Pre-Installation Manual

Sync

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Brunswick®
CUSTOMER SERVICE
A tradition in excellence.

Sync Pre-Installation Manual

Manual Part No. 10-095400-091

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

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SAFETY

Throughout this publication, “Warnings”, and “Cautions” (accompanied by one of the International HAZARD Symbols) are used to alert the mechanic to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. They are defined below. **OBSERVE AND READ THEM CAREFULLY!**

These “Safety Alerts” alone cannot eliminate the hazards that they signal. Strict compliance to these special instructions when performing the service, plus training and “Common Sense” operation are major accident prevention measures.

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.

CONTENTS

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Overview

The Brunswick Sync scoring system consists of several pieces of equipment that can be divided into two subsystems; the Scoring System and the center network system.

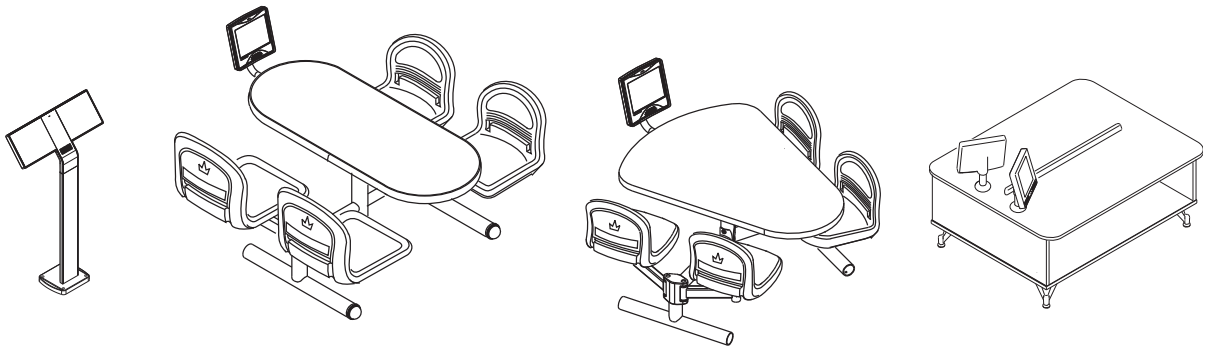
The scoring system consists of electronic assemblies located in the bowler and pinsetter areas. These assemblies control the pinsetter, perform automatic scoring functions, provide the bowler with input capabilities, and display information about the game in progress.

The scoring system is available with keypads or tablets and overhead monitors. A peripheral controller interfaces the bowler keypads or tablets and a display controller supplies video for the overhead monitors. Additional equipment such as Pin Cameras or GS pinsetters and automated bumpers are connected to the peripheral controller as needed.

The center network system consists of one or more computers located at the control desk and as needed various other locations around the bowling center. The main function of center management system is to provide the bowling center personnel convenient control of the scoring system and lanes from the control desk as well as point-of-sale (POS) terminals for other areas of the center.

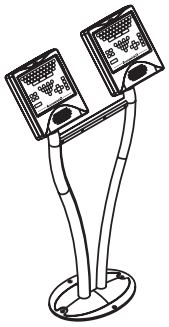
SYNC TABLET

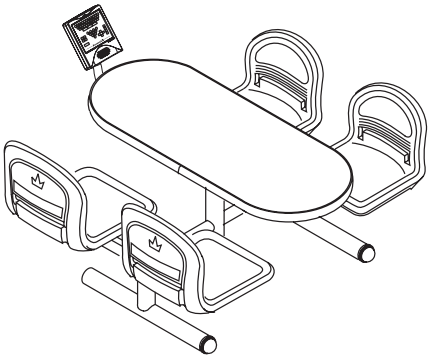
Sync tablet is the top of the line scoring system in Sync. This system offers a lower touchscreen monitor and overhead monitors. Sync Tablet offers the convenience of touchscreen entry that can be free standing or integrated with Brunswick furniture in a table mount configuration. This offers the customer a full range of audio and video functionality of our Center Network systems. This system also allows the bowler the full bowler interface for name entry, score correction, and other special functions.

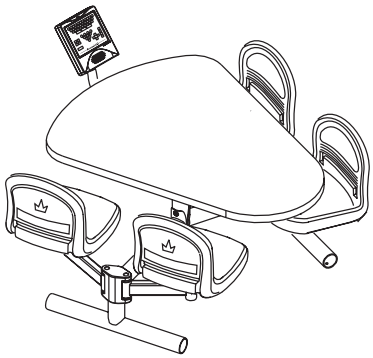


BOWLER'S KEYPAD

This system consists of the overhead monitor and a keyboard console. This system gives the customer the ability of the Sync scorer. The system enables bowler interface into the system. This includes name entry, score correction, and the menu options. Like Bowler's Touchscreen, Bowler's Keypad is offered in both free standing and table mount configurations.







IMPORTANT!: There are two types of bowler's keypads compatible with Sync. The Sync keypad and the Vector keypad, Vector touchscreen is NOT compatible with Sync.

SYNC

Sync is Brunswick's versatile center management system. The system is a network of Windows based PCs (clients) tied to a single server PC. The server is normally located in the office. In some instances (when an office computer is not needed for example), the server can be located at the Control Desk and utilized as a Control Desk terminal.

Clients are used for Control Desk, snack bar, bar, pro shop, and billiards terminals, or any place a point-of-sale (POS) terminal is needed.

Each client and server is available with a standard 17" monitor. However, a 19" touchscreen monitor is also available for any POS terminal.

Preliminary Survey

BUILDING CONFIGURATION

Phase and Voltage

QUESTIONS	ANSWERS
☐ Pinsetter Sub panel	
NOTE: *Brunswick Surge Suppressors are required on each GS-pinsetter and scoring sub panels for new installations. All other installations have only one surge suppressor on the scorer panel.*	
☐ Scoring Sub panel	

Existing Equipment

QUESTIONS	ANSWERS
☐ Scoring	
☐ Bowler's Console	
NOTE: *Vector keypad bowler's consoles are compatible with Sync. Vector touchscreens are* ***NOT*** *compatible with Sync.*	
☐ Server Model Number	
☐ Quantity of Clients and Model Numbers	
☐ Camera Type	
☐ Capping Type	
☐ Ball Lift Type	
☐ Return Type	
☐ Automated Bumper Type	
☐ Foul Unit Type	
☐ Pinsetter Type	
☐ Overhead Type and Size	
☐ Masking Unit Type	

Lane Configuration

NOTE: *Special consideration will be needed for split house, multiple floors, and non-ground floor installations.*

QUESTIONS	ANSWERS
☐ Break or Post Row Pairs	
☐ Distance Between Break	
☐ Existing or New Building	

NEW EQUIPMENT

QUESTIONS	ANSWERS
☐ Scoring	
☐ Quantity of Client Computers	
☐ Digital Signage	
☐ Remote Order Printers	
☐ Wireless Handheld	
☐ Ticket Depot	
☐ Brunswick Music Network	
☐ Overhead Type and Size	
☐ Overhead Configuration	
☐ Masking Units	
☐ Video Projection Screen	
☐ Type of Pinsetter or Pinsetter Interface	

DISTANCES

Ceiling Height and Type of Ceiling

NOTE: Open ceilings require conduit or cable management system.

QUESTIONS	ANSWERS
☐ Over the Approaches	
☐ Over Lanes	
☐ At the Masking Units	
☐ Over the Pinsetter	

Ethernet

QUESTIONS	ANSWERS
☐ Quantity of Switches on Curtain wall	
☐ Distance from Curtain Wall Switch to Control Desk Switch	
☐ Distance from Switch Overhead Structure to Control Desk Switch	
☐ Distance from Control Desk Switch to Office	
NOTE: If there is an existing front desk switch, note how many ports it has.	
☐ Distance from Control Desk Switch to Client #1	
☐ Distance from Control Desk Switch to Client #2	
☐ Distance from Control Desk Switch to Client #3	
☐ Distance from Control Desk Switch to Client #4	
☐ Distance from Control Desk Switch to Client #5	
☐ Distance from Control Desk Switch to Client #6	

Intercom

QUESTIONS	ANSWERS
☐ Distance from the closest end lane bowlers keypad or touch screen to the audio box at control desk	

AUDIO/VIDEO

NOTE: *The Video Distribution Center can accept a variety of signal sources such as satellite boxes, cable set-top boxes, or DVD/Blu-ray players. The audio and video from each source is connected to a modulator that "assigns" a unique "TV" channel to the source. The number of modulators present in the system is determined by the number of video sources to that will be available for display on the monitors. When choosing modulators, it is important to consider the connection type available on the signal source, the output quality of the modulator (Standard or High Definition).*

Three different modulators are available.

MODULATOR	AVAILABLE VIDEO INPUT CONNECTIONS	AVAILABLE AUDIO INPUT CONNECTIONS	OUTPUT RESOLUTION
480 (STANDARD DEFINITION)	COMPOSITE VIDEO	ANALOG AUDIO (MONO) RCA	480I
720* (ENHANCED DEFINITION)	COMPONENT VIDEO	DIGITAL AUDIO (STEREO) (RCA OR OPTICAL)	UP TO 720P
1080* (HIGH DEFINITION)	COMPONENT VIDEO VGA (15 PIN)	ANALOG AUDIO (STEREO) DIGITAL AUDIO (RCA OR OPTICAL)	UP TO 1080I

* *Considered High Definition*

NOTE: *For any video source with only an HDMI connector, HDMI to Component adapter, pn 57-863630-000, must be purchased. VGA to Component adapter, pn 57-863631-000 is available for the 720 MODULATOR. Note: 57-863633-000, VGA to Component adapter ONLY FOR THE 1080 RESOLUTION MODULATOR.*

QUESTIONS	ANSWERS
☐ Quantity of separate sources to display on overheads	
NOTE: *Projectors video is not part of Sync scoring and must be supplied by customer.*	
☐ Quantity of 480 resolution modulator	
☐ Quantity of 720 resolution modulator	
☐ Quantity of 1080 resolution modulator	
☐ Distance from the Video Distribution Center to the middle of the bowling lanes at the overheads	
☐ Will the audio be connected to an external audio system?	
NOTE: *This may cause a timing issue between the audio and the video signals. Customer is responsible for supplying equipment to correct issue.*	

Sync Scoring Installation Schedule

IMPORTANT: ***The following is based on a typical 24 lane center. Schedules may vary depending on center configuration and product to be installed.***

CUSTOMER RESPONSIBILITY

NOTE: *All pre work must be completed prior to equipment arrival. This includes Control Desk assembly and installation.*

1. Site Survey to be performed by a Brunswick Field Engineer. The Field Engineer will need to meet with the center manager/proprietor, mechanic, electrician, and architect to cover the following:
    a. Determine non-bowling hours.
    b. Provide a copy of league schedules.
    c. Review electrical system needs.
    d. Review overhead structure needs.
    e. Review control desk and back office configurations.
    f. Review Pre-Installation manual.

2. Prepare bowlers area for consoles:
    a. Trenching for using electrical conduit.
    b. Dual console risers for existing scorer replacement or surface molding.
    c. Any tile work or carpeting.

3. Prepare control desk and office areas for routing of interconnecting cables.

4. Electrician installs electrical system, sub panels, outlets, surge suppressors, and switches for Tel-E-Foul units.

5. Install overhead monitor support structure.

6. Center to have a storage area ready for arrival of new equipment.

7. Brunswick receives credit approval.

IMPORTANT: ***An installation will not be scheduled until credit is approved and structural certificates are received.***

8. Brunswick receives structural certification from bowling center.

INSTALLATION SCHEDULE

IMPORTANT: ***Brunswick installation completion will be delayed if Brunswick pre-installation requirements are not met.***

To Be Performed By Certified Field Mechanic

Day 1

a. Travel to installation.
b. Unload truck and unpack equipment.

Days 2 and 3

a. Layout and routing of cables from scorer console to pinsetter area.

Day 4

a. Continue layout and routing of cables.
b. Mount equipment on curtain wall.

Days 5 and 6

a. Modify pinsetters.

Day 7

a. Route cables in back office and control desk areas.

Days 8, 9 and 10

a. Install Sync consoles, overheads, and associated cabling.

To Be Performed By Brunswick Field Engineer

Day 8

a. Travel to installation.
b. Power audit of electronic equipment.
c. Install control desk and back office computer systems.

Day 9

a. Continue setup of control desk.
b. Hook-up consoles and overheads.

Day 10

a. Continue console and overhead hook-up.
b. Begin setup of cameras and verify scoring.

NOTE*: Some lanes available for use. Possible league coverage.*

Day 11

a. Continue setup of cameras and verify scoring.
b. Adjust consoles and overheads.
c. Cover leagues and open bowling.

Day 12

a. Complete system checkup and go over spare parts kits.

To Be Performed By Brunswick Field Trainer

Day 9

a. Travel to installation.
b. Control desk management training.

Day 10

a. Scorer training.
b. Control desk session.
c. Possible league coverage.

Day 11

a. Continue control desk session.
b. Cover leagues and open bowling.

Days 12 and 13

a. Back office session (League Record Service, Tournament, Open Bowler Data Base, etc.)
b. Cover leagues and open bowling.

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Important

This document contains information on electrical, installation, conduit, and lighting for Brunswick automatic scorers. It also contains the information necessary for the preparation of a site conforming to Brunswick specifications. Any deviation from these specifications could cause problems to your equipment that may be difficult to detect and/or correct. If you have questions regarding this document, call 1-800-YES-BOWL (1-800-937-2695)

When planning to install Brunswick electronic scoring equipment, the customer is required to provide an electrical sub panel which is solely dedicated to the scoring systems with a neutral and ground buss. These requirements are necessary to prevent electrical noise and damage from lightning strikes. An improperly grounded system can also result in memory losses, erroneous signals, and/or component failures. The scoring sub panel must be installed by a licensed electrician and must meet all local and national codes.

SURGE SUPPRESSION

A transient voltage surge suppressor (TVSS) is supplied with the scoring system. The installation of this device is the responsibility of the customer through a licensed electrician. The unit will be installed on the "Pinsetter" **AND** "Scoring" sub panels. This unit is designed for the most demanding environment and incorporates multistage filtration in its design. The sine wave tracking series is engineered to remove the more complex disturbances found in the electrical environment, in particular, high and low voltage ringing transients and harmonic activity.

NOTE: *The surge suppressor wires should be as short as possible, with no coiling when installed on the sub panel. The TVSS device is provided with a plastic coupler to insulate the unit from the sub panel.*

BRUNSWICK'S RESPONSIBILITY

Brunswick scorer consoles are shipped with the necessary hardware for wood and cement floor installations. The aircraft cable for suspending the overhead monitors will be supplied by Brunswick.

POWER CONDITIONING

In some areas, additional power conditioning or uninterrupted power supply (UPS) equipment may be required to insure optimum performance of your scoring equipment. The purchase and installation of any power conditioning equipment is the responsibility of the customer, including a UPS system. If the bowling center is located in an area that has a history of frequent power failures or interruptions, the customer is advised to contact the Brunswick Electronic Repair. The Brunswick Electronic Repair Department will assist the customer with any additional equipment specifications or Brunswick approved power conditioning equipment required.

WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the pre-installation manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of F.C.C. Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

GROUNDING CONDUCTOR - NEC 384-27

The grounding conductor shall be permitted to pass through one or more sub panels without connection to the panel board grounding terminal as permitted by Section 384-27 Exception, so as to terminate directly at the applicable derived system or service grounding terminal.

EXTENDED POWER OUTAGE

The circuit breakers (electronic sub panel) must be clearly identified and should be left on at all times under normal operation. If power is to be out for an extended period of time, it is recommended that circuit breakers to the electronic equipment be turned off. When power is restored, transient voltages could be induced into the equipment if circuit breakers are not off.

CARPETING IN BOWLER'S AREA

It is not recommended mounting consoles on carpeting. Carpeting may cause static which can be induced into electronic equipment. If carpeting is necessary in the bowlers' area, it is recommended that anti-static type of carpeting be used.

CARPETING IN ELECTRONICS AREAS

It's the Customer's Responsibility: If carpeting is to be installed at the site, it must be a computer-grade type which will generate no more than 2,000 to 3,000 volts of static discharge at 20% relative humidity and a temperature of 22°C (72°F). If carpeting is already installed and is not of a computer-grade type, it should be treated with an antistatic or anti-shock solution after it is cleaned. The frequency of these treatments depends on the amount of floor traffic in the room. Raising the humidity level should also be considered to control the generation of static electricity. Maintain a humidity level of 40-60% to control the generation of static electricity.

ATMOSPHERIC CONDITIONS

It is important that the climate control is maintained throughout the center. Indoor humidity is a large factor in lane conditions as well preventing static electricity. A relative level of 40% must be maintained to obtain optimum characteristics and performance from all equipment. A minimum of 35% and a maximum of 50% is possible if the temperature is controlled and constant.

Electrical Overview

ELECTRICAL SUB PANEL SPECIFICATIONS

IMPORTANT!: ***All sub panels and wiring MUST comply with local and national electrical codes.***

Pinsetter Sub panel - The Pinsetter sub panel provides power to the GS-Series pinsetters and other Brunswick equipment. The pinsetter sub panel must be powered directly from the primary main service sub panel or transformer and must be three phase. Non-Brunswick equipment including electronic video games, arc welders, HVAC, compressors, etc., cannot share this sub-panel.

Scoring Sub panel - The Scoring sub panel is also directly powered from the main service sub panel or transformer. The Scoring sub panel powers computer and electronic equipment. It is important the power for the pinsetter sub panel is not mixed with the Scoring sub panel.

The **ONLY** type of equipment to be installed in the sub panels:

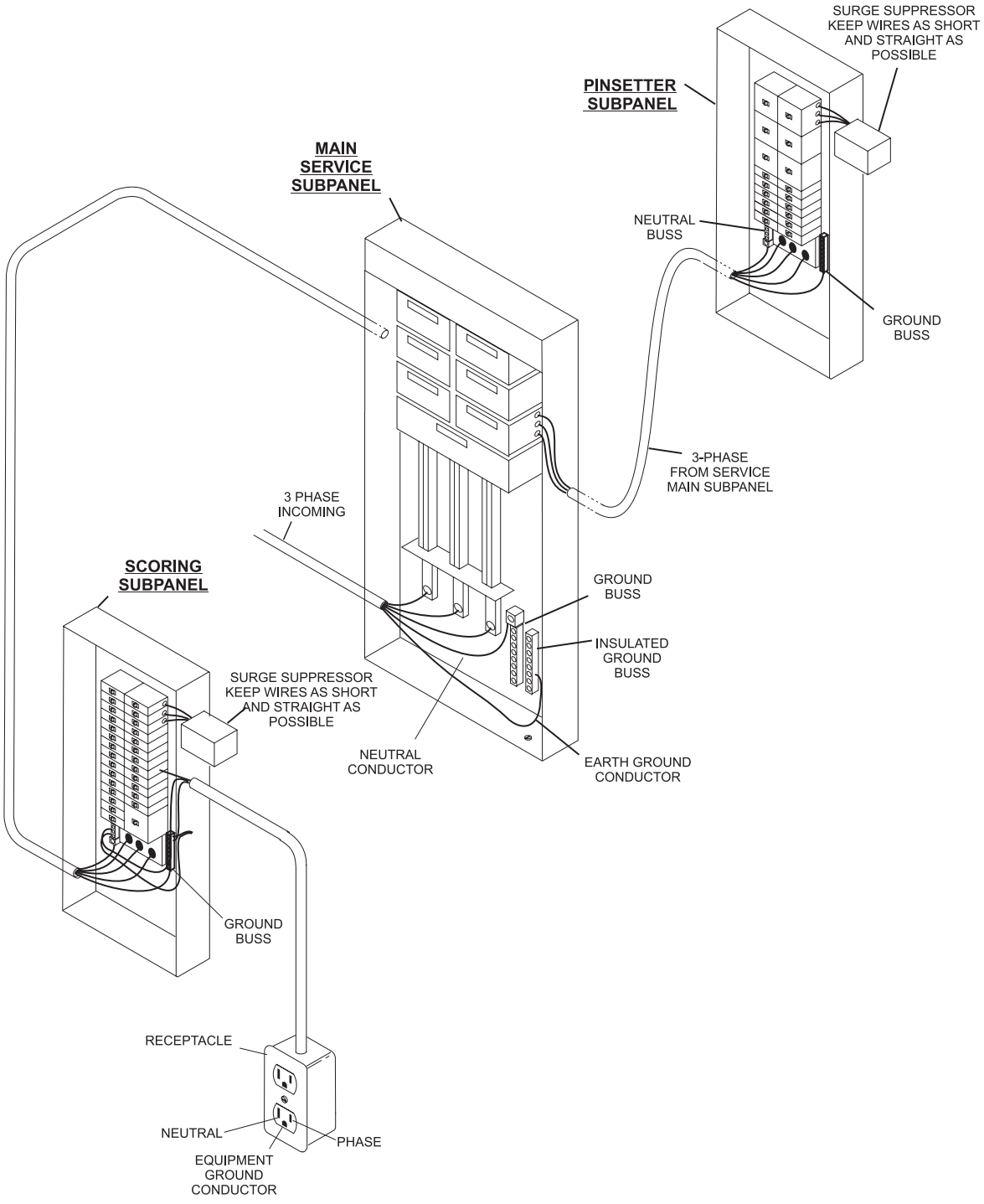
Pinsetter Sub panel

- GS-X Pinsetter
- Ball Lift
- Tel-E-Foul
- Lane Machine
- Ball Polisher
- Lightworx
- Lanescape Video Masking Unit

Scoring Sub panel

- Peripheral Controller
- Overhead Monitors
- Display Controller
- HD Video Distribution Center
- Server Computer
- Client Computer
- Automated - Pinball Wizard
- Digital Signage

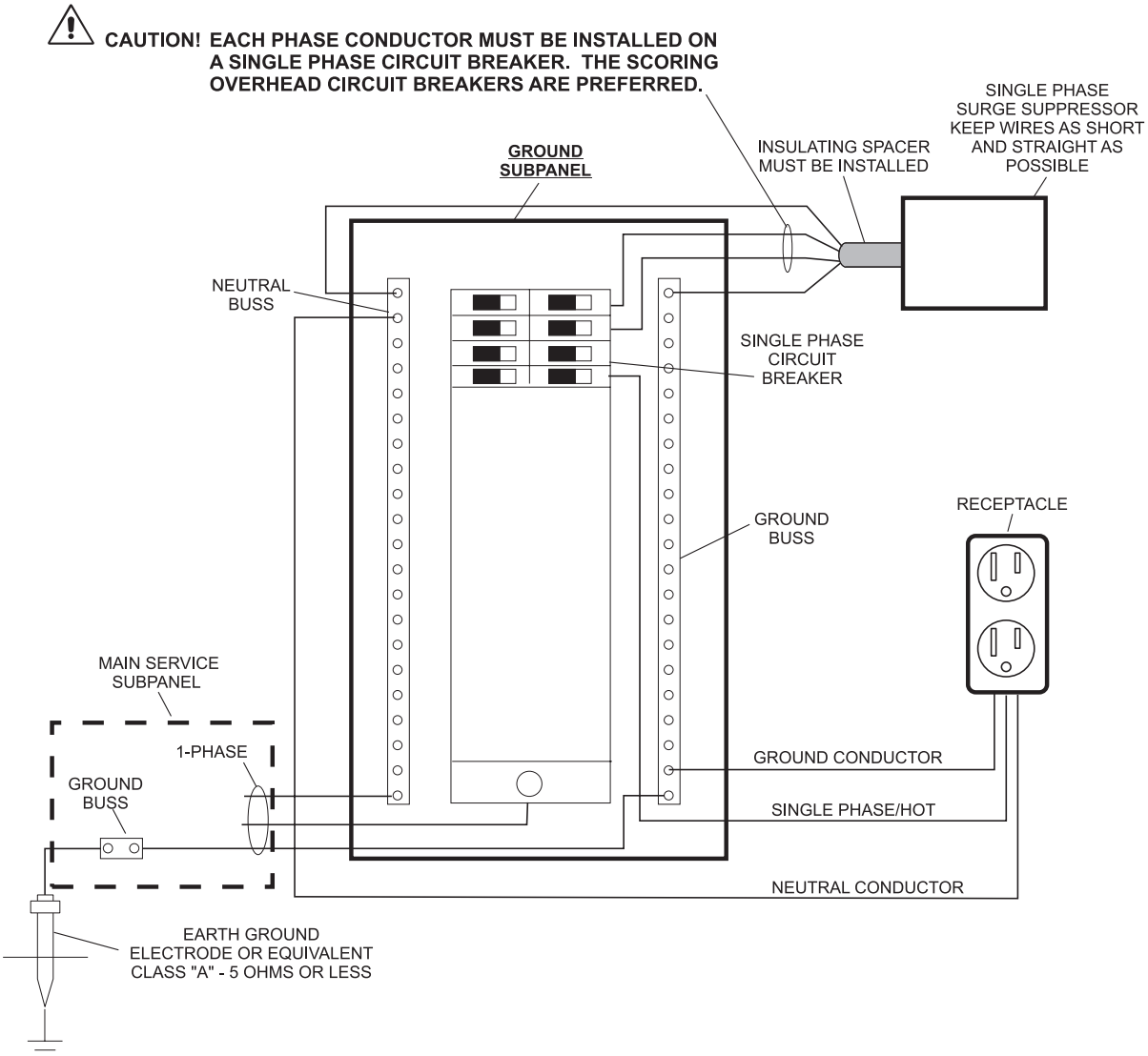
WARNING! Any Non-Brunswick equipment circuits located in these sub panels will VOID ALL WARRANTY. This includes electronic video games, arc welders, HVAC, compressors, etc.



