

## **SECTION 13 11 00.02 (13152)**

### **SWIMMING POOLS - INTERIOR.**

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

**A. Section Includes:**

1. Pool & Spa Constructed of Gunitite and Shotcrete System.
  - a. The Pool Contractor shall be responsible for design and installation of indoor pool and spa system.
2. Pool Contractor shall be responsible for submitting and securing necessary approvals and permits, including payment of fees, and expenses for the preparation of any required documentation.

**B. Related Sections:**

1. Divisions 22, 23 and 26 Specifications for the following:
  - a. Excavation for electrical and plumbing lines.
  - b. Pool deck hose bibs.
  - c. Cold water supply within pool equipment room.
  - d. Gas line for pool heaters.
  - e. Conduit wiring, receptacles and disconnects to the pool equipment room.
  - f. Pool heater flues.
  - g. Filter room, decks, sealing of joints between pool and deck, shall be provided as work of other sections.
  - h. Connection of floor & deck drains and hose bibs is specified in Division 22.
  - i. Connection of pool heater to gas source and heater vent piping in equipment room shall be performed by Contractor.
  - j. Provisions for combustion air.
  - k. Connection of automatic water fill system and fill spout cold water lines from water source in equipment room is specified in Division 22.
  - l. Connection of all pool equipment, starters and switches; grounding of pool, pool equipment, pool lights and niches, and wiring of pool & spa lights from electrical panel in equipment room is specified in Division 26.

##### **1.2 REFERENCES**

- A. Applicable requirements of the following Specifications and Codes apply to work of this Section:**
1. [National Spa and Pool Institute \(NSPI\): Publications](#)
    - a. "Minimum Standards for Public Swimming Pools"

- b. Exception: "Diving Board Standards" not applicable.
- 2. Local building and health codes.
- 3. [National Fire Protection Association \(NFPA\)](#) Publication:
  - a. 70 "National Electric Code"
- 4. [National Sanitation Foundation \(NSF\)](#):
  - a. "Seal of approval program"
- 5. [Gunitite Contractors Association \(GCA\)](#):Publication
  - a. G-84, "Gunitite and Shotcrete"
- 6. [American Society for Testing and Materials \(ASTM\)](#):
  - a. A615 "Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement"
  - b. C33 "Standard Specification for Concrete Aggregates"
  - c. C150 "Standard Specification for Portland Cement"
- 7. [American Society of Mechanical Engineers \(ASME\)](#) Publication
  - a. "Coding and Labeling"
- 8. [Tile Council of America, Inc.](#) Publication
  - a. "Handbook for Ceramic Tile Installation"

### 1.3 SYSTEM DESCRIPTION

#### A. System shall include:

- 1. Provide systems of fully compatible components and construction methods required for complete and operable systems for indoor swimming pool & spa including but not limited to excavation, dewatering of construction area and removal of excess earth from site.
- 2. Gunitite and shotcrete shell.
  - a. Finish Plaster Mix (Diamond Rite).
- 3. Excavating, hauling, backfilling, grading and incidental earthwork in conjunction with the construction of the swimming pool.
  - a. Handle and dispose of excess material, regardless of type, character, or composition.
- 4. Connections of water and gas to pool equipment.
- 5. Connection of motors, pumps, compressors, switches and timers, lights, and wiring necessary for interfacing of equipment.
- 6. Pool Equipment.
  - a. Filter Systems
  - b. Flow Meters
  - c. Water Treatment Systems

- d. Heaters
- e. Recirculation Pumps and Motors
- f. Piping
- g. Fittings, Lights and Accessories
- h. Deck Drain System
  - 1) Automatic Water Fill System and Fill Spout

#### 1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 01 Specification Sections:

1. Product Data:
  - a. Manufacturer's technical literature with installation and storage instructions for each product specified.
  - b. Pumps: Pump performance curves indicating GPM vs. TDH, maximum efficiency point, and maximum amperage draw, together with current characteristics and service factor of motor.
2. Shop Drawings
  - a. Complete design of swimming pool, including all component parts, attachments, devices, or other work, filtration filter, size, turn-over capacity, and supporting calculations.
    - 1) Foundation plan and details and Sections through pool shall be included.
    - 2) Mechanical schematic.
    - 3) Detail for ladder and pool wall interface.
  - b. All Shop Drawings shall be certified and sealed by a Professional Engineer, registered in the state in which project is being submitted.
3. Certifications:
  - a. The pool manufacturer shall certify to the Owner that the depth and configuration of the pool is acceptable and compatible with all known safety standards for the manufacturer's designed product.
4. Design Data:
  - a. Hydraulic analysis: Engineer's sealed calculations and total dynamic head (TDH) for swimming pool system for equipment other than that specified.
  - b. Structural analysis: Engineer's sealed calculations and analysis for pool concrete design.
5. Operation Manual:
  - a. At the completion of the work, the Pool Contractor shall furnish to the Owner two bound copies of an operation manual. Minimum content of these manuals shall be:
    - 1) Operating Instructions

