NEW YORK STATE DEPARTMENT OF HEALTH
Division of Environmental Protection

Engineering Report for Swimming Pool Plans

Design Compliance with Subpart 6-1 NYS Sanitary Code

For Office Use Only

Computer # _____ **Date** _____

Section A

General:

1. Owner of Pool: Town of Oneonta
2. Name of Pool: Town of Oneonta West End Pool
3. City, Town, Village: Oneonta County: Otsego
4. (Check One) New Pool [ ] Change to Existing Pool [X]
5. Type of Pool (check as applicable)

Indoor Pool [ ] 1	Outdoor Pool [X] 2	Spa Outdoor [ ] 3	Spa Indoor [ ] 4
Wading Pool [ ] 5	White Water Slide [ ] 6	Wave Pool [ ] 7	Other [ ] 8
Movable Bottom Pool [ ] 9	Special Purpose Pool [ ] 10		

6. Anticipated Date of Start of Construction: Spring 2025
7. Estimated Date of Completion: Fall 2025

Section B

Pool Configuration:

1. Type of Construction: Concrete
2. Length: 75'-0" Width: 30'-0" Area: 2,250 sf
3. Shape: Rectangle [X] 1 Square [ ] 2 L-Shaped [ ] 3 Z-Shaped [ ] 4
   U-Shaped [ ] 5 Oval [ ] 6 Other [ ] 7
4. Depths Minimum: 3'-6" Maximum: 7'-8"
5. Pool Capacity: 82,600 gallons
6. Transition Slope Shallow to Deep End: 3'-0" over 9'-0" (1'/3') In Shallow End: 1'-2" over 14'-0" (1"/12")

Section C

Bather Capacity:

1. Maximum Number of Bathers Permitted to Use Pool at One Time: 98
   [(Shallow Area Less Than 5') ÷ 15 + (Deep Area Greater Than 5' Depth - 300 x No. of Diving Boards) ÷ 25]
2. Spa Bather Capacity: Area ÷ 10 = N/A

Section D

Water Supply:

Water Source:

1. Drinking Water: City Water 2. Water for Sanitary Use: City Water
3. Water Source for Swimming Pool Use: City Water
4. Quantity Available: 10 gpm 5. Capacity of Fill Pipe: 10 gpm
6. Method Used to Prevent Interconnection or Back Siphonage: air gap
7. Fill Pipe (describe method, size, location): 1-1/2" pipe on deck w/ air gap.

Section E

Deck Equipment

1. Ladders: Number Three (3) Locations Deep End
2. Physically Disabled Access [X] Yes [ ] No If yes, describe ADA lift
3. Diving Boards N/A ft. Above Water, Depth of Diving Area _____ ft., Length _____
   N/A ft. Above Water, Depth of Diving Area _____ ft., Length _____
   Water depth under starting blocks N/A ft.
4. Deck Slide Location N/A
5. Location of 4" Stripe Steps and at break lines
6. Depth Markers: Spacing < 25" Height of Numerals 4" Material Vinyl
7. Fencing/Barrier Height ≥4 ft.
8. Max. Opening Verticals/Horizontals/Under Fence ≤2"
9. Self-Closing Gates [X] Yes [ ] No
10. Positive Latching Device [X] Yes [ ] No
11. Height of Latch Above Grade 36 inches
12. Elevated Lifeguard Chairs: No. & Location Two (2); one on each side, located mid-way
13. Recessed Steps: Riser N/A inches Tread N/A inches
14. Stairs: Tread 12 inches Riser 9-3/4 inches

Section F

Recirculation Equipment

1. Recirculation Pump:
   Make Hayward Model # HCP401003 Turnover $\frac{\text{gals. capacity}}{\text{gpm x 60}}$ = 2.5 hrs.
2.

Pipe Material	Main Drain Suction Pipe	Inlet Pipes	Main Drain Grate
PVC sch 40	Size 4"	4"	9" X 9"
	Length 50 LF	100 LF	
	Velocity		

3. Head Loss Computations, Pump Curve (attached) [X] Yes [ ] No
4. Hair Catcher: Pipe Size 4" Basket Diameter 6" Depth 6"
5. Vacuum Cleaner: Make N/A Type N/A Piping Size N/A Hose Length N/A ft.
6. Filters
   Type Hayward Make HCF663 No. 1 Filter Medium Sand
   Area Each Filter ____ x ____ x ____ = 21.64 sq. ft. Total Area 21.64 sq. ft.
   Filtration Rate $\frac{\text{gpm}}{\text{sq. ft.}}$ = 10.58 gpm per sq. ft. Backwash Rate $\frac{\text{gpm}}{\text{sq. ft.}}$ = 10.58 gpm per sq. ft.
   Body Feeder Capacity (D.E.) N/A
7. Pressure Gauges 2 8. Rate Controllers Ball Valves 9. Flow Meter: Make Blue-White Model # F-30400P
10. Inlets
    No. 50 Spacing 4 ft Depth 6" Size 1/4" Adjustable No
    Make Metafab Model # DTRO 8-10-2 gutter assemblies w/returns to gutter (Funished and installed by Renosys)

Section G

Pool Waste Drain

1. Pipe size N/A Length N/A
2. Grate Opening Area (sq. in.) N/A Number of Grates N/A
3. Length of Time Needed to Empty Pool N/A
4. Describe Arrangement for Backflow Prevention N/A
5. Main Drain: Spacing ≥ 4' Distance from the Wall ≥ 20'-0"
6. Gutter Type Stainless Steel Size 4" Drain Spacing
7. Surge Capacity (provided computations)
8. Skimmers: Make/Model # N/A Number Location
   Pipe Size Flow Rate Through Skimmer
   Equalizer Lines Provided ☐ Yes ☐ No
   Deck Drain Spacing Slope to Drain

Section H

Chemical Feeders and Test Equipment

1. Disinfection Chemical To Be Used Sodium Hypochorite
2. Describe Provisions for Chemical Storage On site in pool equipment room
3. Make and Type of Feeder (Model #) Stenner Pumps, Model #45MP2
4. Capacity of Feeder 10 gallons per day
5. % Strength of Solution 13% Maximum Dosage Point of Application Return line
6. Operation Control
   Alkalinity Hardness Test Kit (Range) 60 to 400 Chlorine Residual Test Kit (Range) 0.03 to 10.0 ppm
   pH Test Kit (Range) 6.8 to 8.2 pH Control Chemical to be Used Acid with pump control
   Make of Feeder (Model #) Stenner Pumps, Model #45MP1 Automatic deactivation device provided ☒ Yes ☐ No

Section I

Waste Disposal System

1. Describe Facilities for Sanitary Waste Disposal City Sewage
2. Have Plans for Facility Been Approved? ☒ Yes ☐ No
3. Describe Facilities for Pool Waste Disposal (including point of discharge) Into existing City Sewage line.
4. Filter Wash Water Main Drain 5. Scum Gutter Waste N/A 6. Vacuum Cleaner Waste N/A

Section J

Bathhouse Facilities (Numbers Provided)

	Men	N/A	Women
Showers			
Lavatories			
Toilets			
Urinals		xxxx	

Section K

Lifesaving Equipment

1. Lifesaving Equipment
   Lifeguard Chairs 2
   Torpedo or Ring Buoys or Rescue Tube (2) ring buoys with 30' rope
   Reaching Pole (2) 16' pole with hook
   Spine Board Yes
   Pocket Mask Yes
2. First Aid: Commercially available First Aid Kit ☒ Yes ☐ No First Aid Room ☒ Yes ☐ No
3. Chlorine Gas Storage Location On site in pool equipment room
   Self Contained Breathing Apparatus ☐ Yes ☒ No
   If Yes, Location

Section L

Electrical and Ventilation

1. Describe Arrangements for Ventilation N/A
2. Underwater Lights:
   Number N/A Make N/A Model # N/A
3. Deck Junction Box
   Number N/A Make N/A Model # N/A
4. Underwriters' Certificate ☐ Yes ☐ No
5. Other Hazards (explain) N/A
6. Overhead Illumination on Water Surface N/A ft. candles
7. Underwater Lights Watts/sq. ft. Provided N/A
8. Ground Fault Circuit Interruptors Provided ☒ Yes ☐ No

Section M

Spas

1. Maximum Water Depth N/A
2. Maximum Depth of Any Seat From Water Line
3. Steps: Tread Height Riser Height
4. Deck Area Provided (Show Calculations)
5. Thermostatic Control: Make Model
6. Alarm System/Timer ☐ Yes ☐ No
7. Air Induction System, Arrangement for Backflow Prevention
8. Warning Sign Area

Section N

1. Water Slides N/A
   Minimum Operating Water Depth Slide Flume Terminus
   Distance between sides of adjacent flumes ft. Distance between side of flume and end wall ft.
2. Special Purpose Pool N/A
   Stair Step Riser Step Tread Hand Rail Height

INFORMATION:

THIS FORM IS INTENDED TO INCLUDE FEATURES PERTINENT TO THE DESIGN AND OPERATION OF A SWIMMING POOL. THE FORM SHOULD BE USED TO SUPPLEMENT THE NARRATIVE REPORT OF THE ENGINEER OR ARCHITECT IN THE TRANSMITTAL OF PLANS TO THE HEALTH DEPARTMENT.

Signature of Designing Engineer or Architect

Date February X, 2025

Address Delta Engineers, Architects, Land Surveyors, Landscape Architects, DPC
860 Hooper Road, Endwell, NY 13760

Professional Engineer's or Architect's License # (or apply seal) 080902

Telephone Number (607) 231-6634

DELTA
ENGINEERS, ARCHITECTS, & SURVEYORS
860 Hooper Road
Endwell, NY 13760
(607) 231-6600 Fax: (607) 231-6650

Town of Oneinta			
DELTA PROJECT #	2024.515.001		
SHEET NO.	1	OF	1
CALCULATED BY	RCA	DATE	1/20/2025
CHECKED/REVISED BY	RCA	DATE	2/3/2025

Pump Head Loss - Pool circulating pump

Flow Rate = 229 GPM
Pipe Distribution Size = 4" PVC Sch 40

Head Loss / 100' for 4" PVC @ 229 gpm = 2.74' / 100'

Fitting Equivent Pipe Length
Fifteen (15) 90 deg elbow = 10.1 ft each x 15 = 151.5 linear feet (lf)
Five (5) Tee (run) = 6.7 ft each x 5 = 33.5 lf
Zero (0) Tee (branch) = 0 lf
Two (2) Ball Valves (Full-open) = 15 ft each x 2 = 30 lf

Fitting length head loss = 215.0 equivalent linear feet

Equipment Head Loss
Filter head loss @ 229 gpm = 6.0 ft
Supply Inlet head loss = 6.0 psi = 14.1 ft
Gutter Assembly = N/A
Main drain = 0.18" = 0.41 ft

Equipment head loss = 20.51 feet of head

Piping Lengths
Pool drain piping = 50.0 lf
Pool supply piping = 100.0 lf
Pool gutter piping = 100.0 lf

Pipe Length = 250.0 equivalent linear feet

Pipe Loss (converting from eqivalent linear feet to feet of head)
215.0 linear feet (fittings) + 250.0 linear feet (straight pipe) = 465.0 linear pipe
465.0 linear feet of pipe x 2.74 ft of head / 100 linear feet of pipe = 12.74 ft of head

Pipe head loss = 12.74 ft of head

Final Required Pump Head
12.74 ft of head (pipe loss) + 20.51 ft of head (equipment loss)

Final Required Pump Head = 33.25 ft of head

Pump Selection = 229 gpm @ 40 ft of head (include 20% safety factor

ADA Inspection Card | 1009.2 Pool Lifts*

1009.2.1 Pool Lift Location

Pool lift shall be located where the water level does not exceed 48". If entire pool water level exceeds 48", place pool lift where convenient.

1009.2.2 Seat Location (Fig. 1)

In the raised position, the centerline of the seat shall be located over the deck a minimum of 16" from the edge of the pool.

1009.2.3 Clear Deck Space (Fig. 2)

On the side of the seat opposite the water, a clear deck space shall be provided parallel with the seat. The space shall be 36" wide minimum and shall extend forward 48" minimum from a line located 12" behind the rear edge of the seat.

1009.2.4 Seat Height (Fig. 3)

The lift seat shall stop at 16" – 19" measured from the deck to the top of the seat surface when in the loading position.

1009.2.5 Seat Width

The seat shall be a minimum of 16" wide.

1009.2.6 Footrests and Armrests

A footrest shall be provided and must move with the seat. Armrests are optional, but if provided, the armrest opposite the water shall be removable or fold clear of the seat.

1009.2.7 Operation

The lift shall be capable of unassisted operation from both the deck and the water levels. Controls and operating mechanisms shall be unobstructed when the lift is in use.

1009.2.8 Submerged Depth (Fig. 4)

The lift shall submerge the seat a minimum of 18" below the stationary water level.

1009.2.9 Lifting Capacity

The lift shall have a lifting capacity of 300 lbs. minimum.

*Please visit www.ada.gov for complete guidelines.

www.poollifts.com

Figure 1

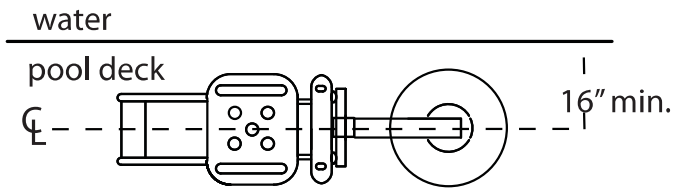


Figure 2

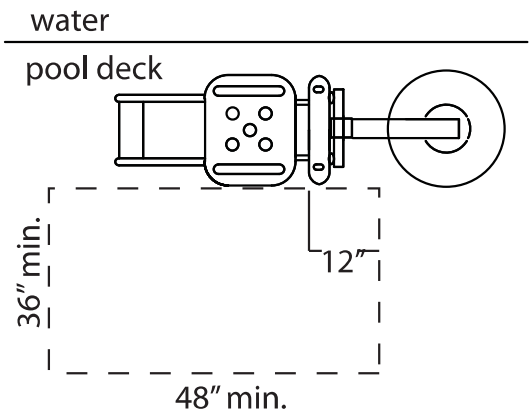


Figure 3

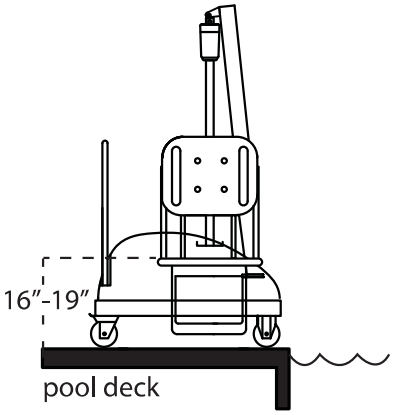
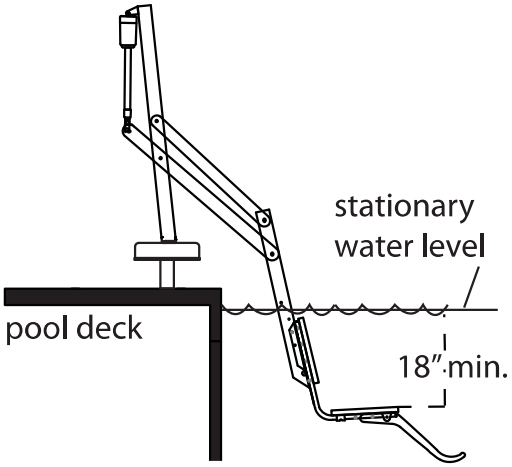


Figure 4



Disclaimer: This document does not constitute comprehensive training on ADA accessibility for aquatic facilities. When addressing accessibility issues, facilities should also comply with all local, state and federal laws, ordinances, codes, rules, regulations and standards ("legal requirements") which may have requirements above and beyond ADA law. Although this guide cites accessibility guidelines as set forth by the Access Board, it is impossible to ensure that the information provided is entirely accurate and up-to-date, or appropriate for any specific jurisdiction. This guide should only be used in conjunction with legal requirements and not as a replacement for those items. Failure to comply with legal requirements may result in serious legal consequences, even if the guidelines suggested in this publication have been followed. The information included in this publication is intended to be educational and informational in nature and is not intended to provide legal or medical advice or instruction regarding the accessibility of any aquatic facility.

