



*Pre-Installation Manual*

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# **Brunswick Interactive Games**

March 2006 / 10-095400-042  
0206-44

**Brunswick**<sup>®</sup>   
CUSTOMER SERVICE  
A tradition in excellence.

## **Brunswick Interactive Games Pre-Installation Manual**

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Reorder Part No. 10-095400-042

Notice: If available, updates to this manual can be found on-line at [www.brunswickbowling.com](http://www.brunswickbowling.com).

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# Important!

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This document contains information on electrical, installation, conduit, and lighting for Brunswick Interactive Games. 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 the Brunswick Customer Response Center at 1-800-323-8141, option 1, or 231-725-4966, fax 231-725-4667, e:mail [crc.support@brunbowl.com](mailto:crc.support@brunbowl.com), 24 hours a day, 7 days a week.

When planning to install the Brunswick Interactive Games, the customer is required to provide an isolated ground (I.G.) electrical subpanel which is solely dedicated to those electronic systems with an isolated neutral and ground buss. These requirements are necessary to prevent electrical noise from compressors, game rooms, fluorescent lights, motors, etc. from interfering with sensitive computer operations. An improperly grounded system can also result in memory losses, erroneous signals, and/or component failures. The isolated ground subpanel must be installed by a licensed electrician and must meet 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 located at the I.G. subpanel that supplies the electronics. 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.

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

## **Power Conditioning**

In some areas, additional power conditioning or uninterruptible 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 Electronics Service Department. The Electronics Service Department will assist the customer with any additional equipment specifications or Brunswick approved power conditioning equipment required.

# *Important!*

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## **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.

## **Isolated Ground Receptacles - NEC 250-74 Exception 4**

Where required, for the reduction of electrical noise (electromagnetic interference) on the grounding circuit, a receptacle in which the grounding terminal is purposely insulated from the receptacle mounting means shall be permitted. The receptacle grounding terminal shall be grounded by an insulated equipment grounding conductor run with the circuit conductors to the electronic subpanel.

## **Grounding Conductor - NEC 384-27**

The grounding conductor shall be permitted to pass through one or more subpanels 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 subpanel) 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.

## **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 reducing static electricity. A relative level of 45% 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.

# Conduit and Low Voltage Cable Specifications

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When routing the conduit from the Brunswick Interactive Games to the Control Desk, extra care must be exercised so as to not place them near a noisy electrical environment.

1. The cables need to be installed in conduit only when local codes require it.
2. Keeping the conduit routing to a minimum is preferred, but keep in mind that routing them away from a noisy electrical environment is most important.
3. If conduit is required, only telephone or communication cables may be routed in the same conduit. Do not route them in conduit with high voltage power cables.
4. **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.
5. 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 Customer Response Center at 1-800-323-8141, option 1, or 231-725-4966, fax 231-725-4667, e:mail [crc.support@brunbowl.com](mailto:crc.support@brunbowl.com), 24 hours a day, 7 days a week.

**i** **NOTE:** Do not use plumbing PVC pipe for low voltage cable runs. Electrical PVC must be used for all conduit runs.

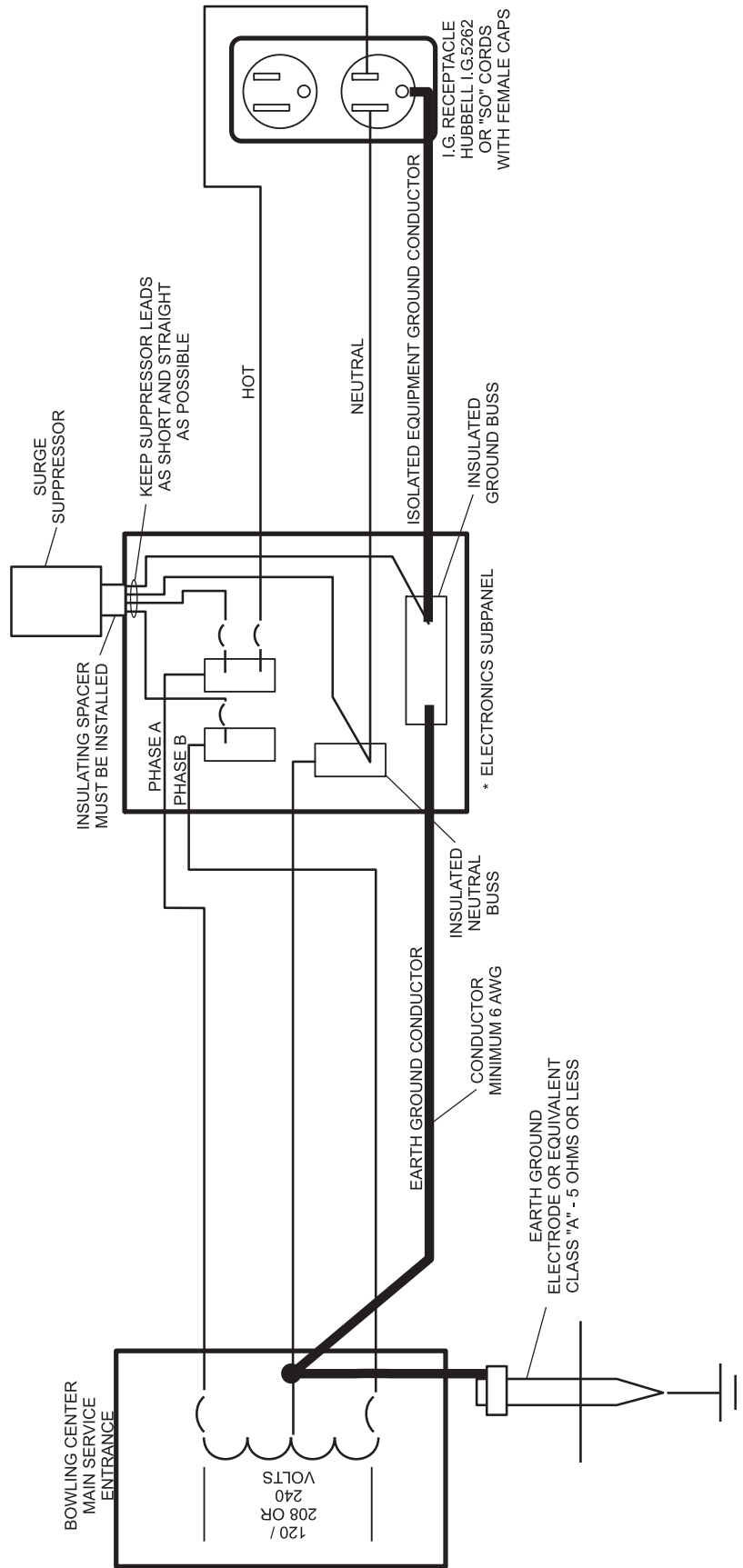
# Electrical Quick Reference Checklist

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- 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 Brunswick Field Engineer arrives on-site.
- A **SEPARATE** and **DEDICATED** subpanel must be provided and **DIRECTLY** wired to main service, hereby called the “**ELECTRONICS SUBPANEL.**” If a transformer is installed, the primary of the transformer to main service must have a separate ground wire.
- NOTE:** Powering from the Electronics Scoring panel is acceptable.
- The **ISOLATED GROUND** and **NEUTRAL** buss bars **CANNOT** be **BONDED** to the electronics subpanel. Reference NEC 250-74 Exception 4.
- EARTH GROUND** conductor **MUST BE** a minimum of **#6 AWG** wire or larger.
- The electrician **MUST** perform a **CONTINUITY** check on the electronics subpanel to ensure **NO** conduit to **ISOLATED GROUND** and/or **NEUTRAL** shorts exist.
- Greenfield or conduit **CANNOT** be used as the **EQUIPMENT GROUND** conductor for the system.
- Each **ISOLATED GROUND** circuit has a **SEPARATE** hot, neutral, and ground wire. Example: 10 circuits = 10 hots, 10 neutrals, 10 grounds.
- All branch circuit runs **OVER 200 FEET** from the electronics subpanel must be **#10 AWG** wire or larger.
- Class-A **CERTIFIED** ground is recommended and should be measured at main service.
- Provide I.G. receptacles at locations of projectors, projection screens and BIG Server location. If local code permits, you may install "SO" cords with insulated female cord cap receptacle.
- NOTE:** *It is very important to also read the specific Pre-Installation Manual needed for 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.*