- 2) Equipment Literature with Parts List of all Equipment
- 3) Water Chemistry Procedures
- 4) Suggested Safety Procedures
- 5) Repainting/Refinishing Procedures
- 6) Include chemical analysis of source/make-up water supply
- 7) Copies of all manufacturer's warranties
- 8) Test reports
- 9) Sealed Engineer's drawings.
- 10) Certificates: From local authorities indicating that pool construction and performance conform to requirements of respective authorities.

## 1.5 QUALITY ASSURANCE

- A. All work under this Section must be performed by a Contractor experienced and regularly engaged in building, commercial swimming pools. Contractors bidding this work must have completed five (5) projects within the past ten years equal to or larger than this project.
- B. Pool specification and related pool drawings are to be considered as performance guidelines only meeting minimum requirements which may change as result of local code and health department requirements.
  1. The standards of these Plans and Specifications are intended to provide the Owner with a low maintenance pool.
  2. The project Drawings and Specifications supplement each other. In the event of a conflict, the Specifications shall govern. Piping locations are schematic. Precise locations of piping shall be determined by actual field condition. Fittings are not shown. The Pool Contractor shall include all fittings normally required for a completed system.
  3. This Contractor shall be responsible for reviewing the complete set of Contract Documents and coordinate work with other trades.
  4. The Pool Contractor to be responsible for design and installation of pools, including layouts, routing of piping, as well as the proper location and quantities of required accessories. Responsibilities also include necessary valves, devices, and controls for pool system as required.
  5. Contractor's design drawings must be sealed and signed by a licensed Engineer registered in State in which project is being constructed.
- C. All work under this Section shall be inspected and installed in accordance with all current local and state codes and regulations.
  1. The Pool Contractor shall obtain the following:
    - a. Board of Health Design Approvals
    - b. State Board of Health Inspections and Final Approval
    - c. Structural and Electrical Inspections and Final Approvals on his Portion of the Work

2. This Contractor shall submit, on his letterhead, a list of all variations and deviations he finds that differ between local code requirements and bid drawings.

D. Testing:

1. At the completion of the work, the Pool Contractor shall fill the pool with water and instruct the Owner's operating personnel in the operation of all equipment.
2. The Pool Contractor shall test the Owner's natural water supply and furnish and supply start-up chemicals as required for start-up, including chlorine and requirements to balance total alkalinity and calcium hardness, and shall obtain same.

## 1.6 PROJECT CONDITIONS

A. Coordination: Coordinate this work with the work of other Sections to avoid any delay or interference with other work.

1. Filter room, decks, sealing of joints between pool and deck, fencing and landscaping shall be provided as work by other Sections.
2. Connection of all pool equipment, starters and switches; grounding of pool, pool equipment, pool lights and niches, and wiring of pool lights shall be performed by Pool Subcontractor from electrical panel in equipment room.
3. Connection of floor drains, deck drains and hose bibs shall be provided as work of other Sections. Pool contractor to coordinate with plumbing contractor exact locations.
4. Connection of pool heater to gas source and heater vent piping in equipment room shall be performed by [Mechanical Contractor](#).
5. Provisions for combustion air will be provided as work by other Sections.
6. Connection of automatic water fill system and fill spout cold water lines from water source in equipment room shall be performed by Pool Subcontractor.

B. Lines, Grades, and Elevations:

1. The General Contractor shall establish a bench mark for elevations and control points for measurements and layouts. The Pool Contractor shall be responsible for lines, grades, and measurements from these points required for the installation of the pool.

C. Utilities:

1. The Contractor shall supply the water required for construction and filling and testing of the pool from permanent accepted system.

