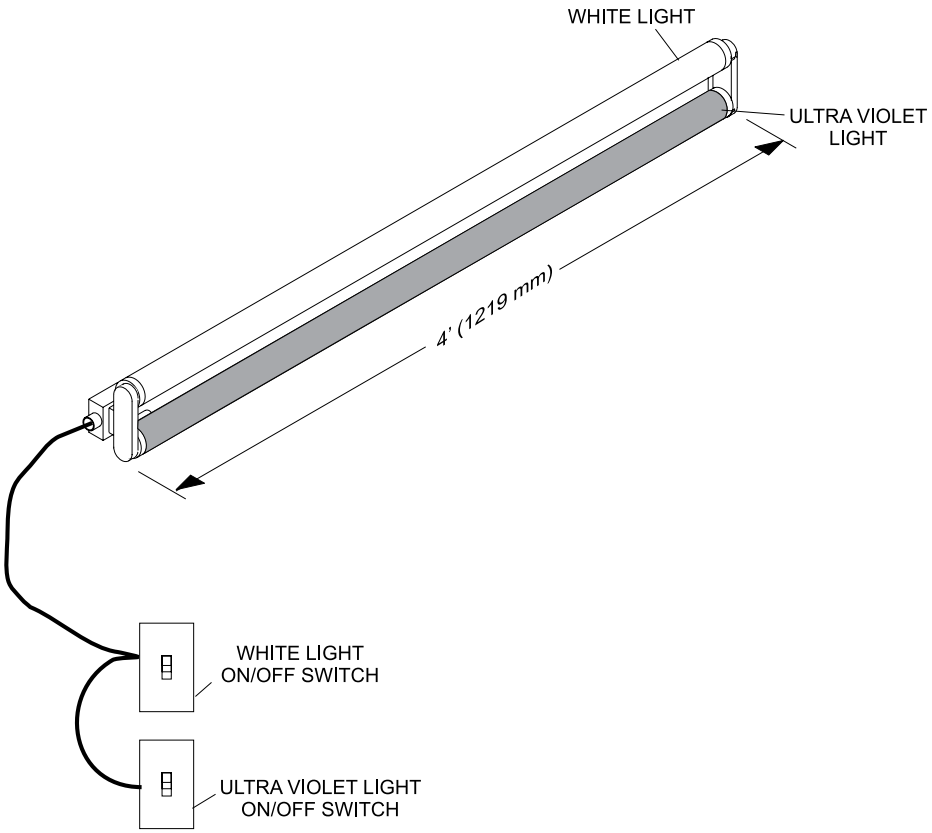
Brunswick recommends florescent light bulbs, manufacturer part number is "F32T8-BLB". If these types of light bulbs are not preferred by the customer, seek professional advisement from a lighting engineer.

NOTE: *Brunswick does NOT recommend incandescent light bulbs. Do NOT mistake this with "F32T8-BL". The "BLB" and the "BL" bulb are different lights and will not perform the same.*

IMPORTANT: ***Failure to follow Brunswick recommendations may drastically affect the "glowing" environment in the bowling centers.***

Light Fixture Configuration

When designing the lighting use a dual light fixture, with one white light and one ultra-violet bulb in the light fixture. Have a power on/off switch for the white light and another separate on/off switch for the ultra-violet light. This will allow the location and the placement of the white and ultra-violet light bulb to be the same to allow for an even light level intensity on the lanes.



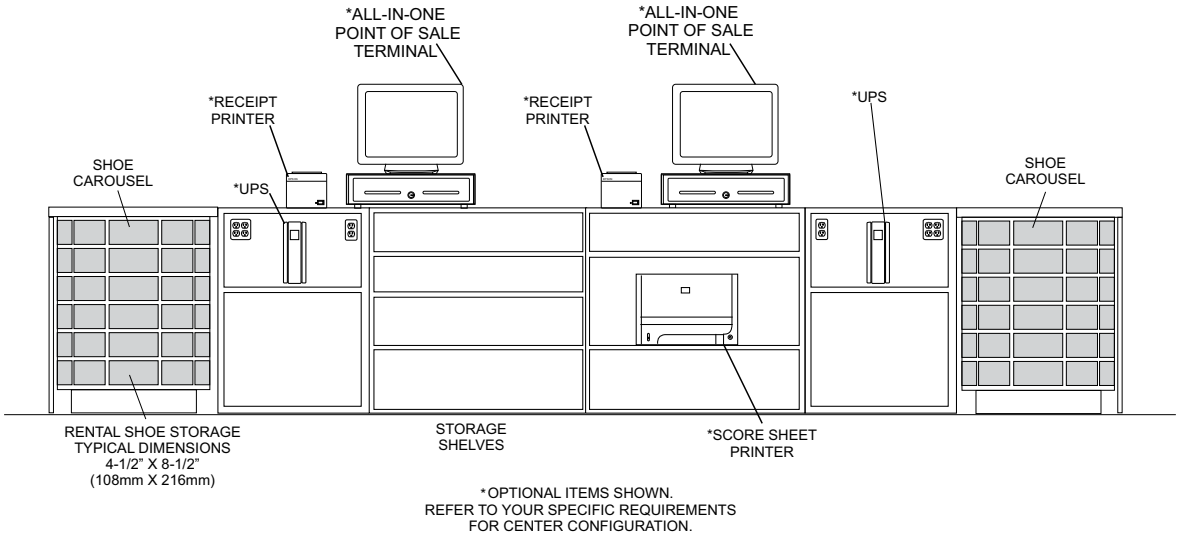
CONTROL DESK AND OFFICE LOCATIONS

Refer to the appropriate Pre-Installation Manual.

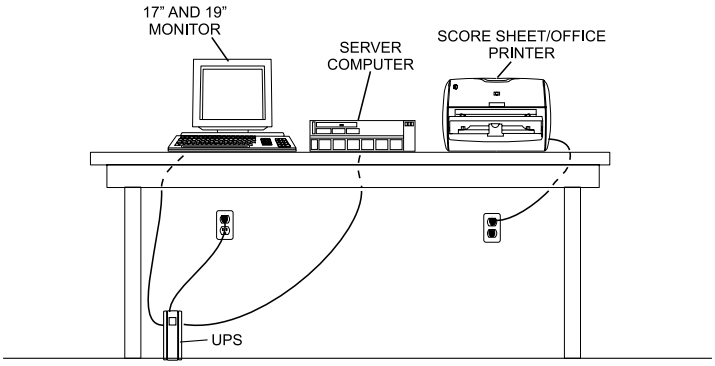
The uninteruptable power source (UPS) at the Control Desk and Office locations is intended for Brunswick equipment ONLY. Provide extra electrical outlets for non-Brunswick equipment.

A suitable raceway or conduit will need to be installed for communication cabling for the Control Desk and Office locations.