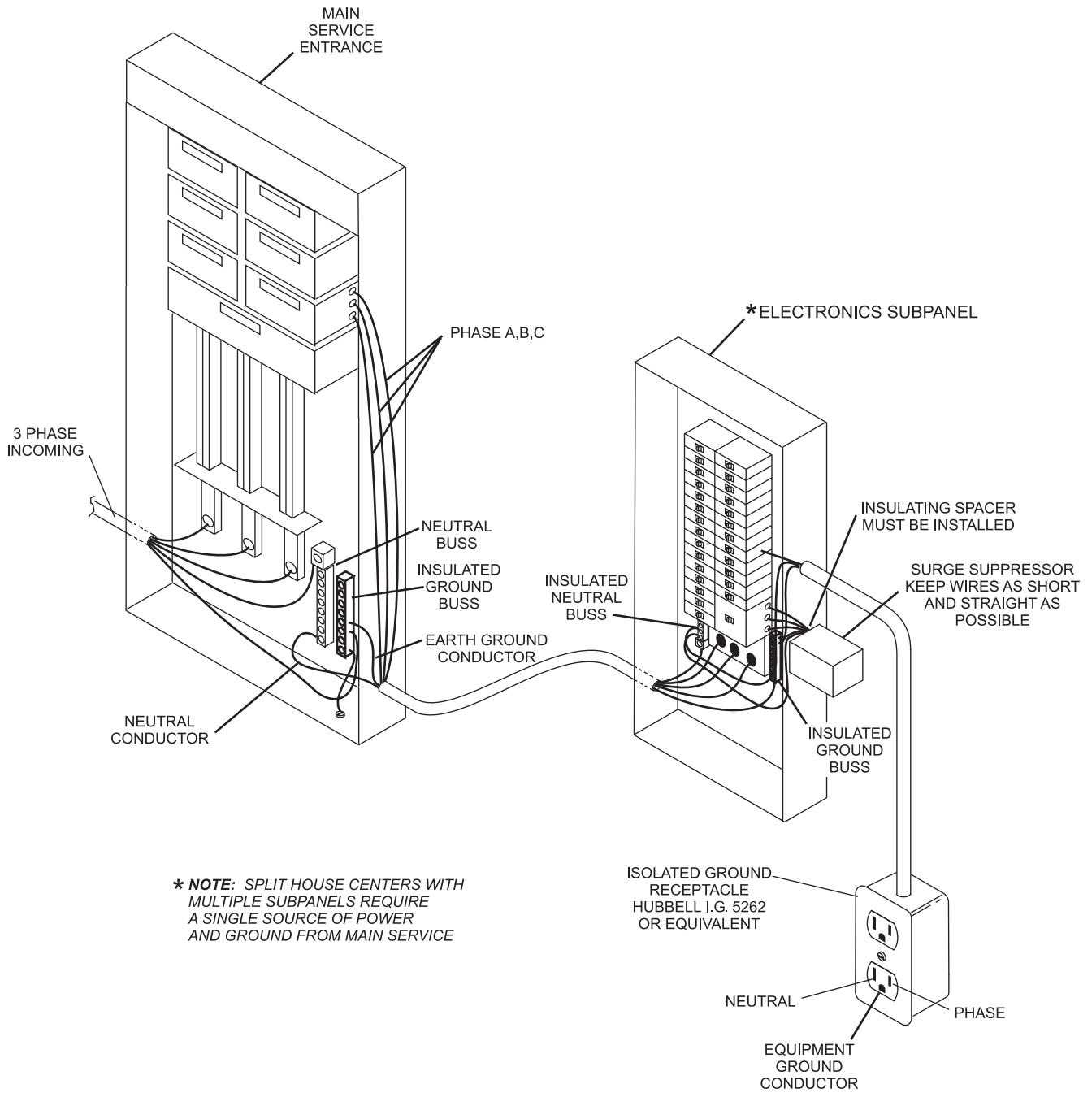
# Electrical Quick Reference Schematic



\* SPLIT HOUSE CENTERS WITH MULTIPLE SUBPANELS REQUIRE A SINGLE SOURCE OF POWER FROM MAIN SERVICE ENTRANCE

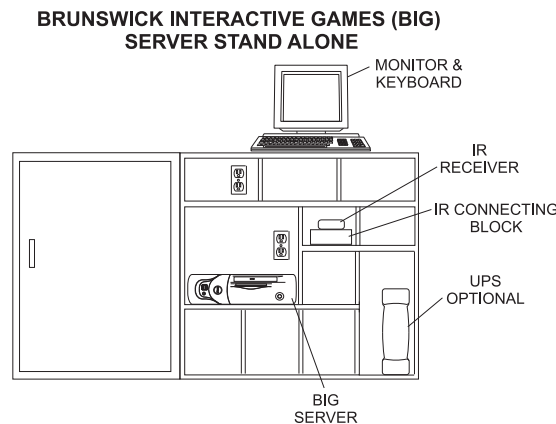
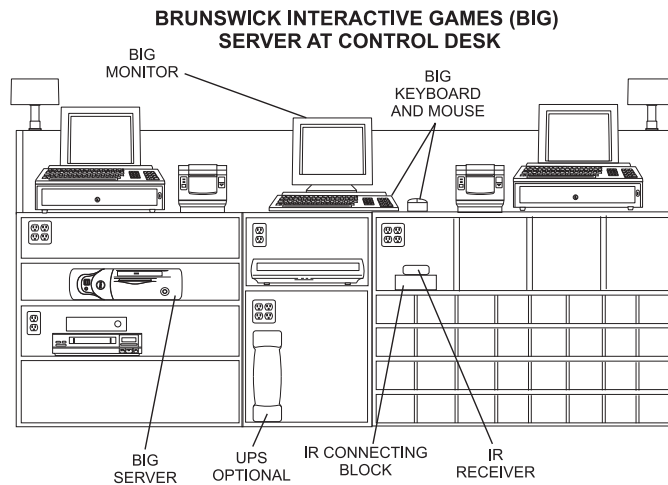
## ISOLATED GROUND SYSTEM

# Electrical Quick Reference



# Brunswick Interactive Games - Server

Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Responsibility
115-130 200-230	50/60	AC	1	8	1200	2 Wires + Isolated Ground	Install circuit with 120V Hubbell I.G. 5262 receptacle or proper receptacle per local electrical code.

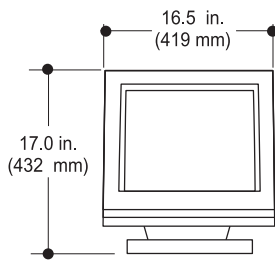


## Installation Information

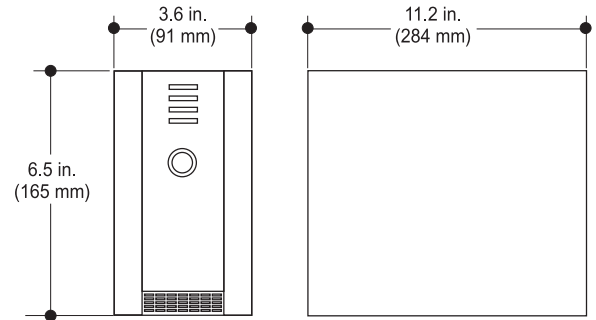
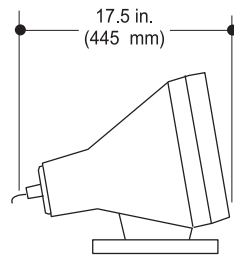
**Customer Responsibility:** The Brunswick Interactive Games server is shown in two examples of possible location. The decision of equipment locations should be made before power outlets and conduits are installed. Please refer to equipment specifications in the back of this manual for equipment dimension.

**i IMPORTANT: Proper ventilation is required for Brunswick Interactive Games server.**

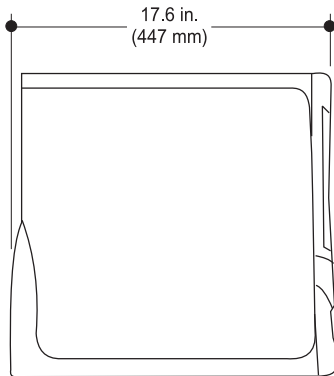
# Brunswick Interactive Games System Equipment Specifications



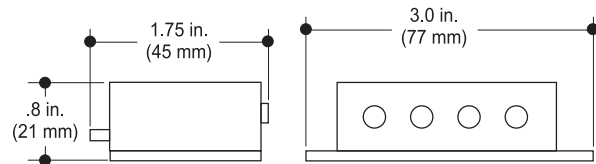
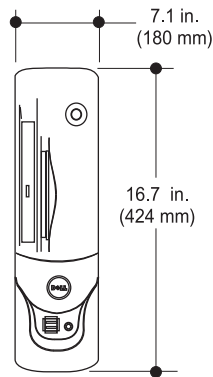
**17" Monitor**



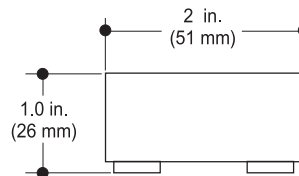
**Optional Uninterruptible Power Supply (UPS)**



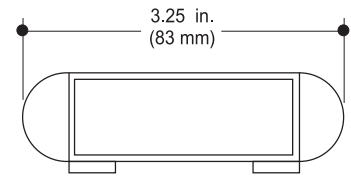
**Brunswick Interactive Games  
Central Processing Unit (CPU)**



**Connecting Block**



**IR Receiver**



# Projector Electrical Specifications

Recommended one projector/screen for every 8-12 lanes. Installation of projector screens must be complete before projectors can be installed.