## 1.7 WARRANTY

- A. The Pool Contractor shall warranty his work against defects in labor and equipment, including paint, for a period of one year from Substantial Completion. Substantial Completion shall be defined as the date of acceptance by the Owner or initial usage, whichever occurs first. This warranty shall not include minor defects that do not affect the use of the pool such as scratches, minor dents, or concrete curing cracks.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS:

A. Accepted Manufacturers:

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CHOICE HOTELS INTERNATIONAL  
**Sleep Inn, Inn & Suites Colby, KS**  
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1. A & B Brush
2. Action/Haviland (800-333-0400)
3. [American Olean Tile Co.](#) (800-933-8453)
4. [American Products](#)
5. [Anchor Industries, Inc.](#) (800-544-4445)
6. [Berkeley \(Sta-Rite Water Systems\)](#) ( 888-237-5353)
7. [Bio-Lab, Inc.](#) (800-959-7946)
8. [Blue White Industries](#) (714-893-8529)
9. [Cal-June, Inc.](#) (818-761-3516)
10. [Dal-Tile Corp.](#) (800-933-8453)
11. [Degroot Studios](#) (954-587-5487)
12. [Federal Stone Industries, Inc.](#) ( 800-513-5030)
13. [Frost Co. \(Inter-Fab\)](#) (800-737-5386)
14. [A. J. Giammanco & Associates, Inc. \(Lion Pool Products\)](#) (800-546-6766)
15. [Gould Pumps, Inc](#) (315-568-2811)
16. [Grace Construction Products](#) (800-778-2880)
17. [Guardex](#) (Bio-Lab) (800-959-7946)
18. [Halogen Supply](#) (800-777-7946)
19. Hydrotech (Bio Lab). (800-795-7946)
20. [Jandy](#) (707.776.8200)
21. [Lochinvar Corp.](#) (615-889-8900)
22. [Mameco International, Inc.; a Division of Tremco, Inc.](#) (800-321-6412)
23. [Mec-O-Matic \(Pulsafeeder\)](#) (800-333-6677)
24. [Mortex Manufacturing, Inc.](#) (800-338-3255)
25. [Omni](#) (Div. Bio-Lab) (800-959-7946)
26. [PAC-FAB, Inc. \(see Paragon Aquatics\)](#) (800-983-7665)
27. [Paragon Aquatics, a division of PAC-FAB, Inc.](#) (914-452-5500)
28. [Pentair Pool Products](#) (800-843-5628)
29. [Purex \(see Pentair Products\)](#)
30. [Quaker Plastic Corporation](#) (888-288-6644)
31. Rainbow ( 845-8906-8320)
32. [Raypak, Inc](#) (818-889-1500)
33. [George Fischer Signet Scientific Co.](#) (800-854-4090)

34. [S. R. Smith Commercial](#) (888.677-7776)
35. [Spectrum Aquatics](#) (800-776-5309)
36. [StaRite Pool and Spa Group a Pentair Company](#) (800-843-5628)
37. [SGM, Inc.](#) (800-641-9247)
38. [Stenner](#)
39. [Swimquip \(See Sta-Rite Pool Spa Group\)](#) (800-752-0183)
40. [Taylor Technologies](#). (800-837-8548)
41. [Telodyne Laars](#) (415-382-8220)
42. [Whitten \(Aquatic Development Group\)](#) (518-783-0038)
43. [W. R. Meadows, Pool Deck Construction Products](#) (800-542-7665)
44. [VAK PAK](#) (800-877-1824)

## 2.2 POOL AND SPA STRUCTURE - GENERAL

- A. Size of pool shall be as shown on Drawings.
- B. Horizontal submersible joint sealant shall be polyurethane type by one of the following Accepted manufacturers:
  1. “[Vulkem 45](#)”; [Tremco, Inc.](#), an RPM Company (800-562-2728)
  2. [Sonneborn Bldg. Products Div.](#), Degussa Building Systems (800-243-6739)
- C. Vertical joint sealant shall be polyurethane type by one of the following Accepted manufacturers:
  1. “[Vulkem 116](#)”; [Tremco, Inc.](#), an RPM Company (800-562-2728)
  2. “[Vulkem 911](#)”; [Tremco, Inc.](#), an RPM Company (800-562-2728).
  3. [Sonneborn Bldg. Products Div.](#), Degussa Building Systems (800-243-6739)
- D. Ceramic Tile: Tile used in conjunction with surfaces in contact with water shall be furnished and installed by pool Contractor.
- E. Perimeter and general purpose sealants shall be polyurethane, refer to Section 07 92 00 (07920)

## 2.3 POOL & SPA MATERIALS

- A. Concrete:
  1. Definitions:
    - a. Guniting: Dry-mix. Originally a trade name used to designate a mixture of Portland cement and sand thoroughly mixed dry, passed through a cement gun and conveyed by air through a flexible tube, hydrated at the nozzle and placed by air pressure.
    - b. Shotcrete: Wet-mix. transit-mix (ready-mix) combination of Portland cement, aggregates and water, pumped in a plastic state to the nozzle, where air is added to place the material.
  2. Materials and mixes for "Guniting" and shotcrete shall conform to [GCA](#) G-84.