UNDER NO CIRCUMSTANCES SHALL S.R.SMITH, LLC, THE AUTHORS OR EDITORS BE LIABLE FOR ANY DAMAGES, INCLUDING DIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES THAT RESULT FROM THE USE OF THIS PUBLICATION OR THE INFORMATION CONTAINED THEREIN.

multiLift™2

The multiLift2 with its field reversible seating design brings increased performance and flexibility to our best selling flange mount series.

- Field reversible seat with integrated armrests
- Rotomolded seat and footrest
- Powder-coated stainless-steel and aluminum construction
- 350 lb/159kg lifting capacity
- Retrofit anchor jig is standard
- LiftOperator® Intelligent Controller
- California CEC Compliant
- Third-party tested and verified ADA compliant

COLORS

TAUPE SLATE GRAY MIST

Due to printing technology actual color may differ.

Part No.	Description	Shipping
580-0000N	multiLift2 w/o anchor, Gray Mist	Box 1 100 lbs 60.5"L x 24.25"W x 18.5"H
580-0000N-ST	multiLift2 w/o anchor, Slate	
580-0000N-TP	multiLift2 w/o anchor, Taupe	Box 2 40 lbs 24" x 24" x 30"

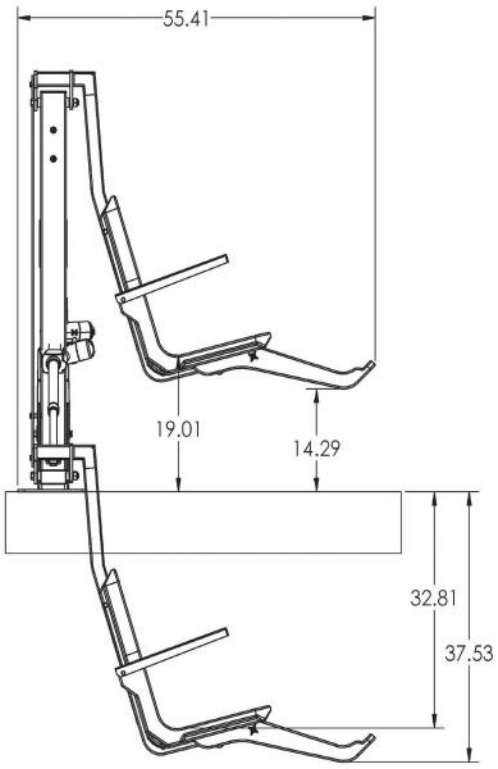
Includes battery, charger, battery console cover, water-resistant hand control, footrest, seat belt assembly, armrests and retrofit anchor jig.

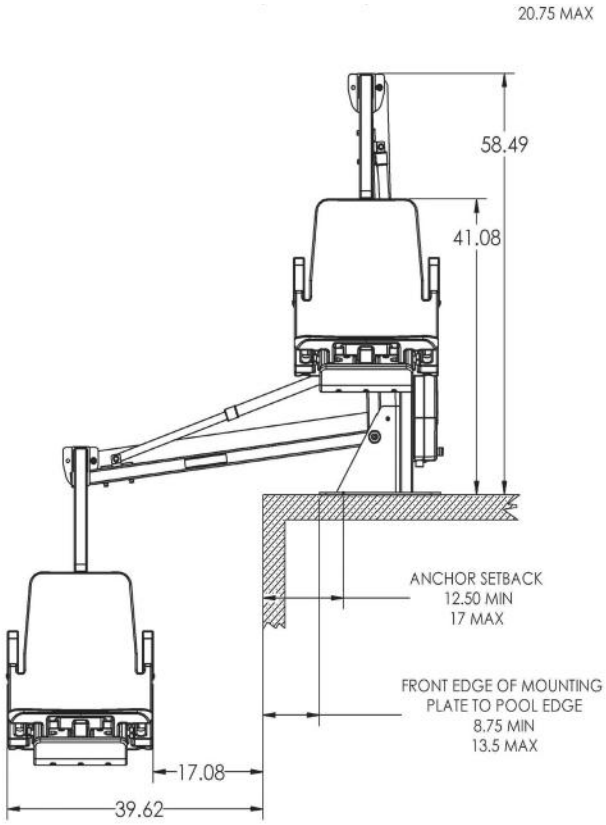
Parts & Accessories

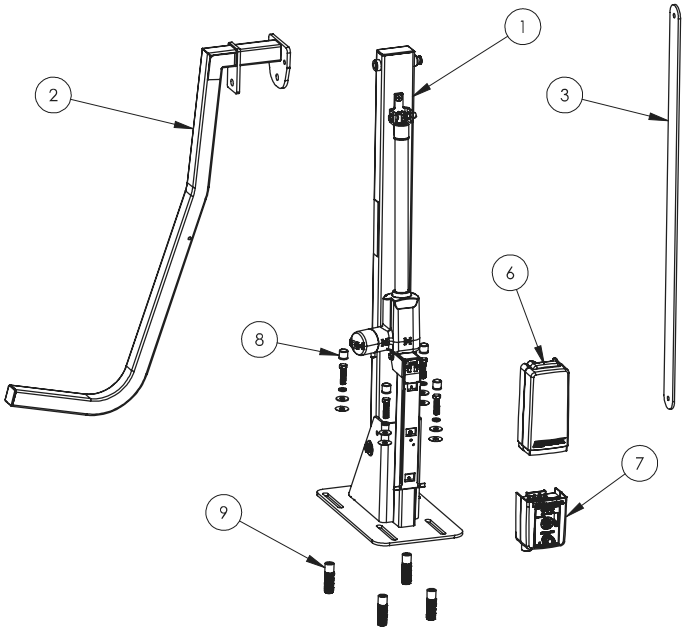
Part No.	Description
1001495-R	LiftOperator Battery
100-4400-R	Hand Control
300-6700A	Anchors, set of 4
300-6800A	Anchor Bolts, set of 4
300-6900	Retrofit Anchor Jig
500-5800T	MultiLift2 Cover, Taupe
500-5800S	MultiLift2 Cover, Slate
900-1000-R	Seat Belt
970-5000T	Seat Saver Cover, Taupe
900-6000	Stability Strap
910-1000T	LiftOperator Cover, Taupe
910-1000S	LiftOperator Cover, Slate

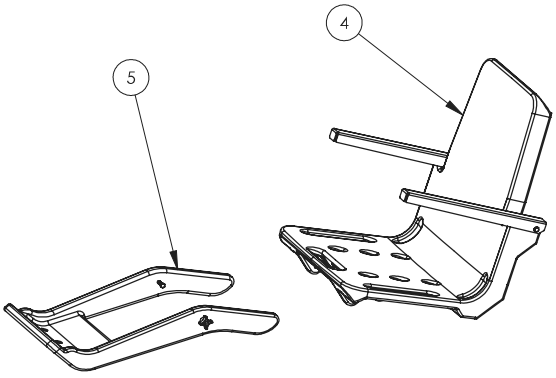
New Construction Jig with Anchors 500-5000A

Anchor Scenario	Part Number	Description
Existing ML Anchors in Deck	300-6800A (Included with Lift)	multiLift2 Deck Anchor Hardware
Retrofit onto Existing Deck	300-6900	multiLift2 Anchor Kit for Existing Decks
New Construction	300-5000A	multiLift2 Anchor Kit for New Construction

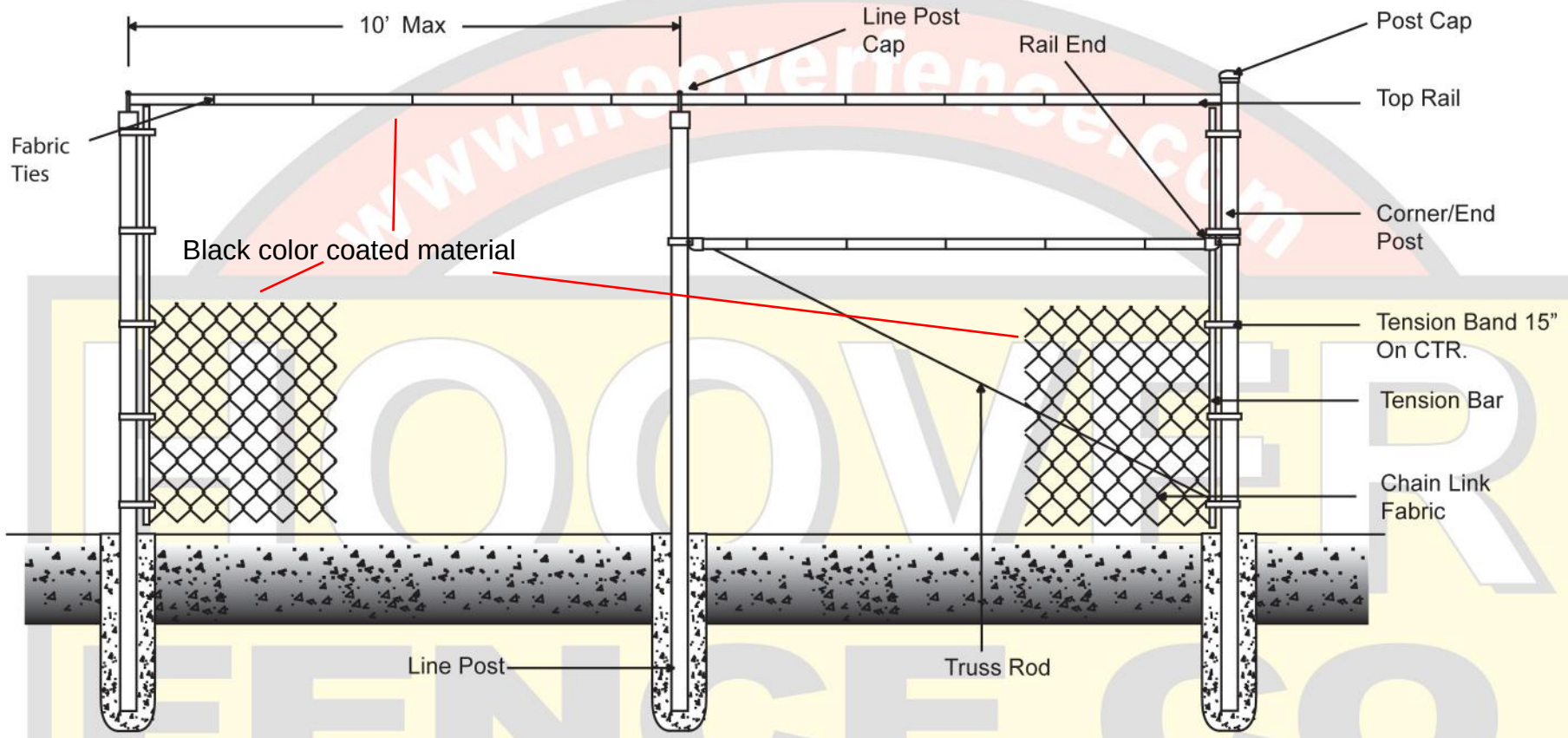








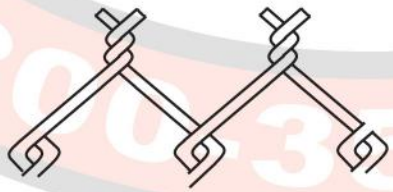
Key	Part No.	Description
1		multiLift2 Base Assembly
2		multiLift2 Seat Arm
3		multiLift2 Leveling Arm
	160-9300-R	Seat Assembly
4	160-9300-TP-R	Seat Assembly, Taupe
	160-9300-ST-R	Seat Assembly, Slate
	160-2700A-R	Footrest w/ Hardware
5	160-2700A-TP-R	Footrest w/ Hardware, Taupe
	160-2700A-ST-R	Footrest w/ Hardware, Slate
6	1001495-R	Battery Assembly
7	400-7001	Controller Unit w/ 2 Button
8	300-6700A	Flush Deck Anchor
9	300-6700	Deck Anchor Hardware
	100-8000A	LA34 Actuator



Fabric	Height	Mesh	Gage	Selvage	Finish
Framework		O.D.	Wall	Wt. per ft.	Length
End/Corner Post					
Line Post					
Rails					
Gate Frame					
Gate Post					

Notes
- Gate Fabric to match fence
- For more information please see www.hooverfence.com

Twist or Barb Selvage



Knuckle Selvage

Last Revised: 10-02-06

Black Color Coated

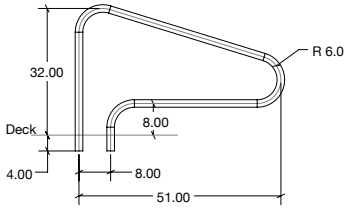
Standard Chain Link Fencing

Standard ChainLink Fence W/Top Rail & Brace Assembly

Approved By/Date	Revision NO.	Drawing NO.
Drawn By	Effective Date	

Hand & Stair Rails

DMS-100



- Tubing: 1.90" OD
- Wall Thickness*: .049" or .065"
- Stainless Steel: 304 or 316L Marine Grade** (add –MG to part number)
- Bends: 6" Radius
- Options: Powder-coating and SealedSteel Salt Friendly
- Recommended Anchors: AS-100P or AS-100B (order separately)
- Recommended Escutcheon: EP-100F (order separately)
- **Sold as a single rail**

* Minimum rail thickness is .065 for Commercial
** Minimum requirement for salt pools is 316L Marine Grade

DMS-100

Model No.	Description	A	Shipping			
			Weight	Length	Width	Height
DMS-100A	51" Center Grab Rail, .049"	51"	13 lbs — 17 lbs 6 — 8kg	59" 150cm	39" 99cm	2" 5cm
DMS-100B	51" Center Grab Rail, .065"	51"	13 lbs — 17lbs 6 — 8kg	59" 150cm	39" 99cm	2" 5cm
DMS-100S	60" Center Grab Rail, .065"	60"	18 lbs 8kg	59" 150cm	39" 99cm	2" 5cm

HAYWARD®
COMMERCIAL AQUATICS

HCP 4000 Series

4" CLASS 3-PHASE PUMPS
5.5–12.5 HP

1 YEAR WARRANTY

NSF

MODERN THERMOPLASTIC DESIGN FOR HIGH-FLOW, MEDIUM-HEAD APPLICATIONS.