NOTE: *Construction of Control Desk, back office and other office locations must be completed at least one week before lane construction completion.*



Typical Control Desk Equipped with Brunswick Center Management Equipment



Typical Back Office Equipped with Brunswick Center Management Equipment

Section 4: Brunswick Construction Schedule Requirements

CONSTRUCTION SCHEDULE

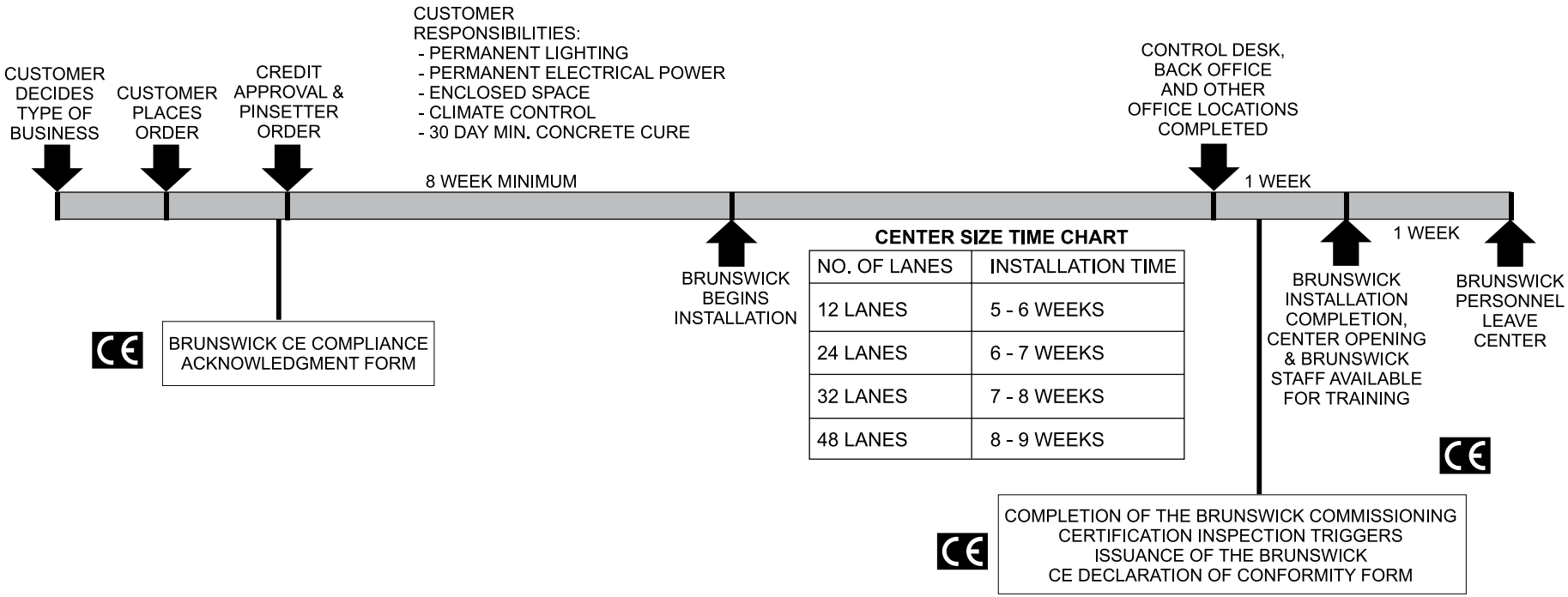
The formulation of an intelligent and realistic construction schedule assures good building practices and quality workmanship. It will coordinate the ordering and delivery of materials to the job site with the correct sequences of trades. It will allow adequate time for tradesmen to properly perform their work and will expedite the total construction program since it will provide time for inspection and testing of the work as it is installed.

All trades should be acquainted with the schedule and strict adherence to the schedule should be insisted upon. In areas deemed necessary by the architect, performance bonds may be required.

Time Line for Brunswick Installation with GS-X & Boost ST Pinsetters

NOTE: *Brunswick installation completion will be delayed if Brunswick pre-installation requirements are not met. Refer to "Brunswick Pre-Delivery Requirements" later in this section.*

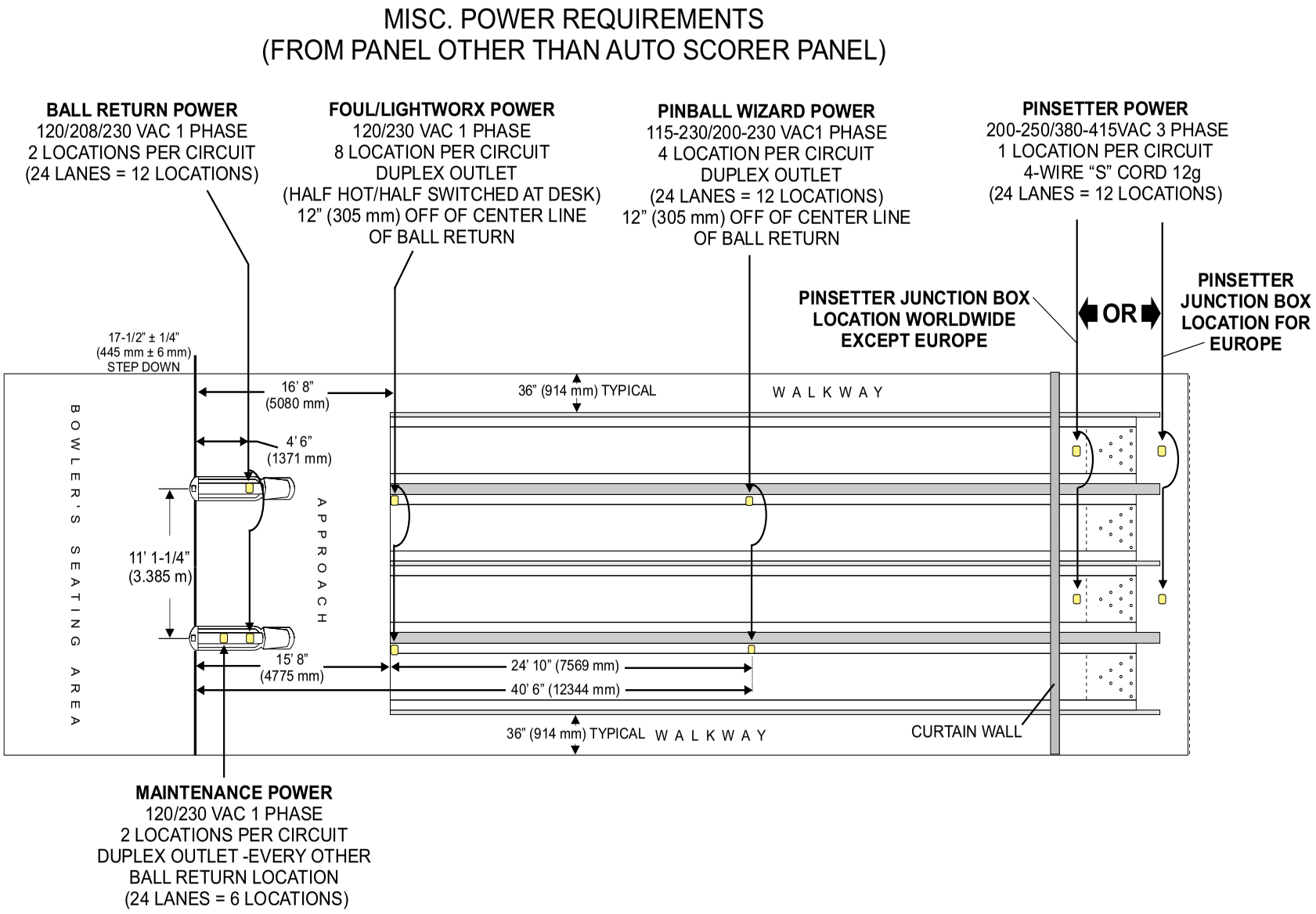
NOTE: *Control Desk, back office and other office locations are required to be completed at least one week before Brunswick's completion date.*