## High Output Projector

Electrical Information									
Volts	Hertz	AC/DC	Phase	Amps Per Unit	Size	Watts	Weight	Branch Circuit	Customer Responsibility
100-130 200-240	50/60	AC	1	8@120V 4@240V	L= 21.6" W=20.4" H=9.5"	800	41 Lbs.	2 Wires + Isolated Ground	Install circuit with 120V No more than two per 20 Amp circuit

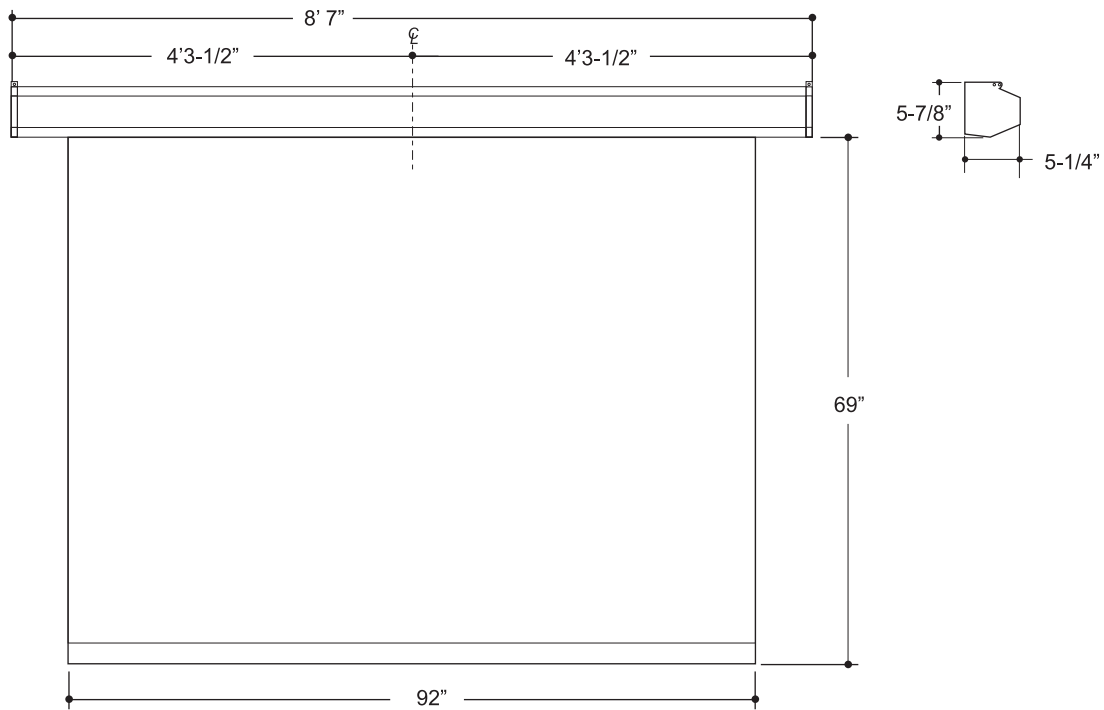
## Standard Projector

Electrical Information									
Volts	Hertz	AC/DC	Phase	Amps Per Unit	Size	Watts	Weight	Branch Circuit	Customer Responsibility
100-130 200-240	50/60	AC	1	3.1@120V 1.4@240V	L= 12.4" W=10.2" H=4.8"	290	7.1 Lbs.	2 Wires + Isolated Ground	Install circuit with 120V No more than four per 20 Amp circuit

# Projection Screen Specifications

## Motorized Projector Screen

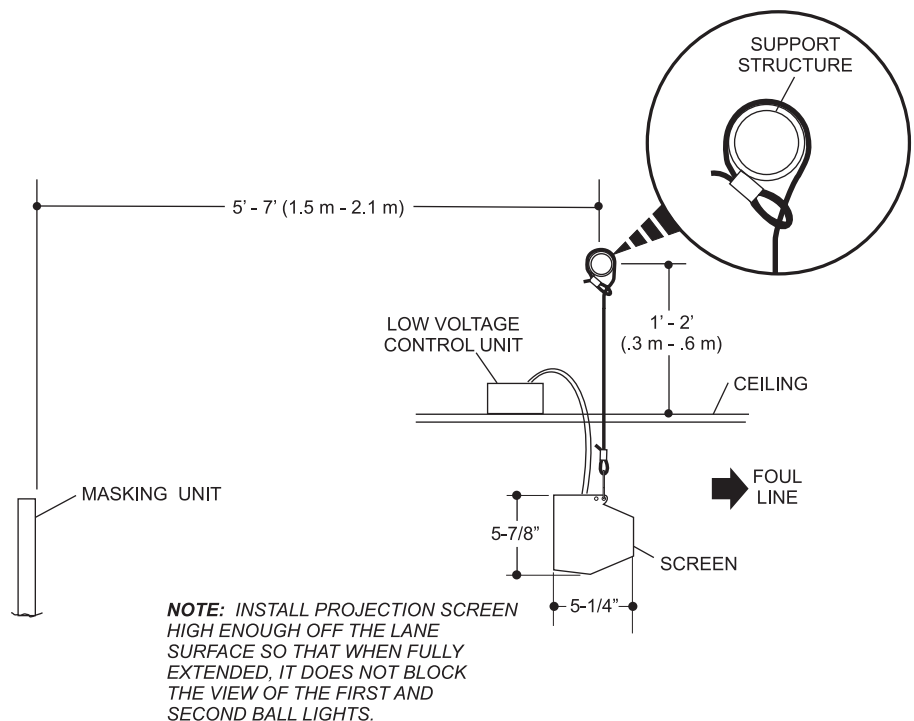
Electrical Information								
Volts	Hertz	AC/DC	Phase	Amps Per Unit	Watts	Weight	Branch Circuit	Customer Responsibility
100-130 200-240	50/60	AC	1	1.1@120V .55@240V	800	45 Lbs.	2 Wires + Isolated Ground	Install circuit with 120V No more than eleven per 20 Amp circuit



# Customer Responsibility - Projection Screen

## Customer Responsibility for Projection Screen Installation

1. Customer is responsible for providing support structure to which the aircraft cables attach, usually a metal bar or wood beam, that will support the weight load of the projection screen.
2. The support should be located 1 - 2 feet (.3 m - .6 m) above the ceiling and 5 - 7 feet (1.5 m - 2.1 m) from the masking unit toward the foul line. Refer to the graphic below.

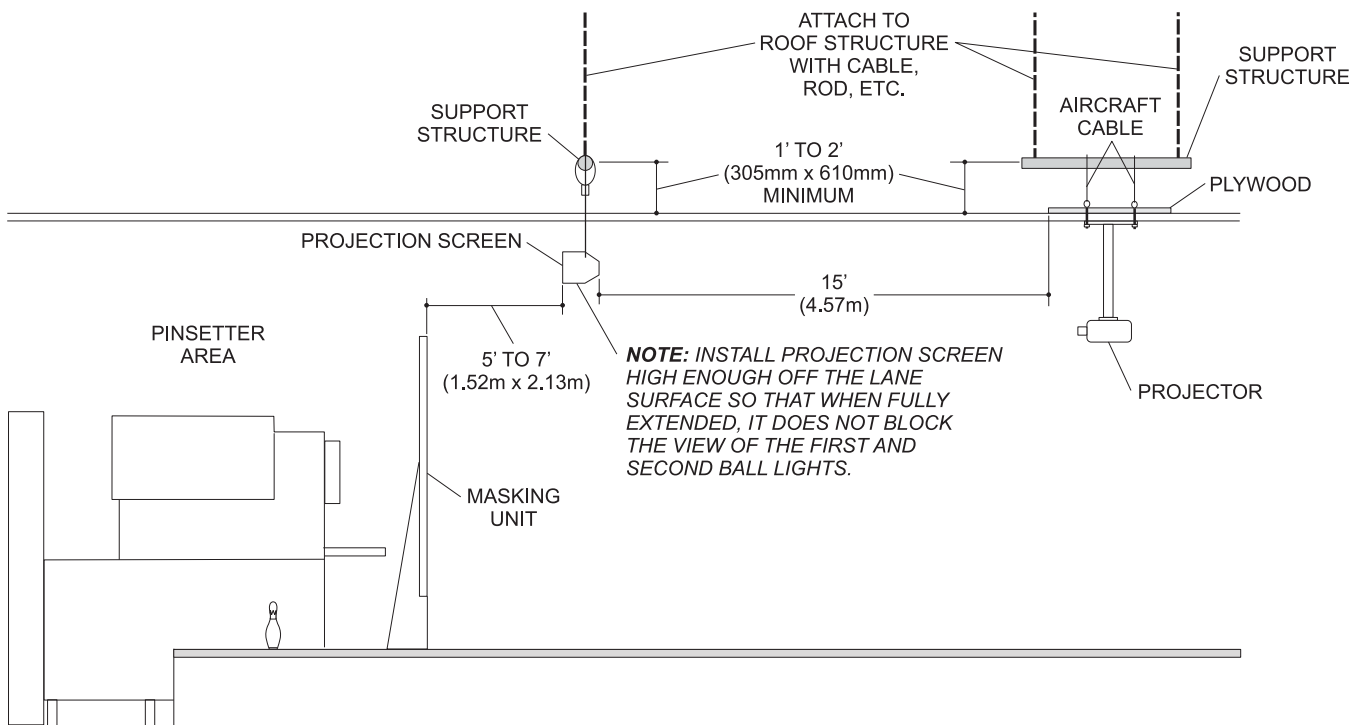


3. The length of the support structure should be longer than the projection screen. Refer to Projection Screen graphic on the previous page. The center line of the support structure should be the same as the center line of the projection screen.

# Customer Responsibility - Projector - Closed Ceiling

## Customer Responsibility for Projector Installation (Closed Ceiling)

1. Customer is responsible for providing support structure to which the aircraft cables attach, usually a metal bar or wood beam, that will support the weight load of the projector. Refer to the system overview graphic below and the projector mounting detail on the following page.

