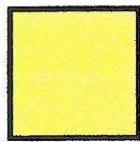


COMPANIES



FEBRUARY 1999



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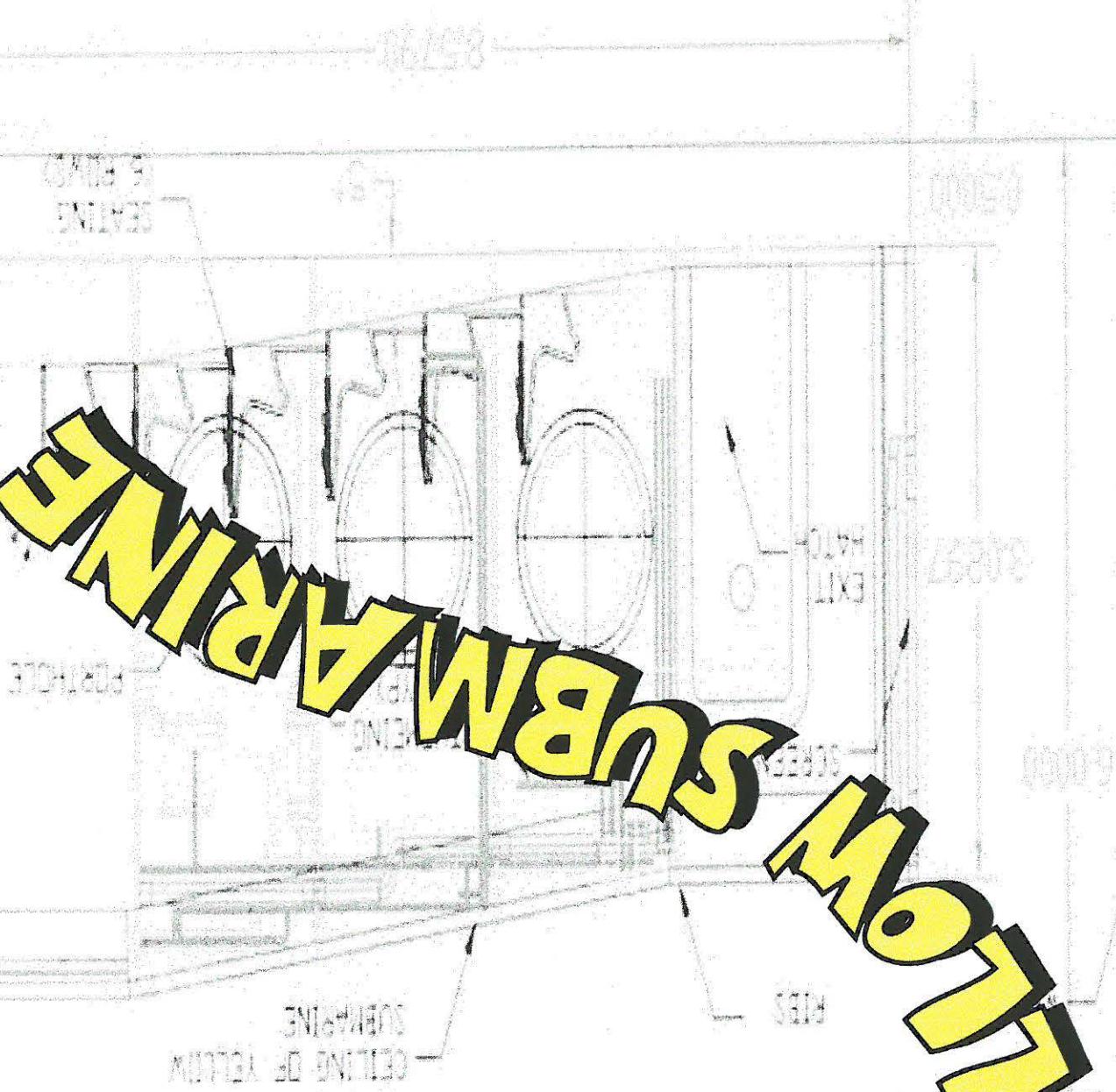


EXHIBIT A

Sony Berlin/Tokyo

Yellow Submarine Interactive Theater

Functional Specification

Approval Signatures

	Authorized Signature	Date
Originator		
Creative		
Gaming		
Engineering		
Production		
Operations		
Project Management		
Finance		

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EXHIBIT A**PART 1 GENERAL****1.1 PROJECT DESCRIPTION**

The Yellow Submarine interactive theater combines an audio-visual experience - based upon images and music from the "Yellow Submarine" feature film - with a motion simulation platform, a panoramic view of the cartoon environments outside, randomly-selected multiple show paths, audience participation, and an interactive virtual "tour guide".

The experience begins in the Boarding Lounge, which is decorated with posters and photos of Pepperland. As the guests enter the Lounge, they are greeted by Captain Fred. Captain Fred is a real-time interactive CG cartoon, voiced and operated by a hidden performer. He appears on a large projection TV screen in the Lounge. Captain Fred can see and hear the guests, and speak directly to them. He introduces and narrates the Pre-Show, and then serves as the tour guide onboard the Submarine itself. When the audience is assembled in the Boarding Lounge, Captain Fred introduces the Pre-Show video. The video begins as a travelogue/sales pitch on the wonders of Pepperland, but then is interrupted when Jeremy Hillary Boob, PhD, (a.k.a. The Nowhere Man) appears to tell us of the Meanies' attack.

When the Pre-Show video ends, a set of double doors will open, and Captain Fred will ask the audience to board the Submarine. The audience enters the Submarine Cabin at the stern-which is themed in the odd Victorian decor of the Submarine in the original film - and takes their seats.

There is a large window at the front of the Submarine cabin, and three portholes along each side. These seven viewports combine to create a panoramic view of the outside environment. The real-time Captain Fred now appears on smaller TV monitors overhead, speaking from the Submarine's (virtual) control room. When the audience is seated, Captain Fred launches the Submarine and the ride begins. The Submarine travels from the Pier to the Sea of Holes, then through one of the three "Seas", and finally to Pepperland to defeat the Meanies. When Pepperland is restored, the audience exits the Submarine at the bow and the show is over.

The Yellow Submarine shall be designed, built, assembled, and potentially installed by the Vendor, within the scope of work of this specification. It is anticipated that the vendor will design and build a prototype which will be scrapped; a first article which will be utilized to prove the design and ultimately installed in an Owner designated facility (probably either Germany or Japan) ; and three (3) production units, also to be installed in Germany or Japan.

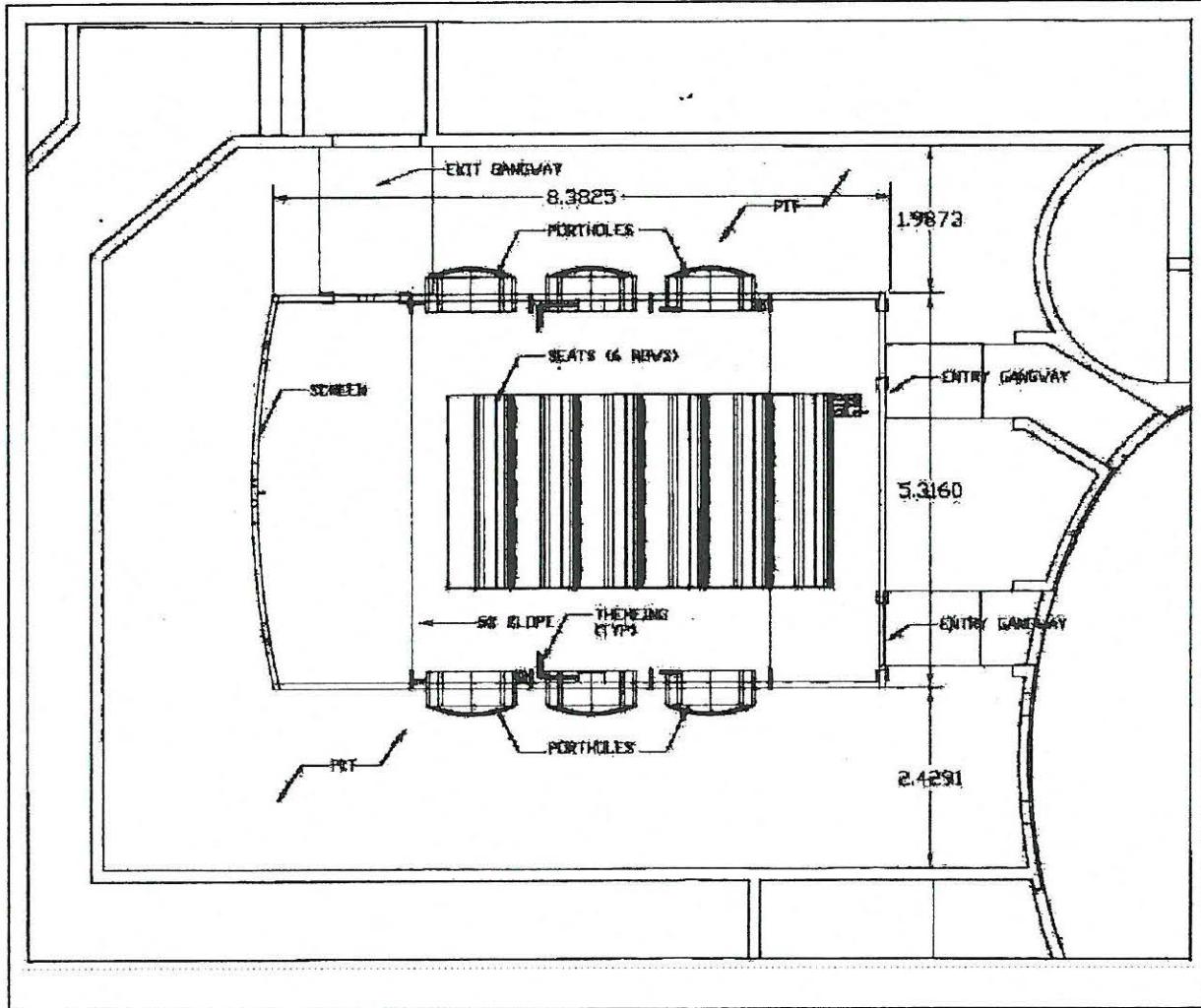
Video and audio hardware will be provided by the Owner, and the Vendor will provide provisions within the bodies for the mounting of ancillary electronics, themed elements (including cabin cladding), show control hardware, speakers, and all appurtenances necessary for the mounting and installation of same. The Owner shall provide the video projection and audio systems. It is anticipated that the video projection system, including projectors, screens, and mirrors shall be mounted independent of the Yellow Submarine. The Vendor shall provide the design and fabrication of the doors / gangways and associated hardware to enable egress and access, and maintain critical dimensional envelope criteria.

