

## **PART 1 – GENERAL**

### **1. – SCOPE OF WORK:**

Provide detailed design, supply of all materials, labour, products, tools, plant equipment and related incidentals necessary to complete the removal and disposal of one (1) bulkhead and manufacturing and installation of two (2) bulkheads into the City of Winnipeg Pan Am Aquatic facility. All designs and equipment must meet the requirements of the Manitoba Building Code – Public Pools and Health Regulations as referenced below. It would be expected upon completion that there would be a fully operational bulkhead system that will allow the City of Winnipeg to easily pin in location at all the required layout positions and to be able to easily move the bulkheads from one location to another. Included in the scope of work is the rotating of the existing bulkhead in the training pool and installation of starting blocks from the competition pool bulkhead. The upgrades to the pool will satisfy the needs of the 2017 Canada Summer Games and the City of Winnipeg. All Work will be completed in accordance to the contract documents, written specifications and drawings.

The drawings and specifications provided are only the minimum standard and necessary dimensions. The drawings are not complete in every detail necessary for the fabrication of the bulkheads and are not to be construed as manufacturing shop drawings. It is the responsibility of the contractor or manufacturer to confirm the exact bulkhead dimensions. The contractor/installer is to confirm with the manufacturer that all their materials and manufacturing meet the Bid Opportunity specifications and requirements.

Ensure that the bulkheads, when pinned, are in the proper position with lane ropes in and tightened and touchpads installed to meet all FINA standards for short/long course swimming competition, men's and women's water polo and synchronised swimming field of play areas. An independent licensed surveyor hired by the contractor must complete and confirm the location of the proper positions. Surveyor must be licensed in the Province of Manitoba.

### **1.2 –SUMMARY**

Related Sections: The following description of work is included for reference only and shall not be presumed complete.

**1.2.1 – Existing Bulkhead Removal** – This section details the specifications of the removal and disposal of the existing single bulkhead located in the competition pool at the Winnipeg Pan Am Pool.

**1.2.2 – New Bulkhead** – This section details the specifications for the manufacturing and installation requirements of two (2) new bulkheads for the Winnipeg Pan Am Pool.

**1.2.3 – OSB 11 Starting Blocks** – This section will detail the removal of the existing OSB11 Blocks from the existing bulkhead and the reinstallation in the training pool on the end wall. Include the stainless steel Step Ups for the Starting

Blocks. Also includes the supply and installation of 16 new starting blocks onto the new bulkheads.

**1.2.4 - Timing System Infrastructure** – This section details the specifications of the required infrastructure to be designed and installed to accept both starting blocks and timing system wiring.

**1.2.5 - Pinning Positions Method and Locations** – This section details the Work required to remove the existing pinning positions and make good those areas. Install new bulkhead pinning positions in the surveyed location. This section also includes the deck brass visual pin required at the 0, 25 and 50m marks.

**1.2.6 - Stanchions** – This section includes all the Work to demo and reinstall all the stanchions. Project includes the demolition of the existing 16 stanchions and the placement of the 16 new stanchions around the pool deck.

**1.2.7 – Pool Shell Tiling Section** – This section details the tile work required for the project. It will outline the deck markers and pinning positions required to meet allow course configurations.

**1.2.8 – Bulkheads in Training Pool** - This section details the requirement of the specification related to the rotation of the bulkhead in the training pool.

**1.2.9 – Stainless Steel Step Ups and OSB11 Starting Blocks** - It also includes installation of stainless steel Step Ups and existing OSB11 Starting Blocks onto the pool deck.

### 1.3 – REFERENCES

#### 1.3.1 - Reference Standards –

**1.3.1.1 - FINA** - Federation International De Natation – Facility Regulations for the 4 Aquatic Sports – Olympic Games Level.

**1.3.1.2 - The Public Health Act – Reg 132/97** – Swimming Pools and Other Water Recreational Facilities – Regulations.

**1.3.1.3 – MBC** - Manitoba Building Code.

**1.3.1.4 - WHMIS** - Workplace Hazardous Materials Information System (WHMIS) as set out under the Hazardous Products Act.

**1.3.1.5 – Manitoba Electrical Code** – Manitoba Regulation 124/2015.

**1.3.1.6 – SAFE WORK PLAN** – Manitoba – Refer to PART D – Supplemental Conditions, Clause D8. Safe Work Plan.

### 1.4 – ADMINISTRATIVE REQUIREMENTS

**1.4.1 – Coordination** – Pre-installation Meetings: Arrange a pre-installation meeting at least 4 weeks prior to commencing work with all parties associated with trade as designated in the Contract Documents or as requested by the Contract Administrator. Refer to Part D – Supplemental Conditions Clause D18 Job Meetings. Review Contract Documents for Work included under this trade and determine a complete understanding of requirements and responsibilities relative to Work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of Work of this Section.

## **1.5 – SUBMITTALS**

**1.5.1 – Product Data** - Include material descriptions, performance characteristics and finishes for each type of the following system components. Submit copies:

- Plans
- Elevations
- Dimensions
- Structural Calculations
- Wall Profile of Bulkhead
- Pinning Systems and Locations
- Accessories, starting block anchors, water polo stanchions, lane anchors, targets, etc.
- Details from any sub trades
- Details of equipment used at the facility
- Route and procedure of entry into the facility

**1.5.2 – Shop Drawings** - Ensure a registered structural/mechanical engineer specified herein is responsible for any shop drawings and all structural design loads shall be stamped by a professional structural engineer licensed to practice in the Province of Manitoba.