Available in 5.5 to 12.5 HP, HCP 4000 Series self-priming pumps feature Noryl® thermoplastic housings, an advanced alternative to traditional bronze or cast iron. This lightweight material ensures an effortless installation, while a totally enclosed fan-cooled (TEFC) motor provides the power and reliability commercial pools, spas and water features demand.

RELIABLY RUGGED PERFORMANCE

A lightweight, glass-reinforced Noryl hydraulic body means HCP 4000 self-priming pumps are solid without being heavy. The impeller and diffuser, made from the same material, provide a maximum strength-to-weight ratio. The TEFC motor design provides years of durable, reliable performance.

SMART STRAINER-BASKET DESIGN

HCP 4000 pumps feature a large, non-corrosive plastic strainer basket that extends the time between cleanings and eliminates rust. The transparent lid allows for easy inspection of the strainer basket, and its quick-release mechanism opens easily without tools.

EASY ONE-MAN INSTALLATION

Lightweight Noryl thermoplastic and 4" union connections make HCP 4000 pumps simple to install on your own in almost any pool pad. An elevated base ensures better circulation and protection from flooding, further aiding in painless serviceability.

Tool-free, quick-release strainer lid allows for fast and easy inspection and maintenance

4" union connections simplify installation and servicing

Large, non-corrosive plastic strainer basket extends time between cleanings and prevents rust

Totally enclosed fan-cooled motor (TEFC) provides maximum efficiency and reliability

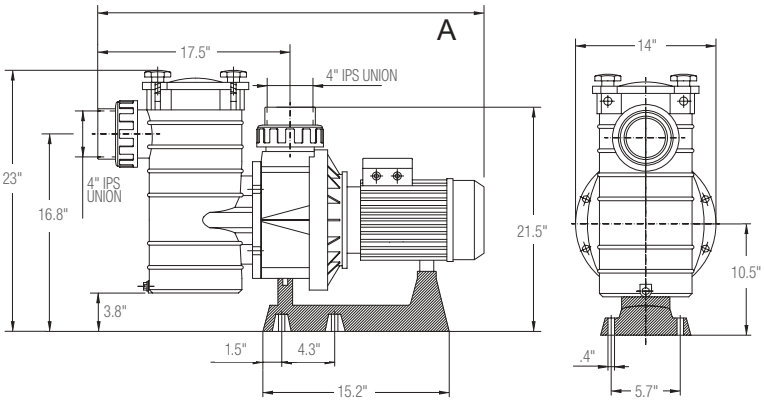
Elevated base improves ventilation and protects against flooding

TECHNICAL SPECIFICATIONS

PART NUMBER	HP	VOLTAGE	HZ	AMPS	CARTON QUANTITY	CARTON WEIGHT
HCP40553	5.5	230/460 3-Phase	50/60	14.6/7.3	1	110 lbs.
HCP40753	7.5	230/460 3-Phase	50/60	21/10.5	1	125 lbs.
HCP401003	10.0	230/460 3-Phase	50/60	26.1/13	1	142 lbs.
HCP401253	12.5	230/460 3-Phase	50/60	31.6/15.8	1	155 lbs.

DIMENSIONS

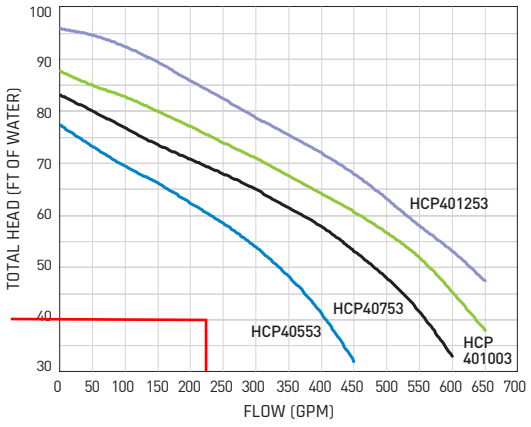
MODEL	HCP40553	HCP40753	HCP401003	HCP401253
HP	5.5	7.5	10.0	12.5
(A) Inch	34.2	36.0	37.2	37.2



PERFORMANCE DATA

PART NUMBER	PUMP OUTPUT (GPM) VS. TOTAL RESISTANCE TO FLOW (FEET OF HEAD)							
	25	30	35	40	45	50	55	60
	FLOW RATE (GPM)							
HCP40553	476	450	431	406	374	333	291	235
HCP40753	641	614	588	561	526	481	430	369
HCP401003	721	695	669	635	602	570	521	461
HCP401253	815	776	739	709	668	631	580	536

HCP SERIES PERFORMANCE DATA



All motors: Certified to UL 1004, IP 55 protection, insulation class F. 60 hz., 3.550 RPM

HCP 4000 Series Pumps are listed by: NSF

LITCHCP400017

HAYWARD® COMMERCIAL AQUATICS

HAYWARD
COMMERCIAL AQUATICS

HCF Commercial Filters

Bobbin Wound Sand Filters

EFFICIENT HIGH PERFORMANCE FILTRATION

5 YEAR WARRANTY

NSF Certified to NSF/ANSI Standard 50

HCF SERIES SAND FILTER 48"

HCF SERIES SAND FILTER 42"

HIGH-PERFORMANCE FILTRATION ENGINEERED TO STAND THE TEST OF TIME.

The large-format HCF Series sand filters are designed to provide the ultimate in filtration performance and durability. Larger sizes eliminate the need to use multiple smaller filters, meaning you'll save valuable floor space and reduce installation and plumbing complexity—and simplify maintenance and backwashing, too. Constructed with heavy-duty filament-wound fiberglass, a UV-protected resin and corrosion-proof internals, the large-format HCF Series sand filters offers a powerful, streamlined filtration solution for the recreational water market.

OPTIMIZED FILTER DESIGN

Multi-diffuser distribution heads and oversized laterals help HCF sand filters distribute water more evenly, lengthening filter cycle time and improving overall filtration effectiveness. An industrial valve and pressure gauge configuration offer increased durability and accuracy.

POWERFUL CORROSION RESISTANCE

Proprietary corrosion-proof resin and fiberglass construction creates a UV-protected finish, guarded against the elements and blooming. The commercial-grade PVC and ABS injection-molded 360 slotted laterals are also resistant against corrosion.

EASE OF ACCESS AND SIMPLE OPERATION

The clear lid is easily accessible from the top of the filter to troubleshoot and simplify operation. Hayward commercial-grade filters always include standard unions and/or ANSI flanges, saving time and money.

KEY FEATURES

» **Large-format filters** eliminate the need for multiple smaller filters, saving valuable space while providing flow rates up to 433 GPM

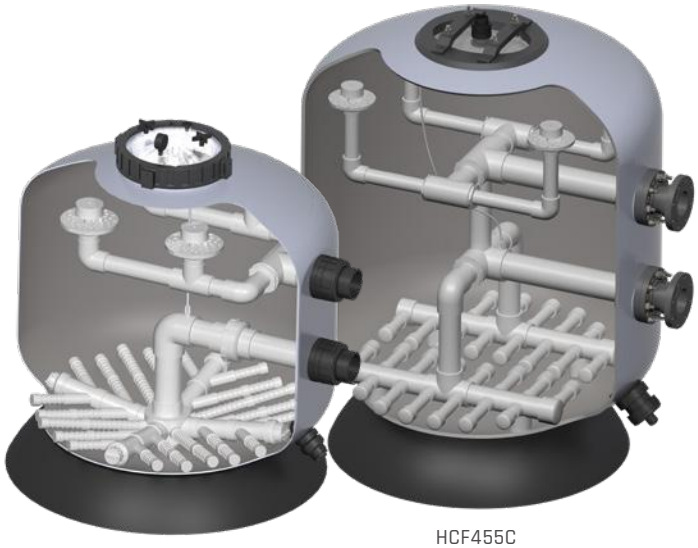
» **Manufactured from heavy-duty filament-wound fiberglass** for high-performance and durability

» **Industrial-grade laterals & quad diffusers** improve filtration and lengthen filter cycle time

» **Durable fiberglass base** for sturdy installation

» **Reduced installation & plumbing complexity** with simplified maintenance and backwashing

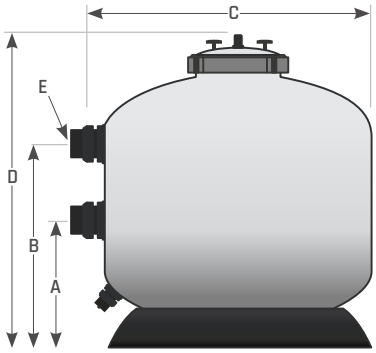
» **Drain port conveniently located** in the center of the filter



HCF342C HCF455C

DIMENSIONS

FILTER MODEL NUMBER	DIMENSIONS (INCHES)					GRAVEL/ SAND QTY.	INSTALLATION CLEARANCE (INCHES)		CARTON WEIGHT	CARTON DIMENSIONS
	A	B	C	D	E	LBS.	VERT.	HOR.	LBS.	(LxWxH)
HCF342C	19.64	31.46	42	48.66	3	225/1400	18	4	224.8	46.1" x 43.3" x 49.2"
HCF348C	27.12	38.94	48	58.03	3	600/2250	18	4	275.5	51.2" x 50" x 57.9"
HCF455C	31.90	48.90	55	74.50	4	500/5300	18	4	599.5	63" x 59.1" x 74.8"
HCF663C	28.22	47.22	67.25	75.82	6	850/6800	18	4	698.7	70.9" x 66.9" x 76.4"



TECHNICAL SPECIFICATIONS & PERFORMANCE DATA

Part Number	HCF342C		HCF348C		HCF455C		HCF663C	
Size of Fiberglass Sand Filter	42"		48"		55"		63"	
Filtration Area/ft²/M²	9.83	0.91	13.40	1.24	16.49	1.53	21.64	2.01
Filtration Rate GPM/ft²	5-20		5-20		5-20		5-20	
Filtration Flow Rate at 15 GPM/ft² (GPM) (LPM)	147	559	201	762	247	937	325	1230
Filtration Flow Rate at 20 GPM/ft² (GPM) (LPM)	197	745	268	1014	330	1249	433	1639
Backwash Flow Rate GPM/ft²	5-20		5-20		5-20		5-20	
Maximum Working Pressure (PSI)	50		50		50		50	
Multiport Valve Part Number	HCV375C		HCV375C		HCV475C		HCV475C	
Inlet/Outlet Connection Type	Union/ANSI Flange*		Union/ANSI Flange*		ANSI Flange*		ANSI Flange*	
Inlet/Outlet Port Diameter	3"		3"		4"		6"	

* Inlet/outlet connection type included.

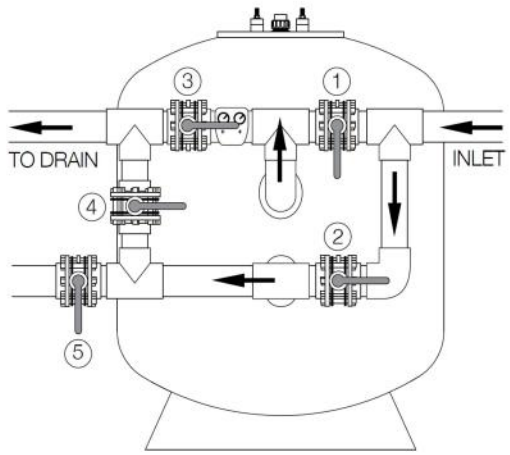
HCF Sand Filters are listed by: NSF

LITHCFBWSF22

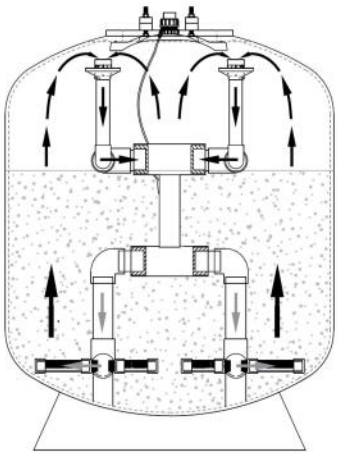
HAYWARD® COMMERCIAL AQUATICS

Backwash

VALVE	POSITION
1	Closed
2	Open
3	Open
4	Closed
5	Closed



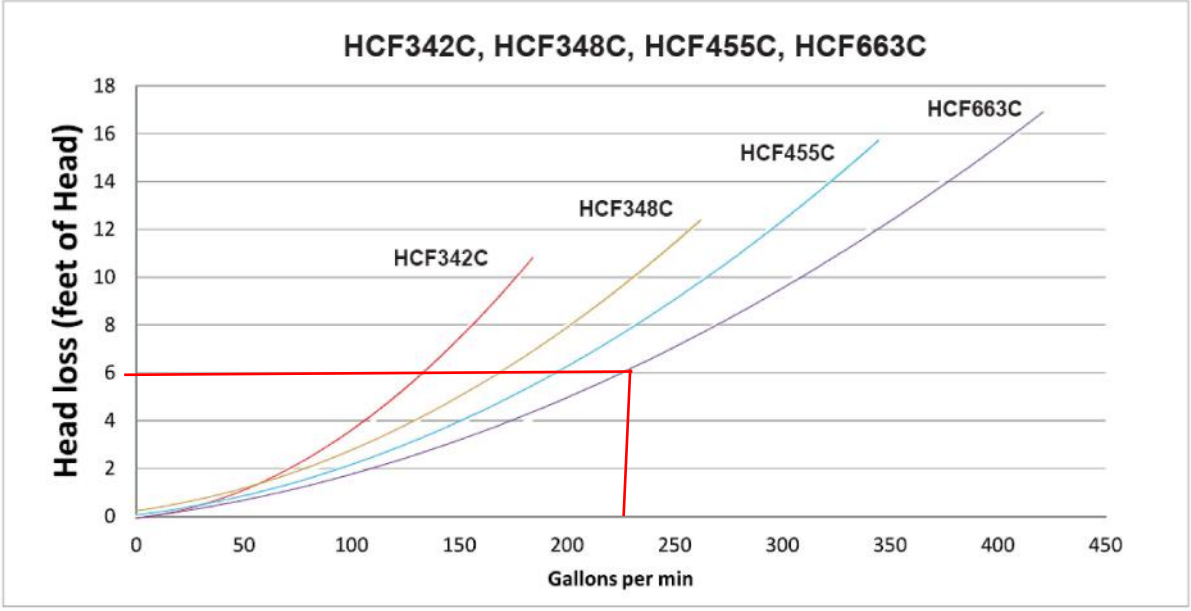
EXTERNAL VIEW


INTERNAL VIEW

Winterizing

Where freezing can occur, be certain to drain the water from the filter tank prior to freezing conditions.