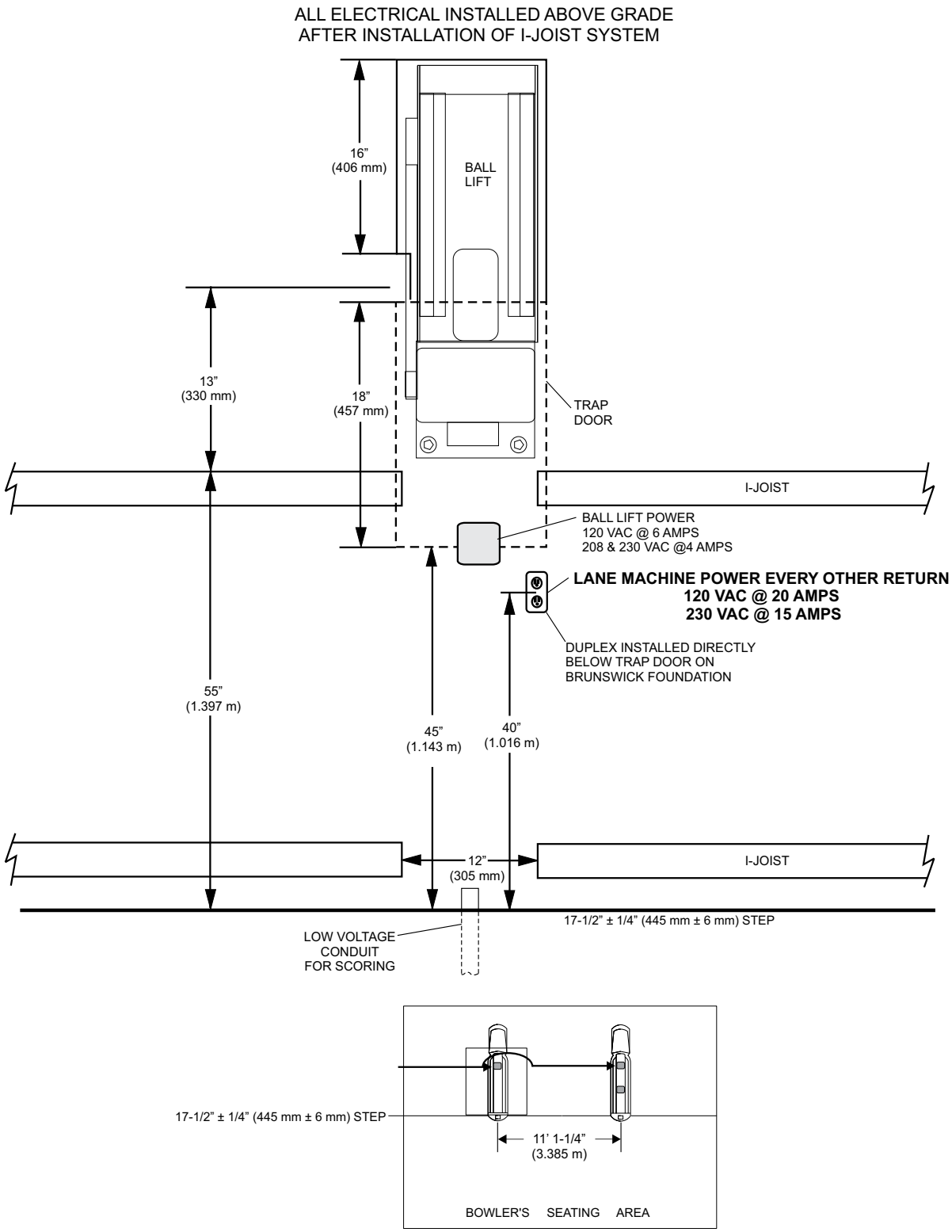
CENTER SIZE TIME CHART

NO. OF LANES	INSTALLATION TIME
12 LANES	5 - 6 WEEKS
24 LANES	6 - 7 WEEKS
32 LANES	7 - 8 WEEKS
48 LANES	8 - 9 WEEKS

ELECTRICAL POWER REQUIREMENTS OVERVIEW



Ball Lift and Lane Machine Electrical Requirements



BRUNSWICK PRE-DELIVERY REQUIREMENTS

NOTE: *Before Brunswick equipment is delivered to the job site, the following conditions must exist to sustain the Brunswick warranty on lanes and equipment.*

The Shell

The entire building must be enclosed. This includes a watertight roof and permanent windows and doors.

The building must be able to be locked and security provisions for storage of Brunswick equipment and mechanic's tools and machinery are required.

Bowling Lane Area

The area for bowling lane installation must be perfectly squared. The curtain wall must be parallel with the end of the approach. If the curtain wall will extend down far enough to block the installation of the pinsetters, construction of the curtain wall must be delayed until after the pinsetters are installed on the kickbacks. The walls along the sides of the first and last lanes should be parallel and squared with the side of the approach, thereby insuring a perfect rectangle.

Concrete Floor

A floor loading certificate, prepared by the architect, is required by Brunswick prior to delivery of Brunswick products. It is necessary that all interior concrete flooring be poured 4" (102 mm) thick and completely dried before arrival of the bowling lane materials to prevent moisture absorption by these materials. A minimum of 30 days is required for the cure time.

The concrete floor of the bowling lane area must be power-troweled and level to within 1/2" (13 mm).

The concrete floor must be waterproofed under the bowling lane area.

All conduit and raceways must be securely placed and checked for accuracy of location in the concrete slab.

Ceiling

The ceiling must be completed before the installation of the bowling lanes begins. Brunswick mechanics cannot work if the bowling lane area is occupied by scaffolding and other equipment used by electricians and other mechanics working on the ceiling or floor. Regardless of the type of ceiling material selected, a provision should be made for supporting Brunswick scorer overhead equipment. Refer to the scoring system pre-installation manual. Refer to Section 6 of this Guide for the proper structural certificate.

Sprinkler Systems

The sprinkler system must be installed and tested prior to installing the lanes.

Lighting

The lighting must be completed before the installation of the bowling lanes begins. Permanent light fixtures should be installed to insure adequate working light. Brunswick mechanics cannot work if the bowling lane area is occupied by scaffolding and other equipment used by electricians working on the ceiling.

Electrical Power

Electrical power for suitable illumination, electrical tools, and equipment used by our mechanics is to be furnished and supplied by the purchaser at his expense and must be available at the time installation commences.

NOTE: *A contractor's temporary line is not sufficient. Electrical Outlets must be permanent. Generator power is not acceptable.*

Permanent Pinsetter Power Wiring

Permanent power wiring must be completed before the installation of automatic pinsetters commences. Confirmation of ability to furnish necessary voltage and adequate service capacity is required from the utility company prior to delivery by Brunswick of the automatic pinsetters and Brunswick automatic scorers.

Climate Control

Continuous controlled atmosphere as outlined in the Heating and Ventilation section of this manual must be maintained prior to delivery of any bowling lane materials to the job site and throughout the installation period. This is to insure ideal installation conditions, continuing minimum maintenance problems, uniform high scoring quality of the lanes, and also, ***to insure the validity of Brunswick warranties.***

Unloading and Storage Space

An adequate unloading area with a suitable driveway must be directly accessible to vehicles to facilitate the unloading of bowling lane materials. Adequate area in addition to the bowling area must be provided for the storage of foundation materials and lane panels and for the storage of equipment, supplies, and tools. This area shall be secure against pilferage and shall be dry and clear of all other trades or their equipment and supplies. *All materials delivered to the job site address is the responsibility of the customer.*

Equipment Entrance Requirements

Adequate entrance space must be available for pinsetters and lane panels. Refer to "Door Size for Building Access" in Section 3 of this guide.