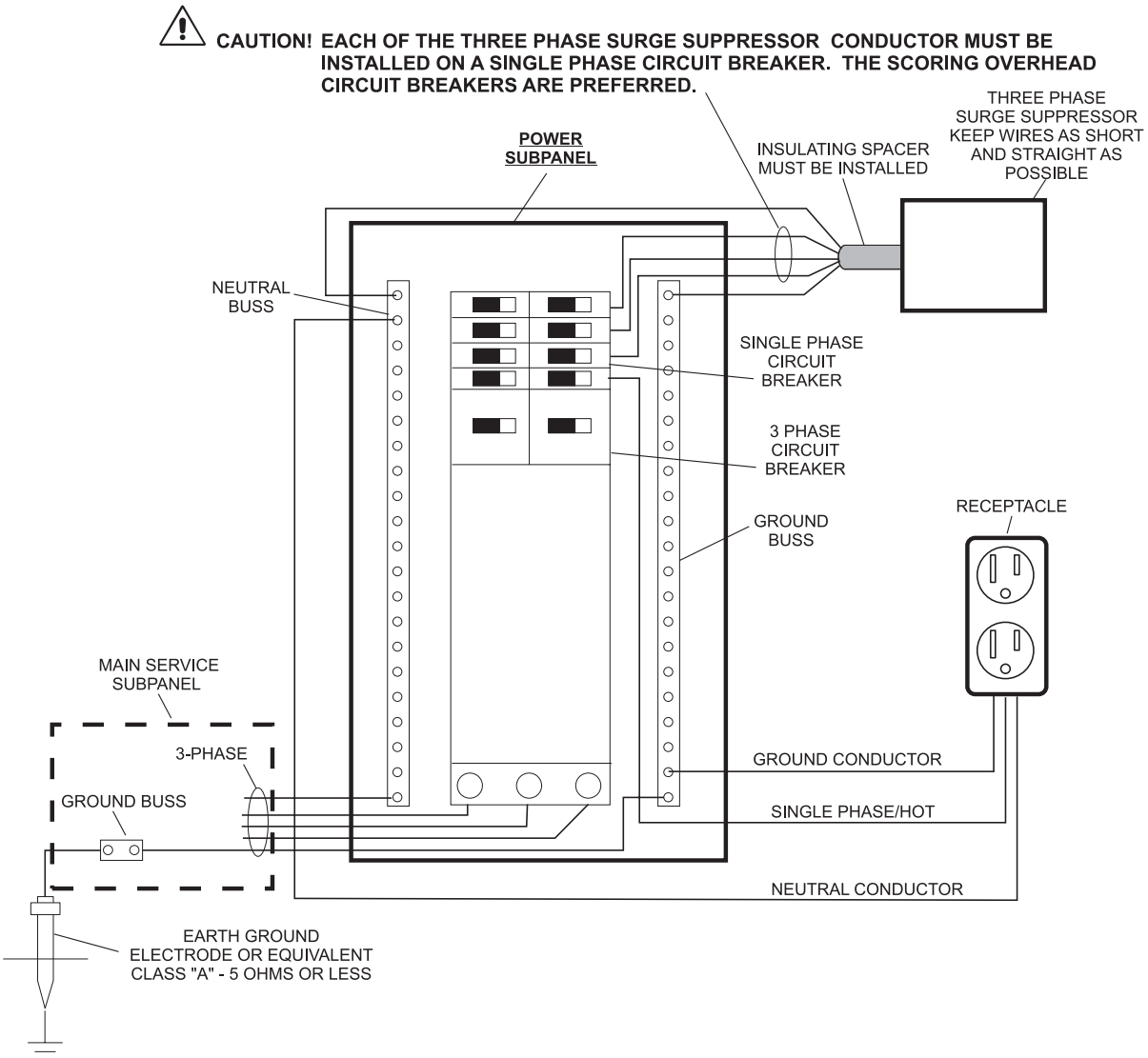
***IMPORTANT!:** Split house centers with multiple sub panels require a single source of power and ground from main service.*

SCORING SUB PANEL INSTALLATION

Single Phase Surge Suppressor



Three Phase Surge Suppressor



ELECTRICAL QUICK REFERENCE CHECKLIST

WARNING!: FAILURE to COMPLY with the Electrical Quick Reference and Pre-Installation Manual specification will VOID ALL WARRANTIES. All electrical work must be completed before the engineer arrives on-site.

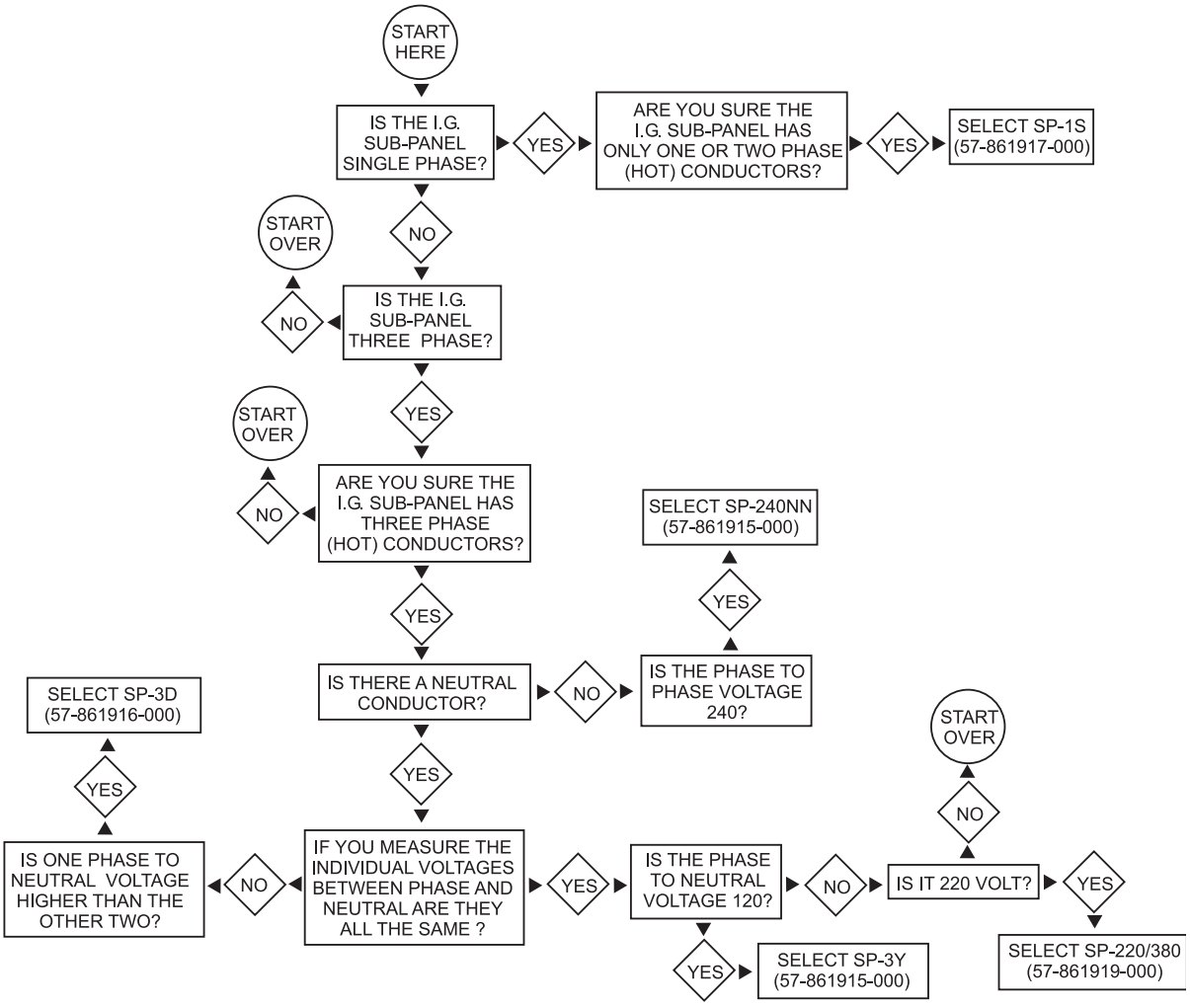
- ☐ A **SEPARATE** and **DEDICATED** sub panel must be provided and **DIRECTLY** wired to main service, hereby called the "**SCORING SUB PANEL**." If a transformer is installed, the primary of the transformer to main service must have a separate ground wire.
- ☐ Split house bowling centers with multiple sub panels **REQUIRE** a single source of power from main service entrance.
- ☐ **EARTH GROUND** conductor **MUST BE** a minimum of **#6 AWG** wire or larger.
- ☐ The electrician **MUST** perform a **CONTINUITY** check on the electronics sub panel to ensure **NO** conduit to **GROUND** and/or **NEUTRAL** shorts exist.
- ☐ Greenfield or conduit **CANNOT** be used as the **EQUIPMENT GROUND** conductor for the system.
- ☐ Each **GROUND** circuit has a **SEPARATE** hot, neutral, and ground wire. Example: 10 circuits = 10 hots, 10 neutrals, 10 grounds.
- ☐ Nonautomatic scorer equipment **CANNOT** share our Scoring sub panel or conduit raceways.
- ☐ All branch circuit runs **OVER 200 FEET** from all sub panels must be **#10 AWG** wire or larger.
- ☐ Class-A **CERTIFIED** ground is recommended and should be measured at main service.
- ☐ Floating receptacles in the consoles **MUST BE** insulated. Metallic electrical boxes **CANNOT** touch console metal base. If local code permits, you may install "SO" cords with insulated female cord cap receptacle.

NOTE: *It is very important to read all the information available for the equipment being installed in your bowling center. Any deviation from these specifications could potentially cause problems to your electronic automatic scoring equipment that may be difficult to detect and/or correct.*

SELECTING A SURGE SUPPRESSOR

A flow chart diagram is shown below to assist you in identifying if the Scoring sub panel is **SINGLE** phase or **THREE** phase and which surge suppressor is needed.

Surge Suppressor Needed	Model	Voltage/Phase	Wye/ Delta	No. of Wires	Brunswick Part No.
1	TK-TT160-3Y208-FB	120/208/Three	Wye	4 Wire + Ground	57-861915-000
2	TK-TT160-1S240-FB	120/240/Single	Wye	3 Wire + Ground	57-861917-000
3	TK-TT160-3D240-FB	120/240/Three	Delta	4 Wire + Ground	57-861916-000
4	TK-TT160-NN240-FB	240NN/Three	Delta	3 Wire + Ground	57-861918-000
5	TK-TT160-3Y380-FB	220/380/Three	Wye	4 Wire + Ground	57-861919-000



CONDUIT AND LOW VOLTAGE CABLE SPECIFICATIONS

It is the customer's responsibility to provide a raceway or means to run wires from the equipment, located at the Control Desk:

- To the Approach Area
- To the Office
- From the network switch on the curtain wall to the network switch on the control desk.
- Overhead Monitors

Additional low voltage cables are routed from the office to the closest end lane pair pinsetter area. Various ways of doing this can be discussed with the Brunswick Service Representative at the time of the survey.

The interconnecting cables are supplied and installed by Brunswick and routed through suitable conduit.

When routing the conduit or interconnecting cables from the scoring computer to the control desk or office, extra care must be exercised to not place them near a noisy electrical environment.

IMPORTANT!: The cables need to be installed in conduit only when local codes require it.

1. Keep the conduit routing to a minimum, but keep in mind that routing them away from a noisy electrical environment is most important.

2. If conduit is required, only telephone or communication cables may be routed in the same conduit. Do not route them in conduit with any electrical equipment with high voltage power cables.

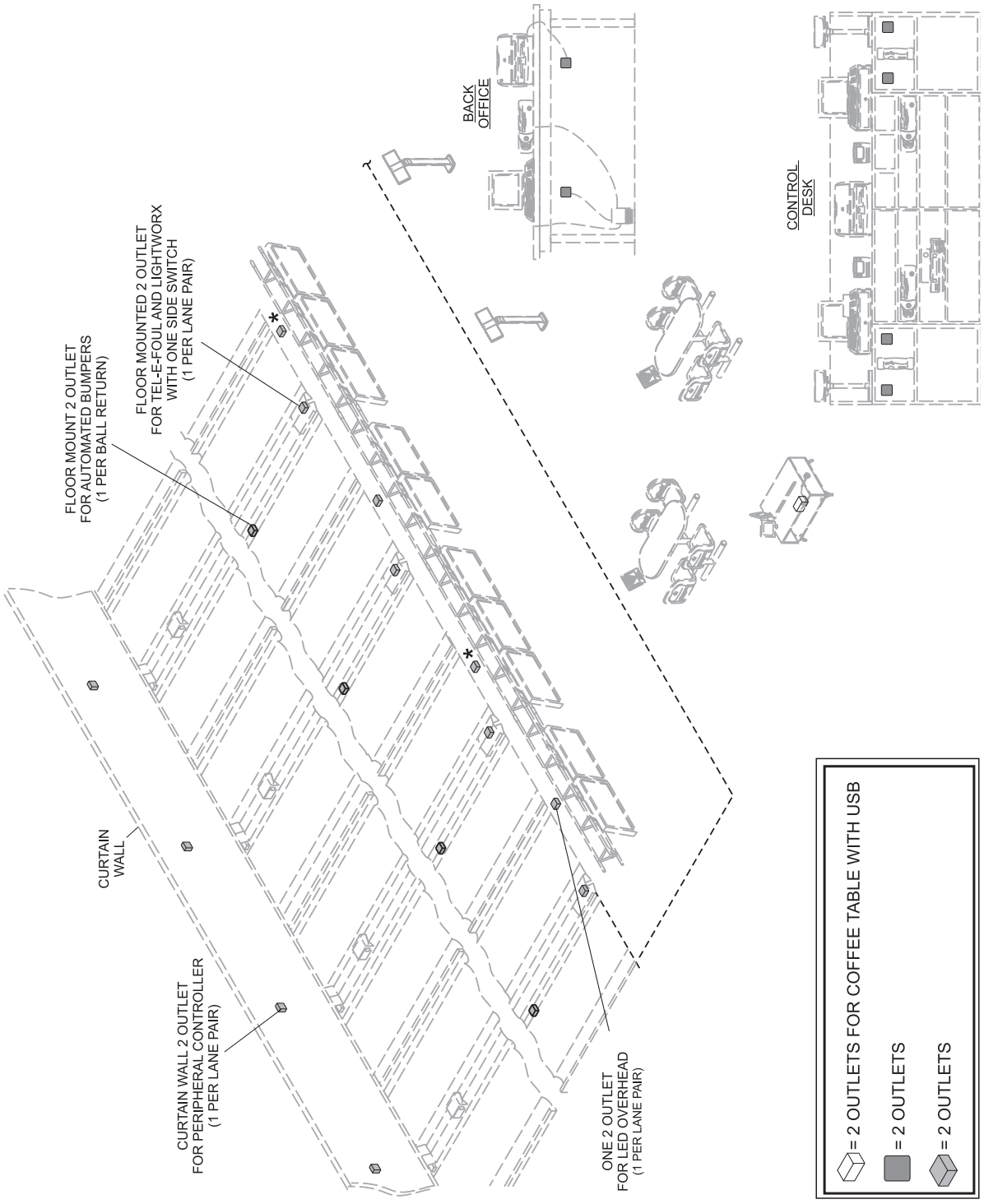
3. Do not lay the interconnecting cables or conduit raceways on top of, or close to fluorescent light fixtures. Route them as far from the fixtures as possible.

4. Keep cables as far away as possible from motors, compressors, and high voltage power cables. Do not lay them next to or closely parallel to existing high voltage electrical cables. When there is any doubt, contact your local representative, or contact the Brunswick Technical Support at 1-800-323-8141 (option 1), in the USA or Canada, or at 231-725-3300 for International. Fax number is 1-231-725-4667.

NOTE: *Do not use plumbing/water pipe for low voltage cable conduits.* ***Electrical Conduit*** *must be used for all conduit. Extra charges will be applied if plumbing/water pipe is supplied.*

ELECTRICAL RECEPTACLE LOCATIONS

Overview



NETWORK SWITCH LOCATION

Curtain Wall and Overhead Structure

The switch for the curtain wall and the overhead structure can accommodate 38 lanes per switch. The placement of the switch is indicated below for both the curtain wall and overhead structure. Ideally the switch is installed in the center of the curtain wall and overhead structure for the number of lanes in the center.

Location of Network Switch on Curtain Wall and Overhead Structure

TOTAL NUMBER OF LANES IN BOWLING CENTER	1,2	3,4	5,6	7,8	9,10	11,12	13,14	15,16	17,18	19,20	21,22	23,24	25,26	27,28	29,30	31,32	33,34	35,36	37,38
2	X																		
4	X																		
6		X																	
8		X																	
10			X																
12			X																
14				X															
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32								X											
34									X										
36									X										
38										X									
40										X									

NOTE: *There is **NO** need for an additional electrical outlet. The curtain wall and overhead switch can connect to other scoring equipment for power.*

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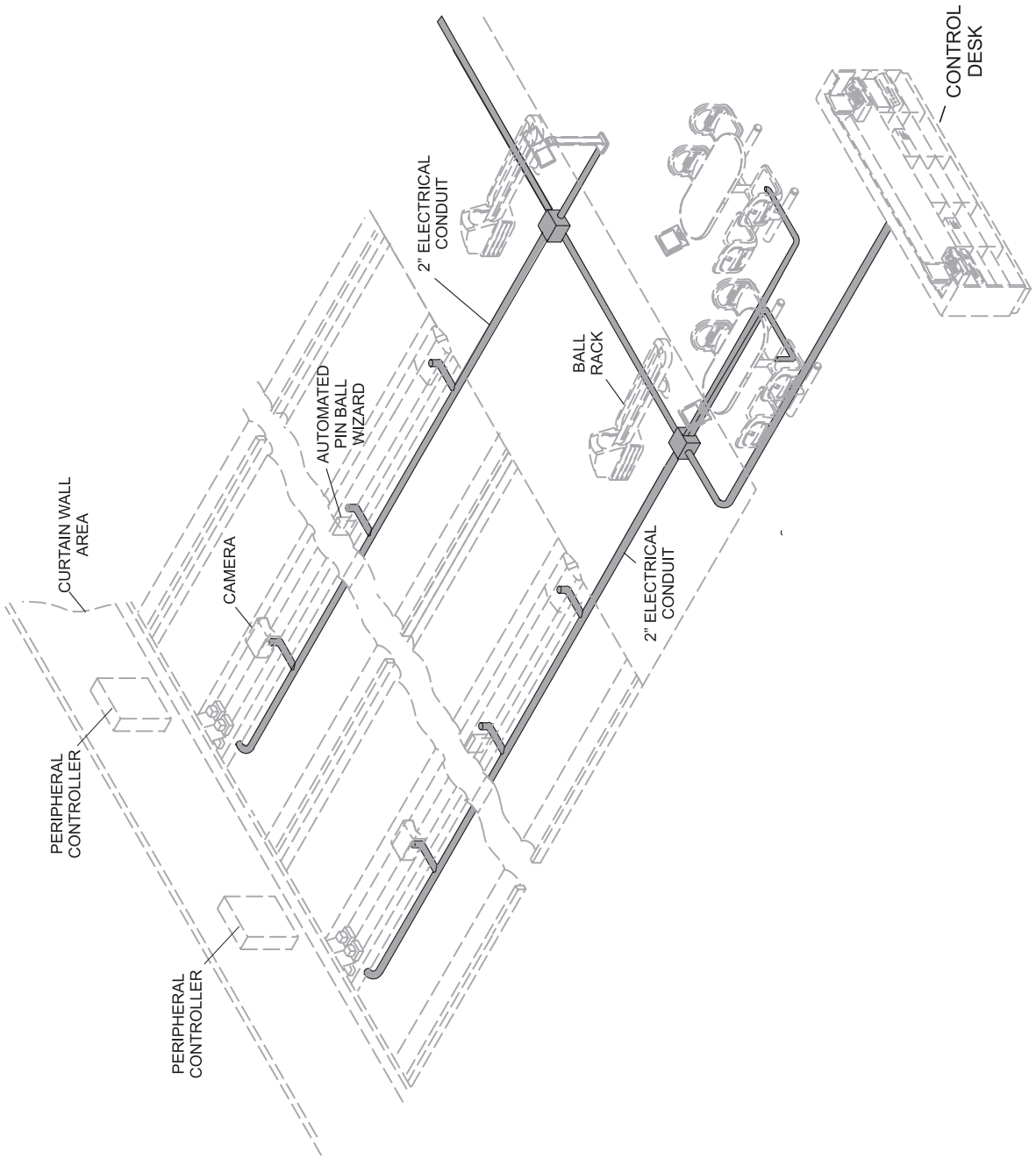
Conduit