Specifications and Replacement Parts



Acceptable Pipe Size for Maximum Recommended System Flow Rates			
Pipe Size	**Flow Rate in gpm & (lpm)**	**Pipe Size**	**Flow Rate in gpm & (lpm)**
2" (63mm)	90 gpm (340 lpm)	4" (100mm)	350 gpm (1325 lpm)
3" (90mm)	200 gpm (757 lpm)	6" (150mm)	800 gpm (3028 lpm)

Blue-White®

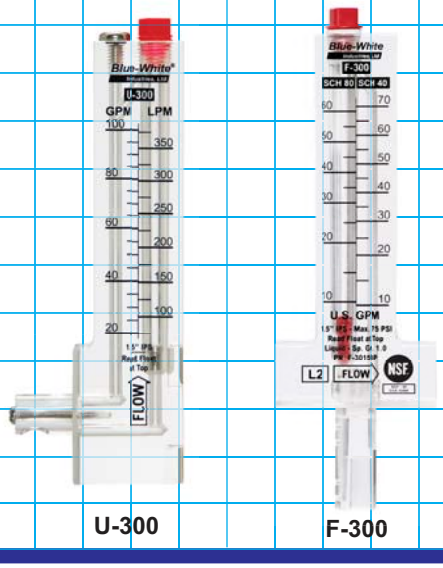
Industries, Ltd.

Pitot Tube Insertion Meters

Engineering and Technical Data

F-300
U-300
D-300

Clamp-on Insertion Mount



Features:

- **1” through 8” pipe sizes.**
- **Flow rates from 4 to 1900 GPM (15 to 7200 LPM).**
- **Resistant PVDF internal float materials.**
- **One piece machined acrylic body.**
- **Mounts to existing pipe. No unions or adapters required.**
- **Models for mounting on horizontal or vertical pipe.**
- **Mounting clamps and gasket included.**
- **NSF Listed**

Specifications:

Pipe Requirements: IPS inch pipe size (ASTM-D-1785)
Max. Psi (bar):. .....75 PSI (5.2 bar) @ 70˚ F (21˚ C)
Fluid temp. range: .. ..0˚ to 190˚ F/ -18˚ to 88˚C @ 0 PSI
Ambient temp. range:.....0˚ to 110˚F / -18˚ to 43˚C
***Note**: Temperature & Pressure ratings of meter only. Actual pipe rating may vary.*

Accuracy:..... .....1”, 1.25”, 1.5”and 2” pipe size: 5% of rate
2.5”, 3”, 4”, 6”, and 8” pipe size: 10% of rate
Power requirement: .....No power required
Enclosure: .....NEMA 4X (IP56)
Approximate shipping wt: .....1”-4” units: 1 lb. (.45 kg)
6”-8”units: 2 lb. (.91 kg)

Materials of Construction:

Meter Body: .....Cast Acrylic
Float:.....PVDF

Gasket:.....Neoprene
Pipe Clamp: .....316 series Stainless Steel

Installation Requirements:

Minimum Straight Pipe Length Requirements

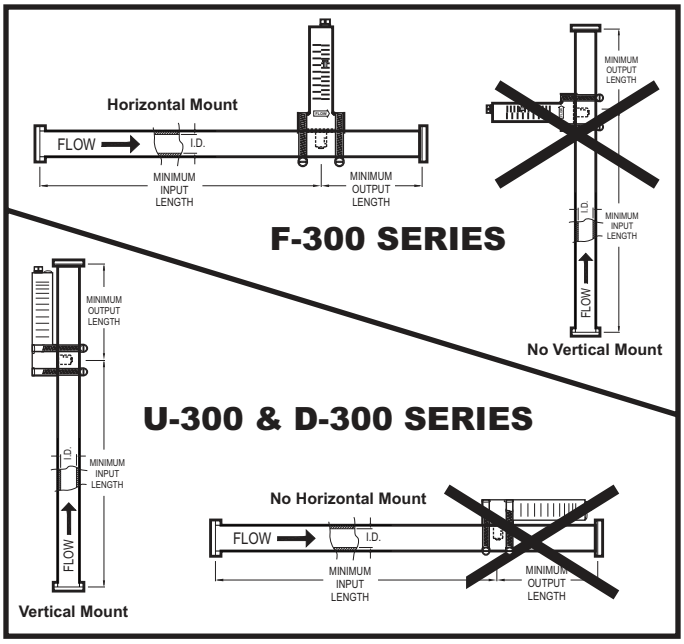
The meter’s accuracy is affected by disturbances such as pumps, elbows, tees, valves, etc., in the flow stream. Install the meter in a straight run of pipe **as far as possible** from any disturbances.

Example of Minimum Straight Pipe Length Requirements

Nominal Pipe Diameter	Minimum Inlet Pipe Length	Minimum Outlet Pipe Length
4 inch	20 inch (5 X 4”)	8 inch (2 X 4”)
6 inch	30 inch (5 x 6”)	12 inch (2 x 6”)

Mounting location

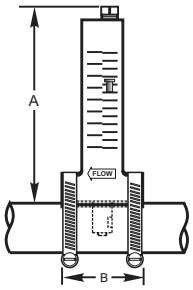
- The meter is designed to withstand outdoor conditions.
- F series meters must be mounted at the vertical (twelve o'clock) position on horizontal pipe only.
- U & D series meters must be mounted on vertical pipe only.
- The pipe must be completely full of water at all times.
- See the minimum straight length of pipe requirement chart above.
- The meter can accurately measure flow from one direction only.
- U-series meters measure upward flows only.
- D-series meters measure downward flows only.



Blue-White® Industries, Ltd.

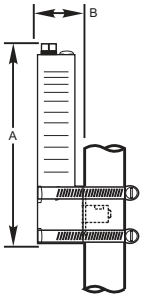
Pitot Tube Insertion Meters

Dimensions:



F-300 Series

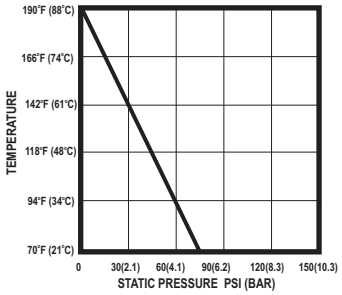
Pipe Size	A	B
1”	6”	2-7/16”
1-1/4”	6”	2-7/16”
1-1/2”	6”	2-7/16”
2”	6”	2-7/16”
2-1/2”	6”	2-7/16”
3”	6”	2-7/16”
4”	6”	2-7/16”
6”	7-1/2”	2-7/16”
8”	7-1/2”	2-7/16”



U/D-300 Series

Pipe Size	A	B
1-1/2”	6”	1-9/16”
2”	6”	1-9/16”

Maximum Temperature vs. Pressure



Flow Stream Requirements:

Low viscosity fluids with a specific gravity of 1.0.

Model Number Matrix:

F - 30 600 P

Meter Series
F = Horizontal Pipe Mount
U = Vertical Pipe with Upward Flow
D = Vertical Pipe with Downward Flow

Meter Series
30 = 300 series meter

Pipe Size
100 = 1”
125 = 1-1/4”
150 = 1-1/2”
200 = 2”
250 = 2-1/2”
300 = 3”
400 = 4”
600 = 6”
800 = 8”

Pipe Size, type and saddle material
P = Sch 40 or 80 IPS Pipe (ASTM-D-1785)
T = Copper Tubing type K or type L

Note: see available models below.

Pipe Size, Flow Range and Display Model Options:

Models for Mounting on Horizontal Pipe

Models for U.S. IPS Sch40 & 80 Pipe (ASTM 1785)

Display in U.S. Gallons per Minute

Pipe Size	Sch40	Sch80	Model Number
1”	5 to 35	4 to 26	**F-30100P**
1-1/4”	9 to 50	8 to 40	**F-30125P**
1-1/2”	10 to 70	10 to 60	**F-30150P**
2”	20 to 120	18 to 100	**F-30200P**
2-1/2”	29 to 150	25 to 130	**F-30250P**
3”	45 to 240	40 to 215	**F-30300P**
4”	75 to 420	70 to 375	**F-30400P**
6”	170 to 1100	160 to 1000	**F-30600P**
8”	300 to 2200	275 to 1950	**F-30800P**

Models for Copper Tubing types K & L

Display in U.S. Gallons and Liters per Minute

Pipe Size	GPM Flow Range	LPM Flow Range	Model Number
1”	4 to 26	15 to 100	**F-30100T**
1-1/2”	10 to 65	50 to 250	**F-30150T**
2”	20 to 105	75 to 400	**F-30200T**

Models for Mounting on Vertical Pipe

Models for U.S. IPS Sch40 Pipe (ASTM 1785)

Display in U.S. Gallons and Liters per Minute

Pipe Size	GPM Flow Range	LPM Flow Range	Flow Direction	Model Number
1-1/2”	20 to 100	75 to 375	UP	**U-30150P**
1-1/2”	20 to 100	75 to 375	DOWN	**D-30150P**
1-1/2”	9 to 30	30 to 120	UP	**U-30150PR**
1-1/2”	9 to 30	30 to 120	DOWN	**D-30150PR**
2”	40 to 150	150 to 550	UP	**U-30200P**
2”	40 to 150	150 to 550	DOWN	**D-30200P**
2”	18 to 70	70 to 280	UP	**U-30200PR**
2”	18 to 70	70 to 280	DOWN	**D-30200PR**

Models for Copper Tubing types K & L

Display in U.S. Gallons and Liters per Minute

Pipe Size	GPM Flow Range	LPM Flow Range	Flow Direction	Model Number
1-1/2”	20 to 100	75 to 375	UP	**U-30150T**
1-1/2”	20 to 100	75 to 375	DOWN	**D-30150T**
1-1/2”	9 to 30	30 to 120	UP	**U-30150TR**
1-1/2”	9 to 30	30 to 120	DOWN	**D-30150TR**
2”	40 to 150	150 to 550	UP	**U-30200T**
2”	40 to 150	150 to 550	DOWN	**D-30200T**
2”	18 to 70	70 to 280	UP	**U-30200TR**
2”	18 to 70	70 to 280	DOWN	**D-30200TR**

Blue-White® Industries, Ltd.
5300 Business Drive, Huntington Beach, CA 92649
Tel: 714-893-8529 **Fax:** 714-894-9492
www.blue-white.com **Email:** sales@blue-white.com

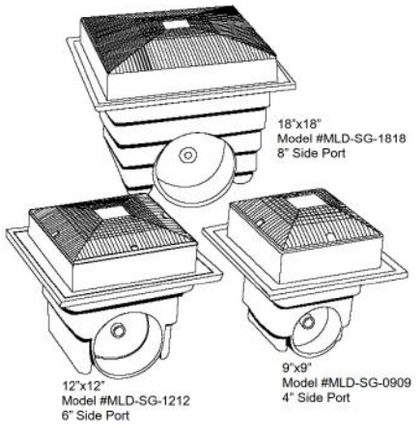
Technical data sheet #85000-071 rev.01162017

MAIN DRAINS

Lawson Aquatics Super Sump

Only Neptune Benson has Lawson Aquatics SuperSump - VGBA-2017 Certified main drain and grates with a super flow rate and a unique top profile design that provides extreme comfort underfoot. Easy to install and no special tools or complicated retrofitting required. Ask your distributor for the number one brand in main drains and grates

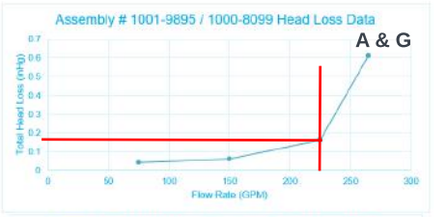
SuperSump

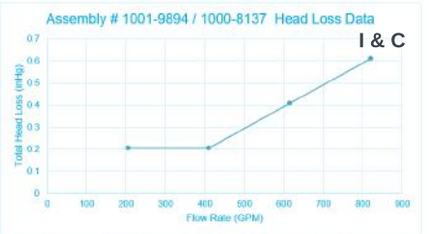


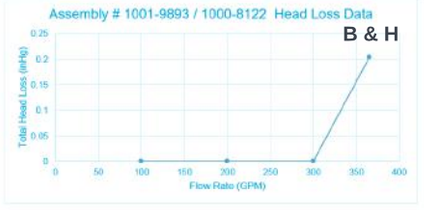
Removes the need for field-built sump certification

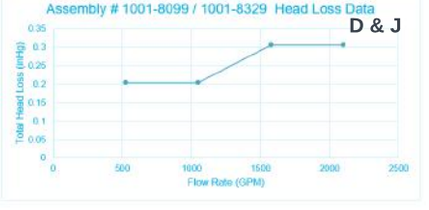
- Open grate area of 54% - allowing for a maximum flow rate (see chart)
- Internal plumbing fittings instead of external. Allows stacking and avoids breaking off or cracking during shipment, pressure testing or handling
- 1/3 the cost of fiberglass and 1/4 the cost of stainless steel
- Unique built-in water stop with two vertical extensions. Prevent water passing over the flange
- A solid one-piece, injection-molded unit. Less expensive than fabricated PVC sheets, stainless steel or fiberglass
- Tapered body for strength -allows for water expansion during freezing, and easily stacks to reduce storage space and shipping costs
- Premium hardware stainless steel screws and brass inserts
- 10 year warranty
- Sumps and grates are available in white

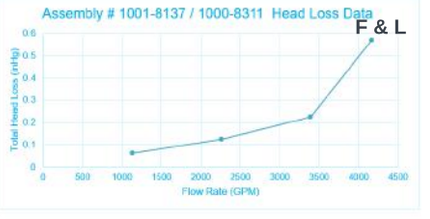
MODEL NUMBER	CONNECTION SIZE	FLOOR GPM	WALL GPM	PRESSURE DROP
MLD-SG-0909	4"	237	199	A
MLD-SG-1212	6"	365	340	B
MLD-SG-1818	8"	816	696	C
FI-SG-1836	12"	2,080	1,496	D
FI-SG-1854	14"	3,120	2,244	E
FI-SG-1872	16"	4,160	2,992	F
MLD-FG-0909	4"	261	248	G
MLD-FG-1212	6"	365	340	H
MLD-FG-1818	8"	816	712	I
MLD-FG-1836	N/A	2,080	1,496	J
MLD-FG-1854	N/A	3,120	2,244	K
MLD-FG-1872	N/A	4,160	2,992	L











Tested to ANSI/ASME 112.19.82017 per section 1404 of the Virgina Graeme Baker Act VGBA Pool and Spa Safety Act

Certified to NSF 50

Certified by NSF International 789 N Dixboro Road Ann Arbor, MI 48113-0140

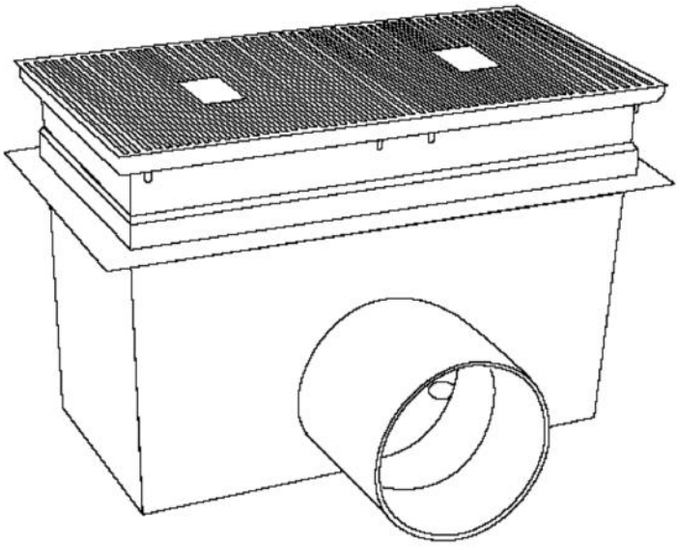
Technical Data Sheet

Neptune Benson evoqua

Tel: +1 (800) 832-8002 / +1 (401) 821-2200

334 Knight St, Warwick RI 02886 www.Neptunebenson.com

Lawson Aquatics Fiberglass Sumps



FIBERGLASS SUMPS
18X36 18X54 18X72

- For single unblockable drains
- Wall or floor installation
- Asme-2017 compliant (larger sizes available in 18" increments)
- Connections can either be threaded for 8" and smaller, flanged, or couplings
- Plumbing connections are configured and customized to your piping schematics
- Grating available in white
- 10 year warranty

The fiberglass sump is fabricated using 8oz. of fiberglass mat, marine quality resin and colored gel coat. The gel coat is only applied to the inside of the sump. The wall thickness is approximately .19+- 0.01". 2" FRP waterstop glassed onto sump.