Toilet Facilities

It is necessary that toilet facilities be provided for use by installation personnel.

Dumpster

Customer must provide and maintain a 30 cubic yard (23 cubic meters) dumpster before Brunswick installation.

Threshold Molding

Threshold molding between the approach area of the lanes and the bowler's seating area is the customer's responsibility.

Section 5: Charts & Check Lists

PROFIT OPPORTUNITIES CHECK LIST

- ☐ Billiards
- ☐ Arcade/Game Room
- ☐ Laser Tag
- ☐ Go Karts
- ☐ Golf
- ☐ Tennis
- ☐ Volleyball
- ☐ Bumper Cars
- ☐ Skate Park
- ☐ Rock Climbing Wall
- ☐ Water Park
- ☐ Theater
- ☐ Restaurant/Cafe/ Snack Bar
- ☐ Sports Bar/Night Club/Disco/Karaoke
- ☐ Party Room
- ☐ Pro Shop
- ☐ Nursery
- ☐ Lockers
- ☐ Bocce Ball

BOWLING LANE WIDTHS

The following dimensions are net measurements of the uninterrupted lane widths only, and therefore, additions should be made for columns, walls, and passages between lanes or beside them.

No. of Uninterrupted Lanes	Minimum Width with 10-1/2" Returns	No. of Lanes	Minimum Width w/out Returns for Separated/ Unnatural Lane Break
1	6' 8-1/4" (2.038 m)	1	5’ 7-3/4” (1.721 m)
2	11' 6" (3.505 m)		
3	17' 9-1/2" (5.423 m)	3	16’ 9” (5.105 m)
4	22' 7-1/4" (6.890 m)		
5	28’ 11” (8.814 m)	5	27’ 10-1/4” (8.496 m)
6	33' 8-1/2" (10.274 m)		
8	44' 9-3/4" (13.659 m)		
10	55' 11" (17.043 m)		
12	67' 0-1/4" (20.428 m)		
14	78' 1-1/2" (23.813 m)		
16	89' 2-3/4" (27.197 m)		
18	100' 4" (30.582 m)		
20	111' 5-1/4" (33.966 m)		
22	122' 6-1/2" (37.351 m)		
24	133' 7-3/4" (40.735 m)		
26	144' 9" (44.120 m)		
28	155' 10-1/4" (47.504 m)		
30	166' 11-1/2" (50.889 m)		
32	178' 0-3/4" (54.274 m)		
34	189' 2" (57.658 m)		
36	200' 3-1/4" (61.043 m)		
38	211' 4-1/2" (64.427 m)		
40	222' 5-3/4" (67.812 m)		
42	233' 7" (71.196 m)		
44	244' 8-1/4" (74.581 m)		
46	255' 9-1/2" (77.965 m)		
48	266' 10-3/4" (81.350 m)		

NOTE: *For each additional pair of lanes above 48 lanes, add 11' 1-1/4" (3.385 m).*

NOTE: *For unnatural lane breaks, contact your Regional Service Manager for layout assistance.*

BRUNSWICK PRE-DELIVERY CHECK LIST

ALL of the following requirements are required to be completed before Brunswick installation can start. Failure to complete ALL of these requirements will delay the construction completion of Brunswick bowling products.

☐ Shell of Building

☐ Bowling Lane Area

☐ Concrete Floor - 30 minimum cure time

☐ Lighting
- PERMANENT lighting fixtures are required

☐ Ceiling
- Structure for overhead monitors
- Wireway from scoring computer to overheads ONLY for open ceiling
- Ceiling completed
- Sprinkling system

☐ Climate Control
- Heating and cooling operational. Humidity control to be at Brunswick standards of 40-50%.

☐ Electrical Power
- Permanent power for power tools. GENERATOR power is NOT acceptable.
- Pinsetter Power
- Ball Lift Power
- Foul Light Power
- Pinball Wizard Power

☐ Unloading and Storage Space - Internal

☐ Unloading and Storage Space - Parking Lot

☐ Equipment Entrance

☐ Toilet Facilities

☐ Dumpster

CE

NOTE!: *Completion of structural and electrical elements as specified in this guide for compliance to the Machinery Directive Including the required service aisle width, required ceiling height and required lighting fixtures and locations.*

NOTE: *If any of the Brunswick pre-delivery requirements are not complete, the customer will be responsible to pay for all additional material, labor, or mobilization charges.*

RENTAL SHOE QUANTITIES

The following chart is an example of the quantity and sizes of shoes for a typical 24 lane Family Entertainment Center.

QTY PER 24 LANES	SHOE TYPE
13	Youth size 8
15	Youth size 9
15	Youth size 10
15	Youth size 11
15	Youth size 12
16	Youth size 13
18	Youth size 1
16	Youth size 2
16	Youth size 3
16	Youth size 4
13	Men size 4/Women size 5.5 - universal
17	Men size 4.5/Women size 6 - universal
17	Men size 5/Women size 6.5 - universal
19	Men size 5.5/Women size 7 - universal
17	Men size 6/Women size 7.5 - universal
24	Men size 6.5/Women size 8 - universal
23	Men size 7/Women size 8.5 - universal
15	Men size 7.5/Women size 9 - universal
16	Men size 8/Women size 9.5 - universal
16	Men size 8.5/Women size 10 - universal
18	Men size 9/Women size 10.5 - universal
24	Men size 9.5/Women size 11 - universal
21	Men size 10/Women size 11.5 - universal
20	Men size 10.5/Women size 12 - universal
19	Men size 11/Women size 12.5 - universal
19	Men size 11.5/Women size 13 - universal
16	Men size 12
11	Men size 13
5	Men size 14
4	Men size 15
4	Men size 16
4	Men size 17
497	**Total**

HOUSE BALL QUANTITIES

The following chart is an example of the quantity and ball weights for a typical 24 lane Family Entertainment Center.

Recommended House Ball Quantities for a 24 Lane Center										
Ball Weight	6 lbs.	7 lbs.	8 lbs.	9 lbs.	10 lbs.	11 lbs.	12 lbs.	13 lbs.	14 lbs.	15 lbs.
No. of Balls	24	22	22	22	22	22	22	22	22	22

Section 6: Required Certificates

The following section contains all the certificates required for Brunswick equipment. The certificates are required only for Brunswick equipment purchased. The Brunswick salesman will be responsible for the collection of any certificates.

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Brunswick Floor Loading Certification

I, by signing this document certify to Brunswick Corporation and to the proprietor named below, that:

1. I am an Engineer/Architect licensed by and in good standing with the state of_____; and

2. I have examined the floor loading diagram for Brunswick Bowling equipment and that I have examined the premises, especially the_____floor on which the Brunswick Bowling Equipment is to be installed at _____

3. I further certify that the _____ floor of the premises which I examined will support _____ lanes of Brunswick Bowling equipment.