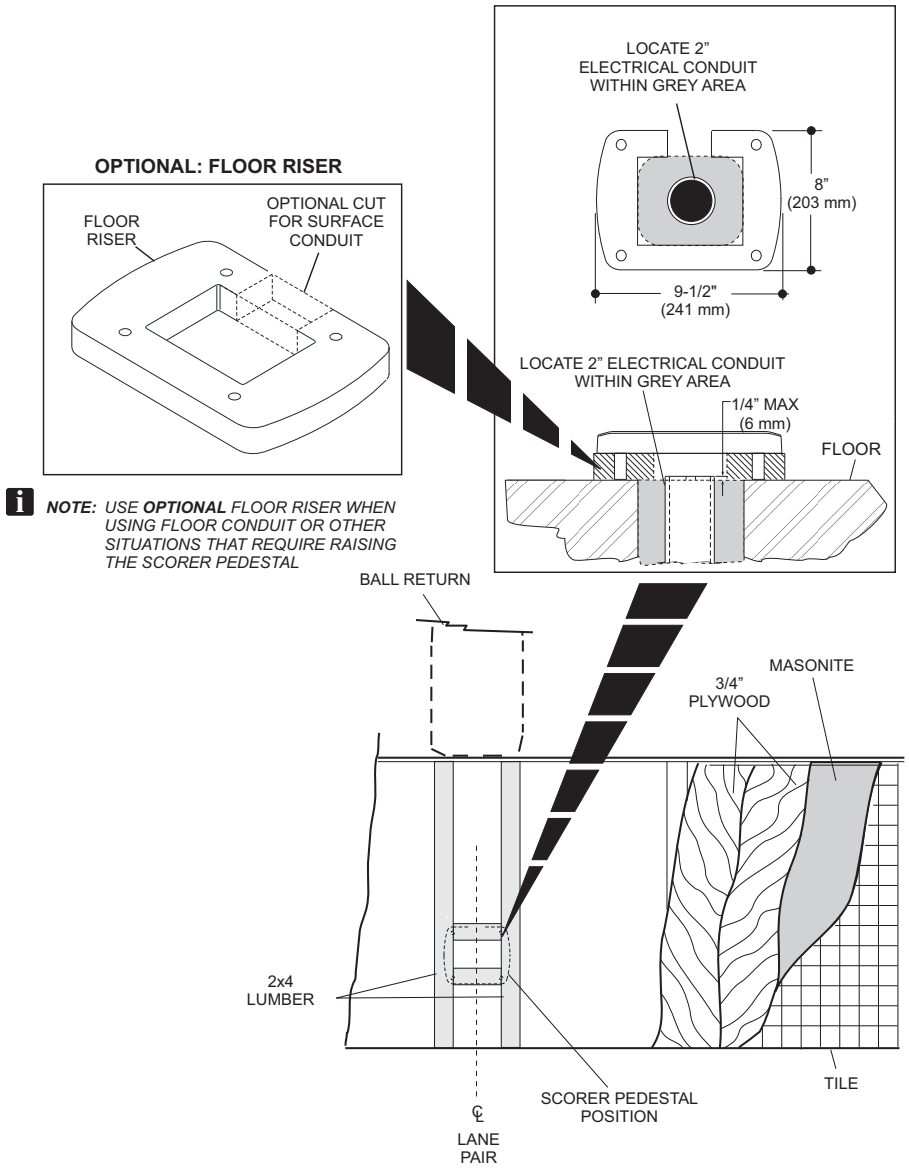
LOCATION IN FLOOR

The illustration below shows a typical conduit network to accommodate all cables in the system. The conduit sizes shown apply to all scoring systems.

NOTE: *If local code requires low voltage electrical to be inside conduit, all conduit must be* ***ELECTRICAL CONDUIT NOT*** *plumbing/water conduit.*



Wood Floor

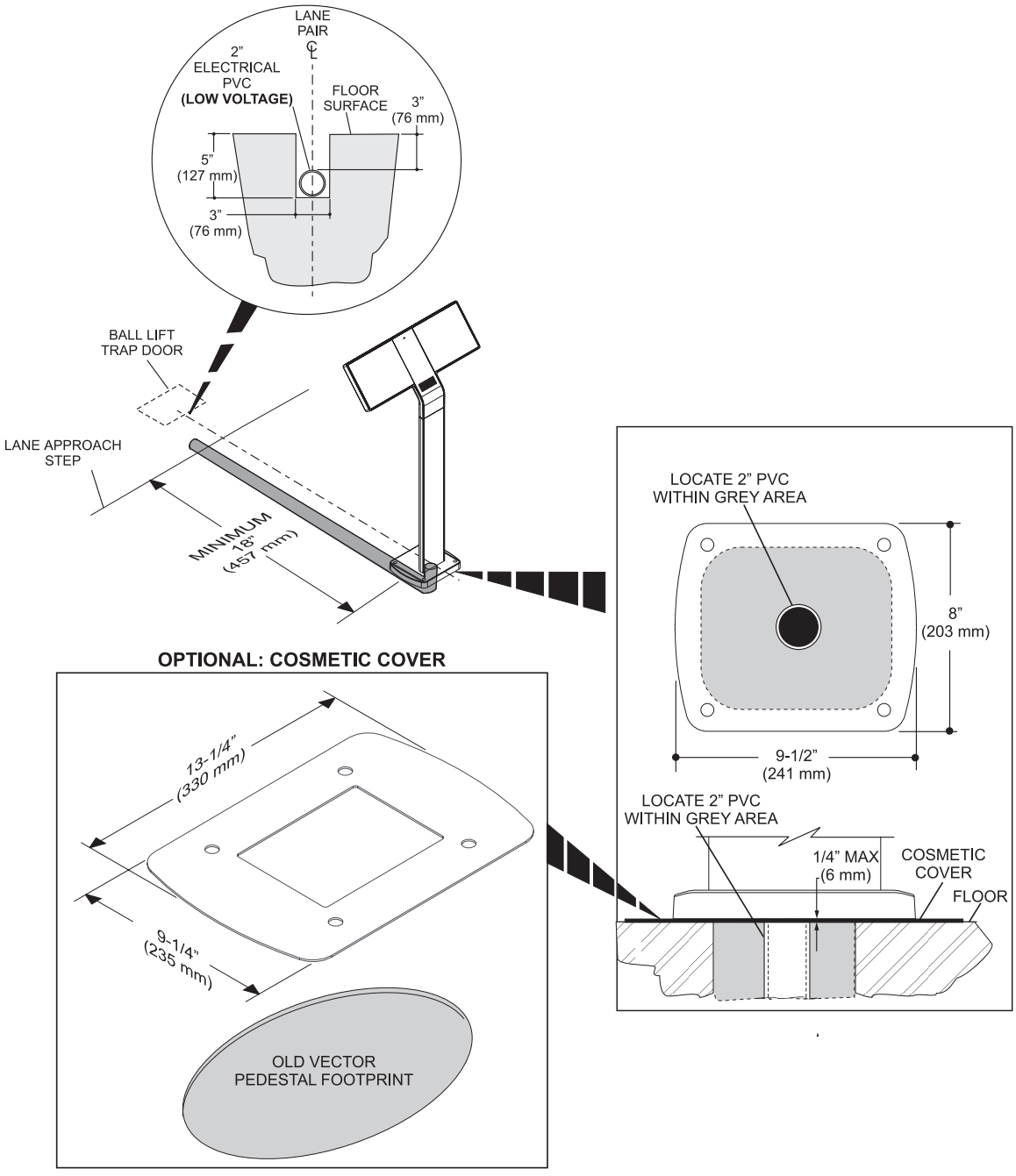


INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: BUILD RACEWAYS USING 2 X 4 LUMBER ON THE EXISTING FLOOR. COVER WITH TWO LAYERS OF 3/4" PLYWOOD, ONE LAYER OF MASONITE AND ONE LAYER OF TILE. IT IS NECESSARY TO CUT OUT A PORTION OF THE APPROACH HEADER TO ALLOW THE CABLES TO BE ROUTED UNDER THE APPROACH. REFER TO DIMENSIONS ABOVE FOR PLACEMENT OF 2 X 4 LUMBER.

THE REMAINING 2 X 4S MAY BE POSITIONED IN ANY MANNER THAT PROPERLY SUPPORTS THE FLOOR. ONE SUGGESTION IS TO PUT THE LUMBER ON 16" (406 MM) CENTERS.

Pedestal

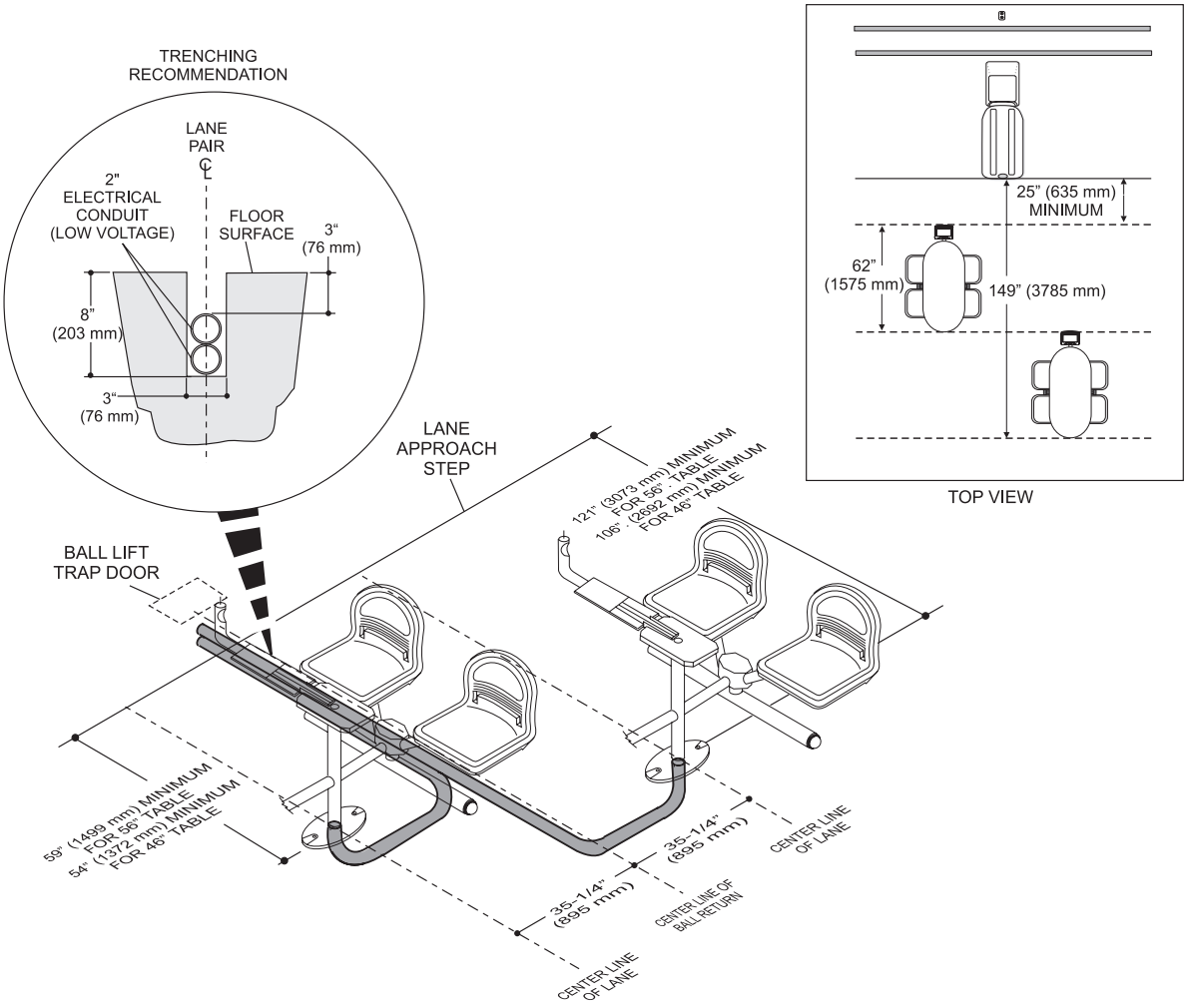


NOTE: *USE **OPTIONAL** COSMETIC COVER TO COVER OLD VECTOR PEDESTAL FOOTPRINT, IF FLOOR WILL NOT BE MODIFIED.*

INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: A LOW VOLTAGE 2" ELECTRICAL CONDUIT FROM THE CENTER LINE OF THE BALL LIFT TO THE PEDESTAL IS REQUIRED FOR LOW VOLTAGE CABLES.

Oval Table

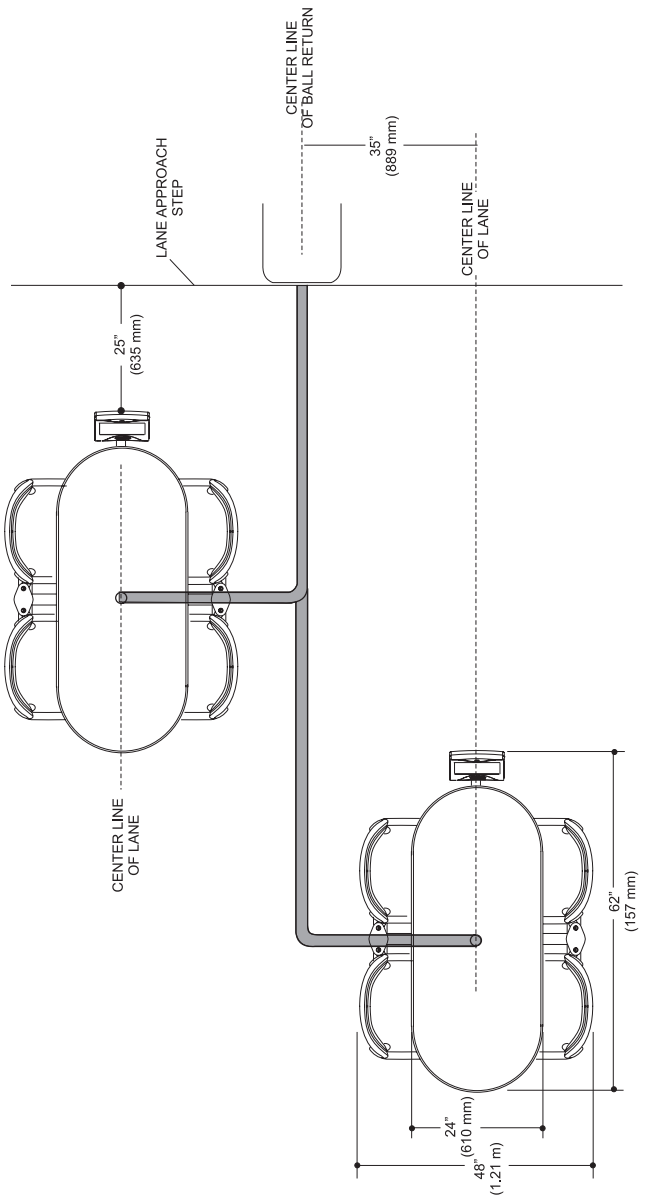


INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: TRENCH OR ROUTE 2 EACH 2" ELECTRICAL CONDUIT FOR LOW VOLTAGE CABLES. THESE CONDUITS MUST BE 3" (76 MM) BELOW FLOOR SURFACE AND MEET LOCAL CODES.

***NOTE**: A minimum space of 25" (635 mm) is required between the lane approach step and scorer.*

BRUNSWICK RESPONSIBILITY: SUPPLY AND ROUTE LOW VOLTAGE CABLES TO THE BOWLER'S KEYPAD OR TOUCH SCREEN.

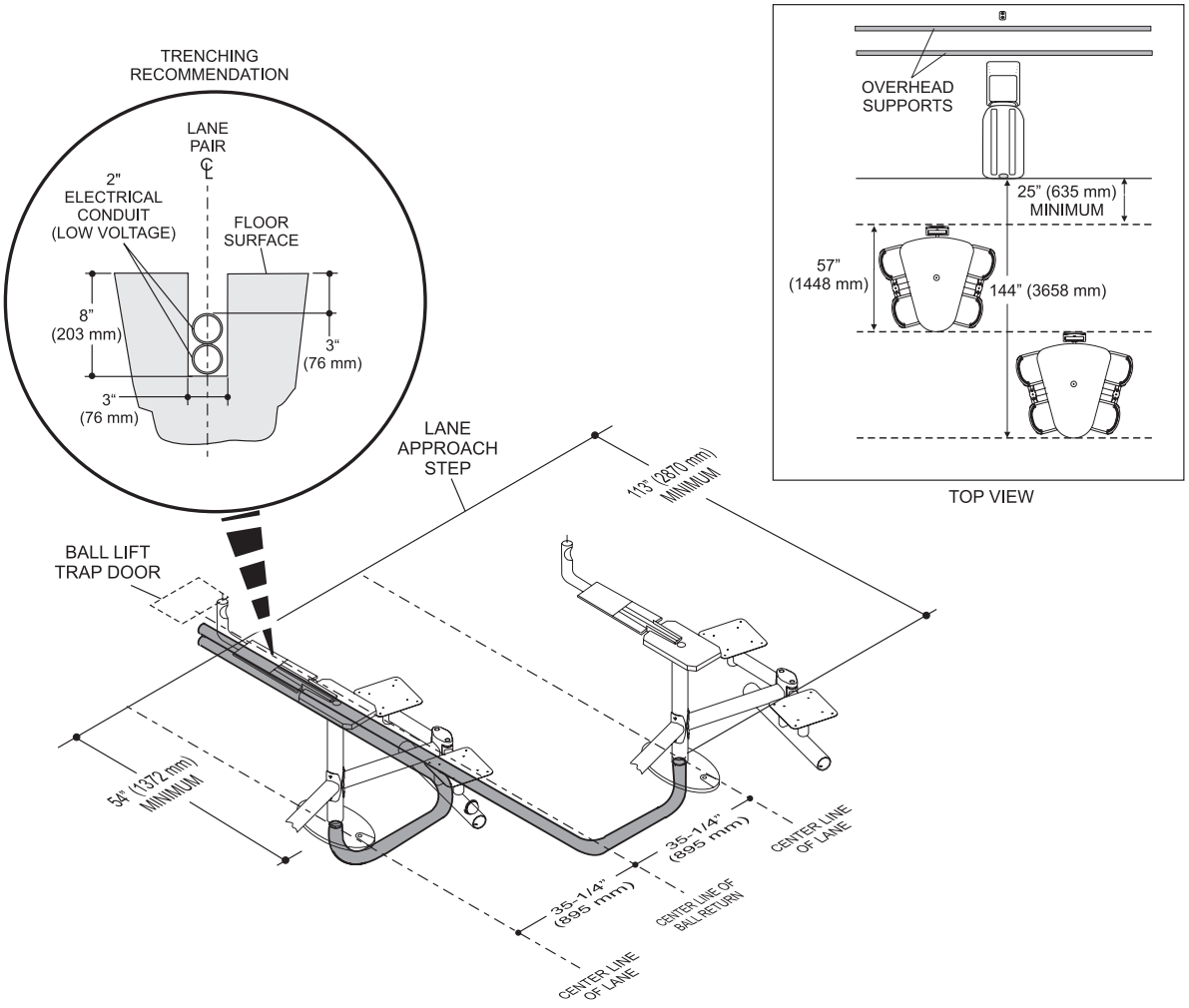


INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: BUILD RACEWAYS USING 2 X 4 LUMBER ON THE EXISTING FLOOR. COVER WITH TWO LAYERS OF 3/4" PLYWOOD, ONE LAYER OF MASONITE AND ONE LAYER OF TILE. IT IS NECESSARY TO CUT OUT A PORTION OF THE APPROACH HEADER TO ALLOW THE CABLES TO BE ROUTED UNDER THE APPROACH. REFER TO DIMENSIONS ABOVE FOR PLACEMENT OF 2 X 4 LUMBER.

THE REMAINING 2 X 4S MAY BE POSITIONED IN ANY MANNER THAT PROPERLY SUPPORTS THE FLOOR. ONE SUGGESTION IS TO PUT THE LUMBER ON 16" (406 MM) CENTERS.

Triangle Table

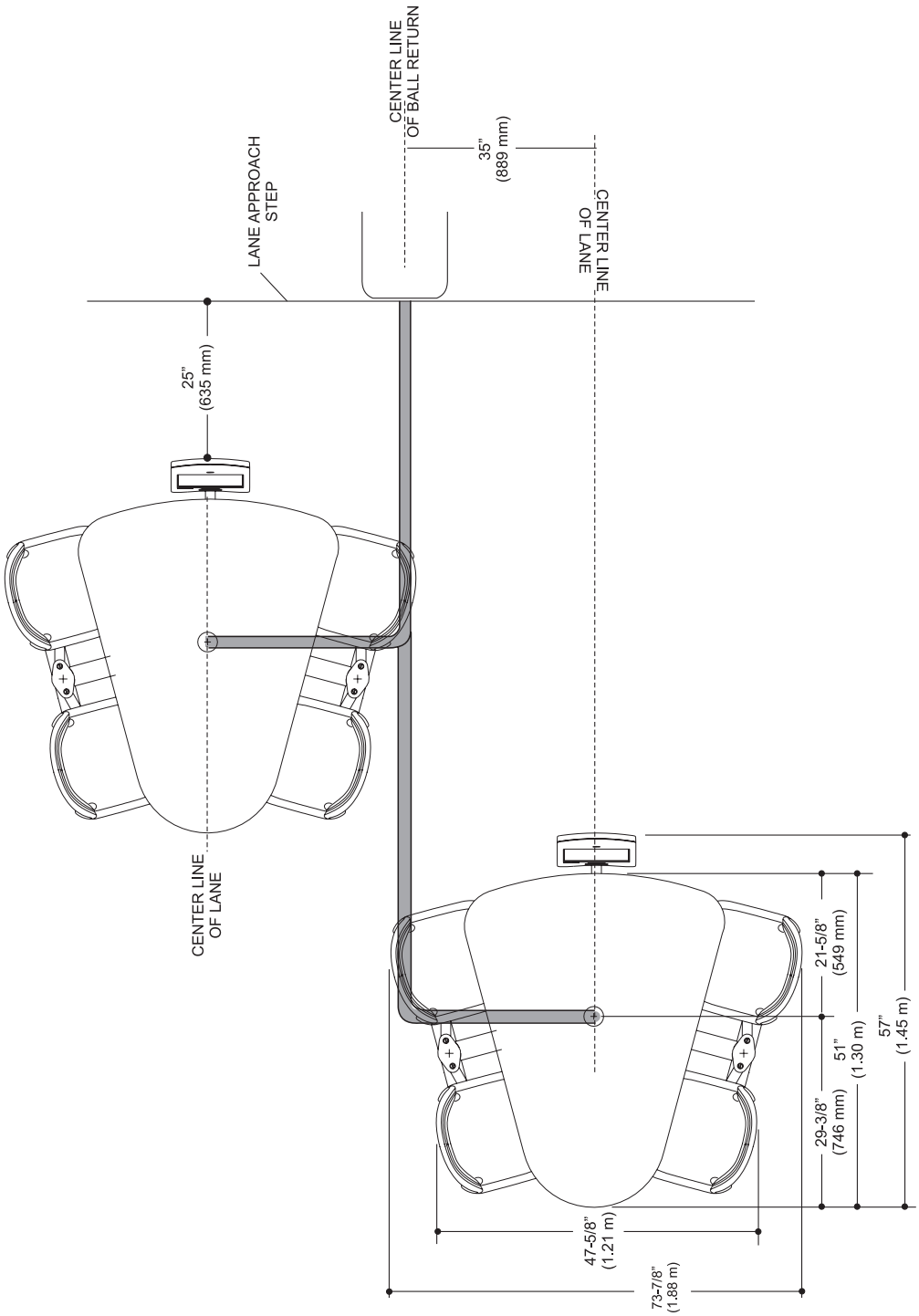


INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: TRENCH OR ROUTE 2 EACH 2" ELECTRICAL CONDUIT FOR LOW VOLTAGE CABLES. THESE CONDUITS MUST BE 3" (76 MM) BELOW FLOOR SURFACE AND MEET LOCAL CODES.