**Provide Shop Drawings for:**

- Plans
- Pool Layouts
- Bulkheads
- Starting Blocks
- Pinning Positions
- Deck Visual Brass Pins
- Stanchion Location
- Elevations
- Dimensions
- Structural Calculations
- Wall Profile of Bulkhead
- Pinning Systems and Locations

- Accessories, starting block anchors, water polo stanchions, lane anchors, targets, etc.
- Details from any sub trades
- Details of equipment used at the facility
- Route and procedure of entry into the facility, including weights, pathway, materials needing removal and reinstallation.

**1.5.2.1** - Production and review of Shop Drawings.

**1.5.2.2** - Stamping and signing each Shop Drawing and any associated calculations performed.

**1.5.2.3** - Provide detailed Shop Drawings of the items of equipment being provided, indicating the dimensions, material and characteristics.

**1.5.2.4** - Provide an electronic and hard copy manual of Operating Instructions, embracing the operation functions and the maintenance processes.

**NOTE: Do not proceed with the manufacturing of the bulkheads until Shop Drawings are reviewed by the Contract Administrator and City of Winnipeg, Planning, Property and Development Department, Municipal Accommodations Division.**

**1.5.3 – Pictures** - Show 3 sets of pictures of the bulkheads at the manufacturer's facility showing quality assessment and transportation protection prior to shipping.

**1.5.4 – Certificates** - Signed by the manufacturer of pool system and bulkheads certifying that products furnished comply with requirements.

**1.5.5 - Test and Evaluation Reports** - The manufacturer must submit drawings reviewed by a Registered Professional Engineer licensed in the Province of Manitoba and/or a structural engineer's report including calculations developed by a Registered Professional Engineer, qualified to engage in design development and/or review of the pool system. The drawings and/or report shall be sealed by the reviewing Engineer. The Contract Administrator may request the Engineer provide completed project lists and descriptions as evidence of qualification.

**1.5.6 - Manufacturers' Instructions** - Manufacturer's instructions must be followed. Wherever specific references to following manufacturer's directions or instructions is made in specifications, submit copies as requested thereof for review before commencing such work. Submit 6 copies of the bulkhead's and other equipment's operating and maintenance manuals.

## **1.6 – CLOSE OUT SUBMITTALS**

**1.6.1 – Operation and Maintenance Data Manuals** – Prior to Substantial Performance completion of project submit to the Contract Administrator 3 final copies of Operations Data and Maintenance Manuals in English.

**1.6.1.1** – Provide three (3) final hard copies and three (3) DVD-ROM version of final copy submitted.

**1.6.1.2** – Bind data in vinyl hard covered, 3 ring loose leaf binder for 215 x 280 mm size paper.

**1.6.1.3** – Assign a number and letter to each Section in the manual. The number is to correspond to the specification numbering system and items shall be provided in the order that they appear in the specifications.

**1.6.1.4** – Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of project; identify subject matter of contents.

**1.6.1.5** – Prepare a Table of Contents for each volume, with each product or system description identified in three parts as follows:

**PART 1:** Directory, listing names, addresses, and telephone numbers of Contractor, Subcontractors and major equipment suppliers.

**PART 2:** Operation and maintenance instructions arranged by system and subdivided by specification section for each category, identify names, addresses, and telephone numbers of subcontractors and suppliers.

**PART 3:** Project documents and certificates, including Shop Drawings, Certificates and originals of Warranties. Include with each copy of Operations data and maintenance manual, a complete set of final Shop Drawings (bound separately) indicating corrections and changes made during fabrication and installation.

## **1.7 – MAINTENANCE MATERIAL SUBMITTALS**

**1.7.1 – Spare Parts** – If any grating is used in the bulkhead design provide a spare section of grating. Provide two (2) extra cup anchors.

## **1.8 – QUALITY ASSURANCE**

**1.8.1 – Experience in Manufacturing** - The manufacturer must have a minimum 5 years' experience in the manufacturing of bulkheads and must have 5 similar competition pool installations that have been in successful operation a minimum of 10 years.

**1.8.2 – Experience in Installation** - The installer must have a minimum of 5 years' experience in the installation and operations of swimming pool bulkheads. The installer will be responsible for all areas of the installations including the

demolition of the existing bulkheads and installations of new bulkheads into the pool shell. Refer to Part B – Bidding Procedures, Clause B12. Qualifications.

**1.8.3 – Experience in Testing** - The manufacturer /installer shall record the results of in-shop tests of the bulkheads to verify the design standards are met. Test records shall be supplied to the City of Winnipeg. Tests shall be verified by a certified registered engineer licensed to practice in the Province of Manitoba.

**1.8.4 – Quality Control Program** - A factory quality control program must be submitted to the City of Winnipeg with submittals which ensures that structural tolerances critical for the moveable bulkhead used for competition have been maintained.

**1.8.5 - Licensed Professionals** – Refer to Part D – Supplemental Conditions, Clause D9, Insurance.

**1.8.6 - Product Options** - The overall appearance of the pool is obtained through specific information such as overall geometry, components, colors, materials and performance characteristics as provided on drawings and specifications. The evaluation of completed construction is subject to inspection for purposes of verification by reasonable methods including, but not limited to, post manufacture testing, field testing, and/or performance evaluation.