Ventilation systems to ensure guest comfort and sufficient cooling and dust/debris protection for the Yellow Submarine cabin shall be achieved through connection to the base building systems. The Vendor shall provide on-board ducts, diffusers, vents, and appurtenances to achieve cabin environmental controls. Appropriate mechanical appurtenances shall be stubbed-out from the cabin to provide for connection to base building systems. Airflow rates and fire safety shall meet local building codes.

The weight of each component must be estimated and identified on each drawing. X, Y & Z coordinates will then be estimated for determining inertial values for the appropriate load cases. All estimates will be validated with individual weights and drawings to recalculate stresses prior to testing. Strain gages will be placed at any critical locations determined during design reviews.

The total weight and center of gravity combination must not violate predetermined maximum loading capacities for the base building which has been established at 53 psf.. A separate report identifying this performance will be supplied to the vendor upon request. The total weight of each body must be identified prior to shipping. Each unit must weigh within 5% of the weight budget presented in Section 1.4.1.

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*Figure 1: Conceptual Location and Orientation of Yellow Submarine Interactive Theater.
(Tokyo Obaiba Project)*

Each Yellow Submarine will be themed and painted by a third party Vendor to be consistent with artwork supplied by the Owner. The Vendor shall provide access to the third party theming vendor during the prototype, first article, and production unit fabrication phases and unlimited access to each unit after final shop assembly.

The Owner anticipates the possibility that an initial order of up to four (4) Yellow Submarine units will be fabricated and installed by the Vendor. Subsequent units may be requested, with installation sites yet to be determined. The Owner requires that all units be designed and fabricated such that each unit complies with the most rigorous code requirements which may apply in Germany, Japan, and the United States. Additionally, all materials and equipment designations must be readily available , including spare parts and trained maintenance resources, for each of the foreign and domestic installation locations. Due to the international diversity of the potential installation sites, the Vendor shall design, document, and specify all aspects of this project utilizing the metric system of measurement.

The Vendor also shall recognize that the Yellow Submarine units will be installed in existing facilities. Component infiltration limitations will exist, requiring the Vendor to design and fabricate the Yellow Submarine units in a modular manner with all components capable of being transported into an existing building through a maximum opening of 6'0" x 6'8" (standard double door). Further limitations may arise on a site – specific basis, which may require that the Vendor provide special consideration during the fabrication process. The Vendor shall design each Yellow Submarine unit to permit on-site final assembly with bolted connections. Every effort shall be made to avoid on-site welding activities during the installation process.

The scope of Vendor services will include a program to adequately test the Yellow Submarines prior to installation as well as coordinate their design efforts with Owner's creative and engineering staff. This will include (but is not limited to) providing a space sufficient to provide a prototype and first article of one Yellow Submarine.

1.2 REFERENCE STANDARDS AND APPLICABLE CODES:

1.2.1 ANSI STANDARDS

The following ANSI standards shall be replaced with Vendor-proposed and Owner-approved equivalent European standards as applicable.

ANSI S3.18.1979, Guide for the Evaluation of Human Exposure to Whole-body Vibration

ANSI B1.1, Unified Inch Screw Threads (UN and UNR Thread Form), 1982

ANSI B18.22.1-1965(R1981), Plain Washers

ANSI/AFBMA 9-1978, Load Ratings and Fatigue Life for Ball Bearings

ANSI/AFBMA 11-1978, Load Ratings and Fatigue Life for Roller Bearings

ANSI/ASME B30.9, Slings

ANSI/ASME B30.20, Below the Hook Lifting Devices

ANSI/IPC A600, International Printed Circuits

1.2.2 ASTM STANDARDS

The following ASTM standards shall be replaced with Vendor-proposed and Owner-approved equivalent European standards as applicable.

ASTM D1208-79, Tests for Common Properties of Certain Pigments, American Society of Testing and Materials (ASTM)

ASTM D1242-56, Standard Test Methods for Resistance of Plastic Materials to Abrasion

ASTM D1308-79, Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes

ASTM D3029-84, Impact Resistance of Rigid Plastic Sheeting or Parts by Means of a TUP (Falling Weight)

ASTM F436-86, Standard Specification for Hardened Steel Washers, 1986

1.2.3 SAE STANDARDS

The following SAE standards, shall be replaced with Vendor-proposed and Owner-approved equivalent European standards as applicable.

SAE J102, Square Head Set Screws, 1969, Society of Automotive Engineers (SAE)

SAE J104, Square and Hex Nuts, 1969

SAE J105, Hex Bolts, 1969

SAE J246, Spherical and Flanged Sleeve (Compression) Tube Fittings

SAE J429, Mechanical and Material Requirements for Externally Threaded Fasteners, August, 1983

SAE J478, Slotted and Recessed Head Screws, Rev A

SAE J479, Slotted Headless Set Screws, Rev A

SAE J487, Cotter Pins, Rev A

SAE J534, Lubrication Fitting

SAE J773, Conical Spring Washers, Rev B

SAE J995, Mechanical and Material Requirements for Steel Nuts, June 1979

SAE J1085, Test for Dynamic Properties of Elastomeric Isolators, Rev A

1.2.4 IEEE STANDARDS

IEEE STD 91, Graphical Symbols for Logic Diagrams

IEEE STD 200, Reference Designations for Electrical and Electronic Parts

IEEE STD 315, Graphic Symbols for Electrical and Electronic Diagrams

1.2.5 EUROPEAN STANDARDS

DIN 18800 Part 1, Structural Steelwork Design and Construction

DIN 18800 Part 2, Structural Steelwork Analysis of Safety against Buckling of Linear Members and Frames

DIN 18800 Part 3, Structural Steelwork Analysis of Safety against Buckling of Plates

DIN 18800 Part 7, Steel Structures; Fabrications, Verification of Suitability

DIN 8563 Part 103 DRAFT, Quality Assurance of Welded Structures, Specification and Qualification of Welding Procedures; Welding Procedure Test for Arc Welding of Aluminum and it's Alloys (Proposal for a European Standard)

EN 288 P4 (DIN), Specification and Approval of Procedures for Welding Metallic Materials, Welding Procedure Test for the Arc Welding of Aluminum and its Alloys

NF P 22-471, Metal Construction Welded Joints - Fabrication, AFNOR

NF P 92-507, Fire Protection - Building Materials - Classification of Building and Interior Materials According to Their Reaction to Fire - Test Methods, AFNOR

DTU P 22-701, Rules for the Design of Steel Structures (Called Rules CM66), AFNOR

1.2.6 MISCELLANEOUS STANDARDS

The following miscellaneous standards shall be replaced with Vendor-proposed and Owner-approved equivalent European standards, as applicable.

QQ-P-416E, Federal Specification, Plating, Cadmium (Electro-deposited), General Services Administration, 21 September, 1972

IFI-111, Hexagon Flange Bolts, Industrial Fasteners Institute (IFI)

IFI-107, Prevailing Torque Type Steel Hexagon Flange Lock-nuts, IFI

STAND-176063, Rigging and Overhead Hanging Standards

SONY DEVELOPMENT

1.3 SCHEDULE

A. Release Specification	February 9, 1999
B. Award Contract	February 12, 1999
C. Prototype Mockup/Design Review	March 26, 1999
D. 1st Article Design Review	April 9, 1999
E. Ship Prototype Superstructure to Owner	April 15, 1999
F. Design Frozen, no more changes	April 16, 1999
G. Build 1 st Article	May 14, 1999
H. Begin Testing 1 st Article	May 21, 1999
I. Complete 1 st Article Testing	June 4, 1999
J. Production (Units #2-#4)	June 1999-August 1999
K. Start Installation	As per Owner's Schedule
L. Complete Test and Adjust	As per Owner's Schedule

1.4 PROJECT DELIVERABLES

This functional specification describes the major components for the Yellow Submarine Interactive Theater. The specification includes requirements for the baseplate, gimbal, lower floor/platform/flooring, drive mechanism (motor/gearbox/gear reducer/brake assembly/crank arms/tie rods), superstructure, seating (bench), gangways, entrance/exit doors, portals, lighting (normal and emergency), power distribution/electrical, fire suppression, HVAC, controls (motor controls/ride control computer/sensors), life safety design, fabrication, assembly, verification, preparation for delivery, delivery, onsite assembly, erection, commissioning, and for related services and deliverables other than hardware.