NOTE: *A minimum space of 25" (635 mm) is required between the lane approach step and scorer.*

BRUNSWICK RESPONSIBILITY: SUPPLY AND ROUTE LOW VOLTAGE CABLES TO THE BOWLER'S KEYPAD OR TOUCH SCREEN.

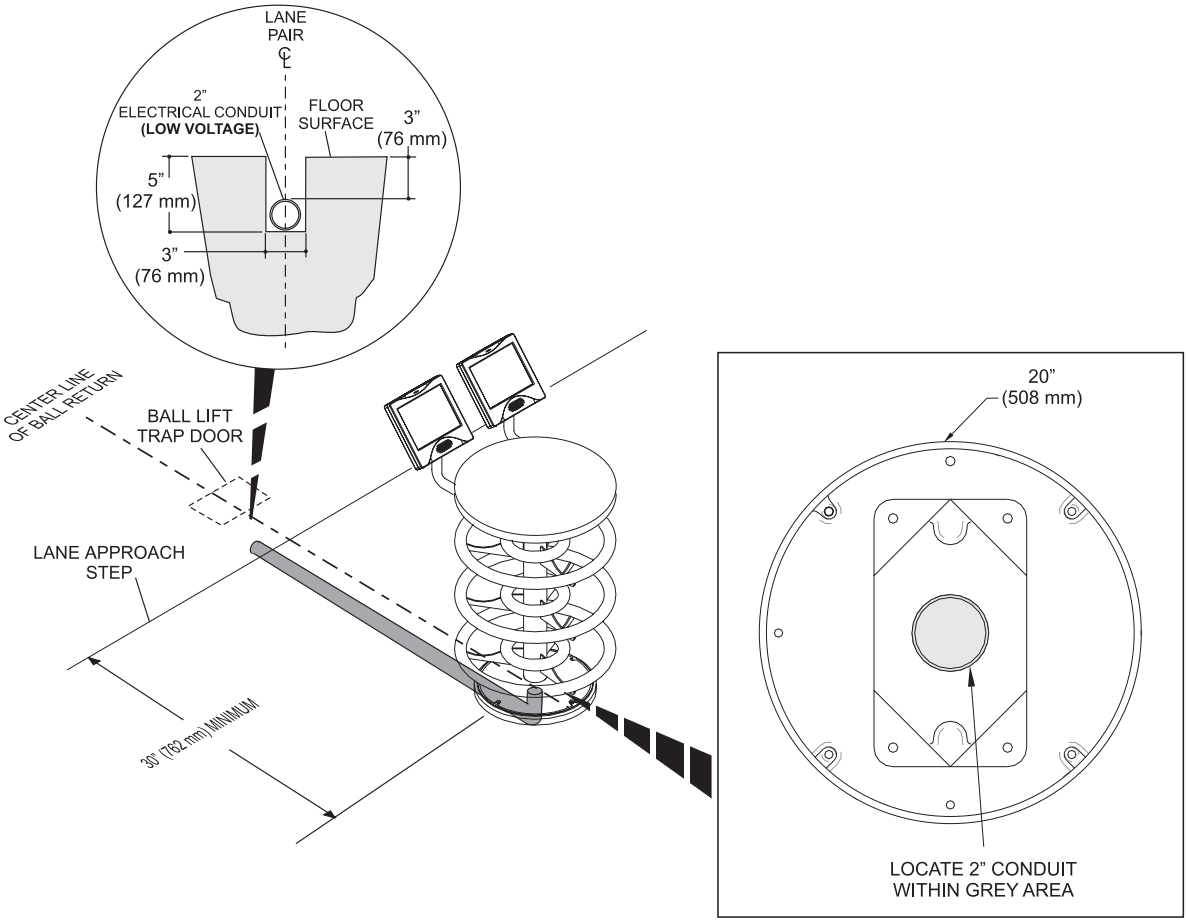


INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: BUILD RACEWAYS USING 2 X 4 LUMBER ON THE EXISTING FLOOR. COVER WITH TWO LAYERS OF 3/4" PLYWOOD, ONE LAYER OF MASONITE AND ONE LAYER OF TILE. IT IS NECESSARY TO CUT OUT A PORTION OF THE APPROACH HEADER TO ALLOW THE CABLES TO BE ROUTED UNDER THE APPROACH. REFER TO DIMENSIONS ABOVE FOR PLACEMENT OF 2 X 4 LUMBER.

THE REMAINING 2 X 4S MAY BE POSITIONED IN ANY MANNER THAT PROPERLY SUPPORTS THE FLOOR. ONE SUGGESTION IS TO PUT THE LUMBER ON 16" (406 MM) CENTERS.

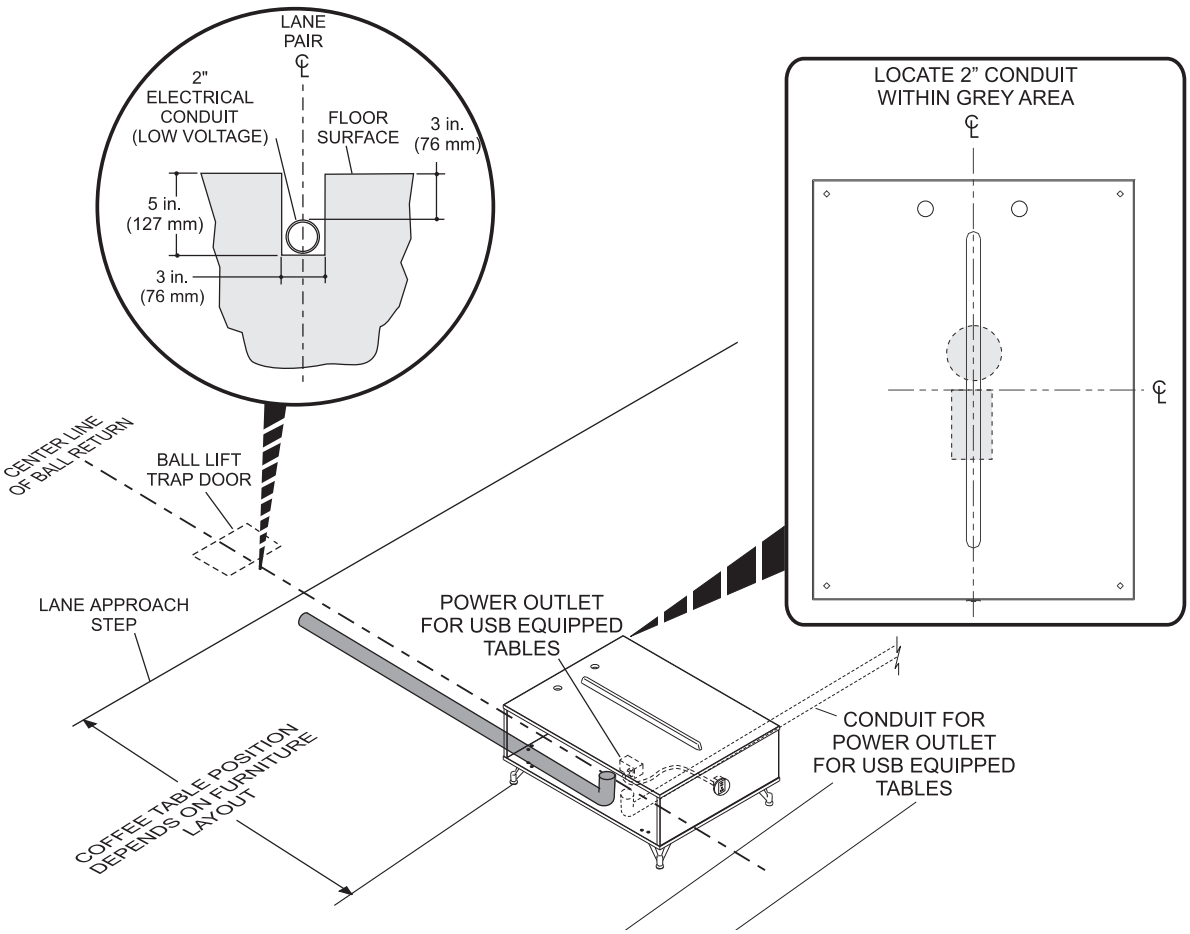
Circular Ball Rack



INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: A LOW VOLTAGE 2" ELECTRICAL CONDUIT FROM THE CENTER LINE OF THE BALL LIFT TO THE CIRCULAR BALL RACK IS REQUIRED FOR LOW VOLTAGE CABLES. FOR INFORMATION ON INSTALLING CIRCULAR BALL RACK ON WOOD STRINGER, REFER TO SECTION "WOOD FLOOR."

Coffee Table

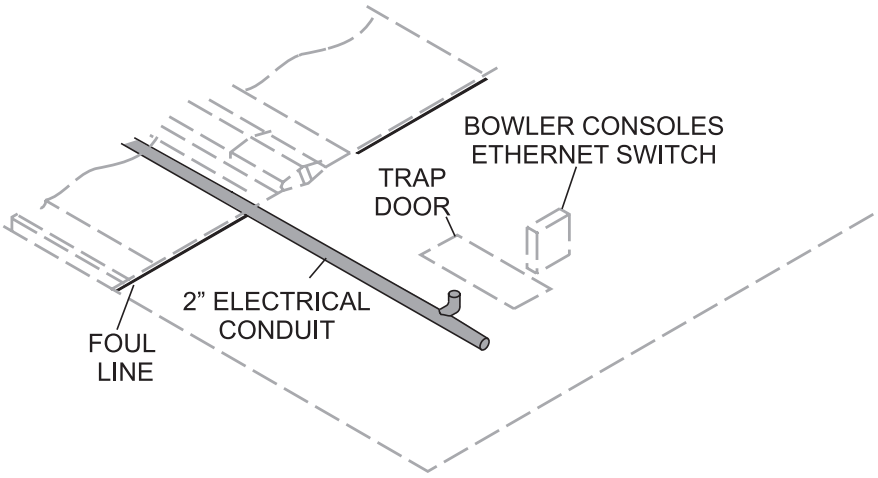


INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: A LOW VOLTAGE 2" ELECTRICAL CONDUIT FROM THE CENTER LINE OF THE BALL LIFT TO THE COFFEE TABLE IS REQUIRED FOR LOW VOLTAGE CABLES. FOR INFORMATION ON INSTALLING COFFEE TABLE ON WOOD STRINGER, REFER TO SECTION "WOOD FLOOR."

IF USB CHARGER / 120VAC OUTLET POWER OPTION IS AVAILABLE IN COFFEE TABLE, FLUSH OR SIDE MOUNTED DUPLEX RECEPTACLES ARE REQUIRED. POWER OUTLET'S MAX RATING IS 15 AMP.

BOWLER'S CONSOLE ETHERNET SWITCH

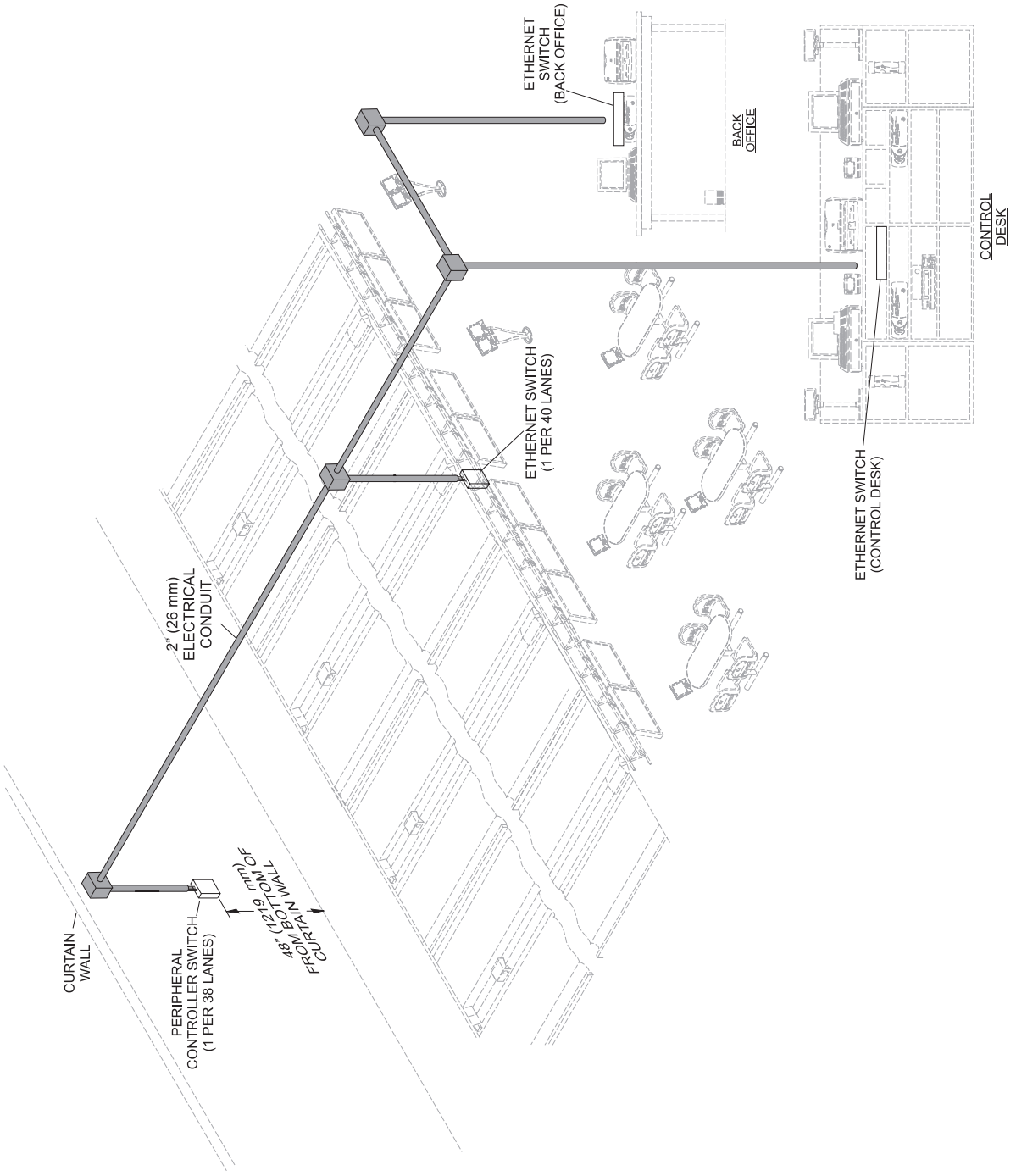


INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: A LOW VOLTAGE 2" ELECTRICAL CONDUIT FROM THE CENTER LINE OF THE BALL LIFT TO THE TRAP DOOR IS REQUIRED FOR LOW VOLTAGE CABLES.

NOTE: *No separate power outlet is needed, power available from curtain wall electronics.*

Location in Ceiling



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Equipment Electrical Specifications

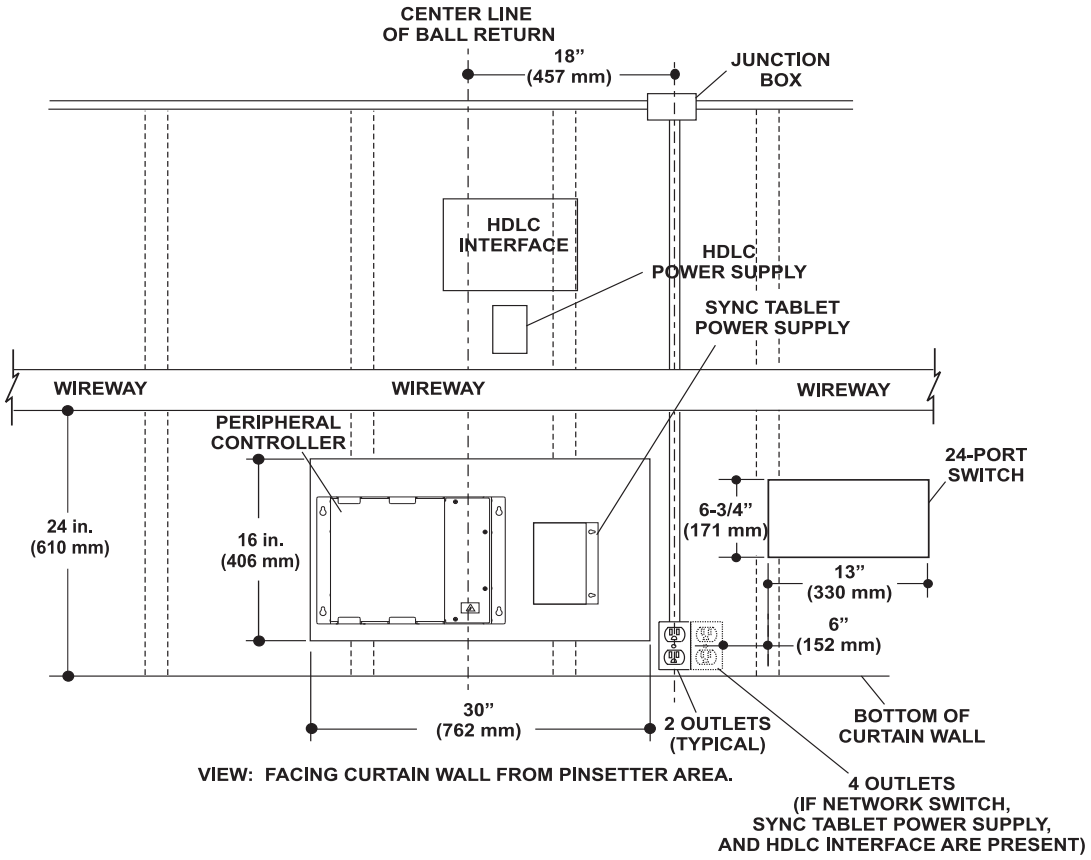
CURTAIN WALL POWER OUTLETS

Electrical Information - Peripheral Controller							
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
100-130	50/60	AC	1	1	120	2 WIRES + GROUND	INSTALL CIRCUIT WITH 2 OUTLET. NO MORE THAN 5 LANE PAIRS PER 20 AMP CIRCUIT.
200-220	50/60	AC	1	0.5	120	2 WIRES + GROUND	INSTALL CIRCUIT WITH 2 OUTLET. NO MORE THAN 8 LANE PAIRS PER 16 AMP CIRCUIT.

Electrical Information - Sync Tablet Power Supply (Sync Tablet Installations Only)							
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
100-130	50/60	AC	1	2	240	2 WIRES + GROUND	INSTALL CIRCUIT WITH 2 OUTLETS. NO MORE THAN 5 LANES PAIRS PER 20 AMP CIRCUIT.
200-240	50/60	AC	1	1	240	2 WIRES + GROUND	INSTALL CIRCUIT WITH 2 OUTLETS. NO MORE THAN 8 LANES PAIRS PER 16 AMP CIRCUIT.

Electrical Information - Curtain Wall Network Switch (Specific Lane Pairs Only)							
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
100-130	50/60	AC	1	1.2	144	2 WIRES + GROUND	THIS POWER REQUIREMENT INCLUDED WITH THE PERIPHERAL CONTROLLER AND OVERHEAD MONITOR POWER.
200-230	50/60	AC	1	0.6	144	2 WIRES + GROUND	

Electrical Information - HDLC Interface (GS-10, GS-92,GS-96, GS-98 Non-Direct Installations Only)							
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
100-130	50/60	AC	1	1	120	2 WIRES + GROUND	INSTALL CIRCUIT WITH 2 OUTLET. NO MORE THAN 16 LANES PAIRS PER 20 AMP CIRCUIT.
200-240	50/60	AC	1	0.5	120	2 WIRES + GROUND	INSTALL CIRCUIT WITH 2 OUTLET. NO MORE THAN 12 LANES PAIRS PER 16 AMP CIRCUIT.



INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: PROVIDE A SUITABLE LOCATION ON THE CURTAIN WALL, AS SHOWN ABOVE, FOR THE MOUNTING THE PERIPHERAL CONTROLLER AND, AS NEEDED, ADD ON DEVICES INCLUDING SYNC TABLET POWER SUPPLY, CURTAIN WALL SWITCH, AND HDLC INTERFACE.

IF A CURTAIN WALL IS NOT AVAILABLE, A SUPPORT STRUCTURE MUST BE INSTALLED TO HANDLE THE 25 LB. STATIC WEIGHT LOAD PER LANE PAIR.

NOTE: *If Brunswick masking units are present, the mounting panel may be mounted to the masking unit structure with optional bracket kit.*

INSTALL POWER RECEPTACLE ON THE CURTAIN WALL. REFER TO LOCATION CHART FOR EXACT LOCATION.