_____
(Print Name of Architect or Structural Engineer)

_____
(Signature of Architect and Date)

_____
(Title)

_____
(License Number)

_____
Seal

_____
(State of)

Certification and Release of Brunswick by Proprietor

I, _____ as proprietor or as duly-authorized representative of the proprietor, certify to Brunswick Bowling Products Corporation that:

1. The proprietor has obtained the above floor loading certification for the proprietor's own benefit; and

2. The proprietor is not relying on Brunswick for assurance that the floor structure described in the *"Floor Loading Certification"* will support the pinsetters with kickbacks selected by proprietor and installed by Brunswick.

In consideration of Brunswick's agreement to install the pinsetters, and by signing below, proprietor for proprietor's own self and for proprietor's heirs, successors, assigns, employees, agents, representatives, insurers, contractors, subcontractors, invitees, and their spouses and relatives ("Proprietor Group"), releases and agrees to indemnify Brunswick, its officers, directors, employees, shareholders, parent company, subsidiaries, and affiliated companies, insurers, agents, contractors, and subcontractors from all claims, demands, action, cause of action, or their functional equivalent, that any member of the Proprietor Group may have or which may subsequently accrue to a member of the Proprietor Group arising out of or connected with, directly or indirectly, they inability of the floor structure described in the above *"Floor Loading Certification"* to support the pinsetters installed by Brunswick in accordance with the floor loading specifications on the reverse side of the sheet.

Send To: Service Department
Brunswick Bowling Products
Muskegon, MI 49441-2601
Email: *install@brunswickbowling.com*

_____
(Print Name of Proprietor or Corporate Officer))

_____
(Signature and Date)

_____
(Title)

(Rev 01-16)

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Brunswick Fire Resistant Construction Certification

The Brunswick lane foundation consists of high pressure laminate mechanically fastened to a wooden underlayment of engineered strand board. The underlayment is spaced above the floor by engineered lumber I-joists. These components do not meet requirements of non-combustible material. It is the responsibility of the proprietor and proprietor's architect to investigate and comply with local building codes. If additional labor and/or materials need to be added to Brunswick's standard installation in order to comply with local codes, it must be done at expense of the proprietor.

Below is some information the architect may find helpful in complying with local codes. The information is taken from the 2015 Edition of the *"International Building Code"* written by International Code Council. The International Code Council consists of representatives from Building Officials and Code Administrators International, the International Conference of Building Officials and, the Southern Building Code Congress International. The intent of this code was to draft a comprehensive set of regulations for building systems consistent with and inclusive of the scope of their existing model codes. The requirements for bowling lane construction can be interpreted many ways. This code makes clear reference to bowling and lane construction below.

The 2015 Edition of the International Building Code states:

Section 603 - COMBUSTIBLE MATERIAL IN TYPES I AND II CONSTRUCTION

603.1 Allowable materials. Combustible materials shall be permitted in buildings of type I or II construction in the following applications and in accordance with sections 603.1.1 through 603.1.3:

10. Finish flooring installed in accordance with section 805.

Section 805 – COMBUSTIBLE MATERIALS IN TYPES I AND II CONSTRUCTION

805.1 Application. Combustible materials installed on or embedded in floors of buildings of Type I or II construction shall comply with sections 805.11 through 805.1.3.

805.1.1 Subfloor construction. Floor sleepers, bucks, and nailing blocks shall not be constructed of combustible materials, unless the space between the fire-resistance rated floor assembly and the flooring is either solidly filled with noncombustible materials or fireblocked in accordance with section 718, and provided that such open spaces shall not extend under or through permanent partitions or walls.

Section 718 - CONCEALED SPACES

718.2.7 Concealed sleeper spaces. Where wood sleepers are used for laying wood flooring on masonry or concrete fire-resistance-rated floors, the space between the floor slab and the underside of the wood flooring shall be filled with an approved material to resist the free passage of flame and products of combustion or fireblocked in such a manner that there will be no open spaces under the flooring that will exceed 100 square feet (9.3m□) in area and such space shall be filled solidly under permanent partitions so that there is no communication under the flooring between adjoining rooms.

Exceptions:

2. Fireblocking is required only at the juncture of each alternate lane and at the ends of each lane in a bowling facility.

Brunswick has installed many bowling centers where the proprietor's contractor installed mineral wool or fiberglass batt insulation (non combustible) fireblocking as specified above. However, by signing below, the proprietor acknowledges that it is the sole responsibility of the proprietor to investigate and comply with local building codes and to secure appropriate methods, and seek code approval for the fire-resistance-rated construction if required prior to the start of installation, and pay for all associated material and labor.