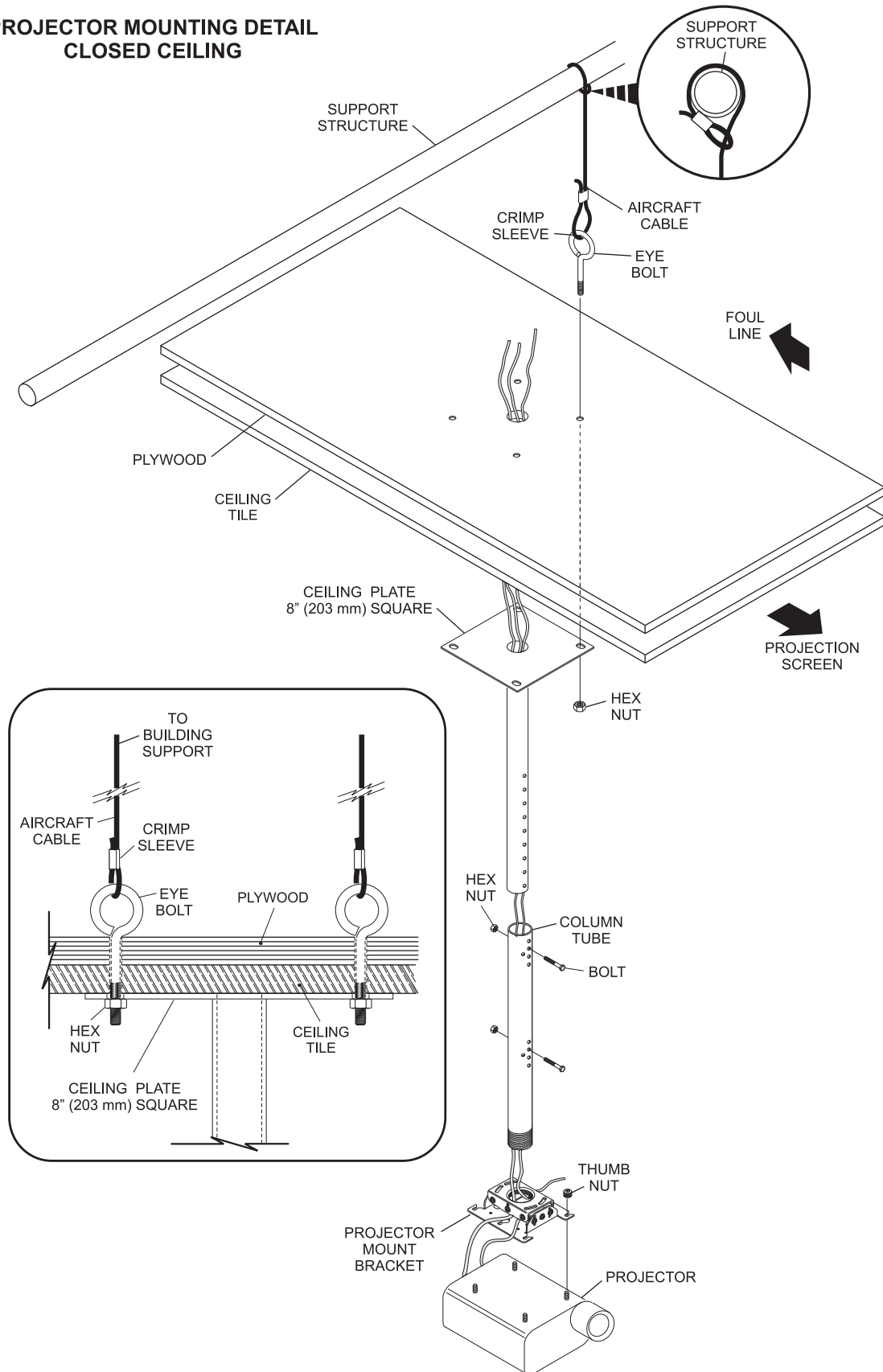


PROJECTION SYSTEM OVERVIEW  
CLOSED CEILING



# Customer Responsibility - Projector - Closed Ceiling

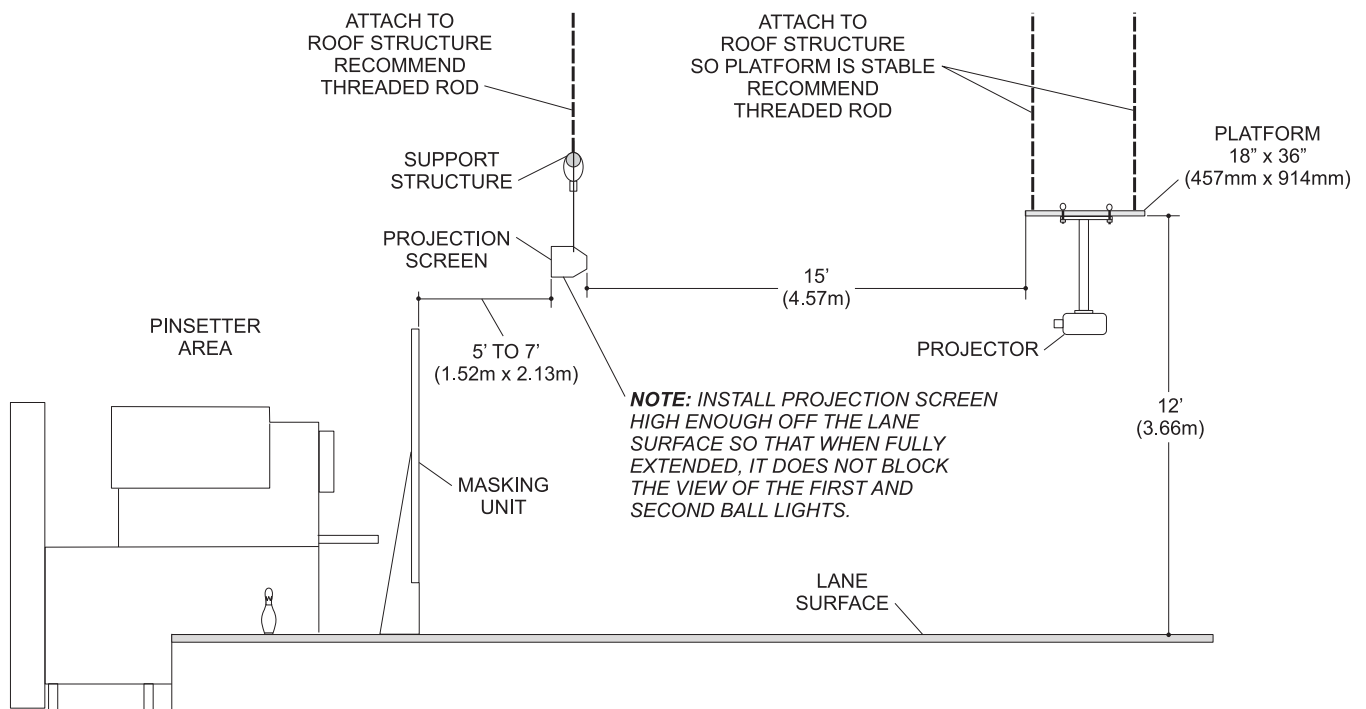
## PROJECTOR MOUNTING DETAIL CLOSED CEILING