3. Gunitite:

- a. Aggregate: [ASTM](#) C33, washed sand; clean, hard, sharp particles, well graded in size within the following limits:

<u>Size</u>	<u>Percent by Weight</u>
Passing through 3/8 inch screen	100
Passing through No. 4	95 to 100
Passing through No. 8	65 to 90
Passing through No. 16	45 to 75
Passing through No. 30	30 to 50
Passing through No. 50	10 to 22
Passing through No. 100	02 to 08

- b. Mix one part cement to 4 1/2 parts of sand based on dry, loose volume (minimum 3,000 psi compressive strength in 28 days).
- c. Portland cement and water: As specified hereinafter.

4. Shotcrete:

- a. Transit mix (ready-mix) materials conforming to aggregate specified above for "Gunitite" and with the additional following grading for pea gravel:

<u>Sieve Size</u>	<u>Percent by Weight</u>
1/2 inch	100
3/8 inch	90

- b. Mix Strength: Minimum 5,000 psi compressive strength in 28 days.
- c. Submit design mix and certify material for weight, water content and mixing time.
- d. Portland Cement and Water: As specified hereinafter.

5. Portland Cement: [ASTM](#) C150, Type I or II.

6. Water: Potable.

7. Forms: Exterior plywood, [APA](#)-B8 Plyform Class 1, mill-oiled.

8. Form Oil: Lacquer or resin type compatible with mill-oil.

9. Reinforcing Steel: [ASTM](#) A615 grade 40.

10. Gauging Wires: Piano wire, 0.027" thick.

B. Ceramic Tile:

1. Tile Mortar and Grout: As specified in Section 09 30 13 (07920) - Ceramic Tile.

- a. Refer to [Sleep Inn, Inn & Suites Interior Finish Specification](#) for colors.

C. Finish Plaster Mix:

1. [White marble, White waterproof cement and bonding agent.](#)
2. [Finish and Color: As selected by Owner.](#)

D. Sealant and Back-Up Material: See Section 07 92 00 (07920) – Sealants.

E. Precast Concrete Pool and Spa Coping:



1. Precast concrete, wet pour, white, 12" wide x minimum 2' long bull nosed coping stone with raised slip resistant pattern on upper surface. Provide one-piece radius corners.
2. Provide bonding coat as recommended by finish manufacturer.

#### 2.4 SPA

- A. Type: Gunnite as specified above.
- B. Heater: As selected by [As selected by Owner's Representative](#).
- C. See drawings for size and configuration.
- D. Provide step and railing to meet all applicable codes.
- E. Furnish and install with 15-minute remote timer for spa operation.
- F. Warranty: Include one-year warranty starting at the Date of Substantial Performance.

#### 2.5 FILTER SYSTEM

- A. Pressure Filters:
  1. Accepted Manufacturers:
    - a. [Pac-Fab](#)
    - b. [Sta-Rite Pentair](#)
  2. Filter systems: Listed as approved by the National Sanitation Foundation for sand filters at flow rates of 20 GPM per square foot of filter area, and bear the [National Sanitation Foundation](#) Seal of Approval. Maximum filter flow rate shall not exceed 15 GPM per square foot of filter area.
  3. Filter or Filter Battery Stainless steel or fiberglass hi-rate pressure sand filters.
  4. Include with each filter top mounted influent pressure gauge, reading 0 to 60 psi, manual air release valve, multi-port diameter valve, backwash site glass and transparent dome top.
- B. Filter Media: Sand, with an effective size of 0.45 to 0.55 mm with uniformity coefficient of 1.6 maximum.
- C. Filter Face Piping:
  1. Pipe, valves, and fittings shall make a complete unit or battery from inlet to outlet.
  2. Arrange piping to carry out operations of filtering, backwashing and by-pass of filter for pool draining.
  3. Face pipe and fittings: PVC SCH 40.

#### 2.6 FLOW METERS

- A. Flow Meter:
  1. Accepted Manufacturers:
    - a. "CF-300 Series; [Blue White Industries](#), pilot tube type.
    - b. [Signet Scientific Co.](#)

## 2.7 WATER TREATMENT SYSTEM

### A. Chemical Feeder:

1. Accepted Manufacturers:
  - a. Model CB8-19 "SpaBrom" - Hydrotech
2. Include in-line flow meter, flow control valve, clear dome top and shut-off valves on both sides of feeder.
3. Quantity: Two - One at spa; one at pool.