Lawson Aquatics™

Model Number	SUMP SIZE			MAXIMUM PORT SIZE
	WIDTH	LENGTH	DEPTH	SIZE
FI-SG-183624	18"	36"	24"	6"
FI-SG-183628	18"	36"	28"	10"
FI-SG-183633	18"	36"	33"	12"
FI-SG-185424	18"	54"	24"	6"
FI-SG-185428	18"	54"	28"	10"
FI-SG-185434	18"	54"	34"	14"
FI-SG-185438	18"	54"	38"	14"
FI-SG-187228	18"	72"	28"	10"
FI-SG-187232	18"	72"	32"	14"
FI-SG-187233	18"	72"	33"	14"
FI-SG-187242	18"	72"	42"	16"

NOTE: Suction pipe opening must be greater than 16" from the finished surface of the pool.

Tested to ANSI/ASME 112.19.82017 per section 1404 of the Virgina Graeme Baker Act VGBA Pool and Spa Safety Act

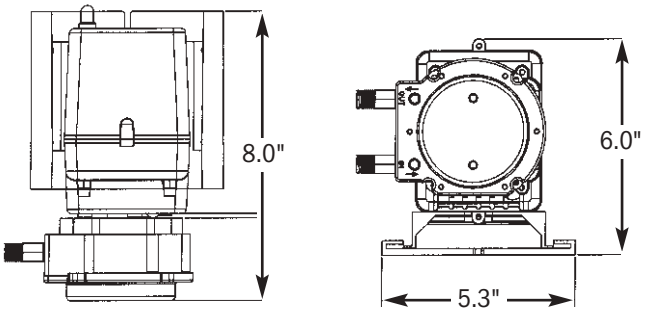
NSF Certified to NSF 50

Certified by NSF International 789 N Dixboro Road Ann Arbor, MI 48113-0140

Technical Data Sheet

CLASSIC SERIES
SINGLE HEAD FIXED SPECIFICATIONS

STENNER PUMPS®



Shipping Weight 8 lbs (3.4 kg)

METERING PUMP
UL LISTED
96F0

METERING PUMP
LR79585
C SA® US

CE IPX4

THIS PUMP IS TESTED AND CERTIFIED BY WQA ACCORDING TO NSF/ANSI 61 FOR CONTACT WITH SODIUM HYPOCHLORITE AND WATER ONLY AND NSF/ANSI 372.
C USA

Intertek
94247
CONFORMS TO ANSI/NSF STD. 50
Equipment for swimming pools, spas, hot tubs and other recreational water facilities.
USE ONLY WITH ANSI/NSF 50 LISTED CONTROLLERS

Listings vary by model

FEATURES

- Fixed flow rate output
- Self-priming, does not lose prime or vapor lock
- Pumps off-gassing solutions and can run dry
- 3-point roller design assists with anti-siphon
- Tube replacement without tools
- Output reproducibility
- Tube lubrication not required
- Foot valve not required to prime
- Output volume not affected by back pressure
- Tubes and pump heads interchangeable between models
- Installation accessories included

CLASSIC SERIES
SINGLE HEAD FIXED SPECIFICATIONS

STENNER PUMPS®

SPECIFICATIONS

Flow Rate Output Control Fixed output

Maximum Working Pressure
25 psi (1.7 bar), 100 psi (6.9 bar)

Maximum Operating Temperature
125°F (52°C)

Maximum Suction Lift
25 ft (7.6 m) vertical lift, based on water

Motor Type 1/30 HP, shaded pole, class B

Shaft RPM (average maximum) 26 or 44

Duty Cycle Continuous

Motor Voltage (Amp Draw)
120V 60Hz 1PH (1.7)
220V 60Hz 1PH (0.9)
230V 50Hz 1PH (0.9)
250V 50Hz 1PH (0.9)

Power Cord Type
120V 60Hz, 220V 60Hz: SJTOW
230V 50Hz, 250V 50Hz: H05VV-F

Power Cord Plug End
120V 60Hz NEMA 5-15P
220V 60Hz NEMA 6-15P
230V 50Hz CEE CEE7/7
250V 50Hz CEE CEE7/7

MATERIALS OF CONSTRUCTION

All Housings Polycarbonate

Pump Tube
Santoprene®* (FDA approved) or Versilon®**

Check Valve Duckbill
Santoprene®* (FDA approved) or Pellethane®†

Pump Head Rollers Polyethylene

Roller Bushings Oil impregnated bronze

Suction/Discharge Tubing, Ferrules
Polyethylene (FDA approved)

Tube and Injection Fittings
PVC or Polypropylene (both NSF listed)

Connecting Nuts
PVC or Polypropylene (both NSF listed)

3/8" Adapter
PVC or Polypropylene (both NSF listed)

Suction Line Strainer and Cap
PVC or Polypropylene (both NSF listed); ceramic weight

All Fasteners Stainless steel

Pump Head Latches Polypropylene

ACCESSORIES

3 Connecting nuts 1/4" or 3/8"
3 Ferrules 1/4" or 6 mm *Europe*
1 Injection check valve 100 psi (6.9 bar) max.
OR **1** Injection fitting 25 psi (1.7 bar) max.
1 Weighted suction line strainer
1/4", 3/8" or 6 mm *Europe*
1 20' Roll suction/discharge tubing
1/4" or 3/8", white or UV black
OR 6 mm White *Europe*
1 Additional pump tube
2 Additional latches
1 Mounting bracket
1 Manual

* Santoprene® is a registered trademark of Exxon Mobil Corporation.

** Versilon® is a registered trademark of Saint-Gobain Performance Plastics.

† Pellethane® is a registered trademark of Lubrizol Advanced Materials, Inc.

FLOW RATE OUTPUT CHART

Single Head Fixed - Flow Rate Output Chart 25 psi (1.7 bar) maximum

	Model	Item Number Prefix	Pump Tube	Gallons per Day	Gallons per Hour	Ounces per Minute	Liters per Day	Liters per Hour	Milliliters per Minute	Liters per Day	Liters per Hour	Milliliters per Minute
45 SERIES	45MP1	**45MFL1**	1	3.0	0.13	0.27	11.4	0.48	7.92	9.1	0.38	6.32
	45MP2	**45MFL2**	2	10.0	0.42	0.89	37.9	1.58	26.32	30.3	1.26	21.04
	45MP3	**45MFL3**	3	22.0	0.92	1.96	83.3	3.47	57.85	66.6	2.78	46.25
	45MP4	**45MFL4**	4	35.0	1.46	3.11	132.5	5.52	92.01	106.0	4.42	73.61
	45MP5	**45MFL5**	5	50.0	2.08	4.44	189.3	7.89	131.43	151.4	6.31	105.14
85 SERIES	85MP1	**85MFL1**	1	5.0	0.21	0.44	18.9	0.79	13.13	15.1	0.63	10.49
	85MP2	**85MFL2**	2	17.0	0.71	1.51	64.4	2.68	44.65	51.5	2.15	35.76
	85MP3	**85MFL3**	3	40.0	1.67	3.55	151.4	6.31	105.14	121.1	5.05	84.10
	85MP4	**85MFL4**	4	60.0	2.50	5.33	227.1	9.46	157.71	181.7	7.57	126.18
	85MP5	**85MFL5**	5	85.0	3.54	7.55	321.8	13.40	223.40	257.4	10.73	178.75
				Approximate Output @ 60Hz						Approximate Output @ 50Hz		

Single Head Fixed - Flow Rate Output Chart 100 psi (6.9 bar) maximum

	Model	Item Number Prefix	Pump Tube	Gallons per Day	Gallons per Hour	Ounces per Minute	Liters per Day	Liters per Hour	Milliliters per Minute	Liters per Day	Liters per Hour	Milliliters per Minute
45 SERIES	45MPHP2	**45MFH1**	1	3.0	0.13	0.27	11.4	0.48	7.92	9.1	0.38	6.32
	45MPHP10	**45MFH2**	2	10.0	0.42	0.89	37.9	1.58	26.32	30.3	1.26	21.04
	45MPHP22	**45MFH7**	7	22.0	0.92	1.96	83.3	3.47	57.85	66.6	2.78	46.25
85 SERIES	85MPHP5	**85MFH1**	1	5.0	0.21	0.44	18.9	0.79	13.13	15.1	0.63	10.49
	85MPHP17	**85MFH2**	2	17.0	0.71	1.51	64.4	2.68	44.65	51.5	2.15	35.76
	85MPHP40	**85MFH7**	7	40.0	1.67	3.55	151.4	6.31	105.14	121.1	5.05	84.10
				Approximate Output @ 60Hz						Approximate Output @ 50Hz		

* Injection check valve included with pumps rated 100 psi (6.9 bar) maximum.

NOTICE: The information within this chart is solely intended for use as a guide. The output data is an approximation based on pumping water under a controlled testing environment. Many variables can affect the output of the pump. Stenner Pump Company recommends that all metering pumps undergo field calibration by means of analytical testing to confirm their outputs. The information contained in this flyer is not intended for specific application purposes. Stenner Pump Company reserves the right to make changes to prices, products, and specifications at any time without prior notice.

HAYWARD®

CAT CONTROLLERS®

CAT 5000®

ADVANCED, WIRELESS, WATER CHEMISTRY FACILITY CONTROLLER

COMMERCIAL AUTOMATION

Web-Based Water Quality Management with Global Wireless Coverage

NSF

CAT 5000 is the world's first wireless, internet-based water quality controller employing both satellite and terrestrial communications to provide worldwide coverage. Now you can take advantage of affordable wireless technology and internet-based monitoring to put you in control like never before.

The CAT 5000 offers unprecedented product quality, value and ease of use. Simply install the factory-assembled CAT 5000 system and log onto PoolComm® to activate your wireless account and begin monitoring. Using your personal PoolComm account you can view water quality data, print charts, analyze graphs, customize your settings and receive alarm notifications via email or SMS.

The Complete Water Quality Solution

- State-of-the-art microprocessor-based water quality controller with integrated global communications
- Eliminates the cost of installing and maintaining dedicated analog telephone lines
- With 4 different wireless communication protocols ranging from Wi-Fi®, reflex, cellular to satellite, the CAT 5000 will comunicate wirelessly 24/7, from anywhere in the world
- Monitor and maintain via web browser from any internet-enabled computer, mobile device or via PoolComm App for iPhone® or Android™
- NSF/ANSI Standard 50

CAT 5000®

ADVANCED, WIRELESS, WATER CHEMISTRY FACILITY CONTROLLER

TECHNICAL SPECIFICATIONS

Enclosure	7" x 7" x 2.3" glass-filled polycarbonate
Interface	UV Protected Lexan membrane switch
Certifications	UL94-5V (UL746 C5) NEMA type 1, 4, 4X, 6, 12, 13 NSF / ANSI Standard 50
Display	2 x 20 character vacuum fluorescent
Keys	Embossed with stainless tactile domes
Display Range	pH 1.0-9.9 / ORP 5-995 mV
Flow Cell	Injection molded with integral baffles Machined acrylic (optional)
Backboard	CNC machined and beveled PVC
Flow Sensor	Magnetic with embedded reed switch Digital rotary (optional)
Power Input	USA - 15 Amp, 120 VAC 60 Hz Intl. - 10 Amp, 230 VAC 50/60 Hz
Communications	Bi-directional wireless reflex or satellite
Internet URL:	http://www.poolcomm.com
Mobile App	Available for iPhone and Android devices
Latency	< 5 minutes per path
Alarm Format	Email, text mesaage, visual, audible
Safety Systems	pH low and high alarms ORP low and high alarms pH and ORP overfeed timeout Temperature Flow alarms
Set Point Range	pH 7.0-8.0 ORP 200-995 mV
Control Accuracy	pH +/- 0.1 pH ORP +/- 5.0 mV
Alarm Ranges	pH - low 6.0 pH / high 9.0 pH ORP - low 200 mV / high 995 mV
Mode Selections	pH automatic / off / manual for 30 minute direct feed ORP automatic / off / manual for 30 minute direct feed pH feed - acid or base ORP mode - auto / set pH mode - auto / set / calibrate
Optional Equipment	Optical level sensors Digital flow rate sensor Chemical feed systems Rotary flow sensor
Inputs	CAT Professional Series pH sensor CAT Professional Series ORP sensor CAT magnetic flow sensor CAT rotary flow sensor Optical pH tank level sensor Optical ORP tank level sensor Optical water level sensor Digital flow meter Temperature
Outputs	pH feed, 4 Amp, 115 VAC ORP feed, 4 Amp, 115 VAC AUX - 1 - dry contact, 1 Amp max AUX - 2 - dry contact, 1 Amp max
Auxiliary Outputs	*Menu Based Programmability:* Remote alarm pH acid feed pH base feed ORP primary feed ORP supplemental feed Dechlorination control Water level control Level / flow sensor #1 Level / flow sensor #2 Level / flow sensor #3 Chlorine generator interface Time-based activation Temperature Control
Warranty	5-year comprehensive warranty and technical support 2-year warranty on sensors