Print or Type Name of Proprietor or Corporate Officer

Signature

Title

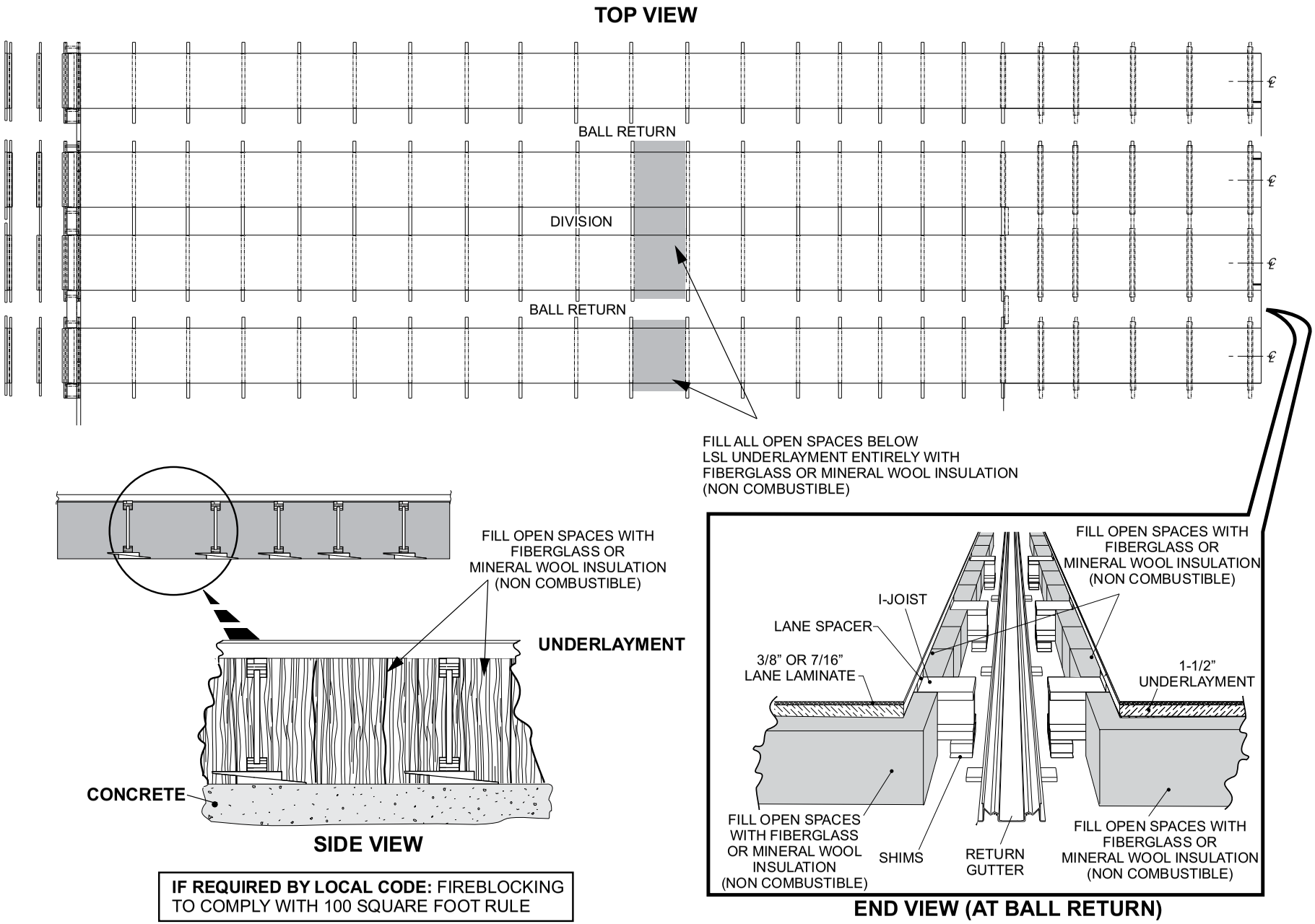
Date

Send To: Service Department
Brunswick Bowling Products
Muskegon, MI 49441-2601

Email: *install@brunswickbowling.com*

(Rev 01-16)

Fireblocking Overview



Brunswick Curtain Wall Structure Certification

I, by signing this document, certify to Brunswick Bowling Products Corporation and to the proprietor named below that:

1. I am an engineer/architect licensed by and in good standing with the State of _____; and

2. I have examined the bowling center premises known as _____ located at _____ ; and

3. The curtain wall structure of the bowling center is fully and safely capable of supporting the configuration of curtain wall electronic units, not exceeding not exceeding 30 pounds actual/static weight for each peripheral controller OR 100 pounds actual/static weight for each scoring computer to be attached to the curtain wall or suitable structure by the means and methods set forth in the support specifications on the reverse side of this sheet.

_____
Print or Type Name of Architect or Structural Engineer

_____
Signature of Architect or Structural Engineer

_____
Title

_____ _____
Seal Date

Certification and Release of Brunswick by Proprietor

I, _____, as the proprietor or as duly-authorized representative of the proprietor, certify to Brunswick Bowling Products Corporation that:

1. The proprietor has obtained the above Structure Certification for the proprietor's own benefit; and
2. The proprietor is not relying upon Brunswick for assurance that the curtain wall or suitable structure described in the Structure Certification will support the curtain wall electronic units selected by the proprietor and installed by Brunswick.

In consideration for Brunswick's agreement to install the curtain wall electronic units, and by signing below, proprietor for proprietor's own self and for proprietor's heirs, successors, assigns, employees, agents, representatives, insurers, contractors, subcontractors, invitees, and their spouses and relatives ("Proprietor Group"), releases and agrees to indemnify Brunswick, its officers, directors, employees, shareholders, parent company, subsidiaries, and affiliated companies, insurers, agents, contractors, and subcontractors from all claims, demands, actions, causes of action, or their functional equivalent, that any member of the Proprietor Group may have or which may subsequently accrue to a member of the Proprietor Group arising out of or connected with, directly or indirectly, the inability of the curtain wall or suitable structure described in the above Structure Certification to support the curtain wall electronic units installed by Brunswick in accordance with the support specifications on the reverse side of this sheet.

_____
Print or Type Name of Proprietor or Corporate Officer

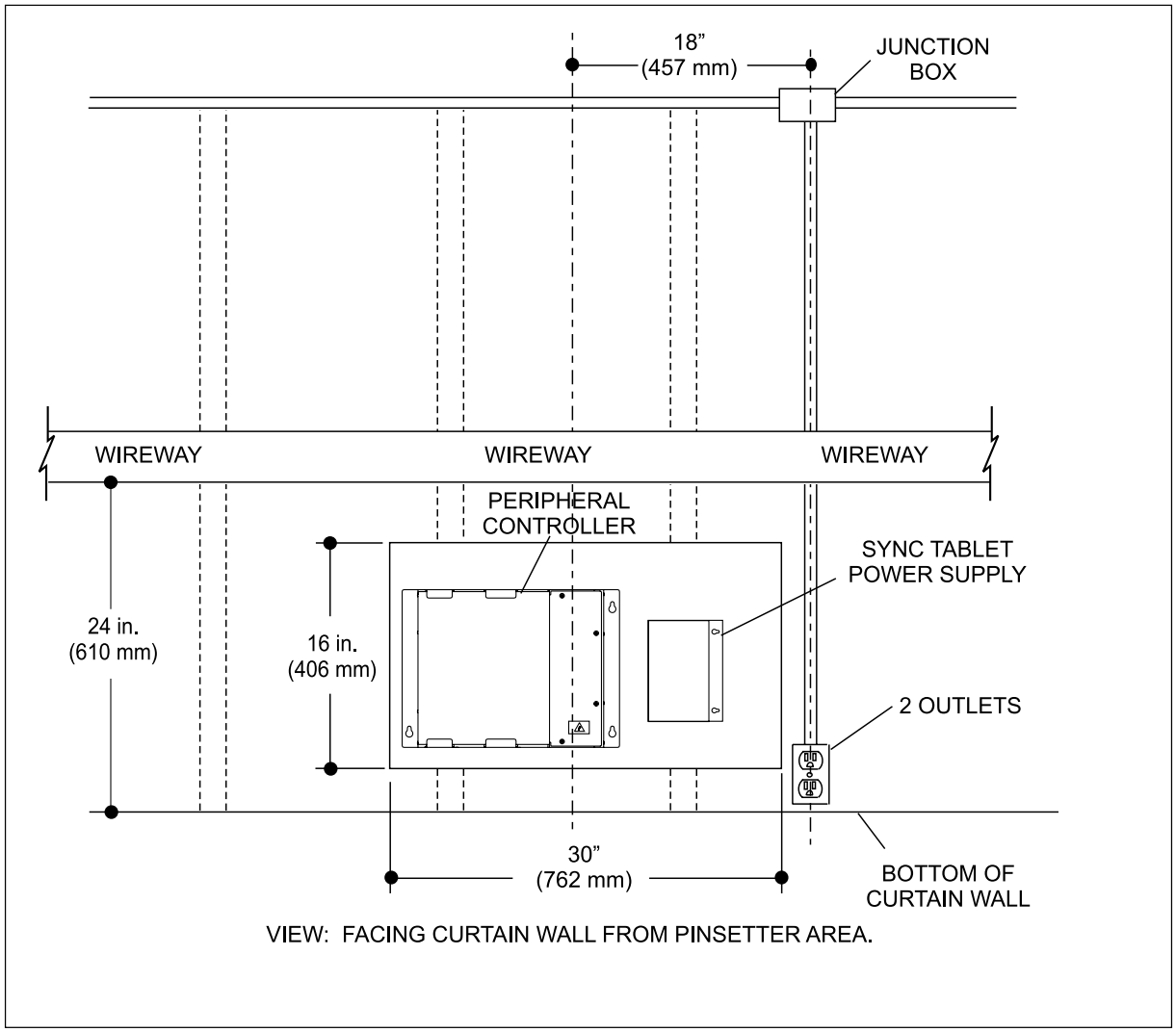
_____
Signature

_____
Title

_____
Date

Send To: Contract Management
Brunswick Bowling Products
Muskegon, MI 49441-2601
Email: *BBB.MSK.ContractManagement@brunswickbowling.com*
Fax: 231-725-4464

Using the preferred method of support for the curtain wall electronics, the customer is responsible for supplying, installing, and maintaining the proper position of the electronics located on the curtain wall. If a curtain wall is not available, a support structure must be installed to accommodate the 30 pounds actual/static weight load per lane pair.