The Vendor's Base Bid shall include all costs related to the design, documentation, fabrication, shop assembly, and testing of a prototype, and first article Yellow Submarine

to be delivered to an Owner designated site within southern California. Add alternate bids shall be provided for the fabrication of production units #2, #3, and #4. Additional add alternate bids shall be provided for the transportation, installation, and start-up of up to four (4) Yellow Submarine units at locations to be determined by the Owner prior to establishment of a bid price by the Vendor.

The major components comprising the Yellow Submarine Interactive Theater shall consist of the following:

- a. Baseplate.
- b. Gimbal
- c. Drive mechanism (motor/gearbox/gear reducer/crank arms/tie rods).
- d. Floor platform (lower floor/platform/flooring).
- e. Superstructure.
- f. Seating (bench). *(By Others)*
- g. Themed panels/cladding. *(By Others)*
- h. Gangways.
- i. Entrance/exit doors.
- j. Portals.
- k. Lighting (emergency).
- l. Audio. *(By Others)*
- m. Video. *(By Others)*
- n. Show Lighting *(By Others)*
- n. Power distribution/electrical.
- o. Fire suppression.
- p. Heating, venting, and air conditioning (HVAC).
- q. Controls (motor controls/ride control computer/sensors).
- r. Life safety.

1.4.1 COMPONENT WEIGHT BUDGET

Component	Quantity	Unit Weight	Total Weight (lbs)
Gimbal,Baseplate,Floor	1	6,000	6,000
Drive Mechanism	2	175	350
Cabin Superstructure	1	7,500	7,500
Seating	30	25	750
Gangways & Doors	3	100	300
Video Monitor &	1	225	225
Supports			
Speakers	8	50	400
Miscellaneous Wiring	1	150	150
Porthole Assemblies	8	250	2,000

Passengers	30	175	5,250
Miscellaneous Loads	1	250	250
Total Est. Weight			23,175 lbs

1.4.2 DESCRIPTION OF COMPONENTS

1.4.2.1 MOTIONBASE (Including Baseplate, Gimbal, Drive Mechanism)

The "Motionbase" is a mechanical assembly that consists primarily of a Baseplate, Gimbal and Drive Mechanism (see figure 2). Through mechanical advantage, this Motionbase provides the Yellow Submarine with the ability to move (pitch and roll) in many different ways. The show designer will choreograph the actual sequence and timing of those movements.

The Baseplate is a rigid steel frame which provides the Yellow Submarine theater with a structural connection to the building or facility and a firm foundation for anchoring the theater structure and its themed elements and/or components (see figure 3). Mounted to the baseplate are the gimbal and the drive mechanism.

The Gimbal is a dynamic coupling linking the baseplate and the floor structure that permits the Yellow Submarine to pitch and roll, thus simulating the movements of a submarine underwater (see figure 1, 2, 3). The gimbal is comprised of a "spider," which is a cross-shaped connecting linkage with four arms of equal length, set at right angles to one another and four pillow block bearings. On two of these spider "arms," which share a common axis of motion, there are two of the four bearings. These bearings are opposite of each other and are fastened to the baseplate. These bearings are mounted in such a manner as to allow the spider to "pitch" (one of two directional motions) the theater structure above. The remaining two pillow block bearings (of 4 total) are connected to the floor of the theater structure and then linked to the remaining two "arms" of the spider. These bearings are mounted in such a way as to allow the spider to "roll" the theater structure. The net result of the Gimbal assembly is a connection that permits free motion about two axis, pitch and roll, while inhibiting motion in a third, "yaw." The Gimbal element should allow a range of motion no greater than 5° at a speed of 1° per second.

The Drive Mechanism, along with the Gimbal, creates and controls the Yellow Submarine's two axes of motion. The drive mechanism's cam action gently rocks the Yellow Submarine side to side and also allows for the slight rise and fall of the Yellow Submarine's bow (front).

The drive mechanism is comprised of a pair of DC electric gearmotors that drive crank arms and coupled with tie rods and associated additional couplings and bearings. There is a gearbox/reducer in the drive train between the motor and crank arms.

A pair of drive motors are mounted forward and to either side of the Gimbal in order to provide the maximum leverage and control of the dynamic motion of the theater structure mounted above. The drive mechanism assembly provides a range of motion no greater than 5° at a speed of 1° per second.

To "roll" the Yellow Submarine (side to side), the pair of crank arms and tie rods are positioned 180° opposite of each other, i. e., one is high and one is low. In a "roll," one side of the submarine or the other is considered high while the opposing side is low. To accomplish this with the crank arms and tie rods, position the crank arm high on the side that is to be high. The other crank arm should then be low. This will accomplish a roll-left or a roll-right of varying degrees.

To raise or lower the Yellow Submarine's bow (front), the pair of crank arms and tie rods are positioned in a like manner, i. e., either both high or both low. When both crank arms and tie rods are high, the bow of the Yellow Submarine is slightly raised. When both crank arms and tie rods are low, the bow of the Yellow Submarine is slightly lowered.

The drive mechanism requires electrical power, ride control and motor control.

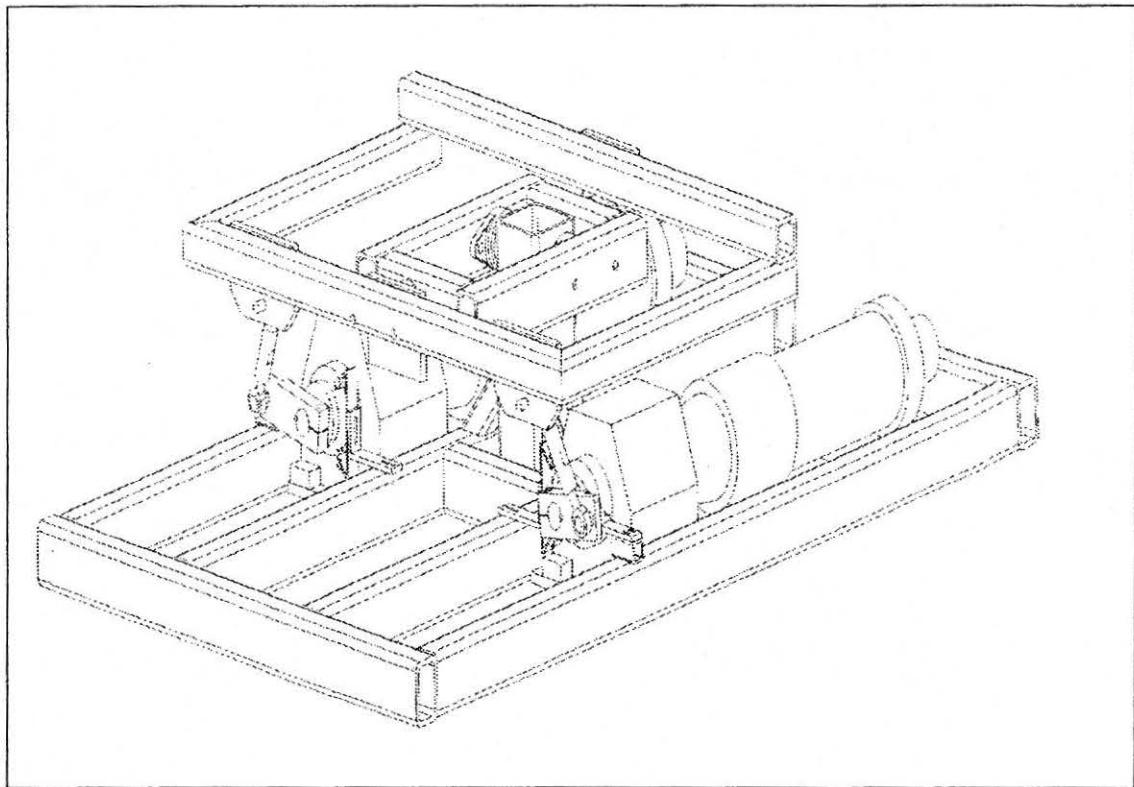


Figure 2: Conceptual Yellow Submarine Interactive Theater Motion Base. This design may be revised during final design.

SONY DEVELOPMENT

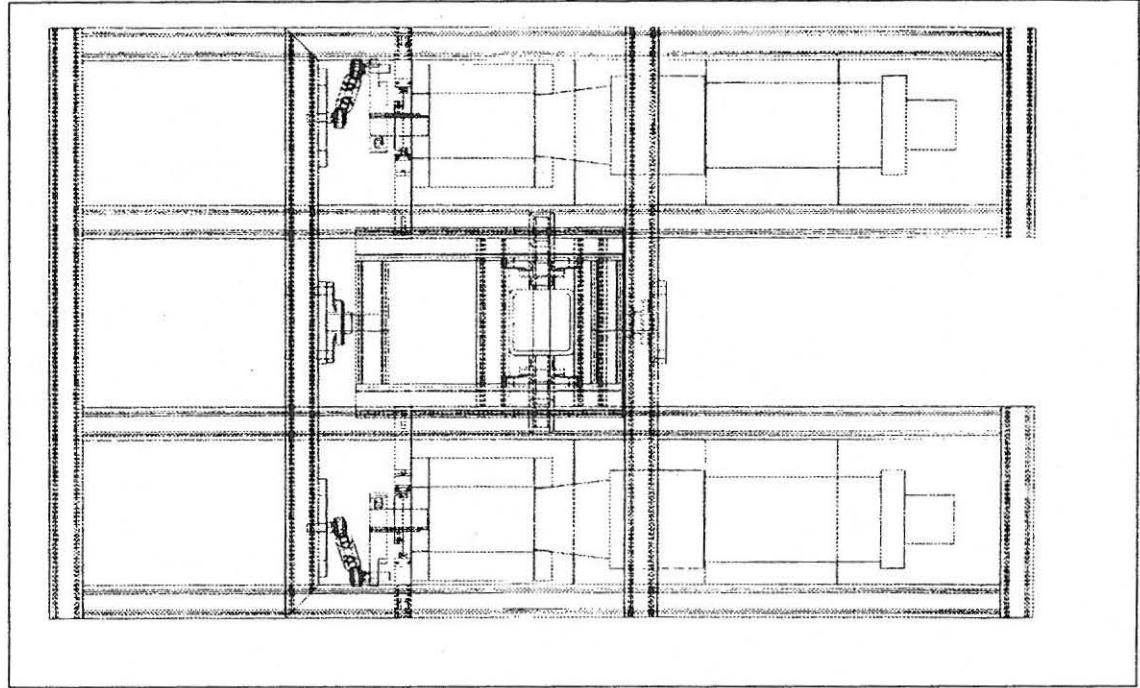


Figure 3: Conceptual Yellow Submarine Interactive Theater Motion Base. (Plan View).