# Customer Responsibility - Projector - Open Ceiling

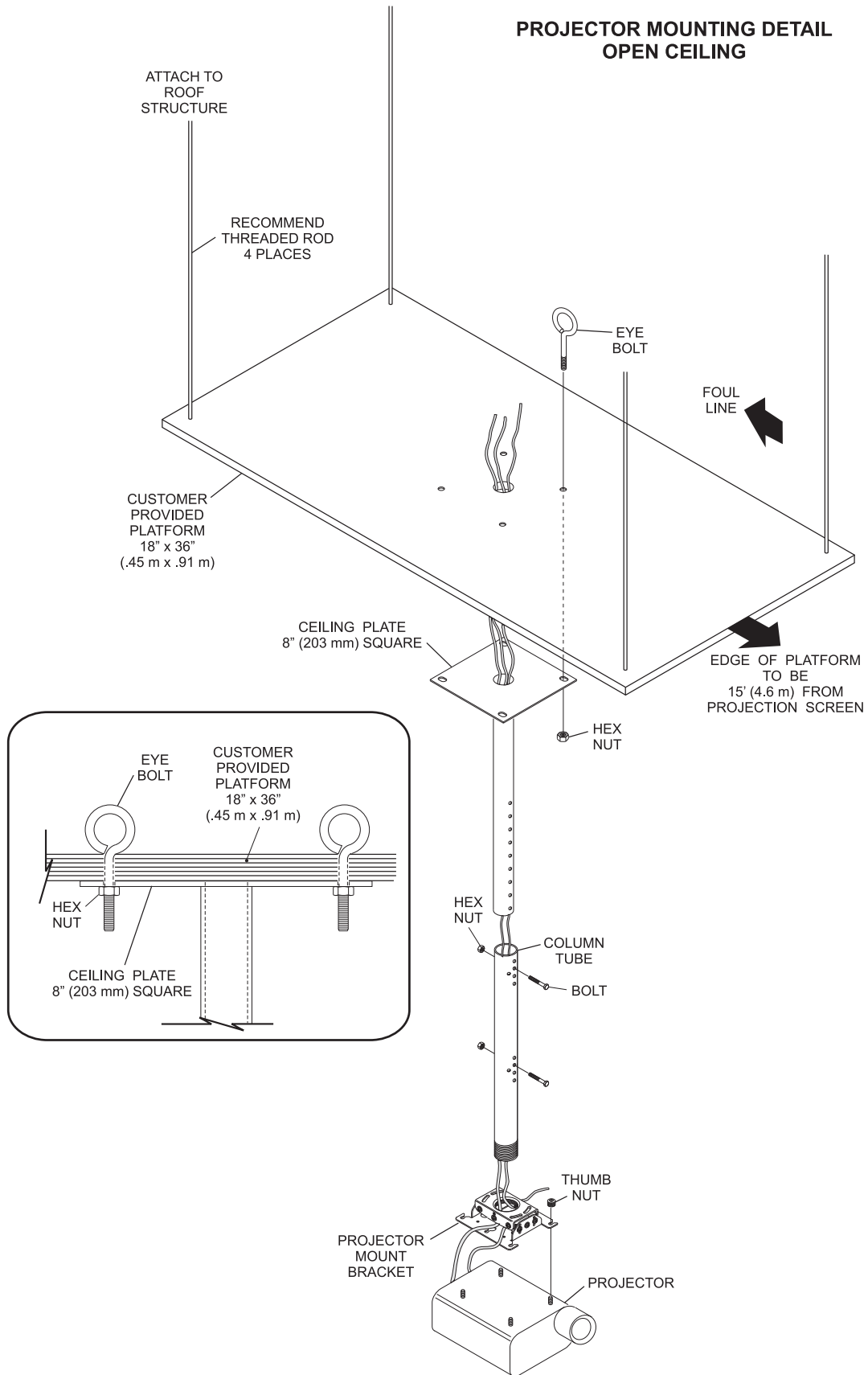
## Customer Responsibility for Projector Installation (Open Ceiling)

1. Customer is responsible for providing platform that will support the weight load of the projector. Refer to the system overview graphic below and the projector mounting detail on the following page.
2. The platform should be located 12 feet (3.7 m) above the lane and 15 feet (4.6 m) from the projection screen, toward the foul line.
3. The platform should be approximately 3 feet (.91 m) long and 1-1/2 feet (.46 m) wide.



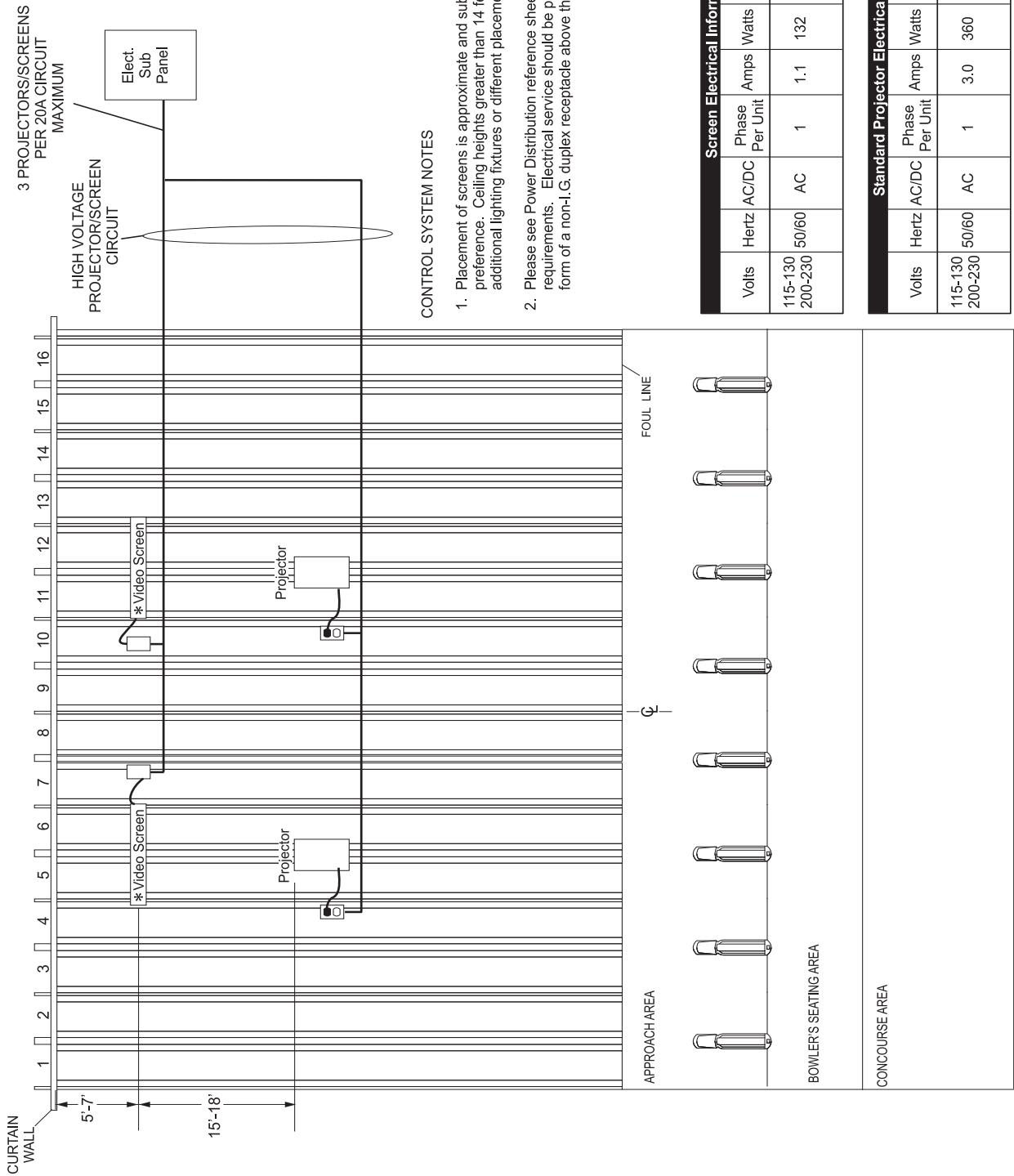
**PROJECTION SYSTEM OVERVIEW  
OPEN CEILING**

# Customer Responsibility - Projector - Open Ceiling



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# Brunswick Interactive Games Layout for 12-16 lanes Standard Projectors



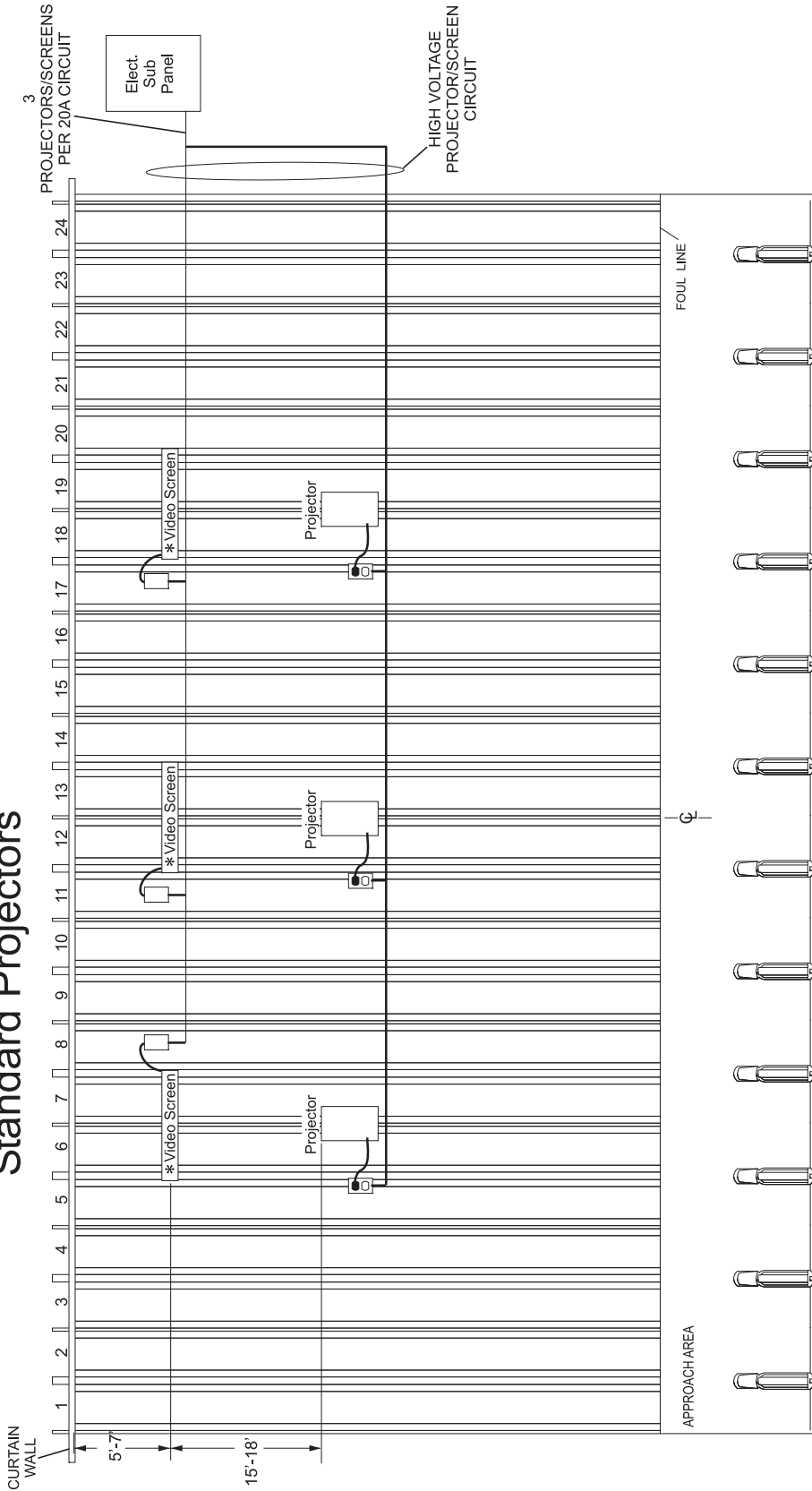
### CONTROL SYSTEM NOTES

1. Placement of screens is approximate and subject to personnel preference. Ceiling heights greater than 14 feet may require additional lighting fixtures or different placement of fixtures.
2. Please see Power Distribution reference sheet for power requirements. Electrical service should be provided in the form of a non-I.G. duplex receptacle above the ceiling near each projector.