**1.8.7 – Modification** - Do not modify intended aesthetic effects, as judged by Contract Administrator, except with Contract Administrator’s written approval. If modifications are proposed, submit comprehensive explanatory data to Contract Administrator for review.

**1.8.8 – Protection** - During performance of work, adequately protect work completed and in progress and existing work to remain, such as pool shell, pool deck, floors, finishes, trim and similar components, as completely as possible to minimize replacement of damaged work by each Subcontractor and trade. Work damaged or defaced due to failure to provide adequate protection shall be repaired, or removed and replaced as directed by Contract Administrator and will be the responsibility of the Contractor to complete at their expense.

**1.9 - DELIVERY, STORAGE AND HANDLING** – The Contractor will work with the Contract Administrator and City of Winnipeg, Municipal Accommodations Division during the design process to define the location and size of the staging area.

**1.9.1 – Staging Area** - The Contractor may use the staging area as determined in conjunction with the Contract Administrator and City of Winnipeg for material storage, equipment or other necessary purpose directly related to the Work.

**1.9.2 – Entry & Exit** - Points for Bulkheads – Drawing AQ100 provides 3 options as the exit point for demolition of existing bulkhead and entry point for new bulkheads. The selected option must be approved by the Contract Administrator and City of Winnipeg and shop drawings submitted for staging area and entry and exit point.

**1.9.3 – Protection of Entry Exit Area** – Ensure outside of entry exit area is protected against damage to sod, landscaping, glazing etc. Contractor is to make good any damage to entry and exit area surroundings.

**1.9.4 - Delivery and Acceptance Requirements:** Deliver components and other manufactured items so as not to be damaged or deformed. Package the small components together in crates or containers to prevent loss of small items. Package hazardous and/or sensitive materials together and clearly labeled to indicate use of caution or extra attention is required.

**1.9.5 – Damaged Goods** - Any items that arrive damaged are the responsibility of the Contractor to repair/replace at no expense to the City of Winnipeg.

**1.9.6 - Storage and Handling Requirements**

**1.9.6.1** - Unload, store and erect pool bulkhead components to prevent bending, warping, twisting and surface damage.

**1.9.6.2** - All bulkhead components shall be stored and staged with sufficient site safety and security to ensure damage or losses from vandalism, theft, and weather do not occur.

**1.9.6.3** - Stack non-structural materials on platforms or pallets, covered with tarp or other suitable weather-tight and ventilated covering. Store boxed items to ensure dryness.

**1.9.6.4** - Store hazardous materials as required by WHMIS and the manufacturer.

**1.9.6.5** - Keep out of direct sunlight.

**1.9.6.6** - Store away from open flame or sources of heat.

**1.9.6.7** - Comply with applicable safety regulations governing hazardous material storage and handling under WHMIS training requirements.

**1.9.6.8** - Any items that are damaged during storage are the responsibility of the Contractor to repair/replace at no expense to the City of Winnipeg.

**1.9.6.9** - Refer to Product MSDS for precautionary measures during storage and handling. Submit to the Contract Administrator and the City of Winnipeg the MSDS Sheets for all products being used on the bulkheads or at the facility that require them. Also make available a site a copy of all these MSDS sheets.

**1.9.7 - Packaging Waste Management** - It is the responsibility of the Contractor to package and dispose of all waste materials using acceptable and recognized waste disposal standards.

**1.9.7.1 – Garbage Removal** - Do not use institutional garbage bin facilities for removal of construction rubbish and debris. Contractor shall be responsible for providing their own debris bins and storage containers with lockable covers.

## **1.10 – SITE CONDITIONS**

**1.10.1 – Existing Conditions** – Examine site at no cost to the City of Winnipeg for all matters relating to Work, extent of Work, means of access and egress, all obstacles, rights and interests of other parties which may be interfered with during execution of Work, all conditions and limitations Contractor to take into consideration in performing Work, including obstructions, existing structures or facilities, local conditions, actual levels, character and nature of project and any other considerations which may affect performance of Work.

**1.10.2 – Draining and Filling** – Draining, Filling, Heating, Treating and balancing of the pool Water is to be completed by the Contract Administrator's Representative and not the responsibility of the Contractor.

### **1.10.3 - Cleaning – Progress Cleaning**

**1.10.3.1** - Keep access areas to Work in tidy condition, free from accumulation of waste products and debris during construction and on completion, other than caused by City of Winnipeg crew or other contractors. Do not dispose of volatile fluid wastes (such as mineral spirits, oil or paint thinner) in storm or sanitary sewer systems or into streams or waterways

**1.10.3.2 – Site Cleanliness** - Keep site and building, including concealed spaces, free from accumulation of dirt, debris, garbage and excess material. Remove oily rags and waste from premises at close of each Day work is performed, or more often if required

**1.10.3.3 – Demolition Bins** - A demolition bin will be allowed on site where indicated on Drawings and as coordinated with Contract Administrator and City of Winnipeg.

## **1.11 – WARRANTY**

**1.11.1** - The manufacturer shall provide the City of Winnipeg a separate five (5) year warranty on the movable bulkhead from the date of installation. The movable bulkhead shall be free of defects in materials and workmanship (blistering, corrosion, rust, etc.) when used in accordance with manufacturer's installation and operation (excluding water chemical balance or ventilation) instructions. Specific defects for the purpose of this specification shall include but not be limited to: any outright failure of bonds, any evidence of separation of laminate layers that affect the bulkhead structural, superficial radial hop cracking, delaminating, SS corrosion, corrosion on the welds, and discolouration of the

exterior material as a result of exposure to pool chemicals. The warranty does not include or cover abusive or improper treatment by others.