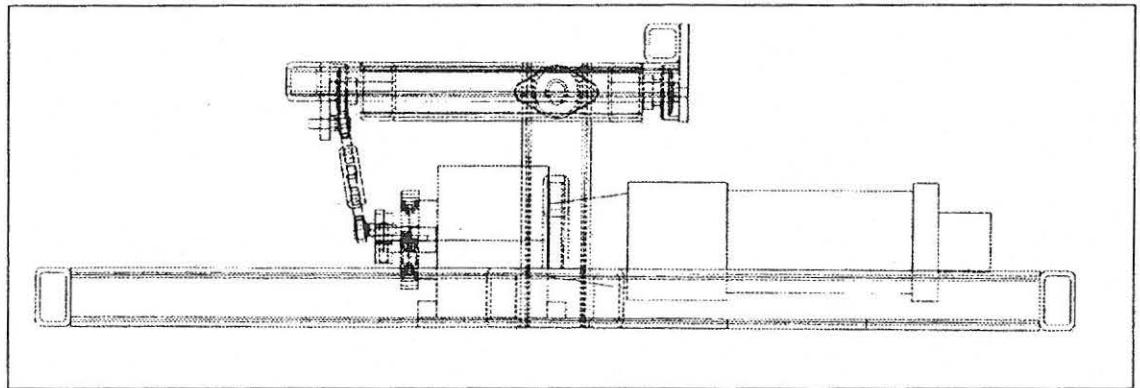


Figure 4: Conceptual Yellow Submarine Interactive Theater Motion Base. (Elevation).

1.4.2.2 CABIN FLOOR PLATFORM (includes Lower Floor Frame & Decking)

The Cabin Floor Platform is the assembly that exists between the Motion Base (section 1.4.2.1) and the Theater Structure (Cabin Superstructure: 1.4.2.3). It is a wedge shaped structural frame that provides an external surface to mount the motion base assembly and supports an integral a raised inner deck for the cabin of the Yellow Submarine. The raised “inner floor” is sloped to 5° in a continuous ramp.

Seating will be attached to the inner raised floor. This “seating” will include multiple rows of bench-type units. Seating attachments will be incorporated in the design of the floor platform (see section 1.4.2.4).

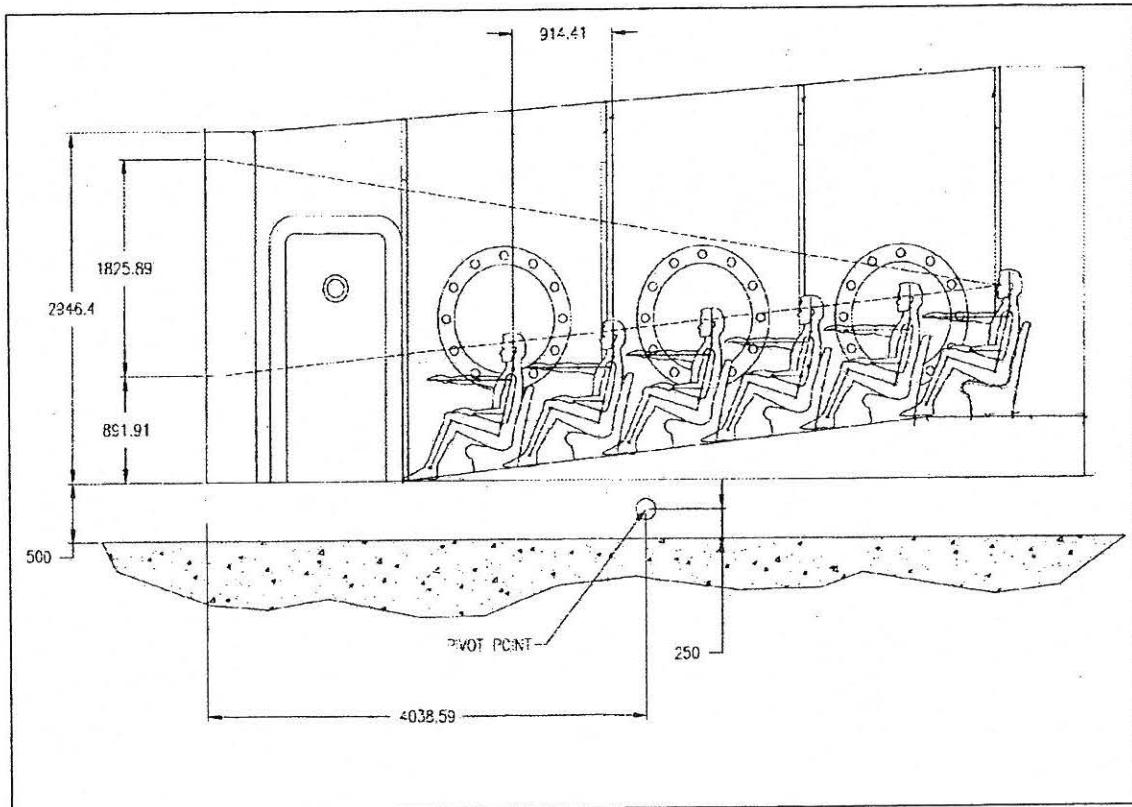


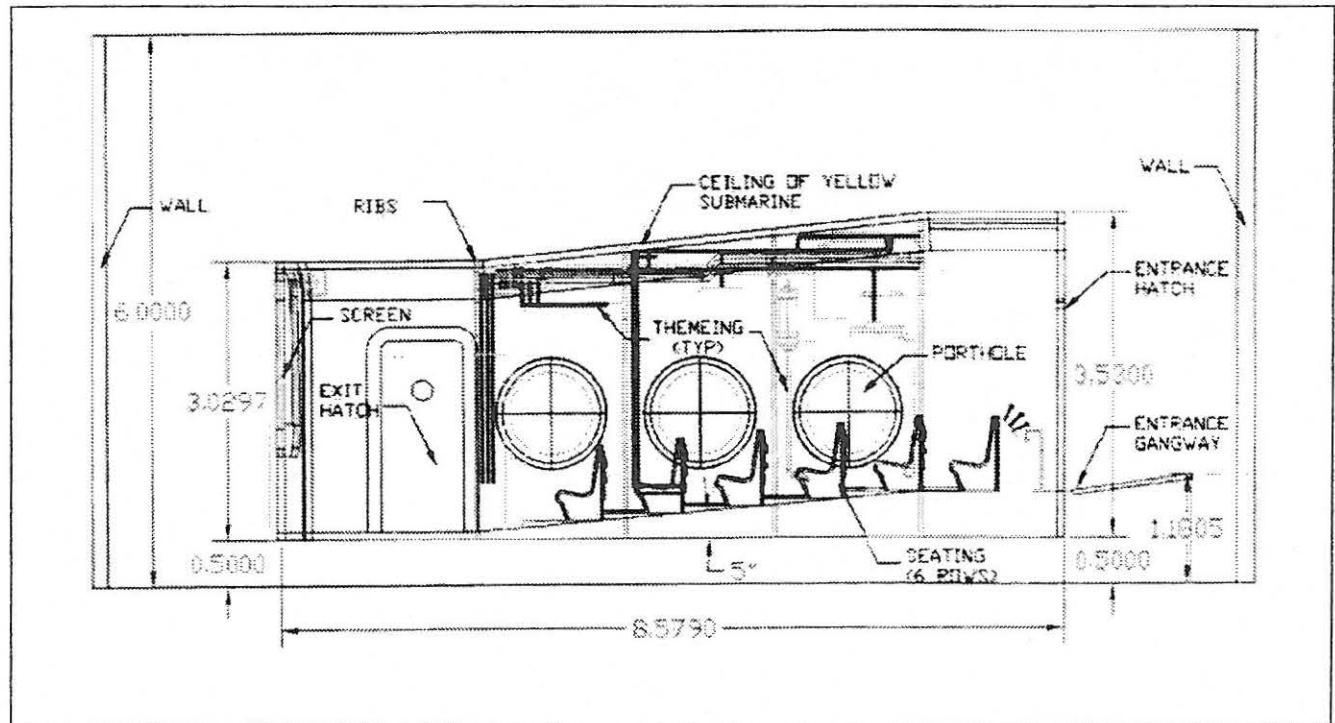
Figure 5: Conceptual Yellow Submarine Interactive Theater Floor Platform. (Elevation).