Curtain Wall Mounting - Sync Scoring

Brunswick Wide Screen LED Overhead Video Display Structure Certification

MONITORS / WELDMENT				
MONITOR / WELDMENT SIZE*	QTY	* LBS	* KG	TOTAL WEIGHT
32" Monitors (lb/kg)		10.5	4.8	
43" Monitors (lb/kg)		17.9	8.1	
50" Monitors (lb/kg)		25.2	11.4	
55" Monitors (lb/kg)		30.7	13.9	
Weldment Length (Feet / Meter)		4.6	6.9	
TOTAL				

NOTE: *It is the Brunswick salesman's responsibility to verify the quantity column(s) in Figure 1.*

** Samsung LED monitor weight as specified in Samsung's product specification literature for models; DB32E, BE50T-H, BE50T-H, and BE55T-H*

Figure 1. LED Monitors with Wide Screen Continuous Mounting Structure.

Certification & Release of Brunswick by Architect/Structural Engineer

I, by signing this document, certify to Brunswick Bowling Products Corporation and to the proprietor named below, that:

1. I am an engineer/architect licensed by and in good standing with the State of _____; and
2. I have examined the bowling center premises known as _____;

   located at; _____; and
3. The roof structure of the bowling center is fully and safely capable of supporting the additional static weight for each LED Overhead Video Display unit as indicated in ***Figure 1***. Display support to be attached to the roof structure by the means and methods set forth in the support specifications on the reverse side of this page.

_____
Print or Type Name of Architect or Structural Engineer

_____
Signature of Architect or Structural Engineer

_____
Title

_____ _____
Seal Date

Certification & Release of Brunswick by Proprietor

I, _____, as the proprietor or as duly-authorized representative of the proprietor, certify to Brunswick Bowling Products Corporation that:

1. The proprietor has obtained the above Structure Certification for the proprietor's own benefit; and
2. The proprietor is not relying upon Brunswick for assurance that the roof structure described in the Structure Certification will support the LED Overhead Video Display units selected in ***Figure 1*** by the proprietor and installed by Brunswick.
3. The proprietor will not hang anything other than the Brunswick-provided video displays from the display supports, and will monitor the bowling center to ensure that customers of the center do not hang or place weight in any way on the display supports.

In consideration of Brunswick's agreement to install the LED Overhead Video Display units indicated in ***Figure 1***, and by signing below, proprietor, for proprietor's own self and for proprietor's heirs, successors, assigns, employees, agents, representatives, insurers, contractors, subcontractors, invitees, and their spouses and relatives ("Proprietor Group"), releases and agrees to indemnify and hold harmless Brunswick, its officers, directors, employees, shareholders, parent company, subsidiaries, and affiliated companies, insurers, agents, contractors and subcontractors (collectively, "Brunswick") from all liability, claims, demands, actions, causes of action, or their functional equivalent, that any member of the Proprietor Group or Brunswick may have or may subsequently accrue to any member of the Proprietor Group or Brunswick arising out of or connected with, directly or indirectly, (i) the inability of the roof structure described in the Structure Certification to support the LED Overhead Video Display units indicated in ***Figure 1*** and installed by Brunswick in accordance with the support specifications on the reverse side of this sheet, or (ii) the inability of the display supports to support any weight placed upon it in excess of the weight of the Brunswick-provided video displays.

_____
Print or Type Name of Proprietor or Corporate Officer

_____
Signature

_____
Title

_____
Date

Send To: Contract Management
Brunswick Bowling Products
Muskegon, MI 49441-2601
Email: *BBB.MSK.ContractManagement@brunswickbowling.com*
Fax: 231-725-4464

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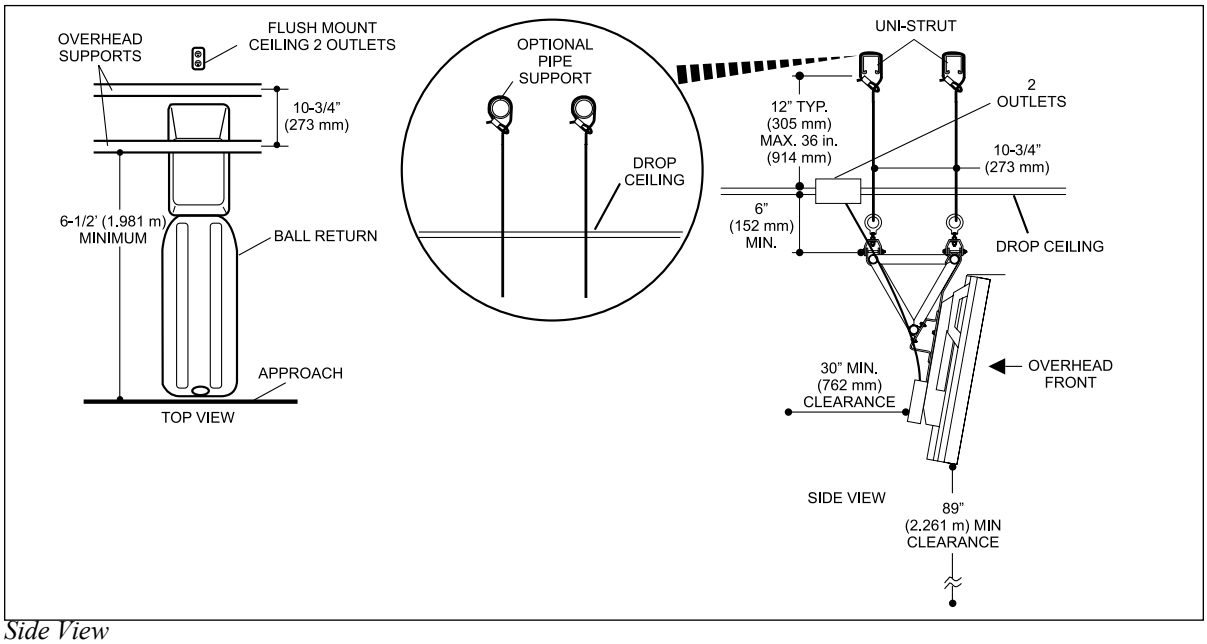
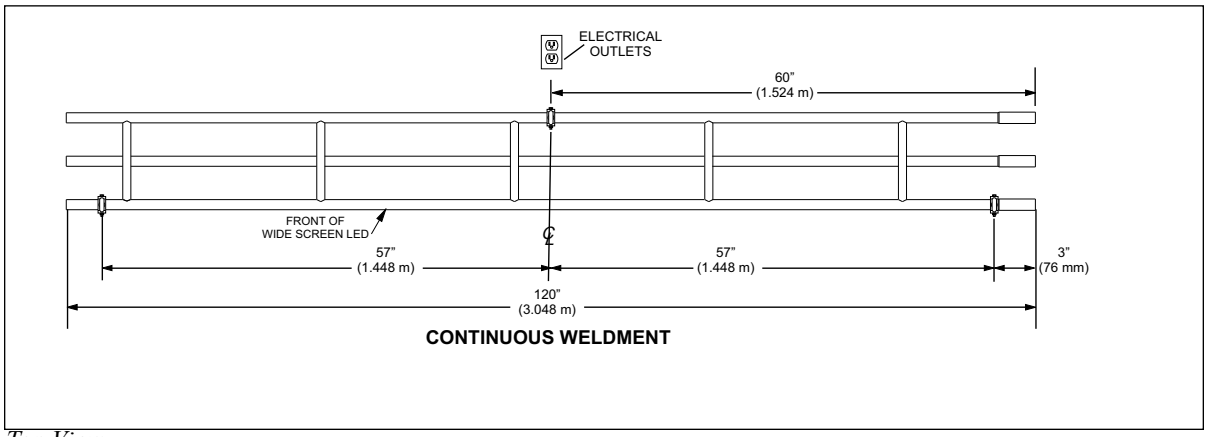
Wide Screen LED Overhead Video Display Support Specifications

The customer is responsible for supplying, installing, and maintaining the proper position of these beams or pipe (refer to figures below) and for having certification from an architect or structural engineer that the method of support will be capable of supporting an additional weight actual/static per lane pair for up to triple overheads.