**1.11.2** - The entire bulkhead shall be guaranteed with a non pro-rated warranty against structural defects (delamination, weakening of structural supports, etc. to which would change the original structural design requirements) for a period of twenty-five (25) years following installation (excluding water chemical balance or ventilation).

**1.11.3** - The manufacturer and installer guarantees that on completion of the installation, the bulkheads will move freely from one location to the other, providing walls are straight and parallel and do not vary more than plus or minus 37mm and will not rack or bind/stop when moved.

## **1.12 – SUBSTITUTION OF EQUIPMENT**

**1.12.1** – Refer to PART B – Bidding Procedures, Clause B7. Substitutes.

## **PART 2 – EXISTING BULKHEAD, NEW BULKHEADS AND ACCESSORIES SPECIFICATIONS**

**2.1 - REMOVAL OF EXISTING BULKHEAD** – Pan Am Indoor Pool currently houses – 1 1.5m bulkhead in the competition pool which must be removed and disposed of prior to the installation of 2 new bulkheads.

**2.1.1 – Coordination** – Coordinate the demolition of the bulkhead with the facility staff around programs and activities. A schedule to completion detailing when the work is to be completed must be submitted for approval prior to work commencing. Refer to Part D – Supplemental Conditions, Form L: Detailed Work Schedule.

**2.1.2 – Existing facility** - Do not interrupt existing services, facilities and activities at the pool complex, except for authorized and scheduled interruptions of services acceptable to the City of Winnipeg. Obtain written permission of City of Winnipeg at least 3 Working Days in advance of any shutdown required for tie-in of new construction systems. Written requests for shutdown permission shall clearly identify exact extent of systems affected, time and duration.

**2.1.3 – Existing Starting Blocks** – the existing eight (8) – OSB11 starting blocks are to be removed from the bulkhead. The starting blocks are to be moved to the training pool and installed on stainless steel Step Ups in the Start End Pool Deck.

**2.1.4 – Site Protection** – Protect all areas of the facility that could be affected by the demolition of the existing bulkhead including but not limited to the pool deck, shell and fittings, stairwells, doors, walls, roof, finishes, etc. from potential damage in the R/R of the bulkhead.

**2.1.4.1** – Post adequate warning signage prominently displayed warning of the illegality and danger of unauthorized trespassing into the parts of the Place of Work under construction.

**2.1.4.2** – Exclude non-construction personnel and public from parts of the Place of Work under construction.

**2.1.5 – Demolition Site** – The contractor shall work with the Contract Administrator and City of Winnipeg during the design process to define the location and size of the demolition area.

**2.1.5.1** - It will be the responsibility of the Contract Administrator and the City of Winnipeg to move the existing bulkhead into the demo area prior to the water being removed from the pool. Protect or tent the area of demolition to ensure any fibreglass dust is contained in this area. Negative pressure exhaust fans maybe required to ensure fibreglass is expelled from the pool. Procedures and precautions are to be put in place to ensure that none of the fibre debris gets into the air of the Natatorium.

**2.1.6 – Demolition** – Cut the existing bulkheads into sections to allow removal from the facility.

**2.1.7 – Waste removal** – Remove the sections of the bulkhead from the facility and dispose of. Generate a written report of how the bulkhead is being disposed of. Clean up the area of the demolition.

**2.1.8 – Removal of Existing Stanchions** – The contractor is to protect the area around each of the existing sixteen (16) brass stanchions to prepare them for removal.

**2.1.8.1** – Core drill out the existing stanchions and disconnect the grounding cable.

**2.1.8.2** – Chip off some of the tile around the stanchion to make a uniform square.

**2.1.8.3** – Remove the stanchion from the hole and prepare for new concrete.

**2.1.8.4** – Pour new concrete into the existing holes and let cure.

**2.1.8.5** – Prepare the old and new concrete for waterproofing.

**2.1.8.6** – Apply waterproofing to concrete.

**2.1.8.7** – Lay a leveling mortar bed and tile the area. The tile shall be approved by the Contractor Administrator.

**2.1.8.8** – Grout in the new tile and transition onto the old tiles. The grout shall be approved by the Contract Administrator.

**2.1.9 – Removal of Existing Bulkhead Pinning Anchors and Make Good –**  
The Contractor is to protect the area around each of the existing 8 SS bulkhead pinning anchors and prepare them for removal.

**2.1.9.1** – Core drill out or chip out the existing pinning anchors and disconnect the grounding cable.

**2.1.9.2** – Chip off some of the tiles around the anchor to make a uniform square.

**2.1.9.3** – Remove the anchor from the gutter prepare the areas for new concrete.

**2.1.9.4** – Pour new concrete into the existing area and let cure.

**2.1.9.5** – Prepare the old and new concrete for waterproofing.

**2.1.9.6** – Apply waterproofing to the concrete.

**2.1.9.7** – Lay a leveling mortar bed and tile the area. The tile shall be approved by the Contractor Administrator.

**2.1.9.8** – Grout in the new tile and transition onto the old tiles. The grout shall be approved by the Contractor Administrator.