PART NUMBERS

Part Numbers	Description	Carton Quantity	Carton Weight (lbs.)
CAT-5000-WIFI	CAT 5000 with Wi-Fi Transceiver	1	20.0
CAT-5000-CELL	CAT 5000 with Cellular Transceiver	1	20.0
CAT-5000-DS100	CAT 5000 with Satellite Transceiver	1	20.0
CAT5000075-WIFI	CAT 5000 with Wi-Fi Transceiver, Machined Flow Cell and RFS	1	20.0
CAT5000075-CELL	CAT 5000 with Cellular Transceiver, Machined Flow Cell and RFS	1	20.0
CAT5000075DS100	CAT 5000 with Satellite Transceiver, Machined Flow Cell and RFS	1	20.0
CAT5000-WIFI-UL	CAT 5000 with Wi-Fi Transceiver, UL Listed	1	20.0
CAT-5000-CELLUL	CAT 5000 with Cellular Transceiver, UL Listed	1	20.0
CAT5000DS100UL	CAT 5000 with Satellite Transceiver, UL Listed	1	20.0
C5000075WIFIUL	CAT 5000 with Wi-Fi Transceiver, Machined Flow Cell and RFS, UL Listed	1	20.0
C5000075CELLUL	CAT 5000 with Cellular Transceiver, Machined Flow Cell and RFS, UL Listed	1	20.0
CAT500075D100UL	CAT 5000 with Satellite Transceiver, Machined Flow Cell and RFS, UL Listed	1	20.0

OPTIONAL ACCESSORIES

Retrofit Kits Available to Upgrade to Wi-Fi and Cellular Models*

Part Number	Description	Carton Quantity	Carton Weight (lbs.)
RFK-C5000-WIFI	Wi-Fi® Transceiver Retrofit Kit with new firmware for CAT 5000	1	3.0
RFK-C5000-CELL	Cell Transceiver Retrofit Kit with new firmware for CAT 5000	1	3.0
HCSC60	Saline C® 6.0 Commercial Salt Chlorine Generator	1	50.0
HCSJBOX-BU	Sanitizer Back-up Junction Box	1	3.0
PTC15	pH Feed Pump, 15 Gal Tank	1	5.0
AC004	Standard CO_2 System	1	7.0

* All controller board revisions prior to CAT 5000 Rev D. cannot be converted to Wi-Fi or Cellular

Watch the PoolComm App Tutorial

Scan the QR code from your mobile device to watch the video.

Contact your dedicated Hayward Commercial products team with questions: 1-800-657-2287 • 10101 Molecular Drive #200 • Rockville, MD 20850
Visit us at: www.haywardcommercialpool.com

HAYWARD®

Liquid Feed Systems

ACID AND LIQUID CHLORINE FEEDER

Easy-fill design. Durable solution.

Hayward's new Liquid Feed System offers the most reliable and durable solution on the market for automatic acid and liquid chlorine dispensing in residential and commercial pools. Consisting of a high capacity, 15-gallon tank made of UV resistant plastics, and a low-power fixed output pump, Hayward's system is long-lasting and energy efficient. Hayward also makes liquid refill easier than ever, employing an upright, ergonomic design and convenient built-in handles.

TAKE THE WORK OUT OF MAINTAINING A POOL
with the most durable, easy-to-use liquid feed systems on the market.

Features & Benefits

- Large capacity15-gallon pump and tank capable of automatically dispensing acid (for pH control) or liquid chlorine (for sanitization).
- Upright, ergonomically designed with convenient built-in carry handles makes it easier to add liquid when refilling.
- Durable, workhorse peristaltic pump provides consistent, reliable delivery of acid or chlorine.
- UV resistant plastics make system resiliant and long-lasting in any environment.
- Childproof cap makes it safe to store on an unlocked or ungated pool pad.
- Tie-down straps for use in hurricane or tropical storm prone areas (optional).
- Energy efficient, low power operation (<10 watts)
- Plug-and-play design with a 6 ft. 110V power cord
- Both SKU's come with a still tray to contain chemical spills.
- Manage with any on/off controller or automation system
- Both SKU's can be used with Hayward's residential AquaRite® Pro, ProLogic® and OmniLogic® or Commerical CAT Controllers®.

Enjoy full water chemistry and backyard automation for residential pools.

Hayward's ProLogic and OmniLogic Automation systems can be paired with the Acid Feed System to automatically sanitize and/or control pH. The system will dispense chemicals based on a schedule set within the automation system.

Hayward's Sense & Dispense® pH and ORP technology can be paired with the AquaRite Pro Salt Chlorination system, and ProLogic and OmniLogic Automation systems. Sense & Dispense continously tests the water, sampling pH and sanitizer activity, and automatically adjusts chemical feeding via the Acid or Liquid Chlorine Feed Systems.

Commercial Pool & Spa Solutions

Both the Acid and Liquid Chlorine Feed Systems come equipped with a still tray for containment of chemical spills, which satisfies regional health department regulations. Both systems are plug-and-play with CAT Controllers® and the Saline C® 6.0 Salt Chlorine Generator, providing the perfect combination of equipment to keep commercial pools automatically balanced, and safely purified at all times.

Specifications

Capacity	15 Gallons
Dimensions	16" x 16" x 30"
Weight	24 lbs. (empty)
Material	High Density Polyethylene
Maximum Delivery Rate	32 gallons per day
Power	6 ft. cord; 110V; 4 watts
Tubing	13 ft.

Ordering Guide

Description	Part Number
pH Dispense, Acid Feed System, 120V	AQL-CHEM4-ACID
Liquid Chlorine Dispense System, 120V	AQL-CHEM4-CHLOR

To take a closer look at chemical automation systems or other Hayward products, go to
hayward.com or call 1-888-HAYWARD.

HAYWARD®
620 Division Street | Elizabeth, NJ 07201

The purpose of this specification is to establish the minimum performance and quality standards. The use of this specification does not preclude other manufacturers or suppliers from bidding. The use of a detailed specification ensures that the purchaser receives the quality expected.

SECTION 13150 – SWIMMING POOL PVC MEMBRANE SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The provision of the Notice to Bidders, Instructions to Bidders, Proposals, General Conditions, Supplementary Conditions, General Requirements, related Sections and other Divisions of these documents if used as part of this project are included as a part of this Section as though bound herein.

1.2 SUMMARY

A. It is the intent of this specification to describe the installation of a complete reinforced PVC membrane lining system specifically designed and formulated for use in swimming pools. The system shall consist of two layers of flexible PVC totally encapsulating a polyester inner reinforcement in combination with required accessory items to complete the installation. The sections of material shall be fuse bonded together at the site to form a watertight continuous membrane lining. The system shall be installed in accordance with the configuration as detailed on the drawings, including all necessary equipment within this specification. Individual rolls of reinforced PVC membrane shall be custom fitted and welded together at the job site using hot air welding techniques. Upon completion, the system shall provide a waterproof, yet flexible membrane, complete with all necessary fittings, attachments, flange transitions and markings.

B. The performance characteristics and installation qualifications as established herein reflect the minimum requirements for any membrane system to be utilized on this project. Systems not meeting the minimum requirements established for this project will not be considered.

C. This specification includes, but is not limited to, the following components:

D. Flexible PVC membrane

E. Slip-resistant reinforced PVC membrane

F. Separator fleece

G. PVC steel edging & sheets

H. Galvanized, Polymer and/or Stainless Stee edging & sheets

I. Sanitizing agents

J. Transition flanges

K. Edge sealants

L. Adhesives

M. Refer to Section _____, Alternates, for alternates that may affect the Work of this Section.

N. This Specification describes Natatec® PVC Membrane Lining System as illustrated by the drawings. Should the requirements of this specification contradict any other section of the project specifications, this section shall govern.

1.3 Scope of Work:

A. Work Included: The work specified herein and as indicated on the drawings includes, but is not necessarily limited to, furnishing all the labor, materials, equipment, appliances, services and drayage to all the operations related to the fabrication and installation of the PVC Membrane System. The Work shall be as herein specified and as denoted on the accompanying drawings.

B. Related Work and Responsibilities Assigned to Others: Coordinate all activities with the appropriate party. Advise owner's representative if proper conditions are not maintained or if responsibilities of others are not properly completed. Related work responsibilities generally include, but are not limited to the following:

1. Provide and maintain appropriate and suitable environmental conditions, including temporary heat shelter and weather protection for the completion of the work.
2. Surface preparation beyond the scope of normal surface patching of concrete, surface repair or cleaning of the existing interior surfaces prior to system installation.
3. Perimeter sealant, caulking, or other sealing except sealants that are integral to the PVC Membrane System.
4. Removal and reinstallation of deck and accessory equipment.
5. Provide means for storage and disposal of scrap material, coating debris, and other material in close proximity to pool area.
6. Electrical work, including grounding of the pool, installation of underwater lights or other components, or any related electrical work.
7. Temporary facilities, including electrical power close to the installation site.

8. Provide temporary water at fifty (50) psi (to gallons per minute) minimum for cleaning, rinsing, and test purposes, as well as facilities for draining pool and maintaining workable conditions within the pool area.
9. Final cleaning of pool area outside of the PVC Membrane System.
10. Provide and maintain all necessary barricades, signs, lights, flares, and other security as required protecting workmen and the public.
11. Drain pool, coordinate with contractor to ensure proper hydrostatic relief is maintained. Closely monitor water table around pool to minimize hydrostatic damage to pool shell.
12. Immediately after installation, protect pool from damage, contamination, spatter, and spillage caused by construction work of other trades. This shall include covering of pool with protective materials when necessary, and responsibility for prompt repair or corrective measures in the event of damage.

C. Where items of the architectural, mechanical, or electrical general conditions, special conditions, and specifications are repeated in this Section of the Specifications or Project Documents, it is intended to call particular attention or qualify these items or to indicate that the requirements of this Section shall govern in the event of conflict with other Sections. It is not intended that any other parts of the documents shall be assumed to be omitted if not repeated herein. Should the requirements of any other Section of the project documents contradict this section, the requirements of this section shall govern.

1.4 DEFINITIONS

A. References Standards: Certain applicable reference standards are incorporated herein to the extent such references are relevant, with the latest revision applicable including, but not limited to:

1. Fabrication standards:

   ASTM - American Society for Testing Materials

   ANSI - American National Standards Institute

   NSF - National Sanitation Foundation
2. The following are utilized as applicable:

   NCAA - National Collegiate Athletic Association

   FINA - Federation Internationale de Natation Amateur

   USS - United States Swimming Incorporated

B. The intent of these specifications is not to establish specific quantities, amounts, or dimensions. Thus, the reference to "one", "each", "an", "a", or like wording is for semantic purposes only. Unless specifically stipulated otherwise, provide materials, equipment, and items as detailed on the drawings or as reasonably required for complete, operational PVC Membrane System installation(s).

1.5 SUBSTITUTIONS

A. The PVC Membrane System has been the subject of a detailed investigation, and the design and operation of adjoining equipment and systems is based upon the specified membrane system. All base bids shall include only that equipment and systems listed herein or subsequently approved by addendum. The Owner reserves the right to reject any and all substitutions without cause and for any reason whatsoever, and the contractor is obligated to provide only the products, equipment or systems as described by the specified manufacturer.

1.6 TRADE NAMES

A. When a particular manufacturer's product, system or brand name is designated in the project documents, either in the drawings, specifications or addenda thereto, only such designated products or systems by the named manufacturer may be provided.

1. When reference is made in the project documents to trade names, brand names or the products of a particular manufacturer, such references are made solely to indicate what products or systems may be furnished under the base bid and are not intended to restrict competition. Should any bidder desire to use products, systems or trade or brand names that are different from those mentioned in the project documents, application for the approval of such different products, systems, trade names or brand names must be provided to the Architect in writing a minimum of 10 days prior to the date set for the opening of bids.
2. The burden of proving acceptability rests with the applicant and any application for approval must be accompanied with adequate and sufficient technical data, drawings and details to clearly and convincingly establish beyond all doubt that the proposed product or system meets or exceeds all express requirements of the project documents.
3. Unless requests for approval of other products, systems, trade names or brand names have been received and approvals have been published by addendum, only such designated products or systems by the named manufacturer may be provided.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate all work activities and installation of the PVC Membrane System with other building components and the work activities of other trades

1.8 DRAWINGS:

A. The drawings are generally diagrammatic and are intended to convey the scope of work and indicate general arrangement. The drawings are intended for contractors having experience, skill and discretion in the execution of the work implied by the drawings.

B. If directed by the Consultant or required for the successful completion of the project, the contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work. Under no circumstances shall any sizes be decreased or increased significantly or radical changes in any part of the installation be made without the written consent of the Consultant or the Owner.

1.9 SUBMITTALS

A. Upon notice to proceed under this Contract, installation details and submittal documents shall be provided, fully illustrating the materials and procedures to be utilized. These details and submittal documents, once accepted by the Owner or Owner's Representative, shall be the basis for the fabrication, installation and inspection.

B. Product Data: Submit manufacturer's technical information and product data including basic materials and installation instructions for the PVC Membrane System including the following:

1. List each material finished and application and cross-reference to the shop drawing(s).
2. Provide dimensional shop drawings showing all pertinent dimensions.

C. Program and Procedures: Prepare and submit a summary of the installation program which involves scheduling, preparation and installation procedures, quality control and project close-out. Submit to architect for approval.

D. Submit comprehensive operations and maintenance manuals. Include recommendations for corrective action of typical situations that may be encountered.

1. Submit recommended and required values for swimming pool water chemistry and other operational aspects of maintaining the swimming pool facilities.
2. Maintenance Instructions and Maintenance Program: Provide complete descriptive information detailing proper care, maintenance and cleaning of the system.

1.10 QUALITY ASSURANCE

A. This is a performance specification. The complete and functional reinforced PVC membrane system, as specified herein and shown on the drawings, is to be the basis for receiving bids. While it is not the intent of these specifications to, in any way, limit competition or restrict the bidder in the preparation of their bid, the bidder shall offer products and materials in literal compliance with these specifications. The bidders are cautioned that offering products or systems failing to meet these specifications will be considered non-responsive.

B. The PVC Membrane System shall be the product of a firm having at least ten (10) years experience in the design, manufacture and installation of PVC Membrane Systems used in swimming pool, aquatic or water feature applications. The firm also must have at least ten (10) installations of similar projects currently in satisfactory operation for no less than three (3) years. All systems shall be in compliance with the code requirements that govern in the State of the installation.

1. In the event an alternate manufacturer's system is approved, all contractors will be so advised per addendum prior to bid opening to allow for inclusion of such a system or equipment in their bids. In the absence of approval for an alternate manufacturer, only the specified manufacturer's system may be incorporated in the project.

2. Listing or subsequent approval of a particular manufacturer as an approved manufacturer does not constitute acceptance of the manufacturer's standard configuration, materials, or equipment, except as they specifically meet or can be made to conform to the requirements defined in this specification. Any bid shall be assumed to include any and all costs to change, modify or otherwise comply fully with the requirements of this specification. Claims for additional compensation to comply with these specifications after bid for any reason whatsoever will not be considered. Only materials, equipment, or systems that absolutely comply with these specifications in all regards will be accepted. Any substitute systems from alternate manufacturers shall be in compliance with all requirements of these specifications.