1.4.2.3 CABIN SUPERSTRUCTURE

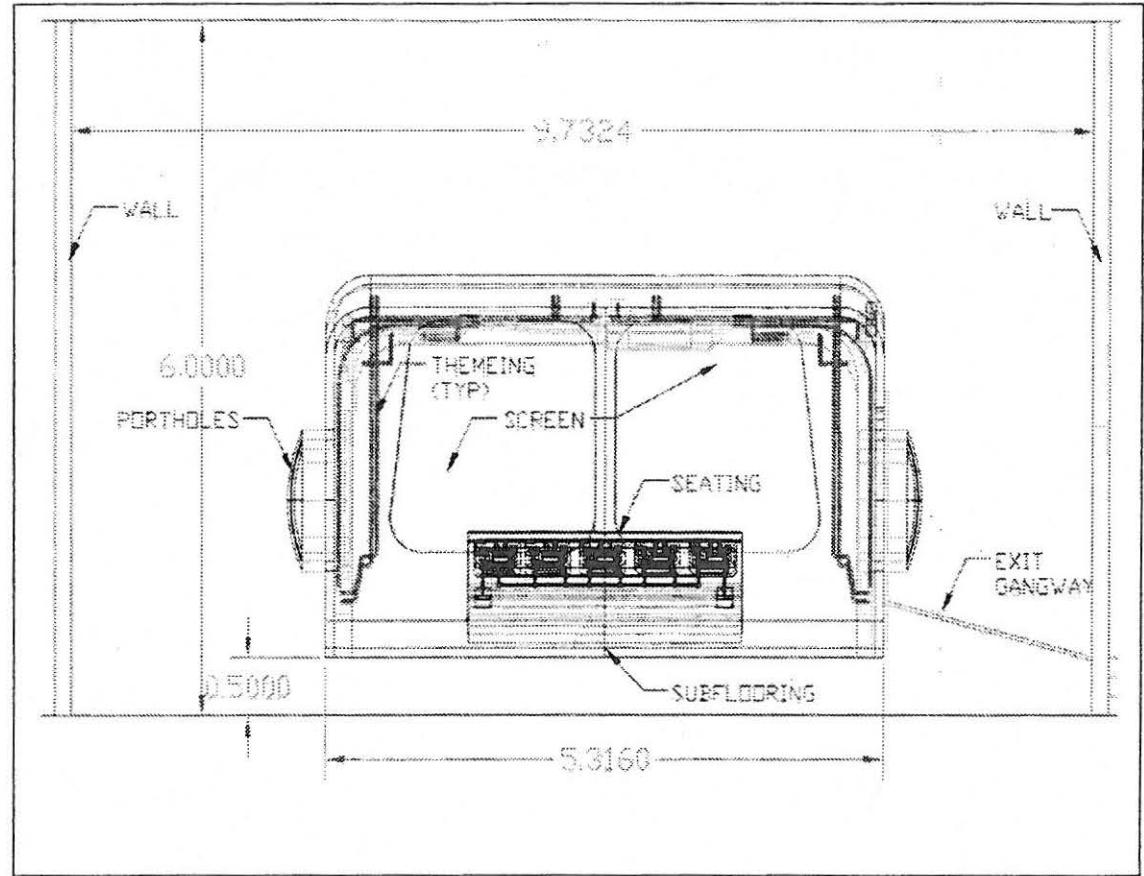
The Cabin Superstructure consists of structural components that support the skeleton (bulkheads) and skin (panels) of the Yellow Submarine (see figures 6, 7). These elements combine to form the walls and ceiling that will support all themed elements, lighting, HVAC, electrical conduit, etc., that is contained within the Yellow Submarine cabin. The superstructure is attached securely to the Cabin Floor Platform (section 1.4.2.2). The two assemblies (Cabin Floor Platform & Superstructure) act as one unit and move together during the ride. Close coordination between superstructure fabricator/designer and themeing contractor is essential.

Lateral bracing, secondary and tertiary structure will be provided as needed to accommodate local code requirements, themed component attachments and other conditions that need linkage to the superstructure. The superstructure must accommodate a total of four (4) doorways (2 entry and 2 exit). Specific attention shall be given to addressing stress concentrations and fatigue points

at door corner attachment points to the superstructure during the design process.



**Figure 6: Conceptual Yellow Submarine Interactive Theater Cabin Superstructure.
(Elevation).**



*Figure 7: Conceptual Yellow Submarine Interactive Theater Cabin Superstructure.
(Section).*

1.4.2.4 SEATING

The Yellow Submarine's seating configuration shall include five rows of six seat benches mounted to the inner (upper) floor. Seating in the Yellow Submarine consists of five (5) rows of bench seats that will accommodate six (6) seated individuals of average weight per bench (see figure 8). These benches will be mounted to the raised inner floor of the Cabin Floor Platform (section 1.4.2.2). Mounting for the benches will be designed with the Cabin Floor Platform design. Spacing of the benches along the raised inner floor will be determined in design and will adhere to all applicable code restrictions, including accessibility considerations for disabled guests. Passageways, Egress and Ingress will likewise maintain the standards of the local code requirements.

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The seating configuration shall also provide for handicap accessibility and contain wheelchair locking mechanisms that enable disabled persons to position their wheelchairs at designated locations and temporarily immobilize themselves securely for the duration of the ride. One possible seating configuration is shown in figure 8.

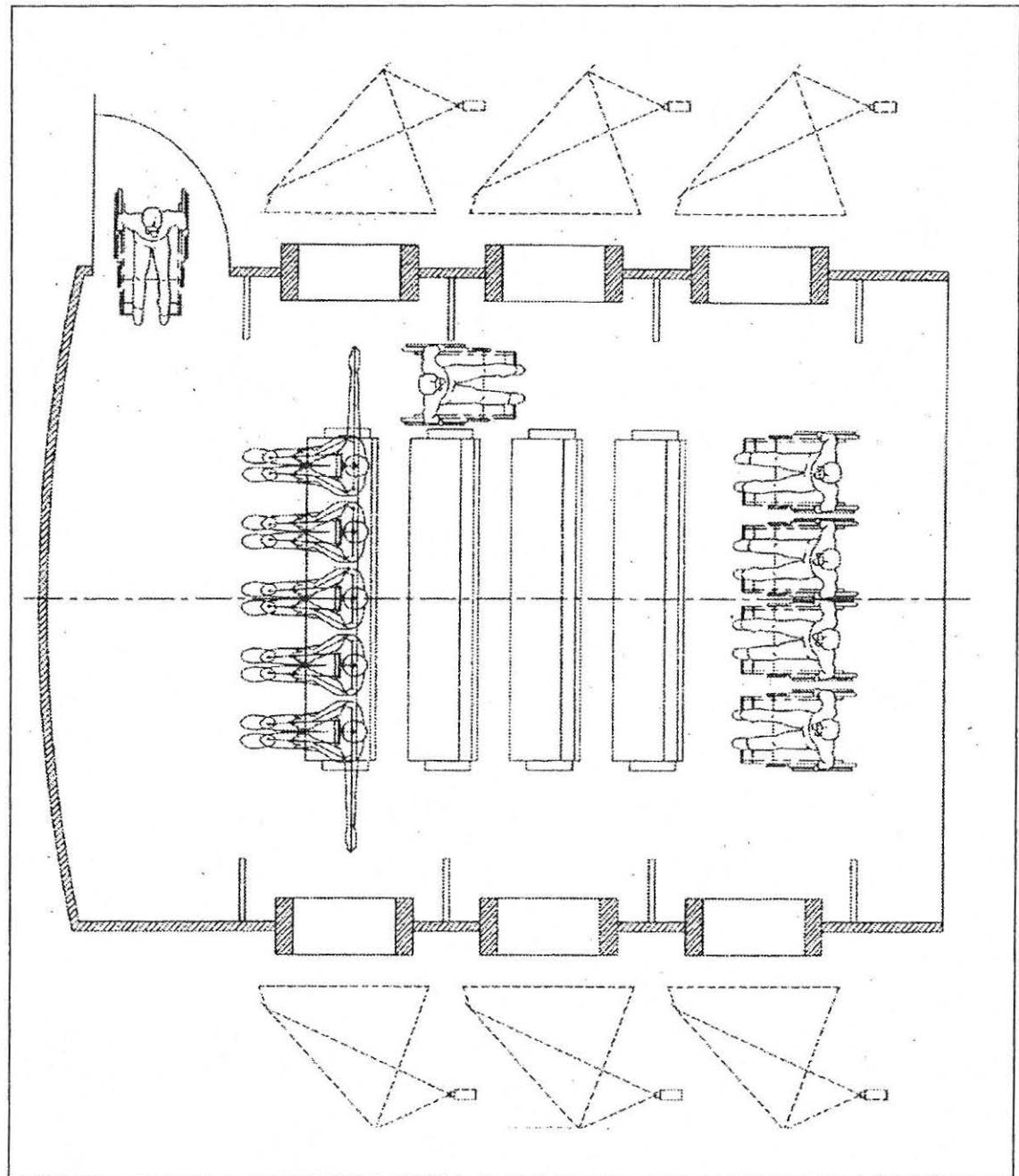


Figure 8: Conceptual Yellow Submarine Interactive Theater Cabin Seating Configuration.

1.4.2.5 CABIN DOORS AND GANGWAYS

Each Yellow Submarine contains entrance and exit "hatches" or doors that provide the guests with a means of accessing the ride from the pre-show area to the ride cabin and then a means of leaving the ride cabin to the post-show area (see figure 9). There are four (4) total hatches per Yellow Submarine. Two are located at the rear or "stern" of the submarine and allow guests to enter the ride cabin and take a seat. The other hatch is located towards the front of the submarine on either the left (port) or right (starboard) sides. The location of these doorways shall be determined by the configuration of the simulators at the facility site and location. All contractors must provide exit hatch designs that account for both port and starboard side orientations. At any given site, however, both forward hatch locations will be constructed for each submarine. This flexibility allows the simulator to perform Ingress and Egress duties in all possible configurations.