### B. Chemicals:

1. Accepted Manufacturers:
  - a. "SpaBrom" bromine sticks - Hydrotech 20 lb..

### C. Test Kit:

1. Accepted Manufacturers:
  - a. "#K-1744-H"; [Taylor Technologies](#)
  - b. "#26122000"-["Guardex" Bio-Lab](#) .

## 2.8 POOL AND SPA HEATERS

### A. Pool Heaters:

1. Accepted Manufacturers:
  - a. [Jandy](#).
  - b. [Raypak](#).

### B. Heaters:

1. Size for pool and spa as shown on the Drawings, complete. Design based on maintaining a temperature of 80 degrees F.
2. Heaters must be [A.S.M.E.](#) coded and labeled.

### C. Furnish in-line thermometer with 2 degrees F. intervals and a minimum range of 60-120 degrees F.

## 2.9 RECIRCULATING PUMP AND MOTOR

### A. Pumps:

1. Accepted Manufacturers:
  - a. [Pac-Fab](#)
  - b. [StaRite Pentair](#)

### B. Pump Motors:

1. Energy efficient, UL listed "E-plus Century"; [Gould Pumps, Inc.](#)
2. Electrical Characteristics: As shown on Drawings

## 2.10 PIPING

- A. Piping within filter room: Polyvinyl chloride (PVC), Type 1-1220, Schedule 40 IPS, Class #135. [N.S.F.](#) approved and labeled.
- B. Pool fill line: Schedule K copper.
- C. Filtered water supply piping to pool: Schedule 80 PVC. [N.S.F.](#) approved.
- D. Filter connection piping which connects the filter plant to the filter pump and to the recirculation piping, backwash piping and other piping associated with filter system: PVC, Type 1-1220, Schedule 40 IPS, Class #135. [N.S.F.](#) approved and labeled.
- E. Fittings for PVC pipe: Whenever PVC pipe is used, all fittings shall be heavy weight, Schedule 40, of same manufacture as PVC pipe used.
- F. NOTE: The first 24" of piping coming from pool heater shall be copper. Where the copper connects to PVC piping, after the 24", provide a copper to PVC transition connection.
- G. Valves:
  - 1. Small Valves (up to and including 2-1/2" in size): Gate valves, all brass with threaded ends for ferrous pipe, 125 lb. non-rising stem type.
  - 2. Large valves (larger than 2-1/2"): Rubber lined, cast iron, water type butterfly valves. Valves shall be hand operated with cadmium plated ductile iron discs, stainless steel stems and pins, and Buna-N seats and rated for 125 psi.
  - 3. Valve extension stems and keys: Provide as required to operate the system.
  - 4. Pipe identification: Plastic tags for valves in filter room.
- H. Pipe Joints:
  - 1. Cement and thinners: Use for making solvent welded joints. Of type compatible with kind of piping used.
  - 2. Teflon tape (.003" min thickness): Use on the male threads of threaded pipe joints.
- I. Fillers and levelers: Provide instrumentation sensors and valves to automatically fill and maintain level of pool complete with wiring and controls.
- J. Chemical feed and heater controls: Provide instrumentation sensors and valves to automatically feed chemicals and maintain temperature of pool complete with wiring and controls.

## 2.11 SCHEDULES OF POOL FITTINGS' LIGHTS AND EQUIPMENT ACCESSORIES

<u>Description</u>	<u>Manufacturer</u>	<u>Model Number</u>
A. Pool Fittings		
1. Floor Inlet	Frost	A-41014
2. Pool Wall Inlet	Swimquip	8429
3. Auto Water Level Control		
1-1/2" Hydrostat Valve	Frost	A-41452
5. 1-1/2" Hydrostat Tube	<a href="#">Swimquip</a>	7017-157
6. 1-1/2" Skimmer	<a href="#">American Prod</a>	844201
7. 1" Fill Spout	Frost	A-41240
8. Pool Main Drain Sump	Swimquip	7017-0103