Screen Electrical Information							
Volts	Hertz AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response	
115-130 200-230	50/60	AC	1	1.1	132	2 Wires + Ground	Install proper receptacle per local electrical code

Standard Projector Electrical Information							
Volts	Hertz AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response	
115-130 200-230	50/60	AC	1	3.0	360	2 Wires + Ground	Install proper receptacle per local electrical code

# Brunswick Interactive Games Layout for 17-24 lanes Standard Projectors



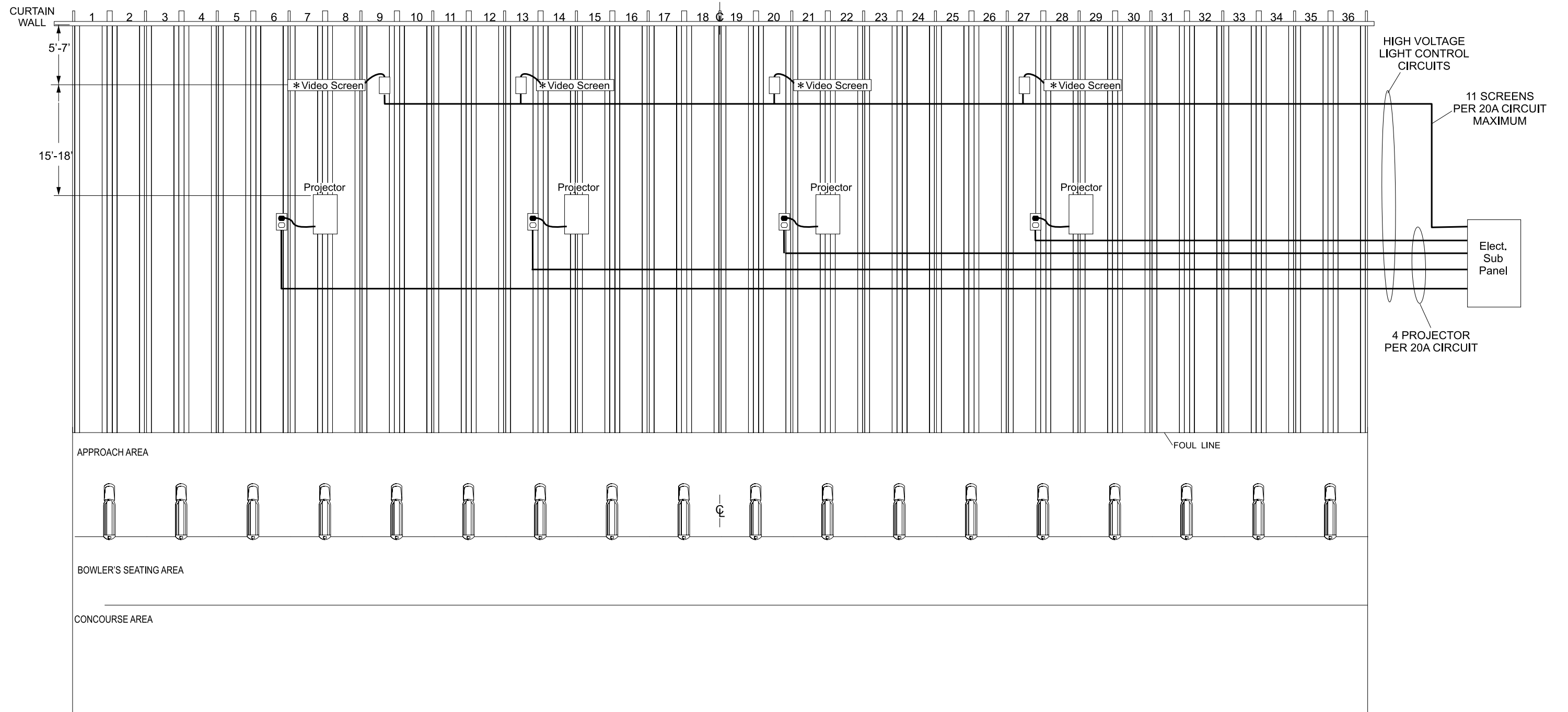
## CONTROL SYSTEM NOTES

1. Placement of screens is approximate and subject to personnel preference. Ceiling heights greater than 14 feet may require additional lighting fixtures or different placement of fixtures.
2. Please see Power Distribution reference sheet for power requirements. Electrical service should be provided in the form of a non-I.C. duplex receptacle above the ceiling near each projector.

Screen Electrical Information				Standard Projector Electrical Information			
Volts	Hertz	AC/DC	Phase Per Unit	Amps Per Unit	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	1.1	132	2 Wires + Ground	Install proper receptacle per local electrical code
115-130 200-230	50/60	AC	1	3.0	360	2 Wires + Ground	Install proper receptacle per local electrical code

# Brunswick Interactive Games Layout for 25-36 lanes

## Standard Projectors



### CONTROL SYSTEM NOTES

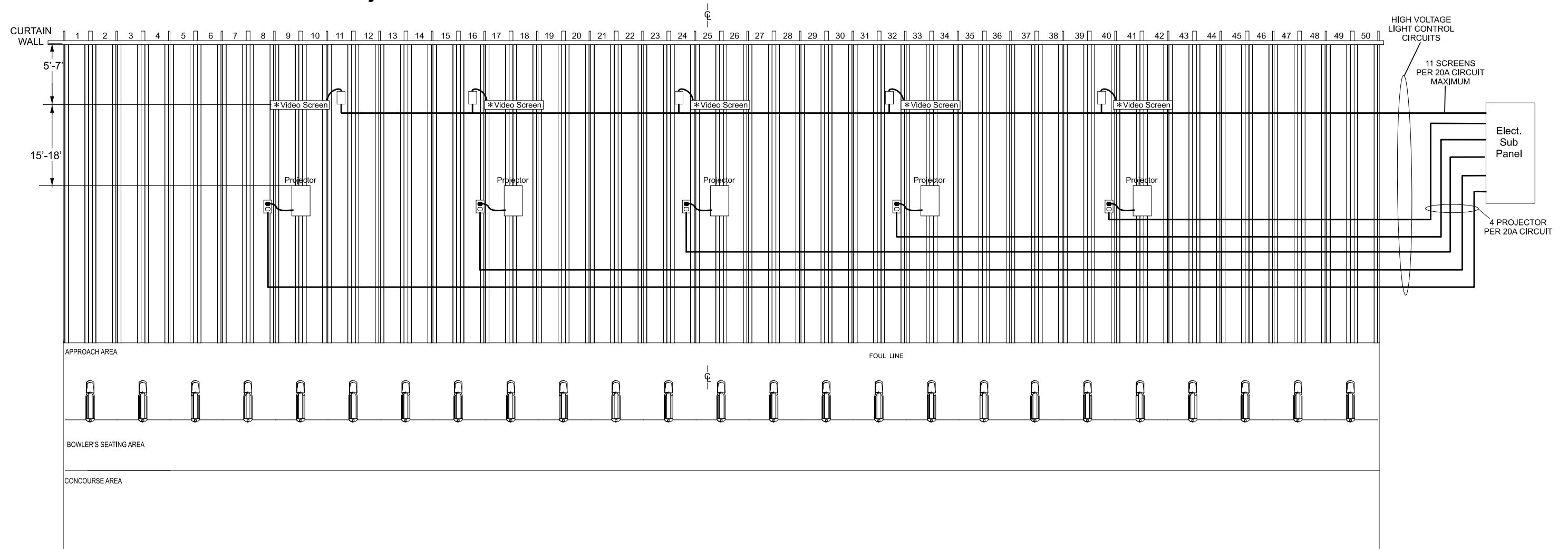
1. Placement of screens is approximate and subject to personnel preference. Ceiling heights greater than 14 feet may require additional lighting fixtures or different placement of fixtures.
2. Electrical service should be provided in the form of a non-I.G. duplex receptacle above the ceiling near each projector.