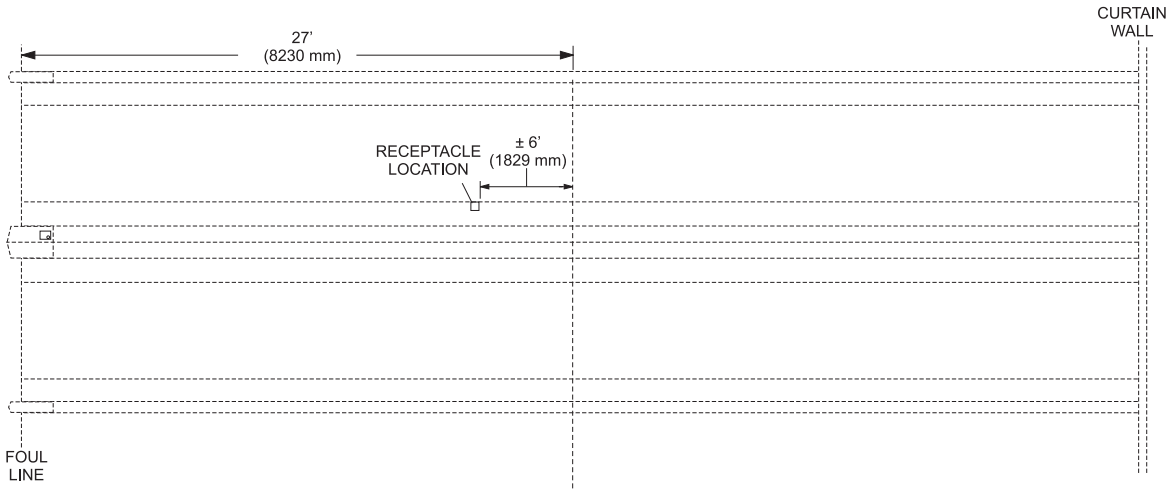
TYPICALLY, INSTALLATIONS REQUIRE 2 OUTLETS EACH LANE PAIR. FOR A LANE PAIR EQUIPPED WITH A PERIPHERAL CONTROLLER, SYNC TABLET POWER SUPPLY, CURTAIN WALL SWITCH, AND A HDLC INTERFACE, FOUR OUTLETS ARE NEEDED.

NOTE: *At lane locations where the Sync Tablet power supply is present, it will share a power receptacle with the Peripheral Controller.*

BRUNSWICK RESPONSIBILITY: TO INSTALL THE ELECTRONICS MOUNTING PLATE ON THE CURTAIN WALL OR SUITABLE STRUCTURE.

AUTOMATED BUMPER SYSTEM - PINBALL WIZARD

Electrical Information							
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
100-130	50/60	AC	1	3.0	360	2 WIRES + GROUND #12 AWG WIRE	INSTALL CIRCUIT WITH 2 OUTLETS. NO MORE THAN 5 LANES PAIRS PER 20 AMP CIRCUIT.
200-240	50/60	AC	1	1.5	360	2 WIRES + GROUND #12AWG WIRE	INSTALL CIRCUIT WITH 2 OUTLETS. NO MORE THAN 8 LANES PAIRS PER 16 AMP CIRCUIT.



INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: THE CUSTOMER MUST PROVIDE ELECTRICAL POWER SOURCE THAT COMPLIES WITH LOCAL CODE.

LIGHTWORX POWER

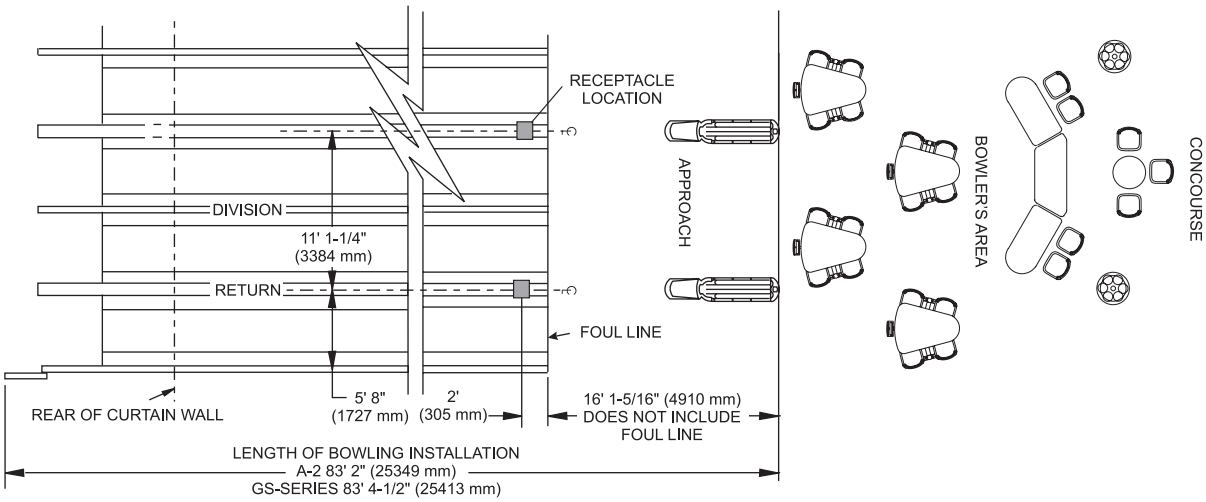
Electrical Information								
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**	**BRUNSWICK RESPONSIBILITY**
120	50/60	AC	1	1	120	2 OUTLETS	TO SUPPLY FEEDER WIRING AND "J" BOX AND LOW VOLTAGE CONTROL. CUSTOMER/ ELECTRICIAN TO CONNECT.	TO SUPPLY POWER CABLE TO "J" BOX.
230	50/60	AC	1	0.5	120			

Circuit Requirements - Lightworx				
WIRES PER CIRCUIT	**UNITS PER CIRCUIT**	**WIRE SIZE**	**BREAKER SIZE**	**RECEPTACLE SUPPLIED BY BRUNSWICK**
3	UP TO 10	12 GAUGE	20 A	NO

Receptacle Location Lightworx

ONE JUNCTION BOX BELOW THE LIGHTWORX UNIT ON EACH BALL RETURN NEAR THE FOUL LINE.

CUSTOMER'S RESPONSIBILITY: THE CUSTOMER MUST PROVIDE ELECTRICAL POWER SOURCE THAT COMPLIES WITH LOCAL CODE.



TEL-E-FOUL

Electrical Information								
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**	**BRUNSWICK RESPONSIBILITY**
120	50/60	AC	1	1.5	120	ON/OFF SWITCH OUTLET	TO SUPPLY FEEDER WIRING AND "J" BOX AND LOW VOLTAGE CONTROL. CUSTOMER/ ELECTRICIAN TO CONNECT.	TO SUPPLY AND INSTALL TEL-E-FOUL AND POWER CABLE TO "J" BOX.
230	50/60	AC	1	.75	120			

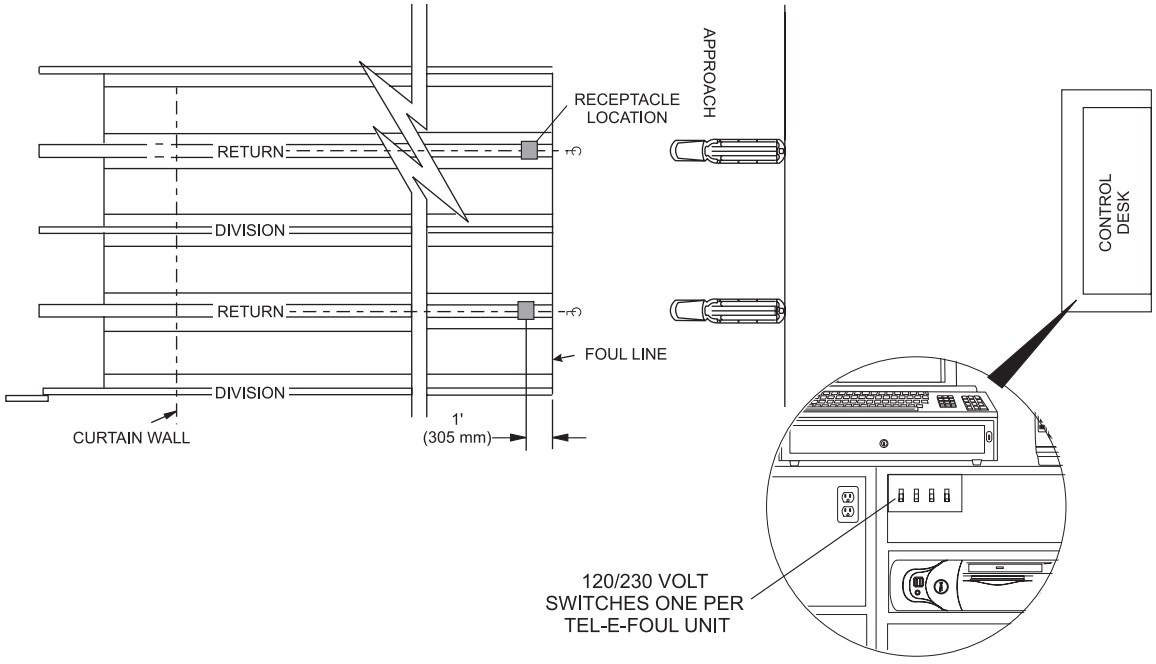
Circuit Requirements - Tel-E-Foul				
WIRES PER CIRCUIT	**UNITS PER CIRCUIT**	**WIRE SIZE**	**BREAKER SIZE**	**RECEPTACLE SUPPLIED BY BRUNSWICK**
3	UP TO 10	12 GAUGE	20 A	NO

Receptacle Location Tel-E-Foul

ONE JUNCTION BOX BELOW THE TEL-E-FOUL UNITS ON EACH BALL RETURN NEAR THE FOUL LINE

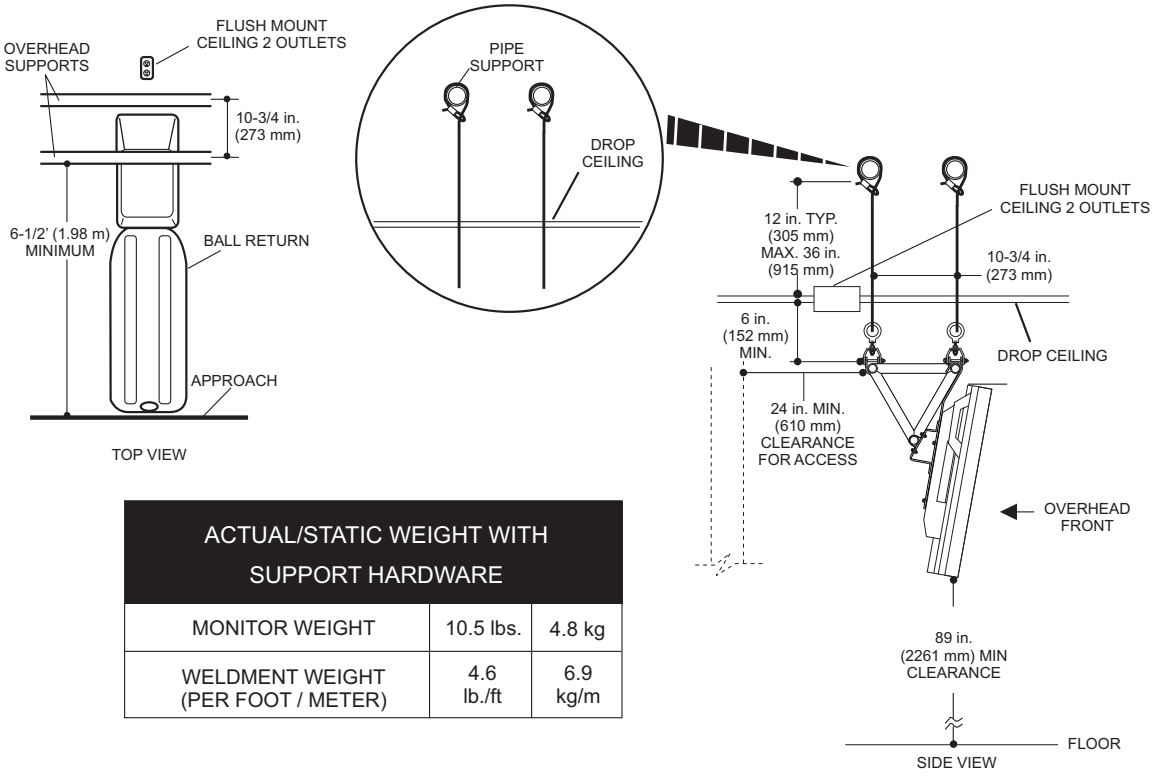
NOTE: *One on/off switch per Tel-E-Foul.*

CUSTOMER'S RESPONSIBILITY: THE CUSTOMER MUST PROVIDE ELECTRICAL POWER SOURCE THAT COMPLIES WITH LOCAL CODE.



32” OVERHEAD LED MONITOR (2 OR 3 UNITS PER LANE PAIR)

Electrical Information								
EQUIPMENT	**VOLTS**	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS TYP/MAX**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
32” OVERHEAD LED	100-130	50/60	AC	1	.65	30W / 77W	2 WIRES + GROUND	2 OUTLETS
	200-240	50/60	AC	1	.33			



ACTUAL/STATIC WEIGHT WITH SUPPORT HARDWARE		
MONITOR WEIGHT	10.5 lbs.	4.8 kg
WELDMENT WEIGHT (PER FOOT / METER)	4.6 lb./ft	6.9 kg/m

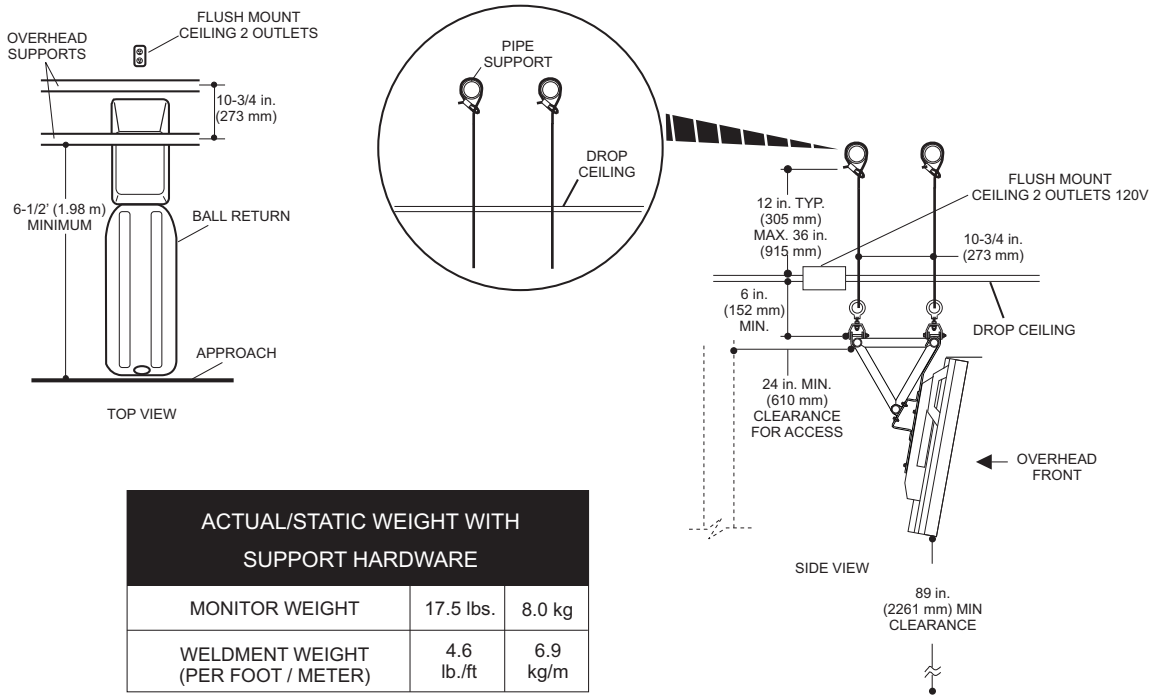
INSTALLATION INFORMATION

CUSTOMER’S RESPONSIBILITY: USING THE PREFERRED METHOD OF SUPPORT, THE OVERHEAD IS TO BE SUSPENDED FROM PIPE SUPPORTS WHICH ARE SUPPORTED FROM ROOF TRUSSES. THE RECEPTACLE IS TO BE INSTALLED FLUSH WITH THE CEILING AND LOCATED NEAR THE REAR SUSPENSION WIRE ON THE CENTER LINE OF A PAIR OF LANES. THE CUSTOMER IS RESPONSIBLE FOR SUPPLYING, INSTALLING, AND MAINTAINING THE PROPER POSITION OF THE SUPPORT PIPE. THE CUSTOMER IS ALSO RESPONSIBLE FOR HAVING THE STRUCTURE CERTIFICATE FORM COMPLETED BY AN ARCHITECT OR STRUCTURAL ENGINEER. SEE “WIDE SCREEN LED OVERHEAD VIDEO DISPLAY CERTIFICATE FOR SUPPORT WEIGHT SPECIFICATIONS.

NOTE: *Support pipes must be as straight as possible. Any variation in the support will affect overhead positioning.*

43” OVERHEAD LED MONITOR (2 OR 3 UNITS PER LANE PAIR)

Electrical Information								
EQUIPMENT	**VOLTS**	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS TYP/ MAX**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
43” OVERHEAD LED	100-130	50/60	AC	1	.83	53W / 99W	2 WIRES + GROUND	2 OUTLETS
	200-240	50/60	AC	1	.42			



ACTUAL/STATIC WEIGHT WITH SUPPORT HARDWARE		
MONITOR WEIGHT	17.5 lbs.	8.0 kg
WELDMENT WEIGHT (PER FOOT / METER)	4.6 lb./ft	6.9 kg/m

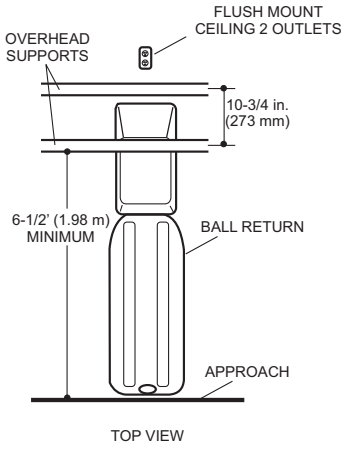
INSTALLATION INFORMATION

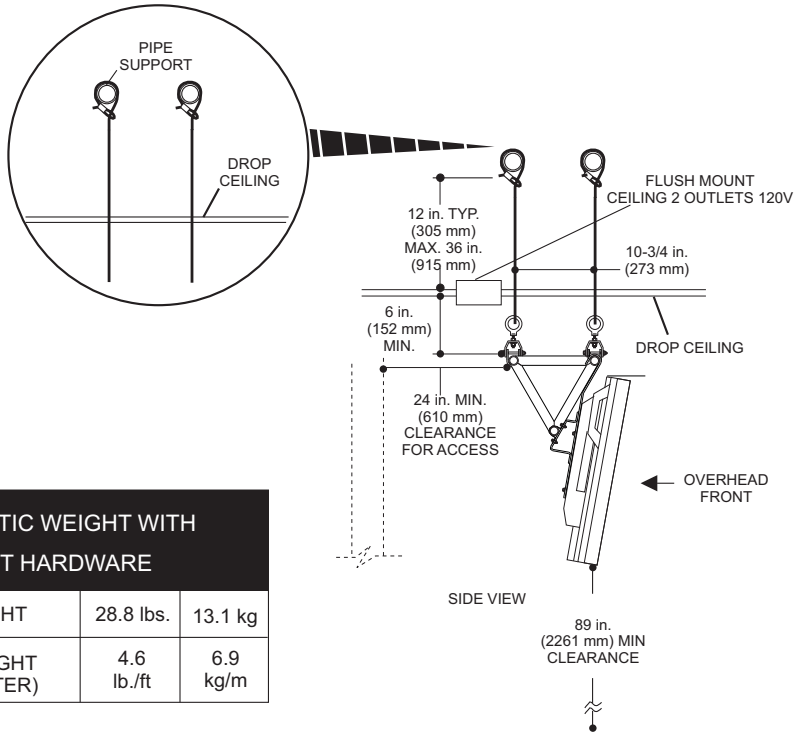
CUSTOMER’S RESPONSIBILITY: USING THE PREFERRED METHOD OF SUPPORT, THE OVERHEAD IS TO BE SUSPENDED FROM PIPE SUPPORTS WHICH ARE SUPPORTED FROM ROOF TRUSSES. THE RECEPTACLE IS TO BE INSTALLED FLUSH WITH THE CEILING AND LOCATED NEAR THE REAR SUSPENSION WIRE ON THE CENTER LINE OF A PAIR OF LANES. THE CUSTOMER IS RESPONSIBLE FOR SUPPLYING, INSTALLING, AND MAINTAINING THE PROPER POSITION OF THE SUPPORT PIPE. THE CUSTOMER IS ALSO RESPONSIBLE FOR HAVING THE STRUCTURE CERTIFICATE FORM COMPLETED BY AN ARCHITECT OR STRUCTURAL ENGINEER. SEE “WIDE SCREEN LED OVERHEAD VIDEO DISPLAY CERTIFICATE FOR SUPPORT WEIGHT SPECIFICATIONS.

***NOTE**: Support pipes must be as straight as possible. Any variation in the support will affect overhead positioning.*

49” OVERHEAD LED MONITOR (2 OR 3 UNITS PER LANE PAIR)

Electrical Information								
EQUIPMENT	**VOLTS**	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS TYP/ MAX**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
49” OVERHEAD LED	100-130	50/60	AC	1	.83	45W / 99W	2 WIRES + GROUND	2 OUTLETS
	200-240	50/60	AC	1	.42			





ACTUAL/STATIC WEIGHT WITH SUPPORT HARDWARE		
MONITOR WEIGHT	28.8 lbs.	13.1 kg
WELDMENT WEIGHT (PER FOOT / METER)	4.6 lb./ft	6.9 kg/m

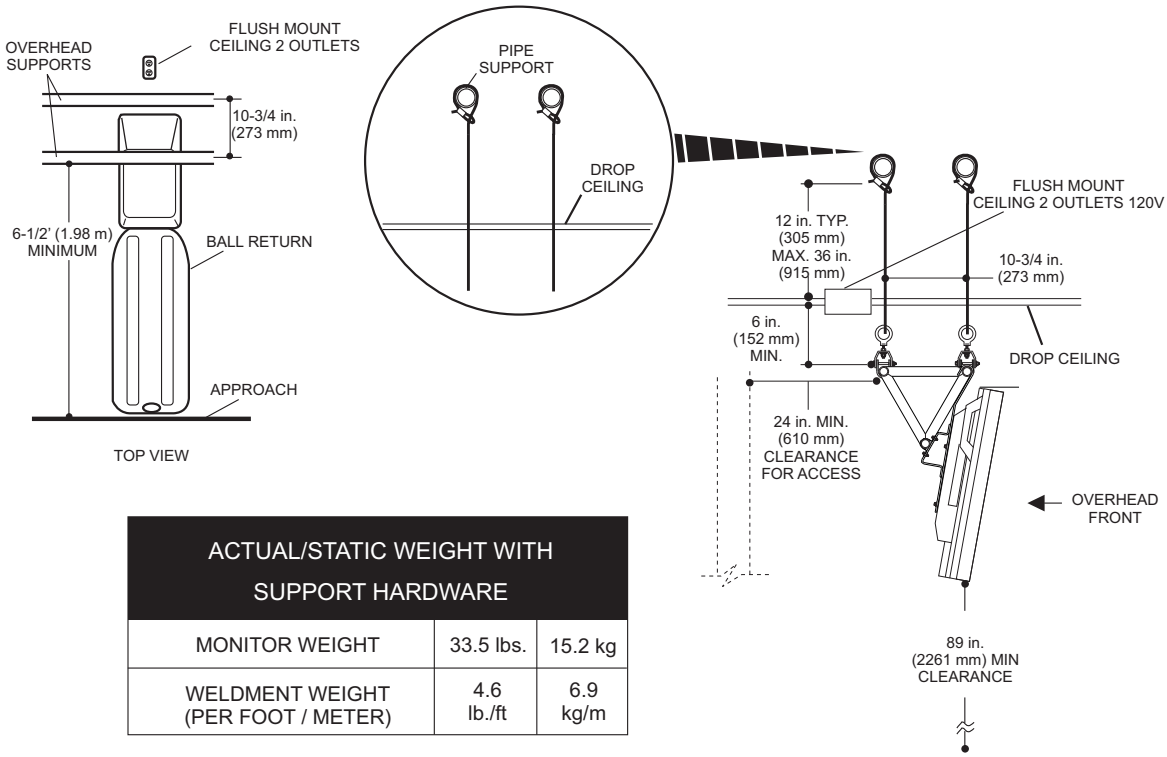
INSTALLATION INFORMATION

CUSTOMER’S RESPONSIBILITY: USING THE PREFERRED METHOD OF SUPPORT, THE OVERHEAD IS TO BE SUSPENDED FROM PIPE SUPPORTS WHICH ARE SUPPORTED FROM ROOF TRUSSES. THE RECEPTACLE IS TO BE INSTALLED FLUSH WITH THE CEILING AND LOCATED NEAR THE REAR SUSPENSION WIRE ON THE CENTER LINE OF A PAIR OF LANES. THE CUSTOMER IS RESPONSIBLE FOR SUPPLYING, INSTALLING, AND MAINTAINING THE PROPER POSITION OF THE SUPPORT PIPE. THE CUSTOMER IS ALSO RESPONSIBLE FOR HAVING THE STRUCTURE CERTIFICATE FORM COMPLETED BY AN ARCHITECT OR STRUCTURAL ENGINEER. SEE “WIDE SCREEN LED OVERHEAD VIDEO DISPLAY CERTIFICATE FOR SUPPORT WEIGHT SPECIFICATIONS.