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9. Pool Main Drain Grate	Swimquip	7010741
B. Underwater Lights: (Coordinate with Section 16510(26 51 00))		
1. 100W/300W/12V Light (Two)	<a href="#">Pac-Fab</a>	PHL-301/PHL-300
2. Light Niche	<a href="#">Pac-Fab</a>	425.4
C. Deck Fittings:		
1. Grab Rail, 1.90" OD x .065" Type 304 Stainless Steel with smooth grip finish	<a href="#">S. R. Smith Commercial</a>	
2. Deck Anchor	<a href="#">S. R. Smith Commercial</a>	AS-100B
3. Escutcheon Plate	<a href="#">S. R. Smith Commercial</a>	IEP-100
4. Ladder 3 tread, 1.90" OD x .065" Type 304 Stainless Steel with mirror finish. Provide every 75' at perimeter	<a href="#">S. R. Smith Commercial</a>	SRS 506 Stainless Steel Commercial Ladder
D. Maintenance Accessories:		
1. Vacuum Cleaner Head Swivel Wheel	<a href="#">Rainbow</a>	Flex-A-Vacuum
2. Vacuum Hose Heavy Duty	Action/Haviland	1-1/2" x 35'
3. Vacuum Pole (Telescopic 8' to 16')	<a href="#">Rainbow</a>	#812-16 (8'-16')
4. Utility Pole	Frost	A40177-2
5. 18" Curved Wall Brush	A&B Brush or <a href="#">Spectrum</a>	A&B 3000 or Spectrum 13210
6. Algae Brush	A&B Brush or <a href="#">Spectrum</a>	A&B 2004 or Spectrum 13260/13270
7. Pole Adapter	Frost	A-41420 w/Brass Bolts & Wing Nuts
8. Deck Swab	Halogen Supply	48" CR Rubber
9. Brush Stabilizer	A&B Brush	Water Foil
E. Safety Accessories:		
1. Life Buoy (24" Approx.)	<a href="#">Cal-June, Inc.</a>	G-24 U.S.C.G Approved
2. Throw Line (40', min.)	A.J. Giammanco (Lion Pool Products)	#60-(60 foot Throw line w/ Floating Ball)
3. Life Hook (Safety Pool Hook)	<a href="#">Rainbow</a>	#153 Double Arm (R221026) with (R221030) Hardware Set.
4. Life Hook Aluminum one piece 16' Pole	<a href="#">Rainbow</a>	820-16 (R191116)
5. Life Hook Pole Adapter	Frost	A-14420 w/Brass Bolts and Wing Nuts
6. Spine Board w/Ties		
7. 16 Unit First Aid Kit		

## 2.12 DECK DRAIN SYSTEM

### A. Deck Drain System.

#### 1. Accepted Manufacturers:

- a. "Deck-O-Drain", W.R. [W. R. Meadows, Pool Deck Construction Products](#) (800-542-7665)
- b. "Deck Drain-A-Way System II", [Quaker Plastic Corporation](#) (888-288-6644)
- c. "Drain Rite" [Mortex Manufacturing](#) (800-338-3255)

### B. Material:

1. Heavy wall, bondable, non-corrosive PVC
2. Provide all nailing clips, couplers and fittings, end adapters, clean-out plugs and protective tape over drain surface.

### C. Size: +/- 1-1/2" x 3-1/4" high x min. 8 ft. lengths, Center Channel.

### D. Color: As selected by Owner's Representative

## 2.13 HANDICAPPED LIFT

### A. Handicapped Lift:

#### 1. Accepted Manufacturers:

- a. Model WC-702"; [Whitten Corporation, An Aquatic Development Group Company](#) (518-783-0038)
  - 1) "Model WC-HSP-3", Cast floor sleeve.
  - 2) "Model WC-HSP-5", Swimming Pool Extension Arm.
  - 3) "WC-112-D", Seat, chains, 24" swivel bar, and components
- b. "Swim-Lift Series, Model Elkhorn"; [Spectrum Aquatics](#) (800-776-5309)

### B. Hydraulic therapy lifter, stainless steel frame with a capacity to support 400 pounds with the horizontal arm fully extended.

### C. Provide lifter and all components required for a complete and operational installation. Provide sleeves in deck at pool and at spa.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine areas in which work is to be performed. Report in writing to Owner's Representative all prevailing conditions that will adversely affect satisfactory execution of work. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Starting work constitutes acceptance of the existing conditions and this Contractor shall then, at his expense, be responsible for correcting all unsatisfactory and defective work encountered.

### 3.2 PREPARATION

- A. Perform earthwork and dewater excavation in compliance with Section 31 20 00 (02300) - Earthwork. Remove excess earth from site if required and as directed by the Owner's Representative.
- B. Trench for system as specified in Section 31 20 00 (02300) - Earthwork and provide system as specified in Section 33 00 00 (02500) - Utility Services.