**2.1.10 – Removal of Existing Pool Shell Tile** – The Contractor is to protect the area around each of the existing pool tile markers that must be removed and re-positioned.

**2.1.10.1** – Chip out the existing black marker tile that will be changed to white in order to relocate the shell markers on the bottom of the pool.

**2.1.10.2** – Chip out the existing white or black marker tile where the new markers will be located. These will be changed to the opposite colour of either Black or White.

**2.1.10.3** – Grout in the new tile and transition onto the old tiles. The grout shall be approved by the Contractor Administrator.

**NOTE:** The Contractor will be responsible for all costs associated with the dismantling of the existing bulkhead and disposal from the location as well any costs associated with ensuring that the pool shell and deck and all other areas of the facility are protected during this process.

**2.1.11 – Removal of Pool Steps** – As per Drawing AQ101 – existing removable pool steps (2 sets) to be removed, safely stored during construction period and re-installed after new bulkheads are installed.

**2.2 – NEW BULKHEADS GENERAL REQUIREMENTS** - Base specified product for this project is a fibreglass bulkhead – Stark.

**2.2.1 – Bulkheads** - There will be two (2) moveable bulkheads.

**2.2.2 – Measurements** - All measurements outlined in these specifications are approximate and will have to be confirmed by the manufacturer or installer.

**2.2.3 –FINA-** The bulkheads will be designed in accordance with FINA competitive swimming and water polo standards – 2015 – 2017.

**2.2.4 – Dimensions** – the approximate dimensions of the bulkheads will be as follows: (Note all dimensions are approximate for bidding purposes only. Final dimensions are to be confirmed by the contractor on their site measurements.)

**2.2.4.1** – The length of the bulkheads from end to end is 23420mm.

**2.2.4.2** – The width of each bulkhead is 1500mm.

**2.2.4.3** – The total height of the bulkheads is 2110mm.

**2.2.4.4** – The freeboard of the bulkhead is 300mm above the waterline.

**2.2.4.5** – The distance of the bulkhead is 1810mm under the waterline.

**2.2.4.6** – The gutter coping overhang is 570mm onto the gutter.

**2.2.4.7** – The width of the racing lanes is 2500mm to center of lane rope.

## **2.3 – MATERIALS – DESIGN CRITERIA**

**2.3.1** – Contractor to provide and install two (2) fiberglass one-piece monolithic double box construction moveable pool bulkhead fabricated to match the design of the end walls and overflow gutters. The bulkhead must span the width of the pool in one monolithic piece. The dimensions are found above. The top and sides of the bulkhead shall have a non-skid surface and be designed as a walkway. Refer to drawings.

**2.3.2** – Contractor to provide a complete fiberglass moveable bulkhead system made entirely with 100% vinyl ester resin with a vinyl ester pigmented gelcoat outer layer that includes a UV inhibitor which is manufactured and installed in one piece (no bolts, fasteners, adhesives, or core materials allowed for structural body) and is entirely constructed of materials which are unaffected by corrosion when exposed to the chlorinated swimming pool conditions. Paint or protected coatings to cover any materials whether they are internal or external areas of the bridge to prevent corrosion shall not be allowed.

**2.3.3** - The moveable bulkhead system in its original solid state must be permanently compatible with the chlorinated swimming pool conditions. The use of carbon steel, mild steel, alloy, aluminum, magnesium, copper, brass, or wood for any structural section or fasteners/hardware or parts of the bridge will not be allowed, unless equivalent submitted in accordance with B7.

**2.3.4** - Moveable bulkhead manufacturer shall supply anchor pin assemblies and support structure integral to the bulkhead, and be responsible for coordinating proper alignment, operation and support of the bulkheads on the gutter curb, as well as its locking mechanisms that will rigidly set the bulkhead at each parking location. Bulkhead anchors shall provide adjustment mechanisms to precisely locate bulkhead. (Contractor will be responsible for the supply and install of the pin plates in the gutter system at each course length as shown on the drawings.)

**2.3.5** - Bulkhead shall be designed to support a unified live load with  $\frac{1}{2}$ " maximum deflection in addition to all dead loads of 5600 lbs on the bulkhead walk area without the assistance of constant foam or additional air to assist with the support of such load. The safety factor for all live and dead loads shall be at least 10. In addition, the bulkhead shall be designed to withstand a uniform lateral live load of at least 30 pounds per linear foot and a point load of at least 500 pounds at the center with a maximum deflection of  $\frac{1}{2}$ ". Racing cup anchors shall be designed to resist pullout loads of at least 400 pounds each.

**2.3.6** - Bulkhead shall feature flow-through openings at the waterline to allow for 100% of waves to pass through the bulkhead. This will also include open foot/hand hold positions. Note – gaps in the flow-through system must meet the Manitoba Building Code for potential entrapment dimensions.

**2.3.7** – A solid horizontal shelf shall be installed inside the bulkhead at the water line, which will also be fused/welded with the main/frame body. This horizontal shelf gives the necessary strength to allow tightening of the racing lane lines (50m) without distorting the competition line of the bulkheads.

**2.3.8** – The bulkhead will be designed so that the weight of the bulkhead rests on protective non-corrosive pads while pinned in the overflow pool gutter. The extension will not be obstructed by any equipment on the pool deck while moving.