Likewise, each Yellow Submarine also includes movable walkways or "gangways" that link the ride cabin to the pre-show and post-show areas. The gangways span the movement/service "pit" and such passage will be appropriately screened from the guest. These gangways will be designed and constructed to accommodate the movements of the ride cabin throughout the duration of the show. The gangways will be located in direct correlation to the location of the hatches.

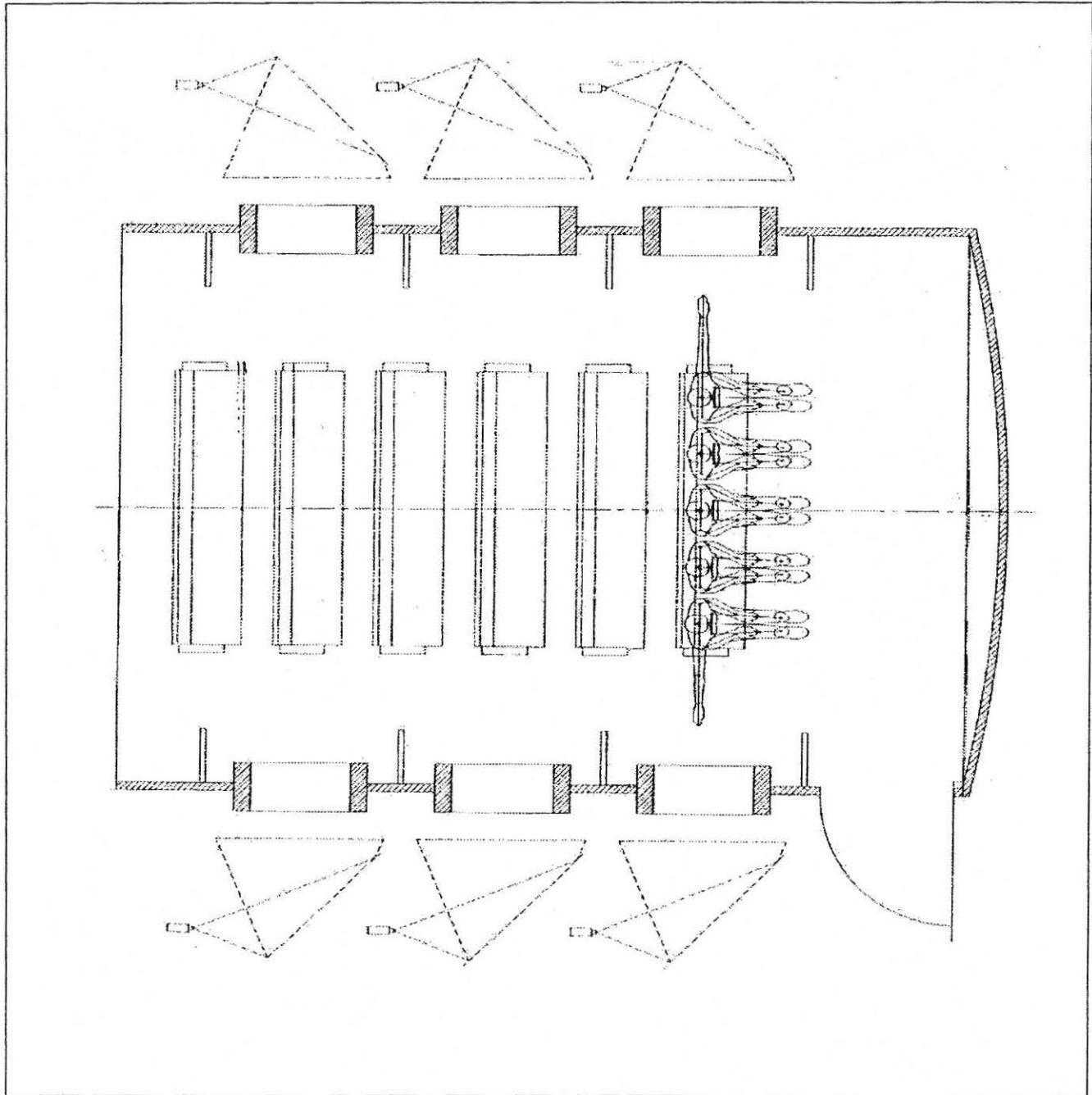


Figure 9: Conceptual Yellow Submarine Interactive Theater Cabin Access Door Configuration.

1.4.2.6 CABIN PORTHOLES

Cabin Portholes are penetrations in the walls of the Yellow Submarine that provide guests with the means of viewing images and video that will be projected on fixed screens located beyond and corresponding to each porthole. The portholes are either circular penetrations such as those located in the sidewalls, or are rectangular penetrations like those that occur at the bow (front) of each Yellow Submarine.

There are six (6) circular portholes: three located on the port side and three on the starboard side. Each porthole is approximately 36" in diameter (see figure 10). These portholes will be individually glazed with clear acrylic. Each porthole will have a corresponding fixed projection screen and projection system that will be provided and designed by others.

There are two (2) rectangular portholes. Both are located side-by-side at the bow of the submarine. Likewise, these portholes are glazed with clear acrylic and have a corresponding fixed projection screen and projection system that will be provided and designed by others.

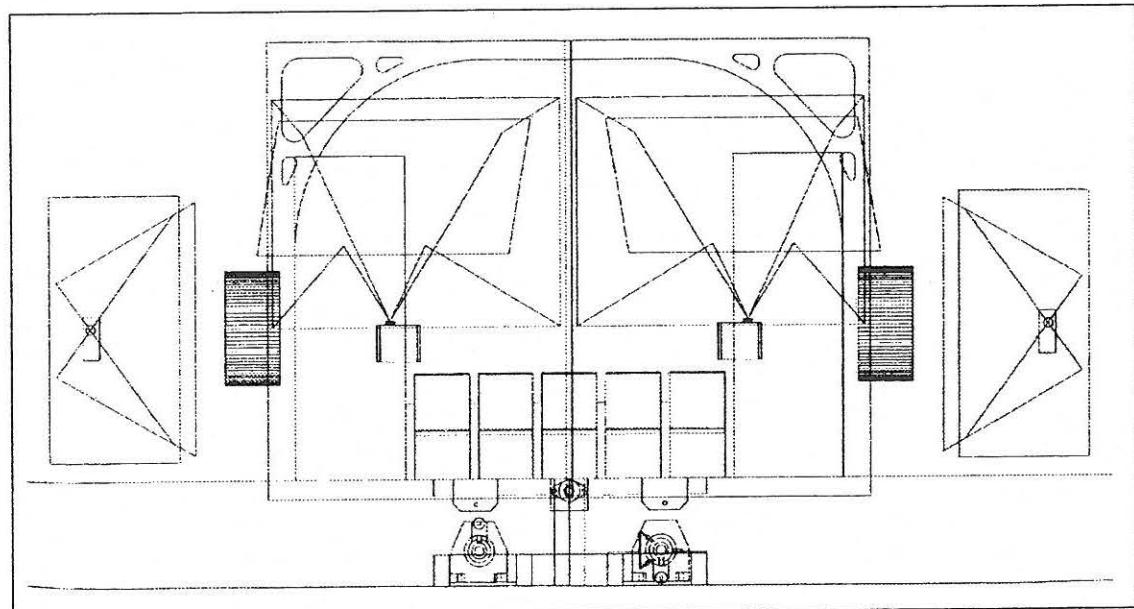


Figure 10: Conceptual Yellow Submarine Interactive Theater Cabin Porthole Configuration.

1.4.2.7 THEMED PANELS / CABIN CLADDING / THEMED ELEMENTS

The themed panels and cladding provide the show interior/exteriors of the Yellow Submarine. They are mounted to the superstructure.

The interior of the Yellow Submarine Cabin will be themed and finished using materials, panels and other elements that match, as closely as economically and technically possible, the "effect" and "atmosphere" desired by the show ride designers (Sony Development-Creative). All of these elements will be designed and fabricated by others. Each themed element and assembly must meet the specific weight criteria and satisfy all applicable local building codes. All themed elements must be securely attached to the Cabin Superstructure.

1.4.2.8 ELECTRICAL POWER SUPPLY & DISTRIBUTION

The Yellow Submarine will be installed at domestic and international locations, and base building power supplies can be expected to be variable. The Vendor must accommodate voltage and frequency differences between installation sites. The Vendor shall be provide power supply from the base building to be accessed at a fused disconnect in the vicinity of the Yellow Submarine installation site. The Vendor shall provide all electrical distribution, switchgear, conduits, conductors, panels, junction boxes, motor control centers, inverters, and electrical appurtenances required to provide for the installation, start-up and operation of the Yellow Submarine ride. The Vendor shall not be responsible for electrical requirements related to show elements, including audio, video, special FX, and related elements.

1.4.2.9 RIDE CONTROLS & INSTRUMENTATION

The Yellow Submarine is a programmable ride/simulator. Instrumentation and interface systems will be designed to allow the show to be altered and modified over time or as the demands of the show change.

This system will require power and a command location to be designated. Physical limitations and movement criteria will be set and implemented as a constraint in the software/system utilized.

- a. Equipment control system shall allow for safe control of all elements as necessary for ride operation and maintenance requirements.
 1. Equipment control system shall allow for self-contained local controls placed where a single operator can see the ride action equipment and its surroundings during the Yellow Submarine operation.
 2. Equipment control system shall include a back-up method by which the equipment may be returned to a safe position in the event of a system failure.
 3. Equipment control system shall include all personnel and equipment interlocks as are necessary for their safe operation.
 4. Equipment control system shall include, but not limited to:
 - a) Operation and maintenance panels.
 - b) Positioning feedback system.
 - c) Limit switch interlocks as necessary for the safe operation of the Yellow Submarine
- b. All simulators are to be equipped with a locally mounted maintenance operation control interface.
 1. Maintenance panel interface will be mounted in view of the simulator.
 2. Maintenance system will allow for lock-out of safety systems by maintenance personnel.
- c. All simulators will include fail-safe locking seeking systems and hard E-stops.