### 3.3 INSTALLATION

#### A. Formwork and Reinforcement:

- 1. Install form work to lines and profiles shown. Brace forms for work to prevent movement during concrete placing operations.
  - a. Allow other trades sufficient time for installation of equipment and materials which must be fastened to forms.
  - b. Clean form surfaces prior to concrete placing operations.
- 2. Place reinforcing steel as shown on drawings. Steel shall be free from dirt' rust' oil, paint and mill scale.
- 3. Securely wire-tie steel at points where bars cross. Stagger splices and laps.
- 4. Install gauging wires to establish thickness of finish work.
- 5. After placing pool reinforcing, but before placing concrete, confirm that grounding circuits have been provided by the electrical contractor to steel reinforcement, grab rails, and hand rails, as required by the National Electrical Code, Article 680. No concrete shall be placed until this requirement has been complied with.

#### B. Concrete:

- 1. Placing of "Gunitite" and shotcrete: Conform to the requirements of [GCA](#) G-84 and as specified herein.
- 2. Gunitite:
  - a. Mixing: Mix dry in batch mixing machine for a period of not less than 1 minute.
  - b. Mix and strength: As specified in Part 2.
- 3. Shotcrete
  - a. Mixing time: Mixing time for materials delivered by ready-mix trucks to job site, shall not exceed two hours or 250 revolutions of drum, whichever comes first. Additional water may be added at job site only if requested by Contractor. When additional water is added, rotate drum minimum of 30 additional revolutions.
- 4. Placing Concrete:
  - a. Place concrete against original undisturbed soil, thoroughly compacted earth.
  - b. Remove all loose, fine aggregate or rebound from surfaces receiving concrete before placing succeeding layers. Whenever possible, first layer shall entirely cover reinforcing steel to secure it in proper position.

- c. Where new concrete is applied against existing concrete, thoroughly clean the existing surface and drench with water at least twice on the day before placing new concrete. Surfaces upon which concrete will be applied shall be sufficiently damp to prevent excessive absorption of water content in new concrete mix, but not so wet as to overcome suction.
  - d. Concrete deposited on vertical surfaces shall be shot at right angle to surface starting at the bottom and continuing upward. Build up in layers of a thickness that will not slump, allowing sufficient time between placing of layers for initial set to take place.
- 5. Finishing:
  - a. When thickness and planes outlined by forms and gauging wires have been reached, rod surfaces to true lines. After rodding, remove gauging wires. Finish all exposed surfaces to straight and true lines.
  - b. Finish: Gun finish as left by nozzle.
- 6. Continuously moisture cure for no less than 7 days.
- C. Equipment:
  - 1. Install all equipment where shown on the Drawings.
  - 2. Flow meters: Install in straight run of pipe having minimum length of 10 pipe diameters upstream and 4 pipe diameters downstream and in position that can be easily read by operator.
  - 3. Chemical Feed injection: Locate Injection points downstream from all filter room equipment.
- D. Deck Drain System:
  - 1. Install deck drain system in strict accordance with manufacturers recommendations and written instructions.
  - 2. Grade subsoil, sloping it toward drain location. Drive 3-1/2" short stakes into ground at 30" o/c – two nailing strips per 10 ft. section. Attach nailing clips and place drain over the stakes. Use couplers to ensure a straight even line. After aligning, nail firmly to stakes.
  - 3. Insert adapter. Install Clean-out. Place concrete and trowel gradual (min. 1/4"/ft.) slope to drain. After concrete has set, install end plug.
  - 4. Coordinate removal of protective tape with deck finish coating application.
- E. Piping:
  - 1. Cut all pipe with mechanical cutter without damage to pipe.
  - 2. Placing and Laying: Inspect pipe for defects before installation. Clean the interior of pipe thoroughly of foreign matter and keep clean during laying operation. Pipe shall not be laid in water or when trench conditions are unacceptable as determined by the Owner's Representative. Water shall be kept out of the trench until the pipe is installed. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substance will enter the pipes or fittings.