C. Warranty**:** The PVC Membrane System shall be guaranteed for workmanship, materials and performance for a period of ten (10) years. This warranty shall not include or cover abusive or improper treatment to the PVC Membrane System by others either during construction or when operational.

D. A sample copy of the warranty statement in accordance with these specifications must be provided prior to approval.

1.11 Delivery, Storage and Handling:

A. The PVC Membrane System components shall be delivered to the job site adequately packaged to prevent damage. Unloading and storage shall be executed by the Contractor. The materials shall not be stacked or stored in any manner which could cause damage or deformity. Site assembly or fabrication of any part of the PVC Membrane System without the complete coordination and supervision of the manufacturer or his representative is strictly prohibited.

1.12 Project Site Conditions:

A. The project site shall be in accordance with the Manufacturers' technical bulletins. Access for the installation of the PVC Membrane System will be provided by others.

B. All surface preparation necessary to produce a reasonably smooth, firm, clean and dry surface shall be completed prior to the onset of installation. The surface must be free of angular materials, bubbles, voids and large cracks. These irregularities shall be filled with suitable patching material or covered with galvanized or stainless steel sheet as detailed on the drawings. Tar, oil, or petrochemical compounds must be removed or isolated. Surface preparation is part of this contract.

1.13 Coordination:

A. The manufacturer shall provide complete descriptive information detailing the design, construction and installation. The contractor shall include all costs for visits to the project site to coordinate various aspects of design, construction, installation and commissioning of the lining system. Coordination shall include the cost for aspects of the installation and to coordinate manufacturing, testing and commissioning programs with the main contractor(s), and other suppliers. Such visits shall take place immediately upon notice to proceed to enable all contractors to be briefed, and a complete production and installation program to be established.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: Natare Corporation, Indianapolis, Indiana. All bids shall include only PVC Membrane Lining Systems from this manufacturer.

B. The system specified is based upon the Natatec® Swimming Pool Membrane System which is a proprietary product of Natare Corporation, located in Indianapolis, Indiana, and the characteristics and standards listed herein. The listed criteria have been established as the minimum acceptable values for any membrane product to be offered on this project. As all aspects and equipment within the pool system have been designed to utilize this system, products not meeting the minimum requirements listed will not be accepted, as that could adversely affect the performance of the system.

C. If alternate systems are approved prior to bidding, all contractors will be notified by addendum.

D. Source Limitations: Provide all PVC Membrane System components through one source from a single manufacturer.

2.2 Materials

A. Ensure that all materials used are compatible with the swimming pool environment, and that these materials are supplied as a system.

2.3 Components and Equipment

A. Flexible Reinforced PVC Membrane: The flexible PVC membrane shall be installed to the dimensions detailed on the drawings and as required. The membrane shall consist of two (2) layers of PVC fuse, bonded to a polyester mesh substrate. The membrane shall be no less than 60.0 mil in thickness (.060-inch/1.5 mm), and shall conform strictly with the following chemical and physical properties as listed herein. Only those membranes specifically formulated for swimming pool use shall be considered. Roofing membranes, general waterproofing membranes, and vinyl liners shall not be acceptable. Additionally, only those swimming pool membranes meeting or exceeding the following ASTM test values, substantiated by independent documentation from a certified testing laboratory, shall be acceptable. The membrane shall be furnished in a color scheme as detailed by the drawings or in a standard color as selected by the owner.

B. *Chemical and Physical Properties:

Thickness:	60 mil	ASTM D374C
Specific gravity:	1.22 g/cc	ASTM D792/method A
Yield tension:	MD166 lbs/in – XD160 lbs/in	ASTM D638
Yield elongation:	MD 60% - XD 104%	ASTM D638
Break tension:	MD 95 lbs/in - XD 90 lbs/in	ASTM D638
Break elongation:	MD 200% - XD 225%	ASTM D638
Secant modulus	MD 1352 psi - XD 1125	ASTM D5323 (100%):

Tear resistance:	MD 25 lb. - XD 24.7 lb.	ASTM D1004- Die C
Low temp. brittleness	-50°C – Pass	ASTM D1790
Water absorption:	<1%	ASTM D570
Puncture Resistance:	125 lbs	ASTM D4833
Ply Adhesion	24 in/2 in.	ASTM D413
UV Resistance: Tensile Strength @ Yield	MD 12% - XD 16%	ASTM D4355
Fungal and Bacteria Resistance	No growth, staining or discoloration	ASTM G21-96
Resistance to Chemicals *(Cyanuric Acid, Sodium Dichloroisocyanurate, Trichloroisocyanuric acid, Calcium Hypochlorite, Sodium Hypochlorie with 12 ppm solution)*	Excellent resistance	ASTM D543 Procedure I (73.4 F) for 7 days

MD = machine direction; XD = cross machine direction *Average values plus or minus 10%

C. Slip Resistant Flexible Reinforced PVC Membrane: A slip resistant reinforced PVC membrane, 67.0 mil in thickness (.067-inch/1.7 mm),, and identical in chemical and physical properties to the flexible reinforced PVC membrane described above, which includes a specifically designed embossed surface suitable for high traffic areas, shall be installed as detailed on the drawings. The slip-resistant surface shall be certified by independent ASTM Laboratory testing to comply with the requirements of ASTM C1028. Furnish in the color scheme as detailed by the drawings or as selected by the owner.

D. Separator Fleece: The interior surfaces of the swimming pool shall be covered with an engineered polyester fleece separator, a minimum of 150.0 mil in thickness (.150-inch/3.81 mm),, weighing at least 10.5 ounces per square yard. The fleece separator must be resistant to freeze, thaw, moisture, soil-chemical abrasion, or ultraviolet deterioration and shall conform strictly to the following chemical and physical properties. All fleece separators shall be certified and guaranteed to be free of foreign materials, which could potentially be damaging to the liner.

E. Chemical and Physical Properties (Property Unit Value Test)

Weight:	10.5 oz/sq.yd.	ASTM D-3776
Thickness:	150 mils	ASTM D-1777
Grab strength:	390/330 lb.	ASTM D-4632
Grab elongation:	75/85%	ASTM D-4632
Trapezoid tear strength:	135/120 lb.	ASTM D-4533
Puncture resistance:	155 lb.	ASTM D-3787
Mullen burst strength;	550 psi	ASTM D-3786
Water flow rate:	100 gpm/ft	
Permeability:	0.52 cm/sec	

F.

G. PVC Steel Edging: An PVC-coated steel sheet, at least 20 gauge with PVC laminated on one side shall be used to form edges, angles, corners, or other transitions where a firm surface is necessary to weld the PVC membrane.

H. Stainless Steel and Polymer Sheet: At least 20-gauge stainless steel or polymer sheet shall be used as required for reinforcement, shaping, or separation as required. It shall be installed over expansion joints when sealants or caulking have been installed.

I. Sanitizing Agents: Sanitizing agents, formulated from a mixture of halogenated organic compounds, and specifically designed for this purpose, shall be applied to the pool surface, beneath the pool liner, to prevent the growth of microbes or fungus.

J. Transition Flanges: Compression flanges fabricated of rigid, white polymer, 1/4 inches thick, shall be furnished at all membrane penetrations or openings to the swimming pool. All transition flanges shall be secured with stainless steel anchoring systems.

K. Edge Sealant: Liquid PVC edge sealant solution shall be applied to all free material edges after welding. This process is to provide a properly detailed edge on material lap joints. Only those membrane systems utilizing an edge sealant solution will be considered, as this process is critical to the overall durability of the membrane.

PART 3 - EXECUTION

3.1 Examination

A. The supervising representative or installer shall verify that the site conditions are in accordance with the Manufacturers' requirements, shop drawings and/or technical bulletins and are suitable for the installation of the membrane.

3.2 Preparation

A. Surface preparation shall be completed prior to the commencement of installation. The surface shall be reasonably smooth without oil or tar-based materials present. Deteriorated surfaces or voids shall be filled with cementitious patching compounds. Areas immediately surrounding fittings, lights, and other transitions or entrances to the pool shall be sound and suitable for drilling of ½ inch diameter anchor holes for the installation of the PVC compression flanges.

3.3 Installation and Application

A. All work to be performed by skilled technicians having adequate experience with, and specific training in, the field welding and fabrication of flexible PVC swimming pool membrane systems. Additionally, to ensure the overall integrity of the installation, the installing crew shall be supervised by a crew leader having had no less than two (2) years experience in the application of PVC membrane systems on at least five (5) pool projects similar in size and scope to this project.

B. To ensure the integrity of the membrane installation and to secure a single source of responsibility for any required warranty service, all membrane system installation personnel shall be full-time, regular employees of the prime bidder, system manufacturer or shall be a factory trained licensee of the Manufacturer. No sub-contract or independent membrane installers shall be utilized. The contractor shall be required to submit installers experience in writing to the consultant prior to project bid.

C. If requested, the Contractor shall submit the personnel and supervisor's experience in writing to the for approval prior to award of contract

D. All work is to be performed in accordance with the manufacturer's technical bulletins. Should the requirements of these bulletins contradict this or any other section of the specifications, the procedures called for in the bulletins shall govern. The work under this section shall be performed by or directed by an authorized licensee of the system manufacturer so that the complete installation will function in accordance with the intent of these specifications.

E. (Optional) Connection to existing perimeter gutter systems: When installing the PVC Membrane System in swimming pool or aquatic facilities with existing stainless steel perimeter gutter systems, a 12 gauge T-304 stainless steel compression skirt shall be continuously welded to the stainless steel gutter system.

F. The compression skirt shall be fabricated as detailed on the drawings and shall provide a smooth, uninterrupted surface onto which the membrane shall be compressed. The PVC membrane and a silicone impregnated sponge gasket shall be compressed between a rigid PVC profile and the compression skirt through the installation of ¼"-20 stainless steel screws, located no greater than 3" O.C. A semi rigid interlocking cap strip shall be installed over the PVC profile to finish the installation. Due to the critical nature of insuring a positive, permanent and enduring watertight seal between the PVC membrane and the stainless steel gutter system, only those systems incorporating a fully welded, stainless steel membrane compression skirt will be allowed.

G. One method of meeting these requirements is furnished by Natare Corporation of Indianapolis, Indiana and is available under license for use by any contractor installing a PVC Membrane System in a swimming pool facility.

1. The PVC membrane contractor is responsible for pressure testing the existing stainless steel gutter supply tube and hydrostatic testing of the return trough prior to installing the compression skirt to ensure that the gutter system is watertight.

3.4 Sequence of Work

A. Attach the fleece to the pool wall and/or the bottom with the appropriate adhesives in the amounts adequate to secure the fleece. Isolate deteriorated surfaces of voids, cracks, or any other areas with moisture proof composition board or galvanized sheet (20-gauge) as required.

B. The flexible reinforced PVC membrane shall be securely welded to PVC coated steel, which has been attached to the pool surface with aluminum drive rivets approximately four (4) inches on center.

C. Install PVC coated steel or shaped galvanized sheet as necessary to form angles, edges, corners, or other transitions.

D. Weld the flexible reinforced PVC membrane in accordance with the procedures established by the manufacturer. The joints shall be hot air welded with a minimum of two (2) inches of overlap. Probe all seams with a hand-held lance or air lance to ensure complete welding. Completely close the seam edge using a PVC edge sealing compound.

E. All seams in the membrane shall be one-piece, single overlap seams. Patching and overlaying of multiple layers of the membrane material is not acceptable. All material sections are to be applied in full roll

PART 3 - EXECUTION

3.1 Examination

A. The supervising representative or installer shall verify that the site conditions are in accordance with the Manufacturers' requirements, shop drawings and/or technical bulletins and are suitable for the installation of the membrane.

3.2 Preparation

A. Surface preparation shall be completed prior to the commencement of installation. The surface shall be reasonably smooth without oil or tar-based materials present. Deteriorated surfaces or voids shall be filled with cementitious patching compounds. Areas immediately surrounding fittings, lights, and other transitions or entrances to the pool shall be sound and suitable for drilling of ½ inch diameter anchor holes for the installation of the PVC compression flanges.

3.3 Installation and Application

A. All work to be performed by skilled technicians having adequate experience with, and specific training in, the field welding and fabrication of flexible PVC swimming pool membrane systems. Additionally, to ensure the overall integrity of the installation, the installing crew shall be supervised by a crew leader having had no less than two (2) years experience in the application of PVC membrane systems on at least five (5) pool projects similar in size and scope to this project.

B. To ensure the integrity of the membrane installation and to secure a single source of responsibility for any required warranty service, all membrane system installation personnel shall be full-time, regular employees of the prime bidder, system manufacturer or shall be a factory trained licensee of the Manufacturer. No sub-contract or independent membrane installers shall be utilized. The contractor shall be required to submit installers experience in writing to the consultant prior to project bid.

C. If requested, the Contractor shall submit the personnel and supervisor's experience in writing to the for approval prior to award of contract

D. All work is to be performed in accordance with the manufacturer's technical bulletins. Should the requirements of these bulletins contradict this or any other section of the specifications, the procedures called for in the bulletins shall govern. The work under this section shall be performed by or directed by an authorized licensee of the system manufacturer so that the complete installation will function in accordance with the intent of these specifications.

E. (Optional) Connection to existing perimeter gutter systems: When installing the PVC Membrane System in swimming pool or aquatic facilities with existing stainless steel perimeter gutter systems, a 12 gauge T-304 stainless steel compression skirt shall be continuously welded to the stainless steel gutter system.

F. The compression skirt shall be fabricated as detailed on the drawings and shall provide a smooth, uninterrupted surface onto which the membrane shall be compressed. The PVC membrane and a silicone impregnated sponge gasket shall be compressed between a rigid PVC profile and the compression skirt through the installation of ¼"-20 stainless steel screws, located no greater than 3" O.C. A semi rigid interlocking cap strip shall be installed over the PVC profile to finish the installation. Due to the critical nature of insuring a positive, permanent and enduring watertight seal between the PVC membrane and the stainless steel gutter system, only those systems incorporating a fully welded, stainless steel membrane compression skirt will be allowed.

G. One method of meeting these requirements is furnished by Natare Corporation of Indianapolis, Indiana and is available under license for use by any contractor installing a PVC Membrane System in a swimming pool facility.

1. The PVC membrane contractor is responsible for pressure testing the existing stainless steel gutter supply tube and hydrostatic testing of the return trough prior to installing the compression skirt to ensure that the gutter system is watertight.