Side View



Top View

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Brunswick Proprietor Supplied Overhead Display Structure Certificate

I, by signing this document, certify to Brunswick Bowling Products Corporation and to the proprietor named below that:

1. I am an engineer/architect licensed by and in standings with the State of _____; and

2. I have examined the bowling center premises known as _____
Located at; _____ and

3. The roof structure of the bowling center is fully and safely capable of supporting a 45 pound overhead display support (to be attached to the roof structure by the means and methods set forth by the engineer/architect of the State), in addition to a number of the proprietor's supplied overhead displays, which support _____ pounds actual/static weight for each pair of bowling lanes in the center.

_____
Print or Type Name of Architect or Structural Engineer

_____
Signature of Architect or Structural Engineer

_____
Title

_____ _____
Seal Date

Certification and Release of Brunswick by Proprietor

I, _____, as the proprietor or as duly-authorized representative of the proprietor, certify to Brunswick Bowling Products Corporation that:

1. The proprietor has obtained the above Structure Certification for the proprietor's own benefit; and

2. The proprietor is not relying upon Brunswick for assurance that the roof structure described in the Structure Certification will support the Overhead Video Display units selected by the proprietor and installed by the proprietor.

In consideration of the proprietor's agreement to install the Overhead Video Display units selected by the proprietor, and by signing below, proprietor, for proprietor's own self and for proprietor's heirs, successors, assigns, employees, agents, representatives, insurers, contractors, subcontractors, invitees, and their spouses and relatives ("Proprietor Group"), releases and agrees to indemnify and hold harmless Brunswick, its officers, directors, employees, shareholders, parent company, subsidiaries, and affiliated companies, insurers, agents, contractors and subcontractors (collectively, "Brunswick") from all liability, claims, demands, actions, causes of action, or their functional equivalent, that any member of the Proprietor Group or Brunswick may have or may subsequently accrue to any member of the Proprietor Group or Brunswick arising out of or connected with, directly or indirectly, (i) the inability of the roof structure described in the Structure Certification to support the Overhead Video Display units installed by proprietor in accordance with the support specifications on this sheet, or (ii) the inability of the display supports to support any weight placed upon it in excess of the weight of the proprietor-provided video displays.

Send To: Contract Management
Brunswick Bowling Products
Muskegon, MI 49441-2601
Email: *BBB.MSK.ContractManagement@brunswickbowling.com*
Fax: 231-725-4464

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Compliance Acknowledgement Form

Brunswick provides a CE Declaration of Conformity for GS-X, GS NXT, and String pinsetters when installed to the specifications in this Guide and when properly provisioned with Brunswick Advanced Guarding packages.

Deviations from this Guide should be made only with advice and consent from local safety inspectors!

The Brunswick distributor and the Customer hereby acknowledge that they have reviewed this Guide and the specifications required for the compliance to the machinery directive and local health and safety regulations as follows.

- Perimeter guarding system (GS-X, GS NXT)
- Local guarding system (String Only)
- Position of the curtain wall
- Position of the masking unit
- Position of pinsetters in relation to walls
- Required ceiling heights
- Height of guards near raised platforms
- Requirements for ambient lighting
- Sound isolation and employee access
- Security requirements for the machine area
- Position of raised walking platforms

The Brunswick distributor and the Customer further acknowledge that the Brunswick CE Declaration of Conformity and associated warranty are dependent upon compliance to the specifications in this Guide and that the Customer has chosen the method of compliance as specified below.

_____ _____

Distributor Signature **Date**

_____ _____

Customer Signature **Date**

_____ The Customer plans to rely upon the Brunswick Declaration of Conformity and is planning a building structure, pinsetter installation and safe system of work compliant with this Guide.

_____ The Customer plans to deviate from this Guide and will rely upon consultation of local health and safety experts and inspectors for compliance to the Machinery Directive and the relevant local health and safety regulations.

_____ _____

Distributor Signature **Date**

_____ _____

Customer Signature **Date**

Send To: Contract Management
Brunswick Bowling Products,
Muskegon, MI 49441-2601

Email: BBB.MSK.ContractManagement@brunwickbowling.com

Fax: 231-725-4464

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Commissioning Form

The Brunswick distributor and Customer hereby acknowledges that they have reviewed the installation of Brunswick GS-X, GS NXT, or String pinsetters installed at _____ and that the following elements comply with specifications defined in the Guide as follows:

- Perimeter guarding system (GS-X, GS NXT)
- Local guarding system (String Only)
- Position of the curtain wall
- Position of the masking unit
- Position of pinsetters in relation to walls
- Required ceiling heights
- Position of raised walking platforms
- Height of guards near raised platforms
- Requirements for ambient lighting
- Sound isolation and employee access
- Required training for operators
- Security requirements for the machine area
- Required safe work systems compliant with Brunswick Operations & Service Manuals

The Customer further acknowledge that compliance with local health and safety regulations requires the following:

- The pinsetters be maintained as installed
- The pinsetter safeguards not be removed, modified or bypassed
- The pinsetter operators be trained on safe systems of work
- The safe systems of work be enforced by management personnel

The Customer hereby requests issuance of the Brunswick CE Declaration of Conformity and related warranty.

_____ _____

Distributor Signature **Date**

_____ _____

Customer Signature **Date**

Send To: Service Department
Brunswick Bowling Products
Muskegon, MI 49441-2601

Email: *install@brunswickbowling.com*

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COMPREHENSIVE PLANNING GUIDE ACKNOWLEDGEMENT SHEET

PROJECT: _____

CONTRACT #: _____ **DATE:** _____

This is to acknowledge that I have received the Brunswick Comprehensive Planning Guide from the Brunswick representative listed below and we have reviewed the contents of the Planning Guide that specifically relate to the project titled above. For projects including pinsetters. I understand the guarding options and requirements. I also understand that if I have further questions or concerns, I should contact the Brunswick representatives listed on the Brunswick Comprehensive Planning Guide Contact Sheet, located at the front of the Comprehensive Planning Guide.

_____
Brunswick Representative (Print)

_____
Recipient Signature

_____
Recipient Name (Print)

_____
Recipient Company

_____
Recipient Title

Send To: Contract Management
Brunswick Bowling Products
Muskegon, MI 49441-2601
Email: BBB.MSK.ContractManagement@brunswickbowling.com
Fax: 231-725-4464