There shall be a mushroom type E-Stop button (push and rotate to release) on the console, which activates the E-Stop circuit. Once activated, a key is necessary to reset the E-stop condition from this location.

Once the E-Stop is activated, power to all motors associated with the Yellow Submarine is disconnected, and power-safe brakes are applied. This ensures that the system is switched to a 'safe' mode as soon as possible.

1.4.2.10 CABIN LIGHTING (includes normal & emergency ; not show)

Lighting for the Yellow Submarine includes two separate modes: normal and emergency. "Normal lighting" will include the fixtures, locations and supplementary elements required for normal operating processes and procedures. These will be governed by all appropriate local codes and those requisites set by the owners (Sony Development). "Emergency lighting" will include all fixtures, locations and supplementary elements that are required by

all local applicable codes for the safe and speedy evacuation of the ride and its immediate vicinity.

This lighting design will include all conduit routings that emanate from facility supply.

This lighting design does not include any special considerations or provisions necessary for special effects lighting, nor does it include show lighting. House and facility lighting and their interface are provided by others.

1.4.2.11 AUDIO / VIDEO / SPECIAL FX / SHOW CONTROLS

The Audio and Video design for the Yellow Submarine includes hardware mounting brackets, conduit routings and similar mounting interfaces only. Development of the content of the Audio and Video, its staging, mixing and coordination are determined and generated by others. All conduit and unit locations will be provided by this design, but will be coordinated with the Audio/Video content to the extent it directly effects the show.

1.4.2.12 HEATING / VENTILATION / COOLING

The Heating, Ventilation and Cooling design for the Yellow Submarine includes hardware mounting brackets, duct routings and similar mounting interfaces only. Heating and cooling supply will be furnished by the facility. Interface and accommodation design between facility source, located in the immediate area, and the demands of the Yellow Submarine will be designed. Ventilation demands imposed on the facility by the Yellow Submarine and its components will be accommodated by the facility.

1.4.2.13 LIFE SAFETY

The Life Safety design for the Yellow Submarine will be a "dry" chemical system. The design of the system, its layout, components, discharge rates, coverage cones and activation system are part of this design. All life safety components must be accommodated by themed elements as directed by applicable code. This system will meet the requirements of all local applicable codes. Any interface between the host facility and the Yellow Submarine will become part of this design.

1.5 PROTOTYPE (to be scrapped or as static prop)

The vendor shall supply a full size mock up as a prototype of the Yellow Submarine (less themeing), to be presented to the Owner for review and comment. The prototype mock up shall be suitable for revision and correction, and shall have sufficient detail to permit assessment of the structural and mechanical systems. The Prototype presentation shall include a presentation of motion base, substructure, and superstructure. The Prototype shall also include a mock up of the door, gangways, and fastening hardware.

1.6. FIRST ARTICLE (to be installed in Sony facility)

The Vendor shall provide a first article of fabrication, to be provided to the Owner for review and comment, for evaluation of the Yellow Submarine. The first article body is intended to be installed in an Owner designated facility. Production units to begin production after written approval from Owner. All molds, tooling and jigs are to remain the property of the Owner.

1.7 PRODUCTION UNITS

The Vendor shall provide four (3 + 1 First Article) production bodies with all the attachments necessary to the motion base, control systems, and facility interfaces. All molds, tooling and jigs are to remain the property of Owner.

PART 2 WORK PRODUCT

2.1 GENERAL MECHANICAL CHARACTERISTICS

Figure 11 illustrates a proposed configuration for the Yellow Submarine, with range of motion portrayed. The general proportional overall dimensions of the cabin are depicted. The Yellow Submarine shall be capable of performing at a theoretical hourly capacity = 600, with a 6-minute average ride duration. Ride motion shall result from automated, pre-programmed operation of a DC-motor driven motion base, equipped with two (2) 2hp DC motors, operating at 90 volts DC. Both motors shall be equipped with integral electric brakes. The unit shall be equipped with jacking points, usable for lifting the unit from below for maintenance operations. The gangways shall connect each of the four (4) doorways to the ride staging areas. Each of the gangways shall be designed and fabricated to permit the full range of motion of the simulator, while

maintaining a permanent and secure attachment to the base building. Each of the four (4) doors shall be designed to operate in a normally-open condition with actuation either, electric or pneumatic. Doors shall open outward from the cabin.

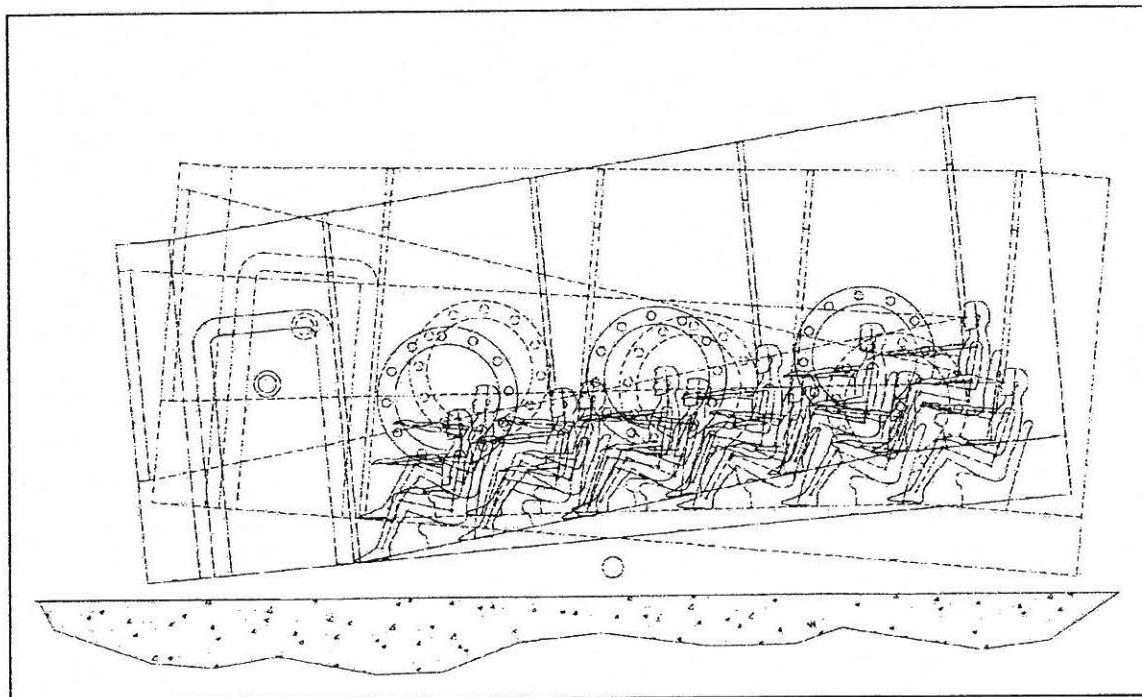


Figure 11: Conceptual Yellow Submarine Interactive Theater Cabin Motion Experience.

2.2 GENERAL DESIGN GUIDELINES

Each individual simulator shall be asynchronous in their movements. Under no circumstances will the simulator bodies touch each other or the base building elements..

The vendor's scope for this project includes the design development, final design, fabrication, shop testing, site installation and site testing of the Yellow Submarine.

All structural panels and panel bending frequencies, including vertical, lateral, and torsional modes, shall be sufficiently removed from all primary excitation frequencies to minimize audible, visible, or otherwise sensible resonant vibrations during normal services and operations.

Resonant vibrations in guest accessible areas shall not exceed acceptable levels. System noise and vibration shall not detract from the show experience or interfere with the audibility of public address announcements.

The noise from any piece of equipment shall not exceed 40 dB @ 1 meter system noise resonant vibrations in guest accessible areas shall be acoustically damped or eliminated by panel design or walls.

Whenever possible, parts, components, and other elements of the Yellow Submarine shall consist of off-the-shelf commercial equipment of industry recognized standard dimensions and tolerances. When commercial equipment is not available or fails to meet the performance requirements specified herein, existing equipment design from either the Owner or the Vendor shall be preferable to the invention of new equipment.

Equipment elements of similar function, performance, and physical characteristics shall be interchangeable. All components, subassemblies, and assemblies bearing identical part numbers are to be interchangeable without modification or changes with the exception of built-in mechanical adjustment provisions.

2.2.1 DESIGN REQUIREMENTS

A. Normal Operating Conditions

Completed System will operate a minimum of 12 hours per day, 365 days per year, with approximately ten (10) rides per hour.

B. Each simulator body will travel in the forward, lateral, and vertical dimensions as defined in this specification at a maximum rotation of +/- 5-degrees at a maximum rate of rotation of 1-degree per second..

C. Design loads under normal operating condition shall be as follows:

175 lbs per guest for endurance and fatigue life calculations

250 lbs per guest for extreme conditions.

Accelerations will be defined in the motion base performance report.

Guest interior shall accommodate the average teen, adult population male and female.

D. Other Components: Engineering judgment shall be used based on generally known industrial and similar standards.

- E. Minimum design requirements and factors of safety under normal operating conditions shall meet all limiting code requirements for German, Japanese, and United States installation locations

	Excursion	Velocity	Acceleration
Roll	$\pm 5^\circ$	1°/second	xx°/second^2
Pitch	$\pm 5^\circ$	1°/second	xx°/second^2

2.2.2 FAILURE MODES EFFECTS ANALYSIS

- A. Design loads under malfunction or unusual conditions shall be as specified herein.
- B. Dynamic Forces and Impact: Use 3g rigid body static equivalent based on the total, installed Yellow Submarine weight in three directions. Verify stresses in simulator structural members, mechanical attachment points, fixed pivots, drive units and related components.
- C. Verify stresses in the body frame and panel related components. Verify stability.