Screen Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	1.1	132	2 Wires + Ground	Install proper receptacle per local electrical code

Standard Projector Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	3.0	360	2 Wires + Ground	Install proper receptacle per local electrical code

# Brunswick Interactive Games Layout for 37-50 lanes

## Standard Projectors



### CONTROL SYSTEM NOTES

1. Placement of screens is approximate and subject to personnel preference. Ceiling heights greater than 14 feet may require additional lighting fixtures or different placement of fixtures.
2. Please see Power Distribution reference sheet for power requirements. Electrical service should be provided in the form of a non-I.G. duplex receptacle above the ceiling near each projector.

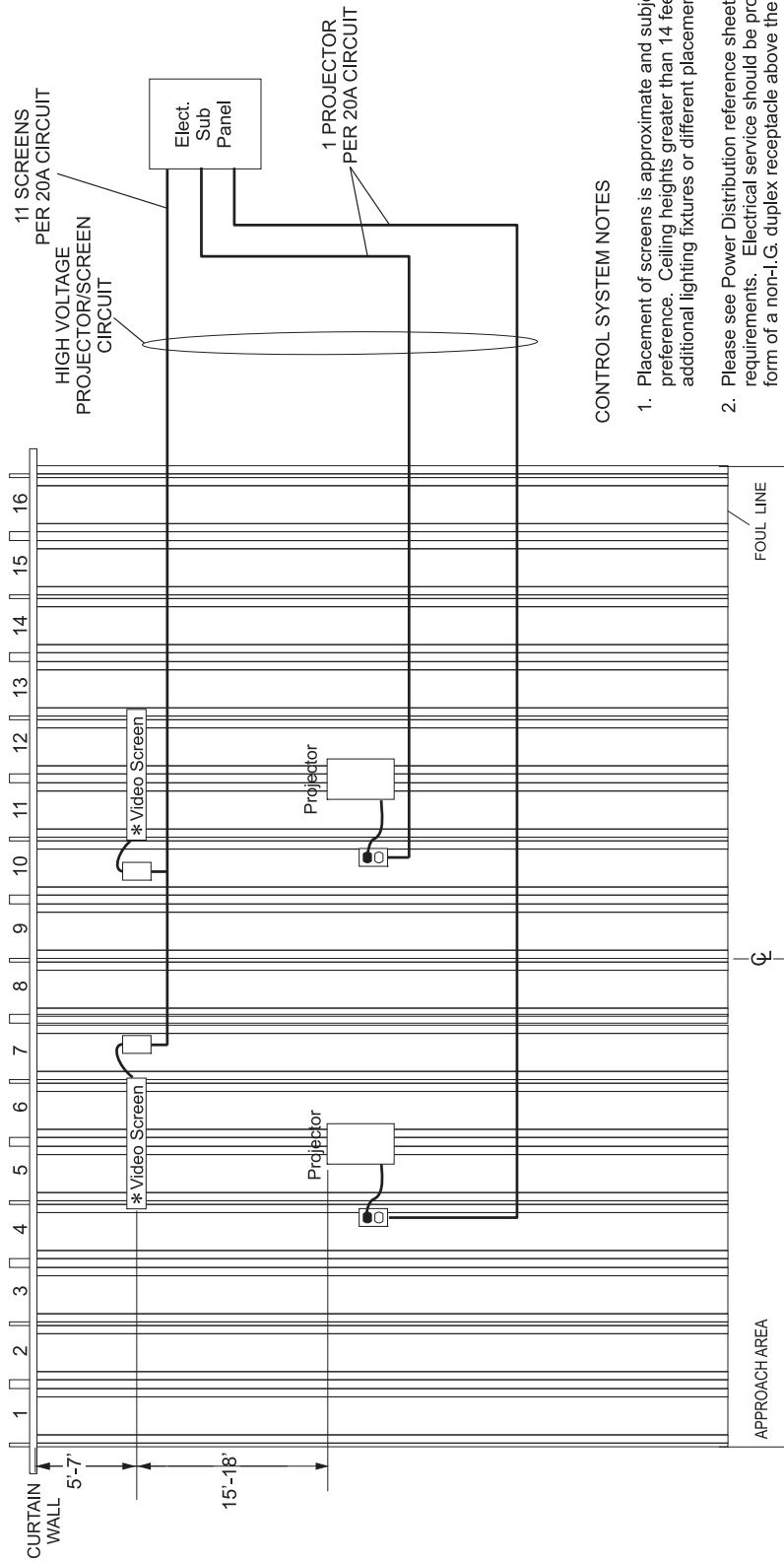
Screen Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	1.1	132	2 Wires + Ground	Install proper receptacle per local electrical code

Standard Projector Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	3.0	360	2 Wires + Ground	Install proper receptacle per local electrical code



# Brunswick Interactive Games Layout for 12-16 lanes

## High Output Projectors

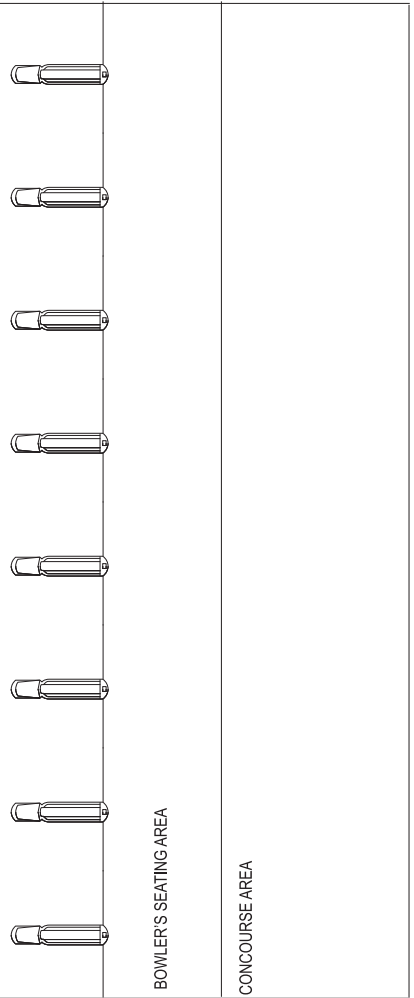


### CONTROL SYSTEM NOTES

1. Placement of screens is approximate and subject to personnel preference. Ceiling heights greater than 14 feet may require additional lighting fixtures or different placement of fixtures.
2. Please see Power Distribution reference sheet for power requirements. Electrical service should be provided in the form of a non-I.G. duplex receptacle above the ceiling near each projector.

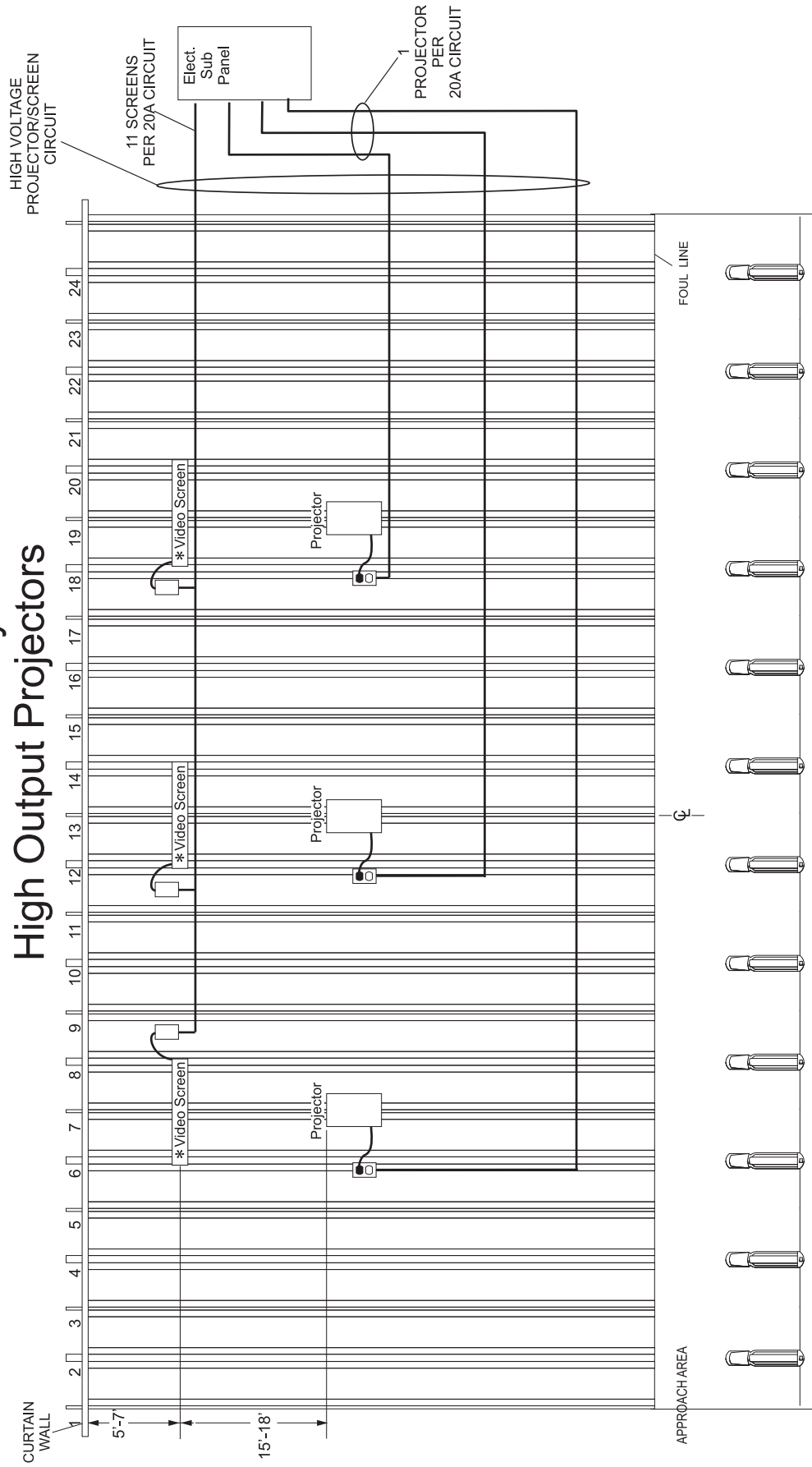
Screen Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	1.1	132	2 Wires + Ground	Install proper receptacle per local electrical code