3. Threaded Joints: After cutting and before threading the pipe shall be reamed and shall have burrs removed. Screw joints shall be made with graphite or inert filter and oil or with an approved graphite compound applied to male threads only. Threads shall be full-cut and not more than 3 threads on the pipe remain exposed. Use Teflon 11 tape on the male threads of all threaded pipe joints. Caulking of threaded joints to stop or prevent leaks will not be permitted. Unions shall be provided where required for disconnection of exposed piping. Unions will be permitted where access is provided.
4. Solvent welded joints shall be made in accordance with the manufacturer's printed instructions and the following minimum standards:
  - a. Fittings shall fit easily on the pipe before applying cement. The outer surface area of pipe and inner wall of fitting shall be dry and dean. Thinner is to be applied to the outer surface of the pipe and to the inner surface of the fitting. Cement is to be applied to the outer surface of the pipe, or on the male section of fittings only. When the outside surface area of the pipe is satisfactorily covered with cement allow ten (10) seconds open time to elapse before inserting pipe end into fitting. After full insertion of pipe into fitting, turn fitting about the pipe end approximately 1/8 to 1/4 of a turn. Wipe off excess cement at the joint in a neat cove bead.
  - b. Joints shall remain undisturbed for a minimum of 10 minutes from time of jointing the pipe and fitting. If necessary to apply pressure to a newly made joint, limit to 10% of rated pipe pressure, during the first 24 hours after the joint has been made.
  - c. Full working pressure shall not be applied until the joints have set for a period of 24 hours.
  - d. Make provisions for expansion and contraction by way of swing joints or snaking.
  - e. Protect plastic pipe from exposure to aromatic hydro-carbons, halogenated hydra carbons, and most of esters and ketones that attack the material. Protect all pipe from mechanical damage and long exposure to sunlight during storage.
5. Install piping without cross connections or inter-connection between distribution supply for drinking purposes and swimming pool that will permit backflow of water into potable water supply. Pipe openings shall be closed with caps or plugs during installation. Equipment and pool fittings shall be tightly covered and protected against dirt, water and chemical or mechanical injury. At completion of work fittings, materials and equipment shall be thoroughly clean and adjusted for proper operation.
6. Filter Face Piping: Arrange to carry out operations of filtering backwashing and filter draining.
7. Valve identification: Label all valves.
8. Testing and Flushing:
  - a. Pressure Piping: After the pipe is laid, the joints completed, and the trench partially backfilled leaving joints exposed for examination, subject new lines to a hydrostatic pressure of not less than 50 pounds per square inch. Joints shall remain watertight under this pressure for a period of two hours.
  - b. Gravity Lines: A water test shall be applied to all gravity drain piping system, either in their entirety or in sections. All openings shall be tightly plugged and each system filled with water and tested with at least a 10 foot head of water. Water shall



be kept in the system, or in the portion under tests for at least 15 minutes before inspection starts. System shall be tight at all joints.

- c. Flushing: Pipelines leading to the pool shall be thoroughly flushed clean with chlorinated water before the pool is filled and placed in use.

F. Plaster Finish:

1. Finish concrete surfaces in pool with a wood float finish to a smooth consistent finish acceptable to Owner's Representative.
2. Fill uneven surfaces and depressions with [manufacturer's recommendations](#).
3. Wash all pool surfaces thoroughly with dilute solution of muriatic acid and flush with fresh water to assure a clean surface free of loose materials, dust, and foreign matter.
4. Plaster installation:
  - a. Apply in accordance with manufacturer's installation instructions.
5. Trowel to smooth, dense, impervious surface free of stains and uniform white color consistency.
6. Fill pool as plaster work progresses.

G. Tile Installation: Where shown on Drawings, use setting materials and grout in accordance with Section 09 30 13. (09310) Ceramic Tiling.

3.4 FIELD QUALITY CONTROL

A. For Guniting Shotcrete Work:

1. Compressive strength test: Take 1 sample for pool floor construction and 1 sample for wall construction but no less than a minimum test for each 50 cu. yd. of concrete.
2. Submit copy of test results to Owner's Representative.

B. Water Treatment

1. Obtain a chemical analysis of the source/make-up water supply and submit to Owner's Representative. Include the following:
  - a. Total alkalinity/ppm
  - b. Calcium hardness/ppm
  - c. Chlorine/ppm
  - d. pH
  - e. Iron
  - f. Copper
2. Treat and balance pool water prior to turnover of pool to Owner's Operations Division.
3. Balance water to establish:

a. Total alkalinity:	80-100 ppm
b. Calcium hardness:	20~275 ppm
c. Total Available CHL (Pool):	1.5 ppm

- d. Free Available CHL (Pool: 1.5 ppm
  - e. Total Available CHL (Spa): 3.0 ppm
  - f. Free Available CHL (Spa): 3.0 ppm
  - g. pH: 7.4 - 7.6
  - h. Iron content: 0.0 ppm
  - i. Copper content: 0.0 ppm
  - j. Saturation Index -.3- +.3
4. Stabilization (outdoor pool) 40 ppm

**END OF SECTION 13 11 00.02 (13152)**