**2.3.9** – Surfaces of the bulkhead that may come in contact with the pool and deck surfaces shall be nonabrasive.

**2.3.10** - Bulkhead shall feature 12"x12" plastic flow-through grates as shown on the drawings between each lane below the waterline to allow for water flow through the bulkhead and to assist with movement in shallower water.

**2.3.11**- The bulkheads have a service access door to allow for inspection of the inside structure of the bulkheads.

**2.3.12** – The bulkheads do not require rotation during their lifetime.

**2.3.13** – The bulkheads will be totally closed in at the bottom.

**2.3.14** – All structural design loads will be confirmed by a professional engineer licensed to practice in the Province of Manitoba.

## **2.4 – VARIABLE BUOYANCY**

**2.4.1** - Moving the bulkheads shall be easily accomplished by one person at each end of the bulkhead. Internal air chambers will be provided as means of reducing the static weight and initial inertial resistance (bulkheads using force for full movement will not be accepted unless accepted as an equivalency). Internal air chambers will be so constructed that when adding air volume not pressure (bulkheads needing air pressure will not be accepted) to raise the bulkhead for change in position it shall have the means to balance and eliminate the need for removal of the starting platforms. Bulkheads shall glide freely on corrosion-proof guides or skid plates both at gutter lips and side walls. Bulkheads that have to maintain buoyancy at all times will not be accepted. Manufacturer shall provide all equipment, including blowers necessary to operate flotation chambers. Other bulkhead moving methods maybe considered but must presented as an equivalency within the specified timelines.

**2.4.2** – Corrosion proof skid plates will be installed on the ends and sides of the bulkheads to protect the bulkhead, pool shell, overflow gutter and deck while moving from one pinning position to another.

**2.4.3** – To have the maximum 100mm distance between the side of the bulkhead and the pool side walls. The bulkhead shall not come into contact with the pool underwater window, ladders, lights, diving boards. Lifeguard chairs or any other fitting equipment.

**2.4.4** – The bulkheads will have the capacity to span the pool while the pool is empty without any additional supports and shall be capable of supporting a uniformed distribution load of 100 lbs. per square foot calculated with a safety factor of three.

## **2.5 – ACCESSORIES**

**2.5.1 – Access Hatches** - Suitable provisions for electronic timing system shall also be provided. Access hatches shall be included at both ends of the bulkhead to facilitate inspection of the interior of the bulkheads, anchor mechanisms and to allow for the installation of wiring in an existing raceway gutter to carry electronic timing cables and conductors.

**2.5.2 - Starting Block Anchors** - Bulkheads shall be fitted with sixteen (16) anchors for the OSB11 Starting Blocks in the locations noted and in the positions required by the manufacturer.

**2.5.3 – Racing Lane Anchors** - Bulkheads to have a total of thirty-six (36) racing lane anchors, nine (9) racing lane line anchors at waterline along on both faces of the bulkhead as shown in the drawings. The cup anchors shall be molded into

the structure and supplied with a stainless steel pin for attachment. Each racing lane anchor will have a min 400 lbs pull out strength.

**2.5.4 – Water Polo Anchors** - Bulkheads to have four (4) Men and Women's water polo boundary line anchors. The cup anchors shall be molded into the structure and supplied with a stainless steel pin for attachment.

**2.5.6 – Racing Lane Targets** - Racing lane targets eight (8) will be supplied on both sides of the bulkhead where shown on the drawings. Lane targets to coincide with lanes on the pool floor and markers on the pool walls. Targets will meet FINA standards for competitive swimming.

**2.5.6.1 –Targets** - Targets will be made of a permanent non-slip surface and will be of the same dimensions as the targets currently laid on the bottom of the pool.

**2.5.7 – Guard Rails** - Removable guard rails shall be provided at both ends of the bulkhead. Rails shall be custom fabricated of one continuous length of tubing. The tubing shall be of type 316 stainless steel, 1.90 inch OD x .145 inch wall thickness polished to 320 grit finish.

**2.5.8 – Hand/Foot Holds** – There will be hand and foot holds on these bulkheads on both faces of each bulkhead. The foot hold will allow water to flow through the bulkhead.

**2.5.9 – Fixed Skirt** – The deep bulkhead shall feature a fixed skirt/flow-through extension at the base of the bulkhead extending to within ½” of the pool floor on one side of the bulkhead as shown on the drawings.

**2.5.10** – All other accessories required to operate the bulkheads to be included in the Bid price. This includes any blowers to inflate the bulkheads when they are moved. Provide any other equipment that is required in order to move the bulkhead from one end of the pool and back.

## **2.6 – STARTING BLOCKS**

**2.6.1 – Removal of Existing Starting Blocks** – The existing starting blocks are to be removed from the bulkhead in the competition and will be re-installed in the training pool.

**2.6.2 – New Starting Blocks** - OMEGA / SWISS TIMING OSB11 FINA standard, non-corrosive, with full detection, track start starting blocks will be installed one in each lane across both bulkheads and or pool ends (16 in total). The blocks need to be tied into the lane deck plate. The starting block will have an adjustable track rest on the platform. Ensure the ability to install the starting blocks on the 2 bulkheads for different pool event configurations.

**2.6.3 – Installation** – Starting blocks must meet all the requirements of FINA standards for competitive swimming.

## **2.7 – TIMING SYSTEM INFRASTRUCTURE**

**2.7.1 – Cable Trays** – The bulkheads will have one (1) – 100mm timing system cable tray installed in each bulkhead. These trays will follow under each of the block positions and carry all of the bulkhead wires.