High Output Projector Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	8	1200	2 Wires + Ground	Install proper receptacle per local electrical code



# Brunswick Interactive Games Layout for 17-24 lanes

## High Output Projectors



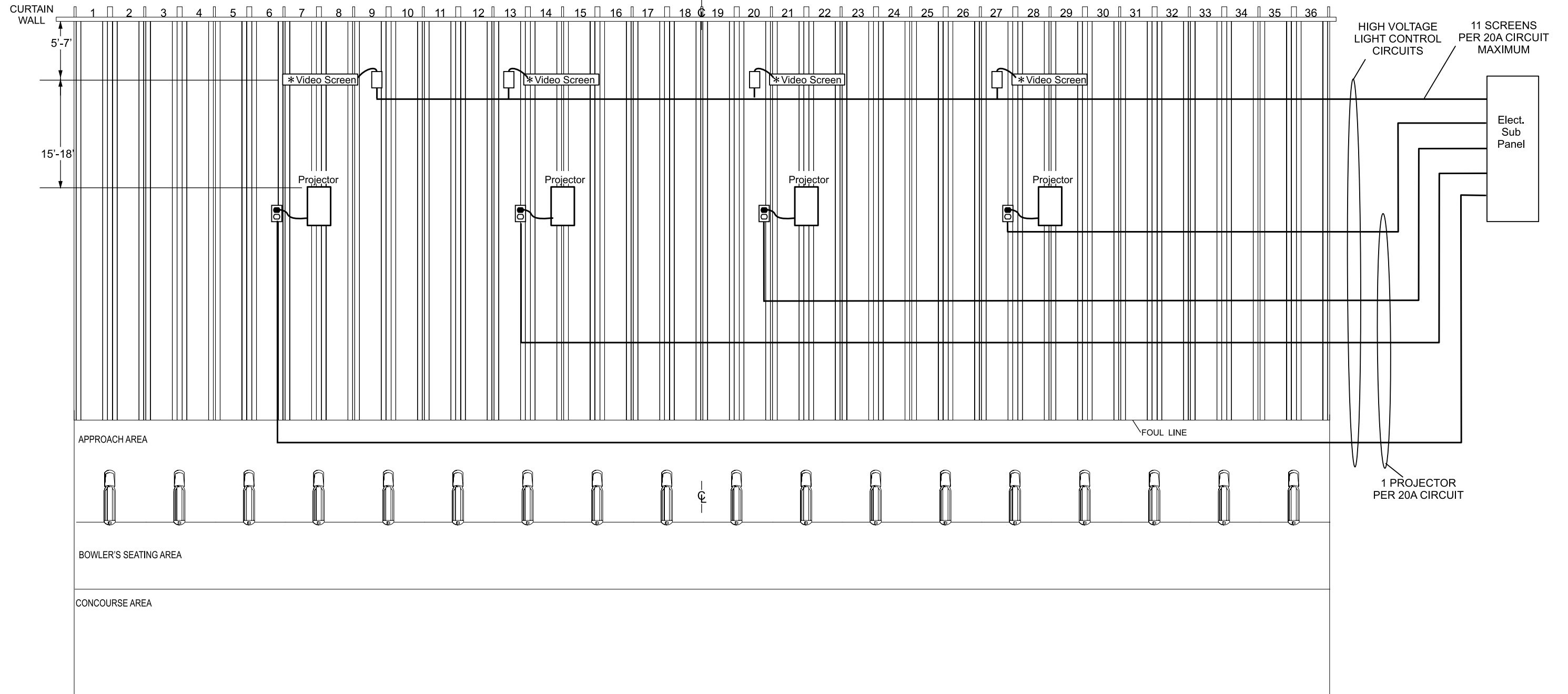
### CONTROL SYSTEM NOTES

1. Placement of screens is approximate and subject to personnel preference. Ceiling heights greater than 14 feet may require additional lighting fixtures or different placement of fixtures.
2. Please see Power Distribution reference sheet for power requirements. Electrical service should be provided in the form of a non-I.G. duplex receptacle above the ceiling near each projector.

Screen Electrical Information						High Output Projector Electrical Information									
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response	Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	1.1	132	2 Wires + Ground	Install proper receptacle per local electrical code	115-130 200-230	50/60	AC	1	8	1200	2 Wires + Ground	Install proper receptacle per local electrical code

# Brunswick Interactive Games Layout for 25-36 lanes

## High Output Projectors



### CONTROL SYSTEM NOTES

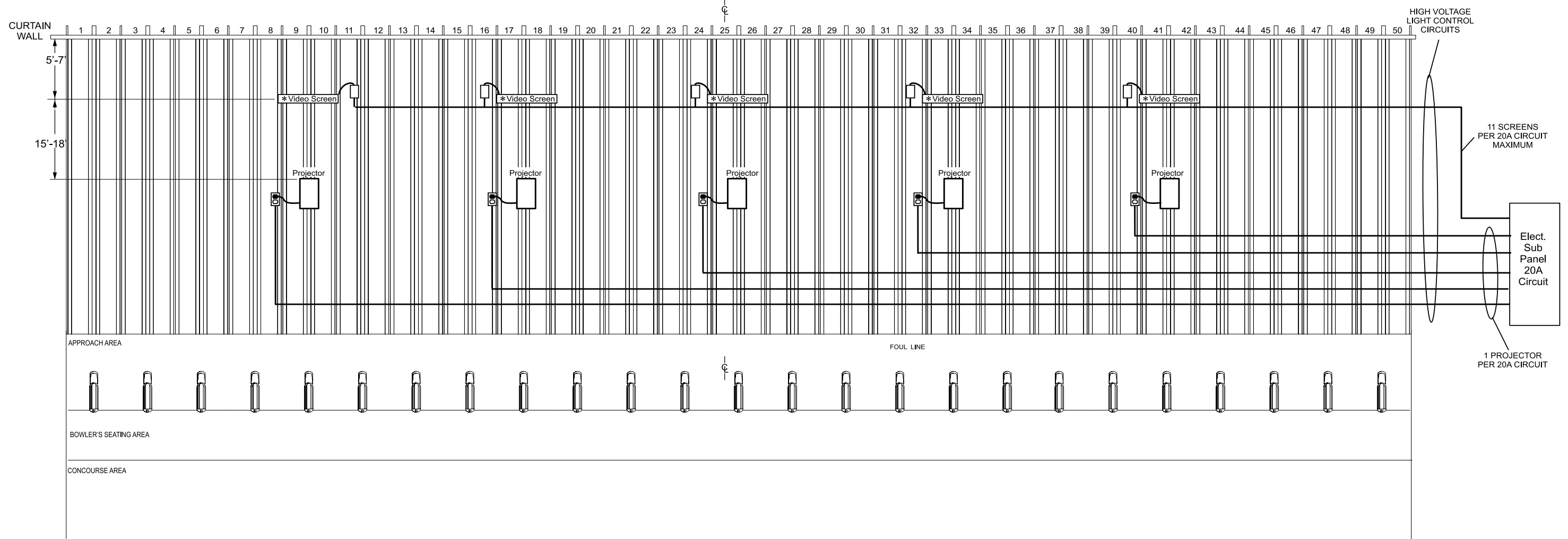
1. Placement of screens is approximate and subject to personnel preference. Ceiling heights greater than 14 feet may require additional lighting fixtures or different placement of fixtures.
2. Electrical service should be provided in the form of a non-I.G. duplex receptacle above the ceiling near each projector.

Screen Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	1.1	132	2 Wires + Ground	Install proper receptacle per local electrical code

High Output Projector Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	8	1200	2 Wires + Ground	Install proper receptacle per local electrical code

# Brunswick Interactive Games Layout for 37-50 lanes

## High Output Projectors



**CONTROL SYSTEM NOTES**

1. Placement of screens is approximate and subject to personnel preference. Ceiling heights greater than 14 feet may require additional lighting fixtures or different placement of fixtures.
2. Please see Power Distribution reference sheet for power requirements. Electrical service should be provided in the form of a non-I.G. duplex receptacle above the ceiling near each projector.

Screen Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	1.1	132	2 Wires + Ground	Install proper receptacle per local electrical code

High Output Projector Electrical Information							
Volts	Hertz	AC/DC	Phase Per Unit	Amps	Watts	Branch Circuit	Customer Response
115-130 200-230	50/60	AC	1	8	1200	2 Wires + Ground	Install proper receptacle per local electrical code