NOTE: *Support pipes must be as straight as possible. Any variation in the support will affect overhead positioning.*

55” OVERHEAD LED MONITOR (2 UNITS LANE PAIR)

Electrical Information								
EQUIPMENT	**VOLTS**	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS TYP/ MAX**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
55” OVERHEAD LED	100-130	50/60	AC	1	1.5	60W / 176W	2 WIRES + GROUND	2 OUTLETS
	200-240	50/60	AC	1	.75			



ACTUAL/STATIC WEIGHT WITH SUPPORT HARDWARE		
MONITOR WEIGHT	33.5 lbs.	15.2 kg
WELDMENT WEIGHT (PER FOOT / METER)	4.6 lb./ft	6.9 kg/m

INSTALLATION INFORMATION

CUSTOMER’S RESPONSIBILITY: USING THE PREFERRED METHOD OF SUPPORT, THE OVERHEAD IS TO BE SUSPENDED FROM PIPE SUPPORTS WHICH ARE SUPPORTED FROM ROOF TRUSSES. THE RECEPTACLE IS TO BE INSTALLED FLUSH WITH THE CEILING AND LOCATED NEAR THE REAR SUSPENSION WIRE ON THE CENTER LINE OF A PAIR OF LANES. THE CUSTOMER IS RESPONSIBLE FOR SUPPLYING, INSTALLING, AND MAINTAINING THE PROPER POSITION OF THE SUPPORT PIPE. THE CUSTOMER IS ALSO RESPONSIBLE FOR HAVING THE STRUCTURE CERTIFICATE FORM COMPLETED BY AN ARCHITECT OR STRUCTURAL ENGINEER. SEE “WIDE SCREEN LED OVERHEAD VIDEO DISPLAY CERTIFICATE FOR SUPPORT WEIGHT SPECIFICATIONS.

***NOTE**: Support pipes must be as straight as possible. Any variation in the support will affect overhead positioning.*

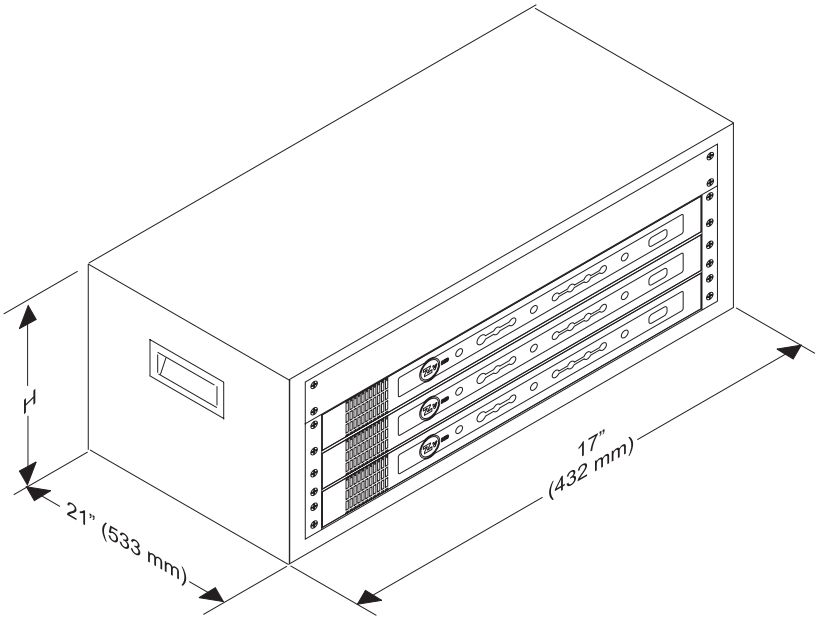
HD VIDEO DISTRIBUTION CENTER

Electrical Information							
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
100-130	50/60	AC	1	.5 PER MODULATOR	60 PER MODULATOR	2 WIRES + GROUND	-
200-240	50/60	AC	1	.25 PER MODULATOR	60 PER MODULATOR	2 WIRES + GROUND	-

NOTE: *The Video Distribution Center can accept a variety of signal sources such as satellite boxes, cable set-top boxes, or DVD/Blu-ray players. The audio and video from each source is connected to a modulator that "assigns" a unique "TV" channel to the source. The number of modulators present in the system is determined by the number of video sources to that will be available for display on the monitors. When choosing modulators, it is important to consider the connections available on the signal source, the output quality of the modulator (Standard or High Definition), and future needs.*

There can be any number of different channels and modulators in the HD video distribution center. The quantity and type of modulator is determined by the customer.

NUMBER OF CHANNELS	H = HEIGHT
1-3 Channels	10.5" (267 mm)
4-5 Channels	14" (356 mm)
6-7 Channels	17.5" (445 mm)
8-9 Channels	22.5" (572 mm)
10-12 Channels	28" (711 mm)



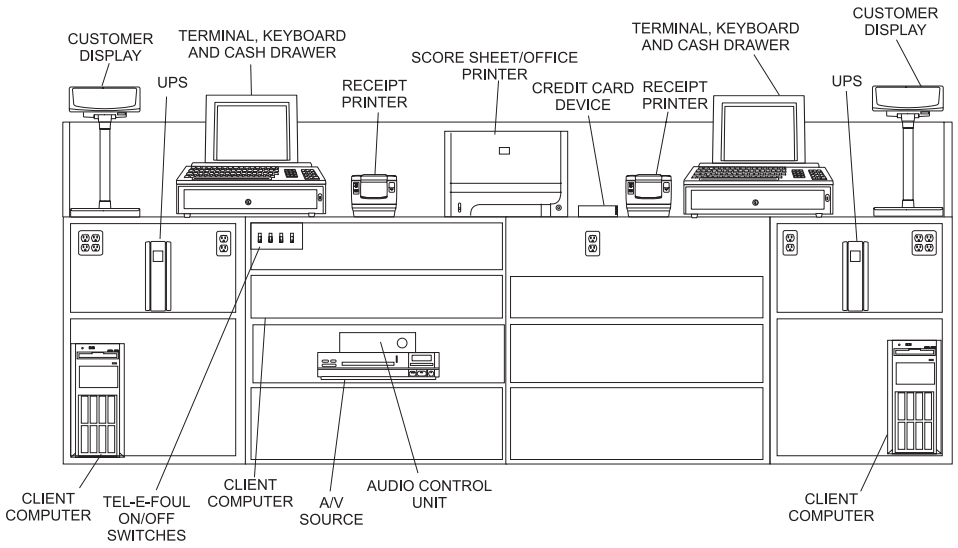
INSTALLATION INFORMATION

NOTE: *All video sources must have a component output.*

NOTE: *The HD video distribution center must be within 3-4 ft (.9-1.2 m) of the component video source.*

CONTROL DESK

Electrical Information							
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
100-130	50/60	AC	1	23	2730	2 WIRES + GROUND	INSTALL CIRCUIT WITH APPROPRIATE OUTLETS.
200-240	50/60	AC	1	12	2730	2 WIRES + GROUND	



INSTALLATION INFORMATION

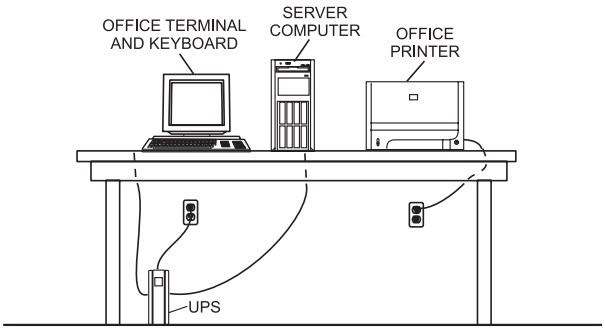
CUSTOMER'S RESPONSIBILITY: THE CONTROL DESK SHOWN IS AN EXAMPLE OF A TWO TERMINAL CONTROL DESK. THE CONTROL DESK LAYOUT VARIES WITH INDIVIDUAL BOWLING CENTERS. THE DECISION OF EQUIPMENT LOCATIONS SHOULD BE MADE BEFORE POWER OUTLETS AND CONDUITS ARE INSTALLED. PLEASE PROVIDE OUTLETS IN SIMILAR CONFIGURATION AS SHOWN.

NOTE: *The CPU must be within 3-4 ft (.9-1.2 m) of the terminal and printer.*

NOTE: *Two circuits are necessary for everything at the Control Desk.*

OFFICE

Electrical Information							
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
100-130	50/60	AC	1	15	1770	2 WIRES + GROUND	INSTALL CIRCUIT WITH APPROPRIATE OUTLETS.
200-240	50/60	AC	1	8	1770	2 WIRES + GROUND	

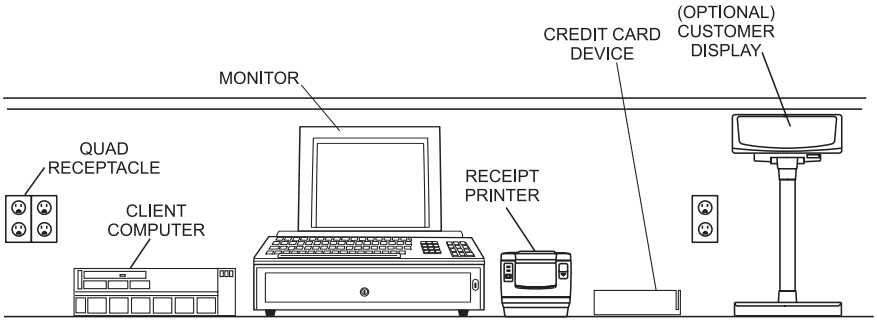


INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: INSTALL ONE CIRCUIT WITH TWO - 2 OUTLETS WITHIN THREE FEET (914 MM) OF THE UPS AND COMPUTER.

POINT OF SALE TERMINAL

Electrical Information							
VOLTS	**HERTZ**	**AC/DC**	**PHASE**	**AMPS PER UNIT**	**WATTS**	**BRANCH CIRCUIT**	**CUSTOMER RESPONSIBILITY**
100-130	50/60	AC	1	12	1440	2 WIRES + GROUND	NO MORE THAN 2 POINT OF SALE TERMINALS PER CIRCUIT
200-240	50/60	AC	1	6	1440	2 WIRES + GROUND	NO MORE THAN 3 POINT OF SALE TERMINALS PER CIRCUIT



NOTE: 120 VOLT SHOWN FOR ILLUSTRATION PURPOSES.

INSTALLATION INFORMATION

CUSTOMER'S RESPONSIBILITY: THE POINT OF SALE TERMINAL CAN BE LOCATED IN VARIOUS AREAS OF THE BOWLING CENTER. THEY ARE TYPICALLY IN THE LOUNGE, SNACK BAR, PRO SHOP, OR BILLIARDS AREA. THE ELECTRICAL CONFIGURATION IS THE SAME FOR EACH LOCATION, A SUITABLE LOW VOLTAGE RACEWAY MUST BE INSTALLED FOR COMMUNICATION CABLES.

Summary of Electrical Information

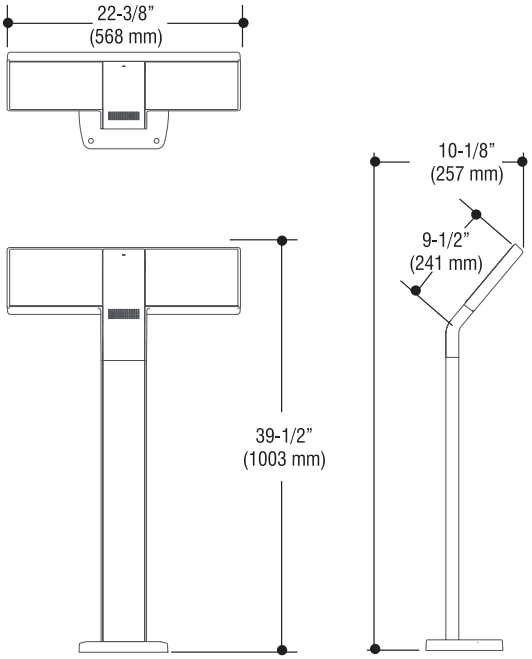
Equipment	Operating Voltage	Frequency (Hertz)	AC or DC	Phase	Max amps per Unit @120 VAC	Max Amps per Unit @240VAC	Wires per Fused Circuit	Power Consumption (Watts)	Connector (Female) Supplied by Customer	Special Notes
32” Overhead LED	100-130	50/60	AC	1	.65	-	3	Typical - 30W Max - 77W	120 Volt Outlet	2 Outlets needed per lane pair. Outlets shared with Display Controller Power Supply
	200-240	50/60	AC	1	-	.33	3	Typical - 30W Max - 77W	230 Volt Outlet	
40” Overhead LED	100-130	50/60	AC	1	1	-	3	Typical - 40W Max - 121W	120 Volt Outlet	2 Outlets needed per lane pair. Outlets shared with Display Controller Power Supply
	200-240	50/60	AC	1	-	.51	3	Typical - 40W Max - 121W	230 Volt Outlet	
49” Overhead LED	100-130	50/60	AC	1	.83	-	3	Typical - 45W Max - 99W	120 Volt Outlet	2 Outlets needed per lane pair. Outlets shared with Display Controller Power Supply
	200-240	50/60	AC	1	-	.42	5	Typical - 45W Max - 99W	230 Volt Outlet	
55” Overhead LED	100-130	50/60	AC	1	1.5	-	3	Typical -60W Max - 176W	120 Volt Outlet	2 Outlets needed per lane pair. Outlets shared with Display Controller Power Supply
	200-240	50/60	AC	1	-	.75	5	Typical -60W Max - 176W	230 Volt Outlet	
Display Controller / Power Supply	100-120	50/60	AC	1	2	-	3	240W	120 Volt Outlet	Outlet Shared with a lane pair of overhead displays
	200-240	50/60	AC	1	-	1	3	240W	230 Volt Outlet	

Equipment	Operating Voltage	Frequency (Hertz)	AC or DC	Phase	Max amps per Unit @120 VAC	Max Amps per Unit @240VAC	Wires per Fused Circuit	Power Consumption (Watts)	Connector (Female) Supplied by Customer	Special Notes
Peripheral Controller	100-130	50/60	AC	1	1	-	3	120	120 Volt Outlet	2 Outlet
	200-240	50/60	AC	1	-	0.5	3	120	230 Volt Outlet	
Sync Tablet Power Supply	100-130	50/60	AC	1	2	-	3	240	120 Volt Outlet	Outlet Shared with Peripheral Controller
	200-240	50/60	AC	1	-	1	3	240	230 Volt Outlet	
HD Video Distribution Center	100-130	50/60	AC	1	.5 Per Modulator	-	3	60 (max) Per Modulator	120 Volt Outlet	-
	200-240	50/60	AC	1	-	.25 Per Modulator	3	60 (max) Per Modulator	230 Volt Outlet	
Curtain Wall or Overhead Switch	120	50/60	AC	1	1..2	-	3	144	120 Volt Outlet	Outlet Shared with Peripheral Controller
	240	50/60	AC	1	-	.6	-	144	230 Volt Outlet	
Client Computer	100-130	50/60	AC	1	5	-	3	600	120 Volt Outlet	-
	200-240	50/60	AC	1	-	2.5	3	600	230 Volt Outlet	
Server Computer	100-130	50/60	AC	1	6	-	3	960	120 Volt Outlet	500 VA UPS Supplies Power
	200-240	50/60	AC	1	-	3	3	960	230 Volt Outlet	
Point of Sale Terminal	100-130	50/60	AC	1	12	-	3	1440	120 Volt Outlet	4 Outlet
	200-240	50/60	AC	1	-	6	3	1440	230 Volt	
Credit Card Device	100-130	50/60	AC	1	.75	-	3	90	120 Volt	2 Outlet
	200-240	50/60	AC	1	.	.38	3	90	230 Volt	

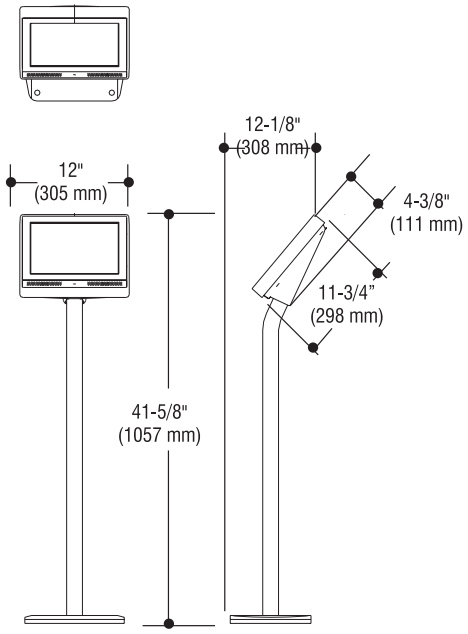
Equipment	Operating Voltage	Frequency (Hertz)	AC or DC	Phase	Max amps per Unit @120 VAC	Max Amps per Unit @240VAC	Wires per Fused Circuit	Power Consumption (Watts)	Connector (Female) Supplied by Customer	Special Notes
Tel -E-Foul	100-130	50/60	AC	1	1.5	-	3	120	120 Volt Outlet	1 - ON/OFF Switched Outlet
	200-240	50/60	AC	1	-	.75	3	120	230 Volt Outlet	
Lightworx	100-130	50/60	AC	1	1	-	3	120	120 Volt Outlet	1 Outlet
	200-240	50/60	AC	1	-	.5	3	120	230 Volt Outlet	
Automated Bumpers	100-130	50/60	AC	1	3	-	3	360	120 Volt Outlet	2 Outlet
	200-240	50/60	AC	1	-	1.5	3	360	230 Volt Outlet	
Scoresheet/Office Printer	100-130	50/60	AC	1	6	-			120 Volt Outlet	2 Outlet
	200-240	50/60	AC	1	-	3			230 Volt Outlet	
Computer Monitor	100-130	50/60	AC	1	1.5	-			120 Volt Outlet	2 Outlet
	200-240	50/60	AC	1		0.75			230 Volt Outlet	

Equipment Dimensions

PEDESTALS



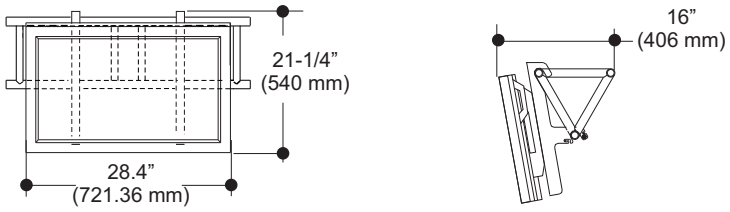
Sync Bowler’s Touchscreen Dual Pedestal



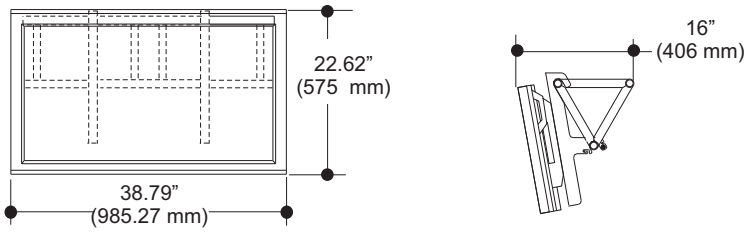
Sync Bowler’s Touchscreen Single Pedestal