**2.7.2 – Deck Plate Boxes** - The bulkheads will have deck plate supported boxes 100mm L x 100mm W x 100mm H under each starting block.

**2.7.3 – Access panel** – Each bulkhead will have an access panel and shelf to place a waterproof box on the west or east side for timing cable connections. The area of the box will be 300mm L x 300mm W x 300mm D. The box will be as waterproof as possible when not in use and closed with a snap latch.

**2.7.4 – Touchpad inserts** – The bulkheads will require threaded stainless steel inserts and screws on both sides (36 per bulkhead) to secure the touchpads to the bulkhead.

**2.7.5 – Starting block anchors** – Each bulkhead to include anchors for 8 racing starting blocks installation with the ability to dive from both sides of the bulkhead (32anchors).

**2.7.5.1** – The blocks will be 2.500m apart centered on the bulkhead.

**2.7.5.2** – Installation of starting blocks must meet all the requirements of FINA standards for competitive swimming.

**2.7.5.3** – The anchors extend from the top of the deck through the horizontal shelf located at water line.

**2.7.5.4** – Ensure bulkhead's centre of gravity and buoyancy line up so the bulkhead does not tip forward or backwards while moving with the starting blocks installed or removed.

**2.7.5.5** – The anchors supplied or recommended by the starting block manufacturer must be a min. 316L stainless steel. The anchors are to be an integral part of the structure.

**2.7.6 – Water polo goal and net stanchions** – The bulkheads will have 0.050m stainless steel stanchions to meet FINA standards for water polo. The shallow end bulkheads will have enough 0.5mm stainless steel stanchions across the length of the bulkhead to install a netting system when water polo is played. This is to protect the other swimming areas from water polo balls.

## **2.8 – PINNING POSITIONS, METHOD AND LOCATIONS**

**2.8.1** – The bulkheads will travel horizontally the length of the pool into the designated pinning positions.

**2.8.2** – Include eight (8) – 25mm diameter fibreglass or stainless steel pins.

**2.8.3** – The pin inserts will be placed in the overflow gutters and will be made of high grade stainless steel (316L) and should fit the pin tolerance of 25mm any direction.

**2.8.4** – There will be a total of eight (8) pinning positions with a total of sixteen (16) anchors.

**2.8.5** – The pin holders in the bulkhead will have the ability to adjust the bulkhead positions by a minimum 25mm in all 4 directions.

**2.8.6** - From the start/finish end of the pool there are pinning positions for the bulkhead on both sides of the pool at the following locations. These 8 positions will meet the requirements for the aquatic sport field of plays as provided in the drawings. These positions must be surveyed to ensure they are in the proper spot. The survey can be completed prior to installation of the bulkheads but must be redone at commissioning with water in the pool and with the bulkhead pinned, lane ropes and touchpads in place.

**2.8.7** – The first pin placement will be in the centre of the deep end bulkhead on both sides to ensure the bulkhead is as close to the end wall as possible. The remaining pins will be surveyed and placed using this position as one end.

**2.8.8 – Field of Play Dimensions** – Race course dimensions shall be field certified in compliance with the competitive standards having jurisdiction and submitted to Contract Administrator Representative in writing by the certifying engineer or land surveyor.

**2.8.9 – Brass Survey Pins** - There will be six (6) Brass Visual Survey pins installed on the pool deck. The first is at the 1.5m mark from the deep end wall the second 2 at the 25m mark and the last 2 at the 50m mark. These pins will be placed at these marks as a visual to the officials when the bulkhead is pinned in the proper position.

**2.8.10** - The pool shell, fittings, anchors, stanchions and other metal equipment within 3m of the pool must be grounded.

**2.8.11** - Pool contractor is responsible to have a hydro inspection completed on the grounding prior to pool being filled

**2.8.12** - The Contractor is responsible to pull the Hydro Permit required for the bonding and grounding of the pool equipment.

## **2.9 – STANCHIONS**

**2.9.1 – Existing Deck Stanchions** – Will be removed and deck area made good.

**2.9.2 – New Deck Stanchions** - Provide twelve (12) deck stanchions that will hold the back stroke flags and the false start rope during training and competition. These will be placed at 5m, 6m, 12m, 15m, 16m, 20m, 21m, 31m, 32m, 36m, 37m, 44m, 45m marks. The stanchions will be installed on the pool deck far enough back from the pool edge to allow the movement of the bulkhead without removing the stanchion poles.

**2.9.3 – Material** – the new deck stanchions will be brass.

**2.9.4 – Grounding** - The pool shell, fittings, anchors, stanchions and other metal equipment within 3m of the pool must be grounded.

**2.9.5** - Pool contractor is responsible to have a hydro inspection completed on the grounding prior to pool being filled.

## **2.10 – POOL SHELL TILING REQUIREMENTS**

**2.10.1** – Contractor to install new tile markers on the pool shell bottom.

**2.10.2** – A total of forty-eight (48) new tiled T markers and thirty-two (32) false start markers to be tiled onto the bottom of the pool in the new positions as required by FINA and Drawing AQ110.

**2.10.3** – Apply waterproofing to the concrete area clear out under the demolition Section of the specification.

**2.10.4** – Lay a leveling mortar bed and tile the area. The tiles shall be approved by the Contractor Administrator.

**2.10.5** – Grout in the new tile and transition onto the old tiles. The grout shall be approved by the Contractor Administrator.