2.2.3 SAFETY CHARACTERISTICS

2.2.3.1 Fail-Safe Design

Fail-safe shall be defined as a design property or properties that enable the system to achieve a safe state configuration in spite of a single-point failure of any element. All system elements capable of initiating or contributing to a critical, Class 1 failure (a Class 1 or Critical Failure is any show element failure or defect that could lead directly to the injury of any person), shall comply with the applicable safety requirements of [applicable standard], as a minimum, and shall be fail-safe. Exceptions to the fail-safe requirement shall be granted only by the Owner in writing.

2.2.3.2 Materials Safety

All plastic and synthetic materials and assemblies shall have a flame spread classification in accordance with the most limiting code requirements for German, Japanese, and United States installation sites.

2.2.3.3 Edges and Surfaces

Employee-accessible surfaces shall contain no edges or corners with radii of less than 0.03 inch (1mm).

2.2.3.3 Pinch Points

All exposed articulating mechanical elements in guest-accessible areas shall have no gaps less than 3 inches (50mm) between articulating elements and rigid elements or other articulating elements.

2.2.3.4 Machine Guards

Machine guards shall be designed to protect employees from hazards associated with, but not limited to, belts, chains, pulleys, cables, and gears. Machine safety guards shall comply with the applicable requirements of selected codes.

2.2.3.5 Hazard Labeling

Warnings and caution labels shall be applied to hazardous surfaces and elements in accordance with local codes and regulations. These warnings and cautions shall be in [applicable language]. Examples of warnings and cautions include: "High voltage," "High Temperature," and "Danger."

- A. The entire system shall be designed and constructed as a fail-safe mechanical and electrical design. No single point failures are acceptable in the design.

- B. Motion base shall attempt to return to level position when an error code is identified. An abort code will stop the base in its last position. Owner will provide the software to accommodate this function.

2.2.4 STRUCTURAL CHARACTERISTICS

- A. All load carrying structural members shall have a safety factor of 3x-yield strength under simultaneous conditions of worst case configuration and worst case dynamic loads.

2.2.5 SPARES

Vendor will specify and supply 10% spares for the first year of operation, and include these in its bid and contract price. Vendor will provide a schedule of value for all spare parts.

2.2.6 RELIABILITY AND MAINTENANCE CHARACTERISTICS

A. Mean Time Before Failure (MTBF)	500 Hours
B. Mean Time to Restore (MTTR)	24 Hours
C. Minimum System Life:	10 Years

PART 3 EXECUTION

3.1 WORK BREAKDOWN & REVIEW SCHEDULE

Vendor will submit the Yellow Submarine design documents and data for a complete system in accordance with the contract schedule. Documents to be minimum acceptable to document safety requirements and maintenance. Vendor will provide, manufacture, install, test, and commission of the complete system in accordance with the requirements listed herein.

1.1 30% Review

- Preliminary Design Development
- Preliminary Baseplate & Gimbal Design
- Preliminary Motor Drive Assembly Design
- Preliminary Floor Platform w/Seating Attachment Design
- Preliminary Superstructure Design
- Preliminary Portal Support Design
- Preliminary Video Monitor Support Design
- Preliminary Speaker Support Design
- Preliminary Lighting Support Design
- Preliminary Gangway Design
- Preliminary Entrance & Exit Door Design
- Preliminary Ride Control Design
- Preliminary MCC Design
- Preliminary Ride - Show Control Interface Design
- Preliminary Ride Control Programming Interface Design
- Preliminary Power, Audio, Video & Control Distribution Design
- Preliminary Fire Suppression Design
- Preliminary HVAC Design
- Preliminary Life Safety Plan
- Preliminary Test / Acceptance Plan
- Preliminary Schedule for Design Development, Production and Installation Plan
- Preliminary Mockup
- Budget Confirmation

1.2 60% Review

- Motion Base Review and Buyoff
- Mockup Buyoff
- Progress review of all 30% preliminary items listed above
- Confirm all attachment details and interface elements
- Budget confirmation

1.3 90% Review

- Final Design
- Progress review of all 30, 60 & 90% items listed above
- Final Proposed Production Plan
- Prototype Demonstration
- Budget Confirmation

SONY DEVELOPMENT

1.4 Pre-Production Review

- First Article Demonstration
- Pre-Production QA Review & Inspection
- Documentation Review
- Motion Base Integration and Testing
- Facility Documentation Review
- Installation Plan Review
- Maintenance and Operational Manuals (Final Draft)
- Test / Acceptance Plan Review
- Budget Confirmation

1.5 Installation, Test & Adjust

- Ship 1st Article and production Units to sites specified by Owner
- Onsite Installation Management as Required

1.5 Project Close Out

- Maintenance & Operations Manuals

3.2 DOCUMENTATION

- A. Vendor will supply a complete set of AutoCAD Version 14 (or higher) drawings (or tools where applicable) for the system sufficient for another vendor to build the complete system. The drawings will include all mechanical assembly and fabrication for the Yellow Submarine with complete parts listing/sources, shop details, and related documentation for the unit assemblies and installation, and ancillary equipment.
Vendor will deliver documentation in both paper and electronic formats to Owner.
- B. Vendor will provide an Operations Manual and a separate Maintenance Manual for the system compatible with Microsoft Word.
 1. Operation & Maintenance Manuals - quantity two (2)
 2. Installation Plan/ Assembly Plan
 3. Test and Acceptance Plan
 4. Equipment manufacture, test, and delivery schedule
 5. Wire harness and routing (Interior, Connections)
 6. Terminal block assignments for all external connections
 7. Facility requirements including electrical power distribution
 8. Recommended test equipment list
 9. Recommended spare parts list
 10. Summary of the proposed factory test plan, procedure & report
 11. Reliability calculations
 12. As-built documentation

3.3 MANUFACTURING

The selected manufacturer shall be a company specializing in interactive mechanical systems, metals or composites manufacturing with a minimum five years documented experience. They must demonstrate they have produced similar systems successfully. A complete reference list will be made available to the Owner to make contacts if desired.

3.4 FIRST ARTICLE ACCEPTANCE

The vendor shall demonstrate a complete and operating system to Owner at the vendor's facility prior to shipping and installation, at the pre-production phase.

3.5 INSTALLATION

- A. The vendor is responsible for ensuring all field dimensions are verified prior to installation. The vendor will complete any adjustments necessary to complete a successful installation in a timely manner
- B. Vendor shall plan for installation in a regular 40 hour workweek (M-F, 8am - 5pm).

3.6 MANUFACTURER'S FIELD SERVICES

- A. Start and commission systems. Allow sufficient time for start-up and commissioning prior to attraction opening.
- B. Provide basic operator training for 4 persons on site. Include sufficient dedicated instructor time.

3.7 INSPECTION

- A. All welds shall comply with the applicable standards. Weld stress calculations, including allowable reductions, shall comply with the applicable standards.

3.8 FINAL SYSTEM TESTING

- A. The vendor to establish start of the warranty will perform acceptance testing of the Yellow Submarine system equipment. At minimum, the following tests will be required. The Owner reserves the right to request additional testing as warranted.
 - 1. Site field test
 - 2. Operations test
 - 3. Maintenance test

3.9 SUBMITTALS AT PROJECT CLOSEOUT

- A. Project Record Documents:
 - 1. Revise shop Simulators to reflect actual installation and operating sequences. (shop drawings)
 - 2. Include data specified in "Submittals" in final "Record Documents" form.
- B. Operation and Maintenance Data:
 - 1. Include interconnection wiring diagrams complete field installed systems with identified and numbered, system components and devices.
 - 2. Include keyboard or graphic illustrations and step-by-step procedures indexed for each operator function. Owner is responsible for motion base software related items.
 - 3. Include inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
 - 4. Include all software as configured with updates and revisions. Owner is responsible for motion base software items.
- C. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owners name and registered with manufacturer.
- D. All systems must meet applicable local building codes.

3.10 WARRANTY

- A. Correct defective work within a reasonable time period after Substantial Completion.

3.11 SCHEDULES

- A. Submit preliminary schedule with vendor's proposal based on project schedule..
- B. During progress of work revise and resubmit as specified in the contract.

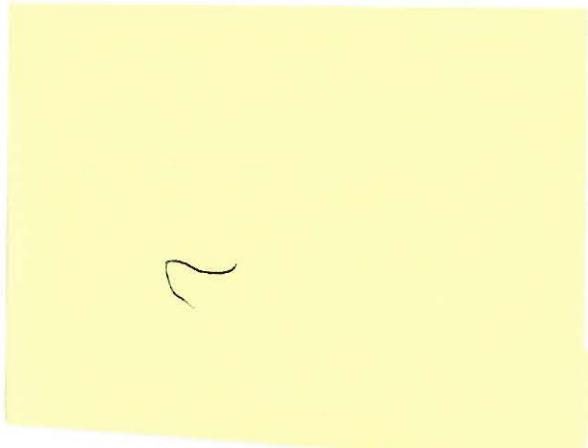
3.12 SUBMITTALS

- A. Submit preliminary shop drawings, assembly drawings, product data for review and approval.
- B. Deliver closeout submittals for review and preliminary inspection to the Engineering & Production Manager.

3.13 PROJECT COORDINATION

The Vice President of Production [REDACTED] will coordinate the project at the
Sony Development Address Below

3.14 CONTRACT ADMINISTRATION



END OF SPECIFICATION