LED OVERHEAD MONITORS

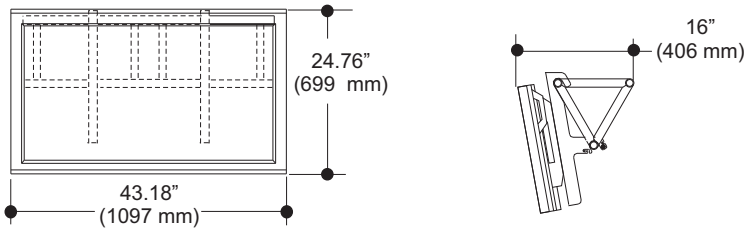
32” LCD MONITOR



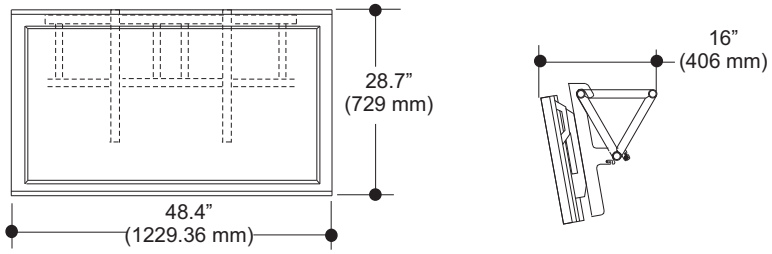
43” LCD Single Overhead



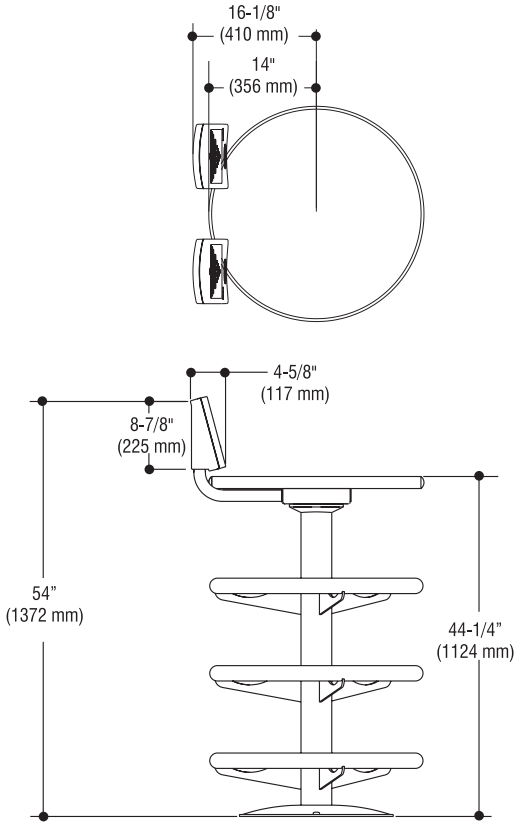
49” LCD Single Overhead



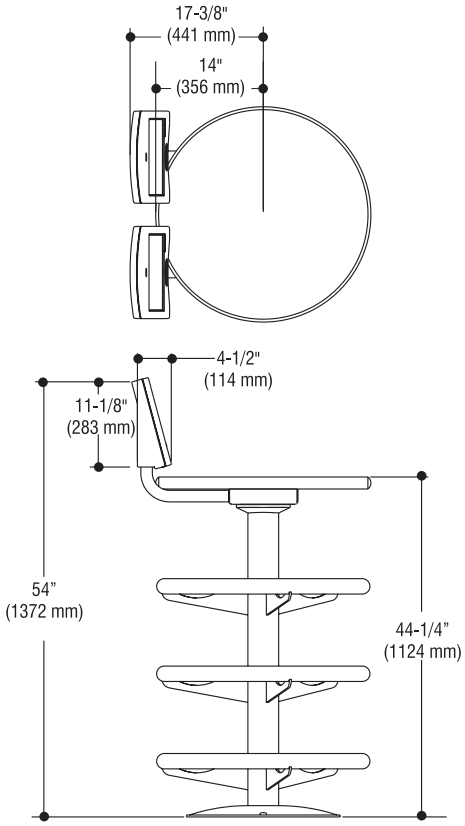
55” LCD Single Overhead



CIRCULAR BALL RACKS

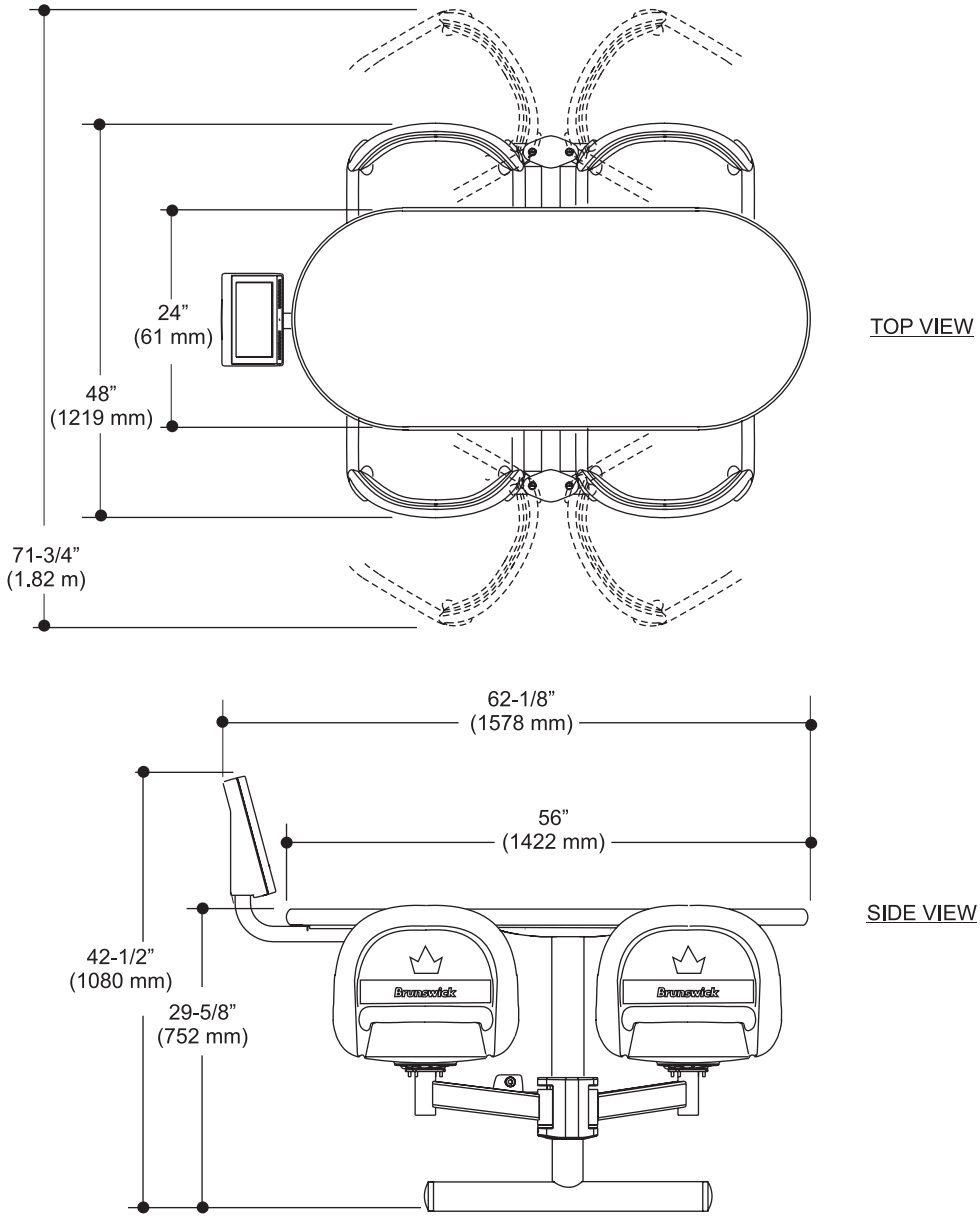


3 Tier Ball Rack with Bowler's Keypad



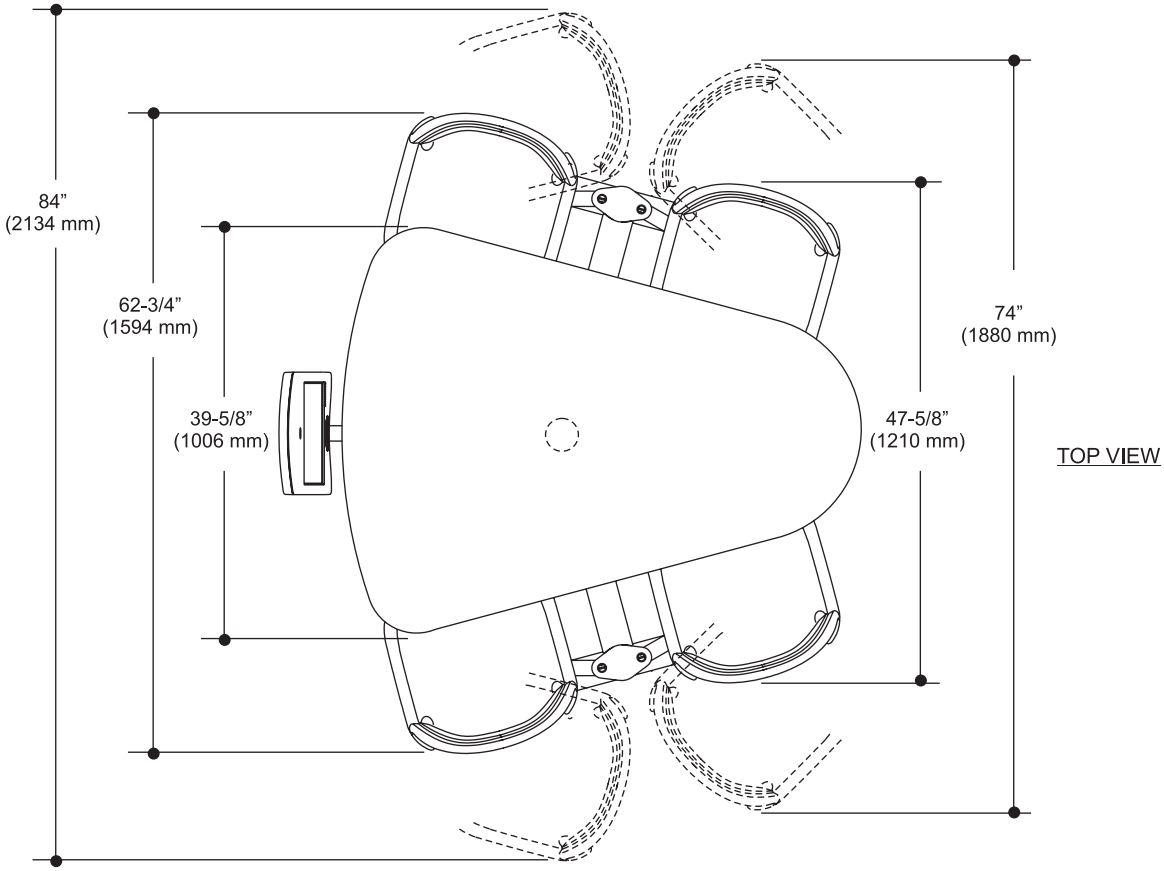
3 Tier Ball Rack with Bowler's Touchscreen

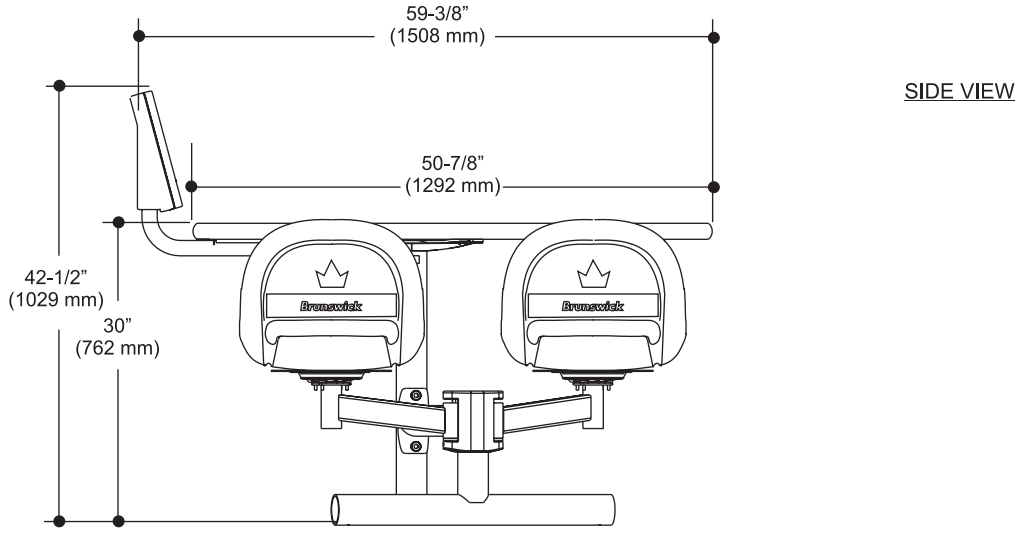
OVAL TABLE



Oval Table

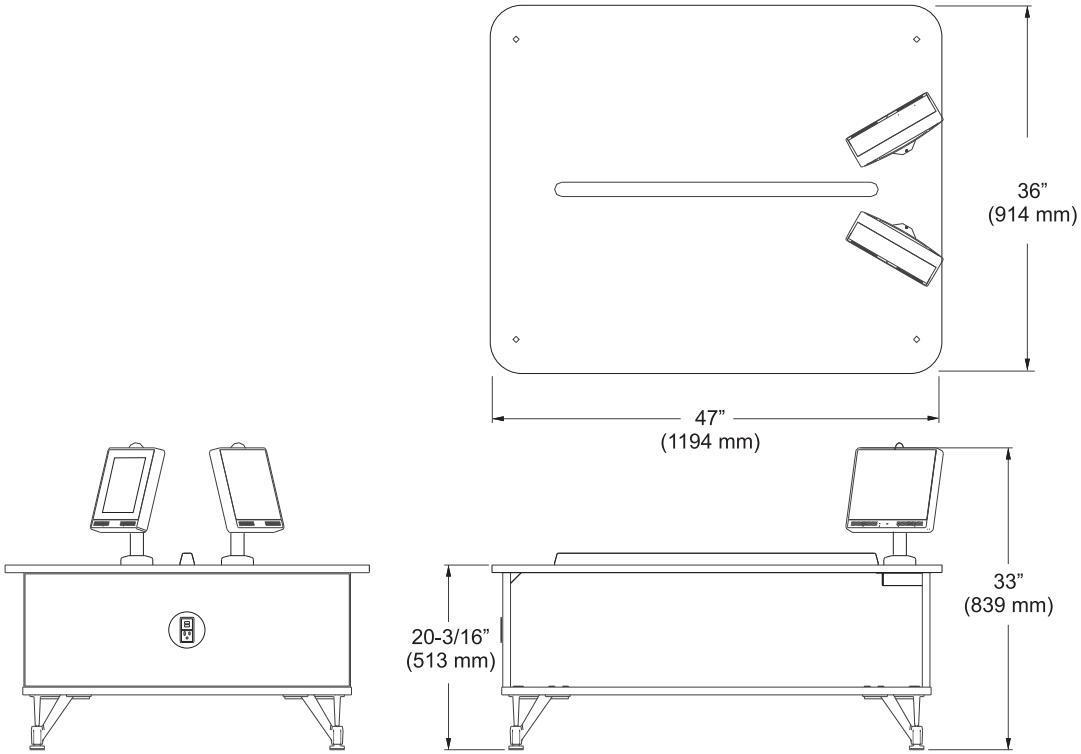
TRIANGLE TABLE



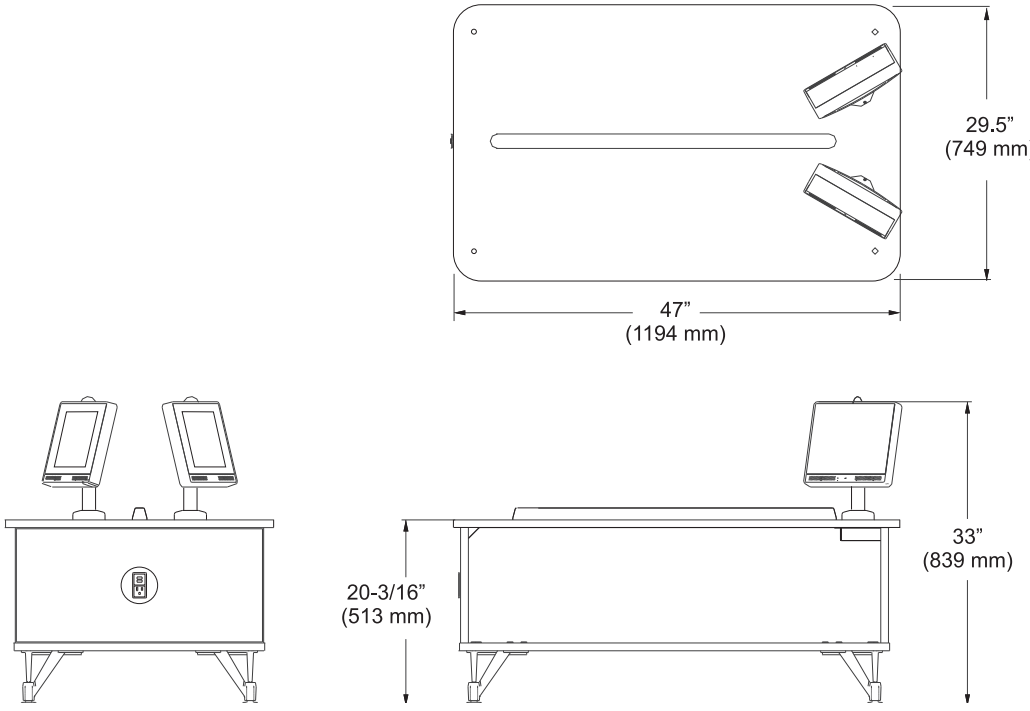


Triangle Table with Bowler’s Touchscreen

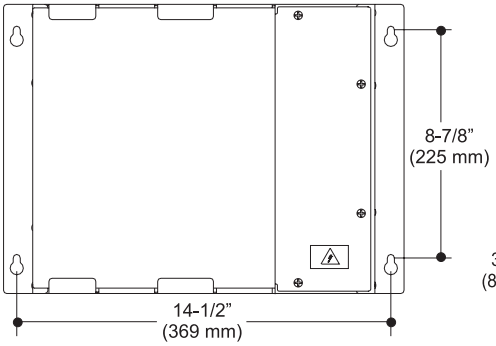
COFFEE TABLE

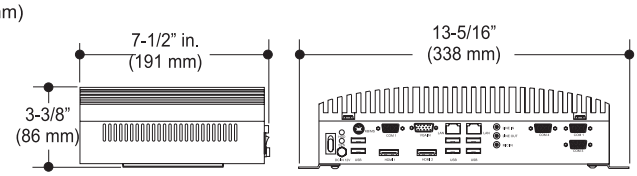


COFFEE TABLE (NARROW)

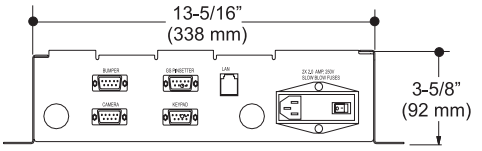


SCORING

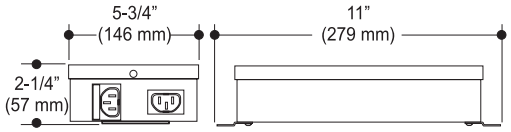




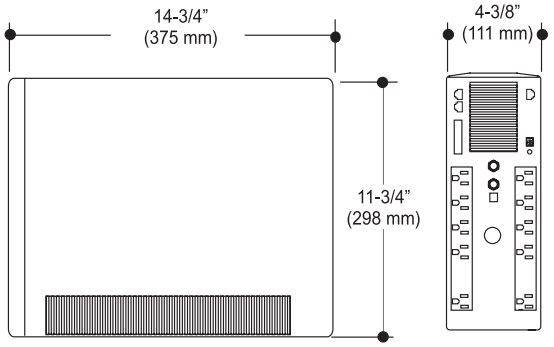
HD Controller



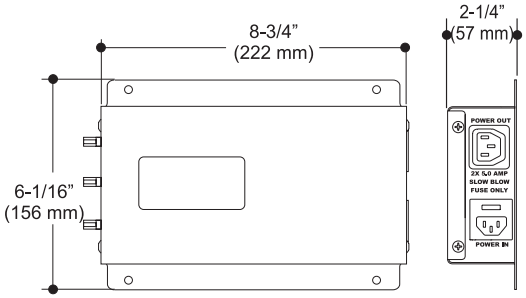
Peripheral Controller



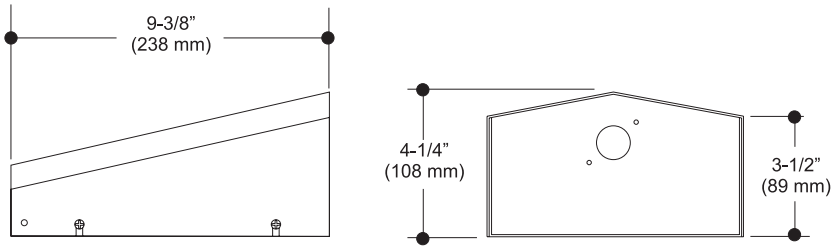
HD Controller
Power Supply



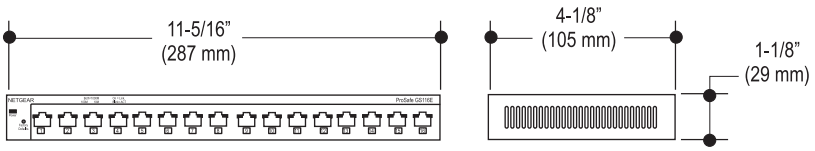
Uninterruptable Power Supply (UPS)



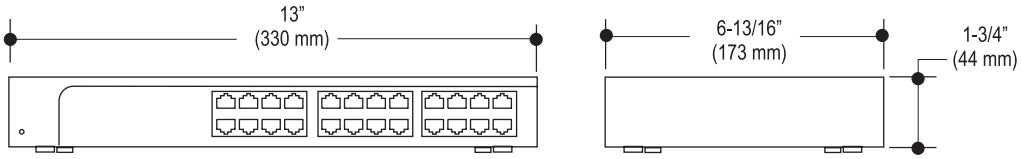
Bowler's Power Supply



Camera

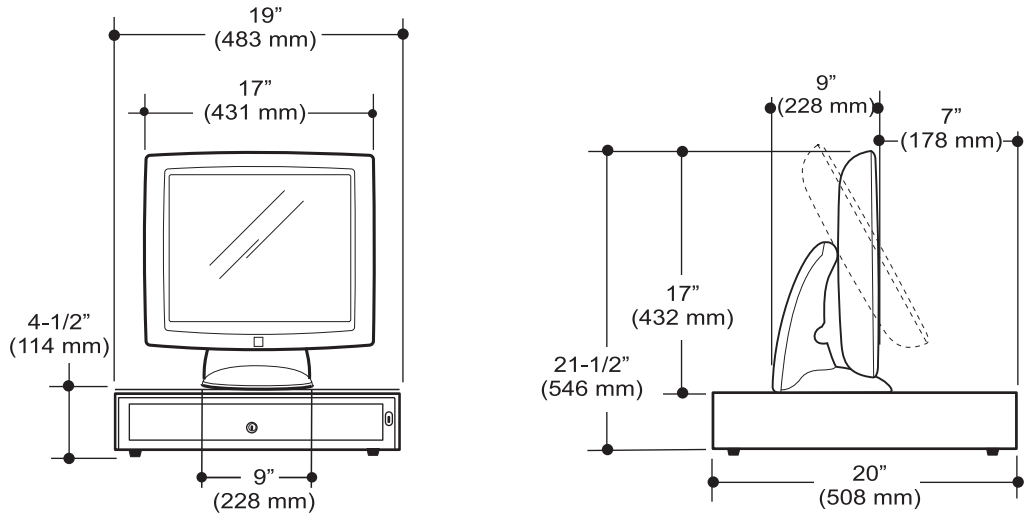


16 Port Ethernet Switch

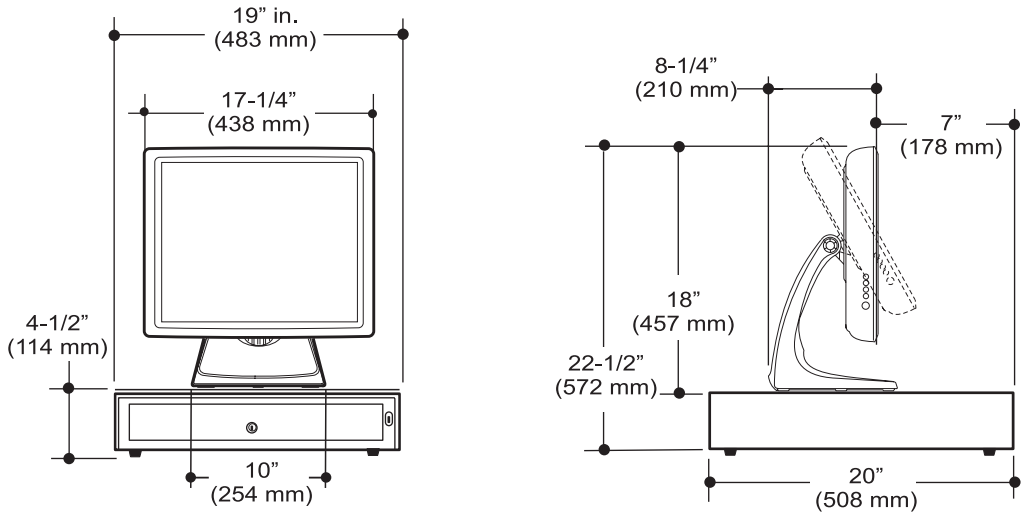


24 Port Ethernet Switch

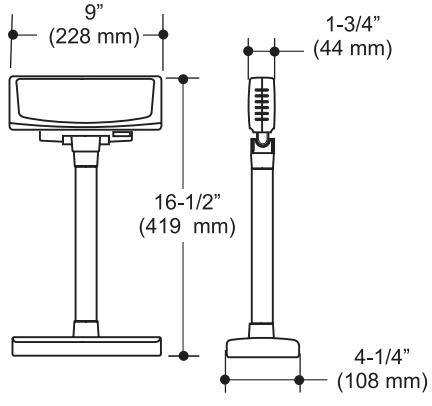
CENTER MANAGEMENT SYSTEM



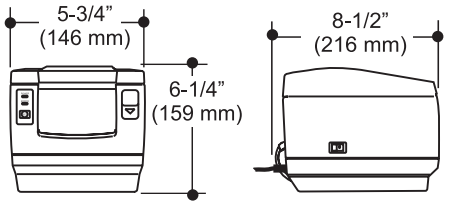
Optional 17” Touch Screen
Point of Sale Terminal and Cash Drawer