## **2.11 – INSTALLATION OF NEW BULKHEAD**

**2.11.1** – Contractor and Sub-contractors are to familiarize themselves with the site conditions and shall determine how the installation of the bulkhead is to be facilitated into the pool. The contractor shall be responsible for making any alterations required to facilitate installation then make good these affected areas. A proposal for installation is to be included as part of the base bid submission as it needs to be approved prior to starting.

**2.11.2** - Bulkhead manufacturer shall provide factory trained and experienced personnel for coordination, consultation, and instruction for the actual bulkhead delivery and for training of the Contract Administrator's Representative's personnel in the use, operation, and maintenance of the bulkhead. Provide necessary instruction and coordination as required to coordinate anchorage installation.

**2.11.3** - Bulkhead must be shop fabricated and delivered in not more than one piece. The bulkhead shall be installed per manufacturer's instruction.

**2.11.4** - All costs for installation onto pool gutter, adjustments, certification of parking dimensions and cleanup upon completion shall be borne by the contractor.

**2.11.5** - The installation shall be true, level and plumb with the existing structure to permit full range of movement.

**2.11.6** - Suitable means of anchoring the bulkhead shall be provided and installed by the Contractor into the gutter system. .

**2.11.7** - During installation, protection shall be provided for the existing deck, pool walls, pool floor and general building construction. The contractor shall bear all costs for replacement or repair as a result of damage by neglect.

**2.11.8** - The bulkhead shall be self-supporting, not requiring jacks for support when the water is removed from the pool. The bulkhead shall be placed only where the gutter system has added bracing to support bulkhead whenever the pool is empty.

**2.11.9** - The bulkhead shall not be moved until water is in the pool and at the level of the gutter lip.

**2.11.10** – All draining, filling, heating, treating and balancing of the pool water is to be completed by City of Winnipeg.

**2.11.11** - Restore site to original or condition equal conditions.

**2.11.12** - Make Good surfaces and finishes damaged or disturbed due to Work of this Contract to match existing. Ensure materials used to repair damage are compatible with existing work.

## **2.12 – ROTATING THE TRAINING POOL BULKHEAD**

**2.12.1** – Under the existing pool configuration and equipment with the touchpads in, the centre lanes in the training pool are too short to meet the FINA swimming distance requirements for long course competitions. The existing bulkhead was installed in 1998 for the 1999 Pan Am Games and has bowed slightly in the centre.

**2.12.2** – The Contractor is to arrange to have the moving equipment available (forklift). To lift the existing bulkhead out of the water and rotate 180 degrees so the bow in the bulkhead is now facing the other direction.

**2.12.3** – Place the bulkhead back into the pool and ensure it moves freely up and down the pool without issue.

**2.12.4** – Modify the bulkhead pinning anchor on the side of the pool to accept the new positioning of the bulkhead. This bulkhead must be able to be pinned into position at the 50m mark.

**2.12.5** – Ensure that the bulkheads, when pinned, are in the proper position with lane ropes in and tightened and touchpads installed to meet all FINA standards for short/long course swimming competition, men's and women's water polo and synchronised swimming field of play areas. An independent licensed surveyor hired by the contractor must complete and confirm the location of the proper positions. Surveyor must be licensed in the Province of Manitoba.

### **2.13 – TRAINING POOL – STAINLESS STEEL STEP UPS AND OSB11 STARTING BLOCKS**

**2.13.1** – As per the drawings have the manufactured 8 316L Polished stainless steel OSB11 Step Ups.

**2.13.2** – Install stainless steel anchors into the pool deck around the deck plate to accept the new SS Step Ups.

**2.13-3** – Mount these step ups using stainless steel fastening bolts and washers to the pool deck using newly installed anchors.

**2.13-4** – Install the 8 existing OSB11 Starting Blocks from the competition pool onto the new stainless steel Step Ups and align across the pool to ensure they are all the same.

**2.13.5 – Grounding** - The pool shell, fittings, anchors, stanchions and other metal equipment within 3m of the pool must be grounded.

**2.13.6** - Contractor is responsible to have a hydro inspection completed on the grounding prior to pool being filled.

### **3.0 – COMMISSIONING**

**3.0.1** - To provide 2 on-site training sessions on the operation and maintenance of the bulkheads.

**3.0.2** - Submit a complete record of instructions as part of maintenance instructions and data book given to the Contract Administrator. For each instructional period, supply following data:

- 3.0.1.1.** Date.
- 3.0.1.2.** System or equipment involved.
- 3.0.1.3.** Names of persons giving instructions.
- 3.0.1.4.** Names of persons being instructed.

**3.0.1.5** Other persons present.

**3.0.3** – Operation and Maintenance Manuals - Refer to Appendix A - Clause 1.6 Closeout Submittals.

**3.0.4** – To demonstrate that the exposed surfaces are free of all imperfections or irregularities. A field inspection by the City of Winnipeg will be conducted upon completion of the installation to ensure compliance before acceptance.

**3.0.5 – Final Cleaning** - Prior to building occupancy, clean the place of the Work thoroughly, free of rubbish and surplus material. Dispose of rubbish and debris. Vacate the place of the Work in a clean and tidy condition satisfactory to the Contract Administrator and City of Winnipeg.