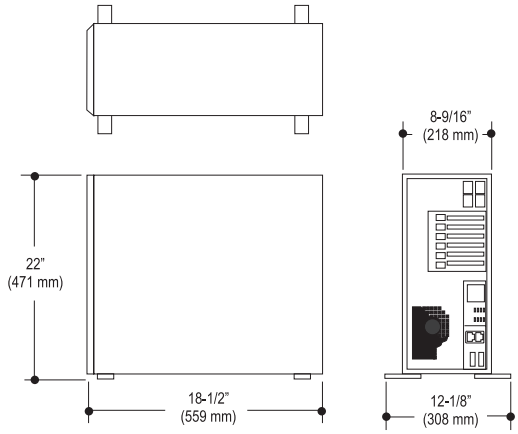
Optional 19” Touch Screen
Point of Sale Terminal and Cash Drawer



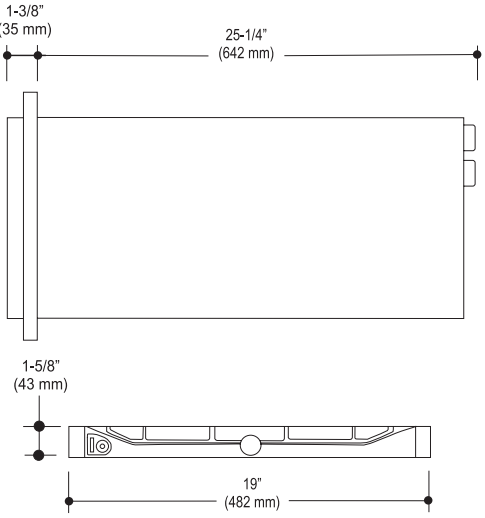
Customer Display



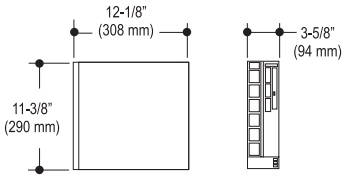
Receipt Printer



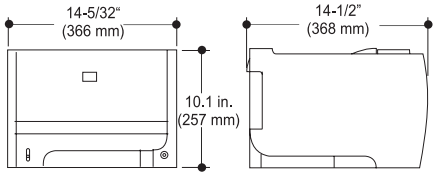
Sync Server Computer



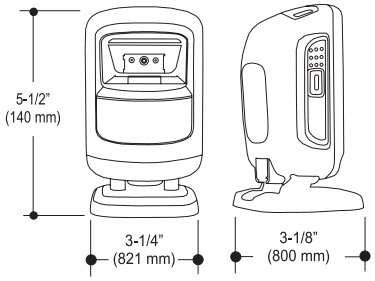
Rack Mount Sync Server Computer



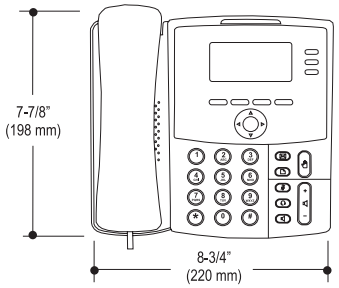
Sync Client Computer

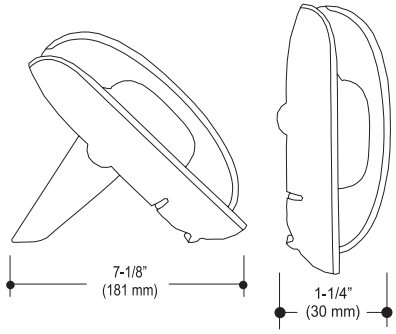


Scoresheet Printer

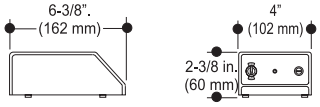


Bar Code Scanner

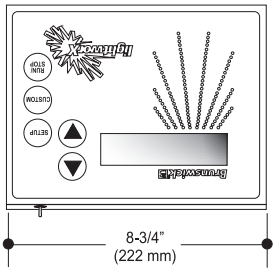


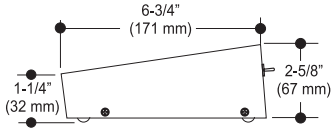


Intercom

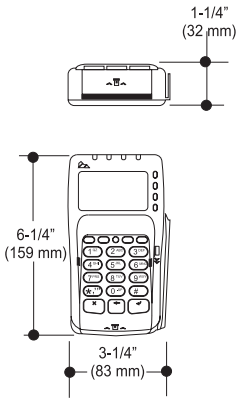


GS Pinsetter Black Light Controller

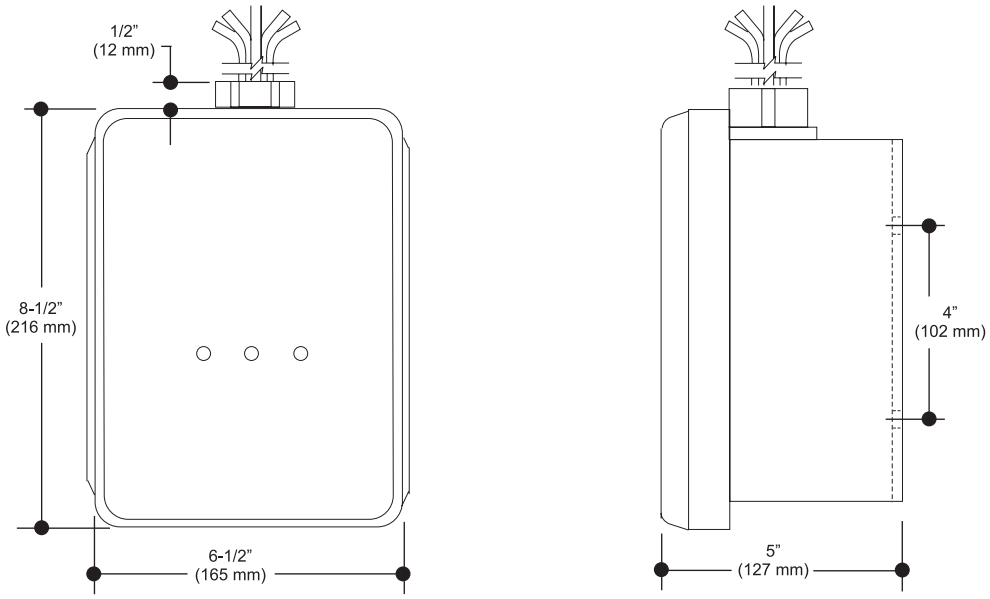




Lightworx Controller



VX 805 PIN Pad Credit Card Device



Surge Suppressor

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Required Certificates

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 30 pounds actual/static weight for each peripheral controller 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

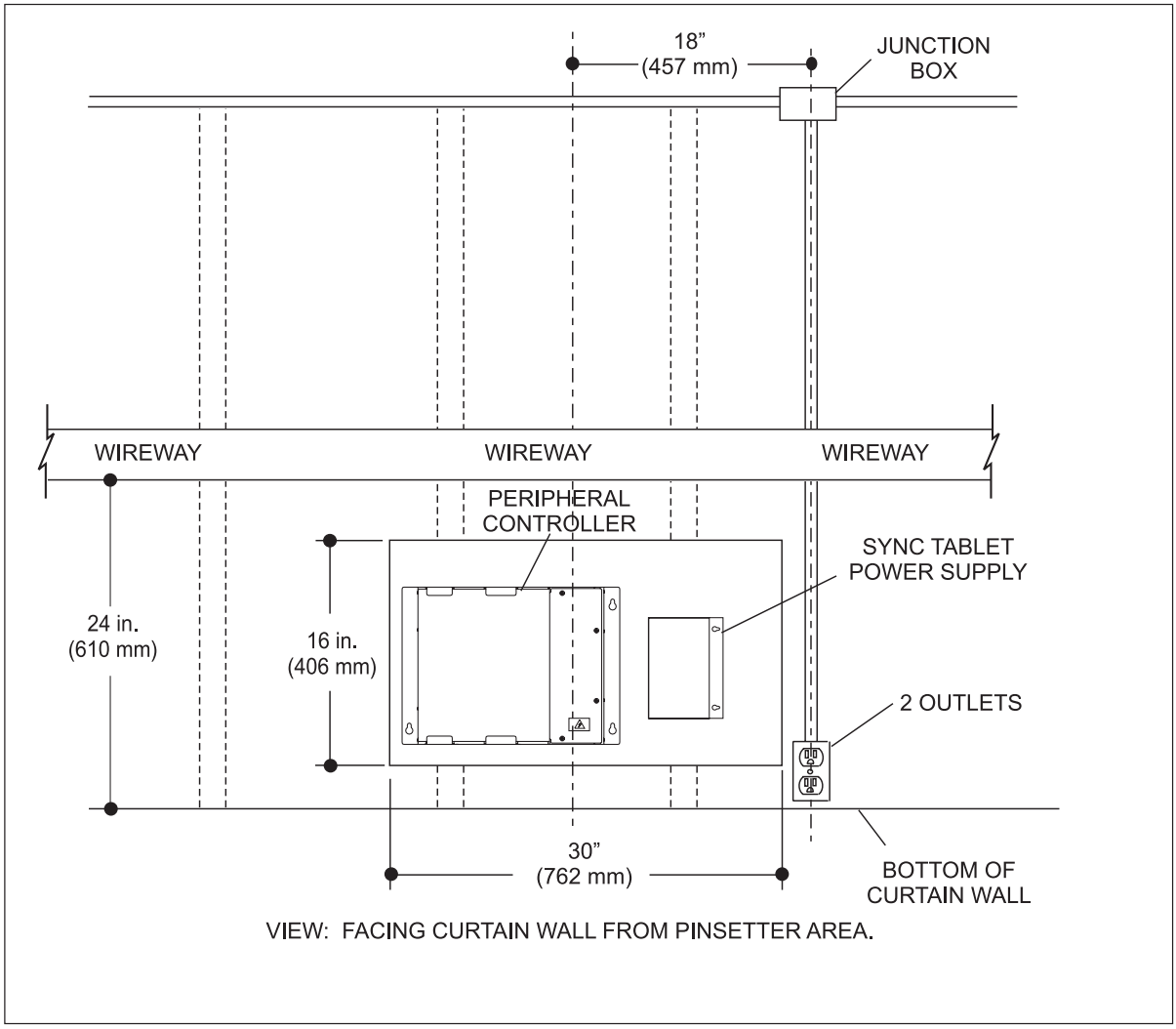
_____
Title

_____
Date

Send To:
Contract Management
Brunswick Bowling Products
Muskegon, MI 49441-2601
or Fax: 231-725-4464

Brunswick Curtain Wall Structure Support Specifications

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

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)		17.5	8.0	
49" Monitors (lb/kg)		22.5	10.3	
55" Monitors (lb/kg)		33.5	15.2	
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, DC43J, DC49J, and DB55E*

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

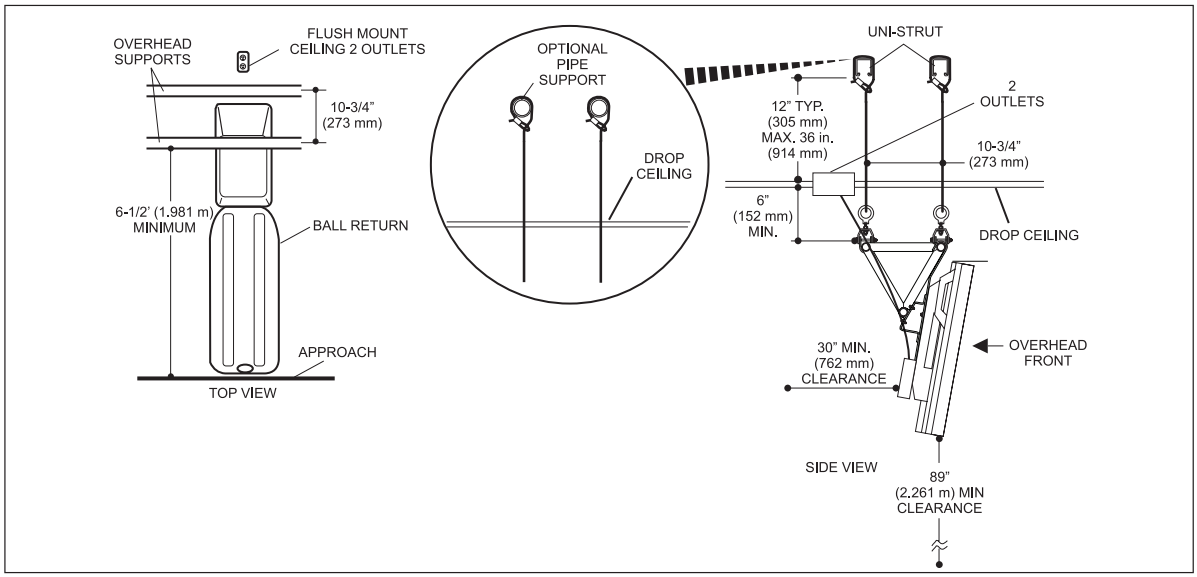
_____
Title

_____

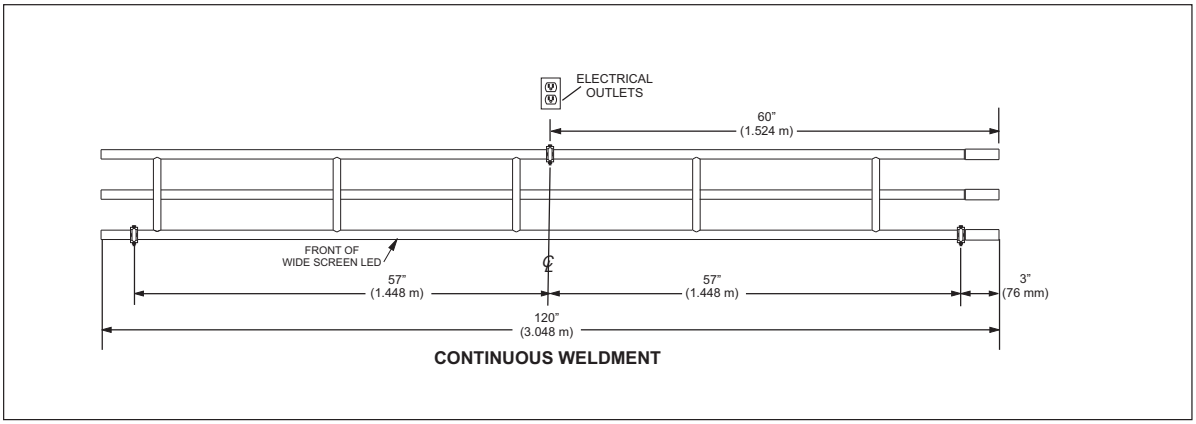
Send To: Contract Management
Brunswick Bowling Products
Muskegon, MI 49441-2601
Email: *BBB.MSK.ContractManagement@brunbowl.com*
Fax: 231-725-4464

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

Brunswick Customer Purchased Overhead Monitor Waiver of Liability and Hold Harmless Agreement

This Waiver of Liability and Hold Harmless Agreement (this "Agreement") is dated as of _____, by and between Brunswick Bowling Products Corporation ("Brunswick") and _____ ("Buyer").

Recitals

WHEREAS, Brunswick and Buyer have entered into that certain Sales Contract No. _____ (the "Sales Contract");

WHEREAS, Brunswick and Buyer have entered into that certain Installation Contract No._____ (the "Installation Contract");

WHEREAS, Buyer has requested that Brunswick permit Buyer to self-install the overheads monitors and hanging support structure purchased to the Sales Contract;

WHEREAS, Brunswick will permit Buyer to self-install such equipment, if Buyer agrees to indemnify Brunswick and waive any claims against Brunswick arising from or related to the installation of such equipment pursuant to this Agreement.

Agreement

FOR VALUABLE CONSIDERATION, the receipt of which is hereby acknowledged, Buyer hereby agrees as follows:

Buyer acknowledges that it has been advised by Brunswick as to the risks involved in self-installing overheads monitors and hanging support structure, and Buyer understands that it is solely responsible for ascertaining the proper installation, accepts the potential risks and waives any warranty claims on such overheads monitors and hanging support structure.

Buyer and its successors, and assigns, assume the entire responsibility and liability for, covenant not to sue, and will protect, indemnify, defend, and hold harmless Brunswick, its officers, directors, employees, agents, representatives, shareholders, insurers, subsidiary and affiliated companies, successors, and assigns from and against all liabilities, losses, expenses, costs, penalties, forfeitures, suits, actions, demands, pending or threatened claims, proceedings or their functional equivalent or causes of action of whatever nature or character as well as all related costs and expenses including, without limitation, reasonable attorneys' fees and court costs, made against Brunswick, its officers, directors, agents, representatives, employees, successors, or assigns for any reason whatsoever including, without limitation, any injury, death, monetary loss or governmental violation, actual or alleged, arising out of or resulting from the installation of the overheads monitors and hanging support structure by Buyer.

This Agreement shall be interpreted under the laws of the State of Illinois.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date and year first written above.

BRUNSWICK BOWLING PRODUCTS CORPORATION

_____

By: _____

Its: _____

_____

BUYER

By: _____

Its: _____

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

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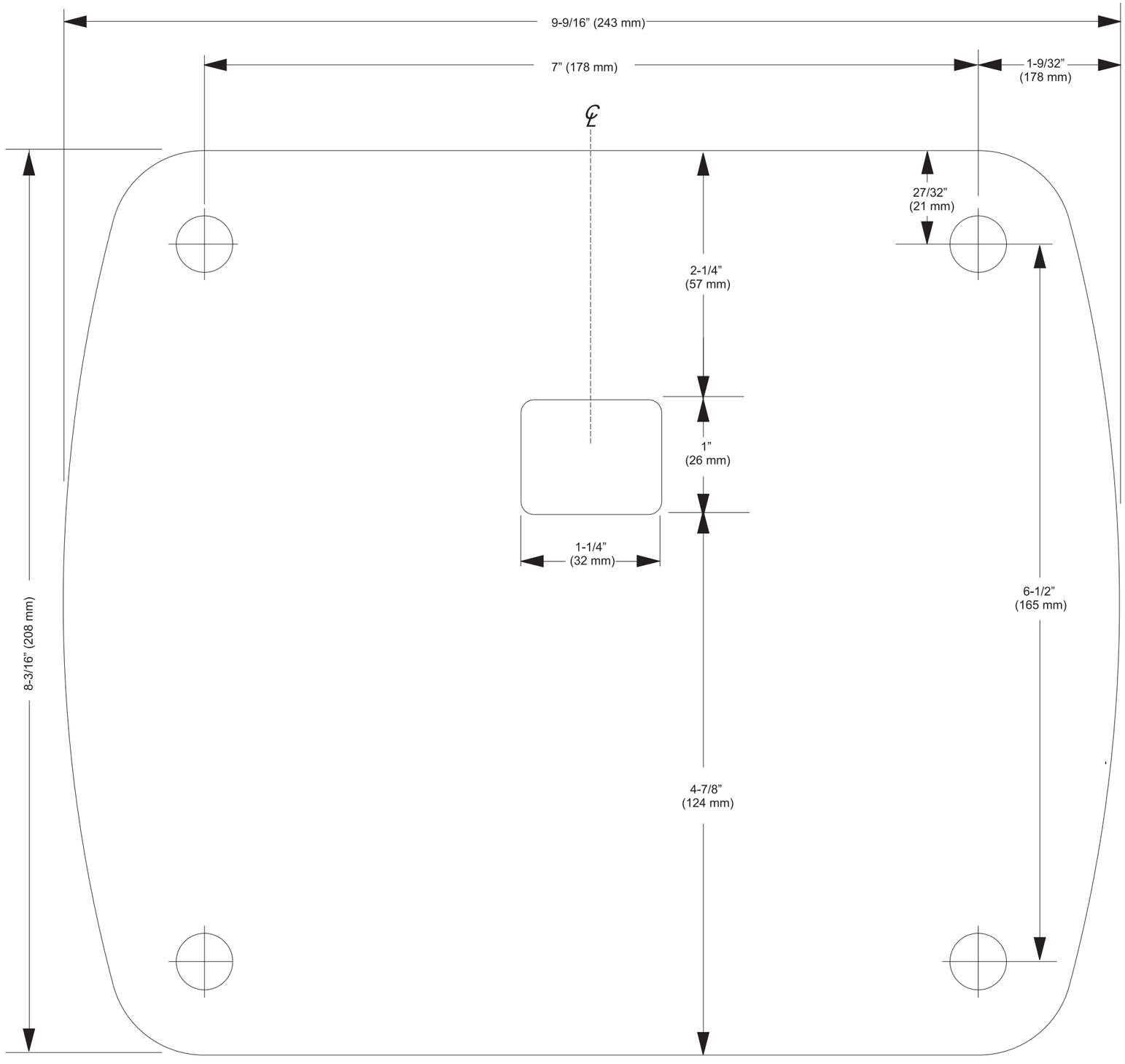

SYNC PEDESTAL FOOT TEMPLATE

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