3.4 Sequence of Work

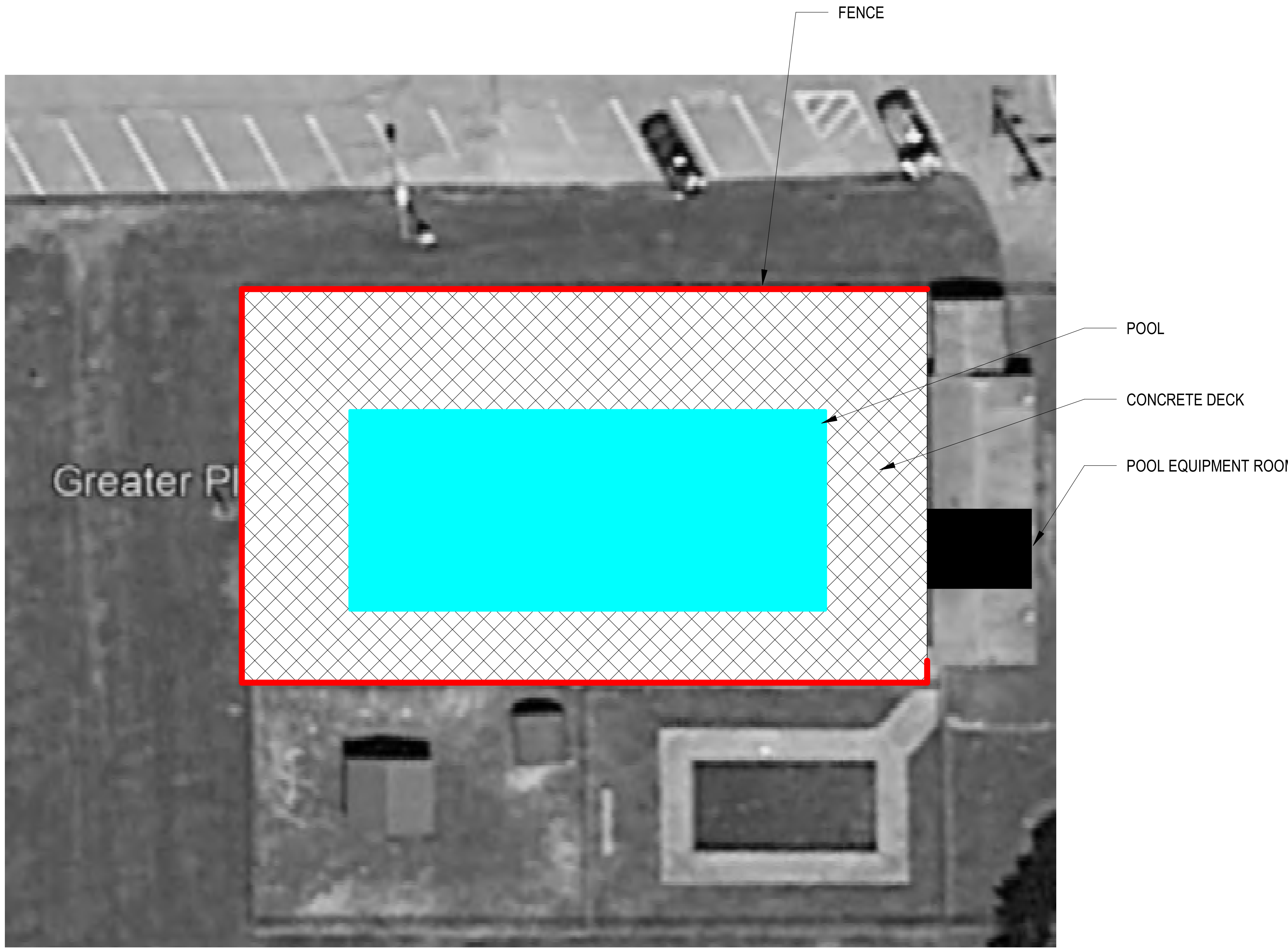
A. Attach the fleece to the pool wall and/or the bottom with the appropriate adhesives in the amounts adequate to secure the fleece. Isolate deteriorated surfaces of voids, cracks, or any other areas with moisture proof composition board or galvanized sheet (20-gauge) as required.

B. The flexible reinforced PVC membrane shall be securely welded to PVC coated steel, which has been attached to the pool surface with aluminum drive rivets approximately four (4) inches on center.

C. Install PVC coated steel or shaped galvanized sheet as necessary to form angles, edges, corners, or other transitions.

D. Weld the flexible reinforced PVC membrane in accordance with the procedures established by the manufacturer. The joints shall be hot air welded with a minimum of two (2) inches of overlap. Probe all seams with a hand-held lance or air lance to ensure complete welding. Completely close the seam edge using a PVC edge sealing compound.

E. All seams in the membrane shall be one-piece, single overlap seams. Patching and overlaying of multiple layers of the membrane material is not acceptable. All material sections are to be applied in full roll



1
C-101

SITE PLAN

SCALE: N.T.S.

PLAN NORTH TRUE NORTH

No.	Revision	Date

Seal

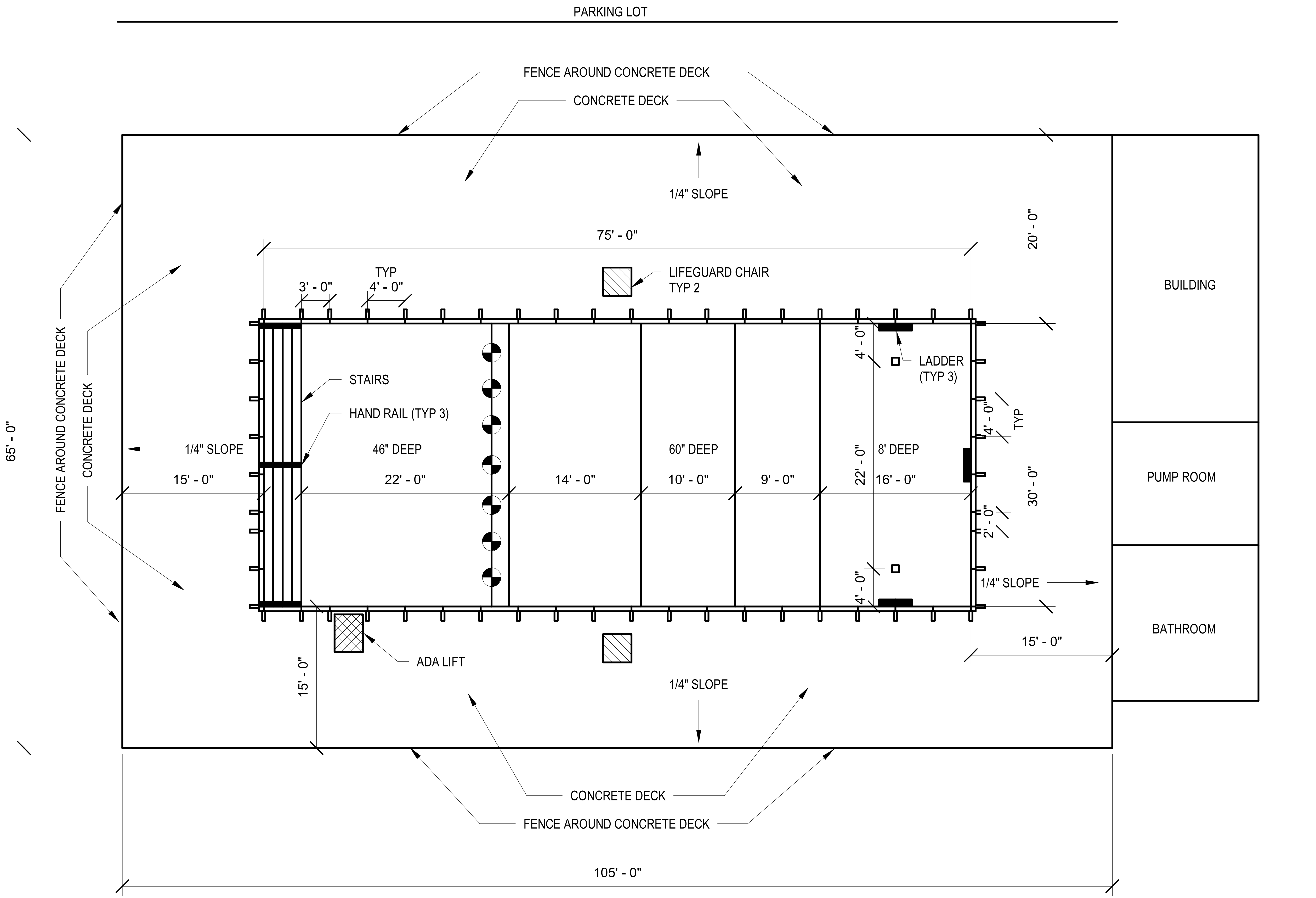
UNAUTHORIZED ALTERATION OF THIS DRAWING IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, SECTION 7209, SUBDIVISION 2.

Project Name
TOWN OF ONEONTA POOL

DELTA
ENGINEERS, ARCHITECTS, & SURVEYORS
860 Hooper Road
Endwell, New York 13760
Tel: 607.231.6600
Fax: 907.231.6650
Email: mail@delta-eas.com.com
www.delta-eas.com
CERTIFICATE OF AUTHORIZATION #: 018598

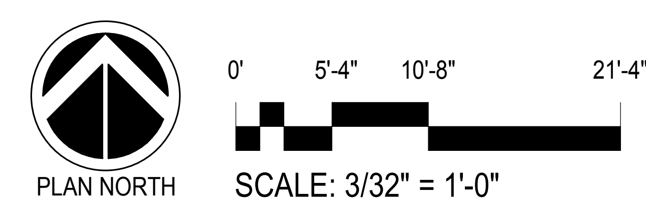
Phase	DOH-1309 SUBMISSION
Project No.	2024.515.001
Date	2025.02.03
Drawn by	SMO
Checked by	RCA
Drawing Title	SITE PLAN
Drawing No.	C-101

2/3/2025 1:30:21 PM



1 C-102 **SITE PLAN**

SCALE: 3/32" = 1'-0"



PLAN NORTH TRUE NORTH

No.	Revision	Date

Seal

UNAUTHORIZED ALTERATION OF THIS DRAWING IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, SECTION 7209, SUBDIVISION 2.

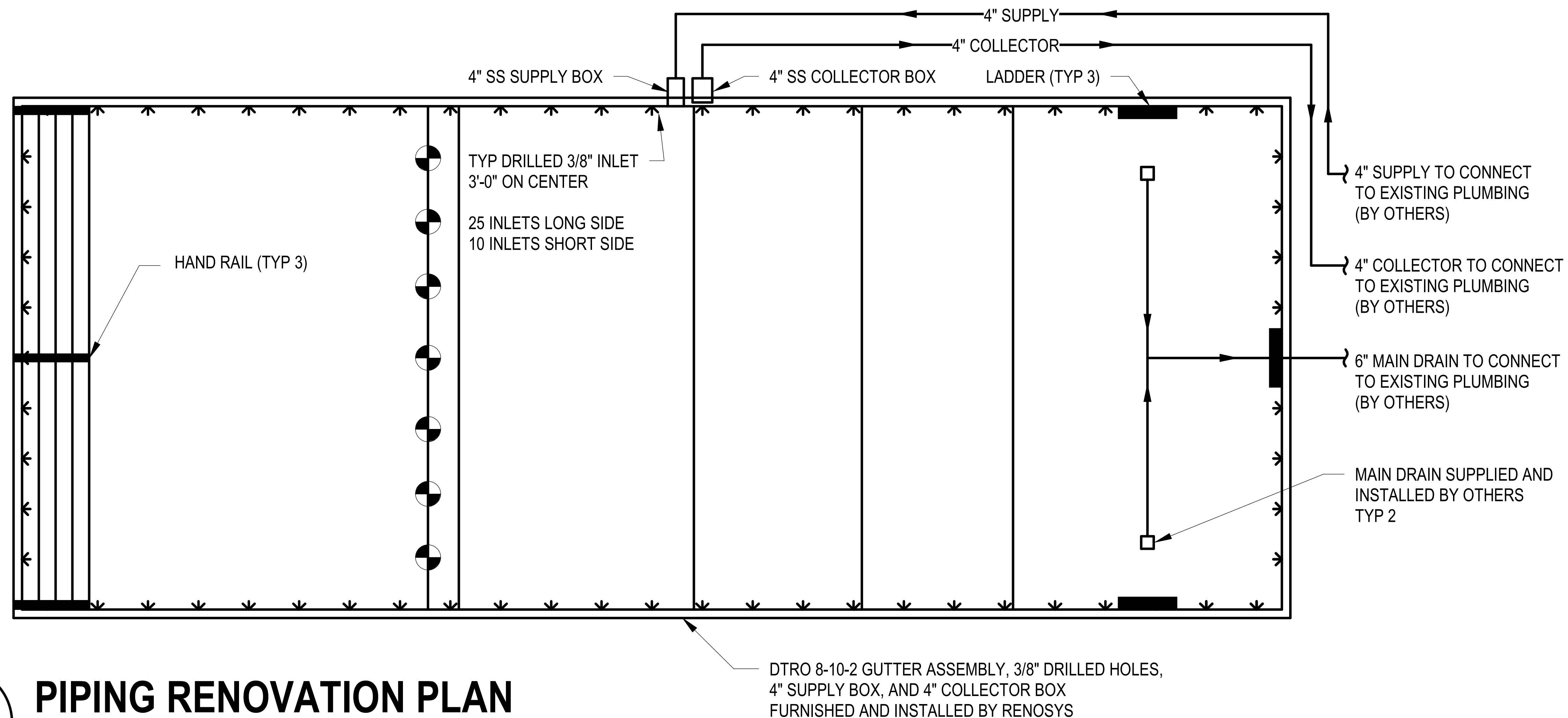
Project Name

TOWN OF ONEONTA POOL

DELTA
ENGINEERS, ARCHITECTS, & SURVEYORS
860 Hooper Road
Endwell, New York 13760
Tel: 607.231.6600
Fax: 907.231.6650
Email: mail@delta-eas.com.com
www.delta-eas.com

Phase	DOH-1309 SUBMISSION
Project No.	2024.515.001
Date	2025.02.03
Drawn by	SMO
Checked by	RCA
Drawing Title	SITE PLAN
Drawing No.	C-102

2/3/2025 1:30:17 PM



1
P-101

PIPING RENOVATION PLAN

SCALE: 1/8" = 1'-0"

PLAN NORTH

0' 2' 4' 8' 16'

SCALE: 1/8" = 1'-0"

PLAN NORTH TRUE NORTH

No.	Revision	Date

Seal

UNAUTHORIZED ALTERATION OF THIS DRAWING
IS A VIOLATION OF THE NEW YORK STATE
EDUCATION LAW, SECTION 7209, SUBDIVISION 2.

Project Name

TOWN OF ONEONTA
POOL

DELTA
ENGINEERS, ARCHITECTS, & SURVEYORS
860 Hooper Road
Endwell, New York 13760
Tel: 607.231.6600
Fax: 907.231.6650
Email: mail@delta-eas.com.com
www.delta-eas.com
CERTIFICATE OF AUTHORIZATION # 018598

Phase: DOH-1309 SUBMISSION

Project No.: 2024.515.001

Date: 2025.02.03

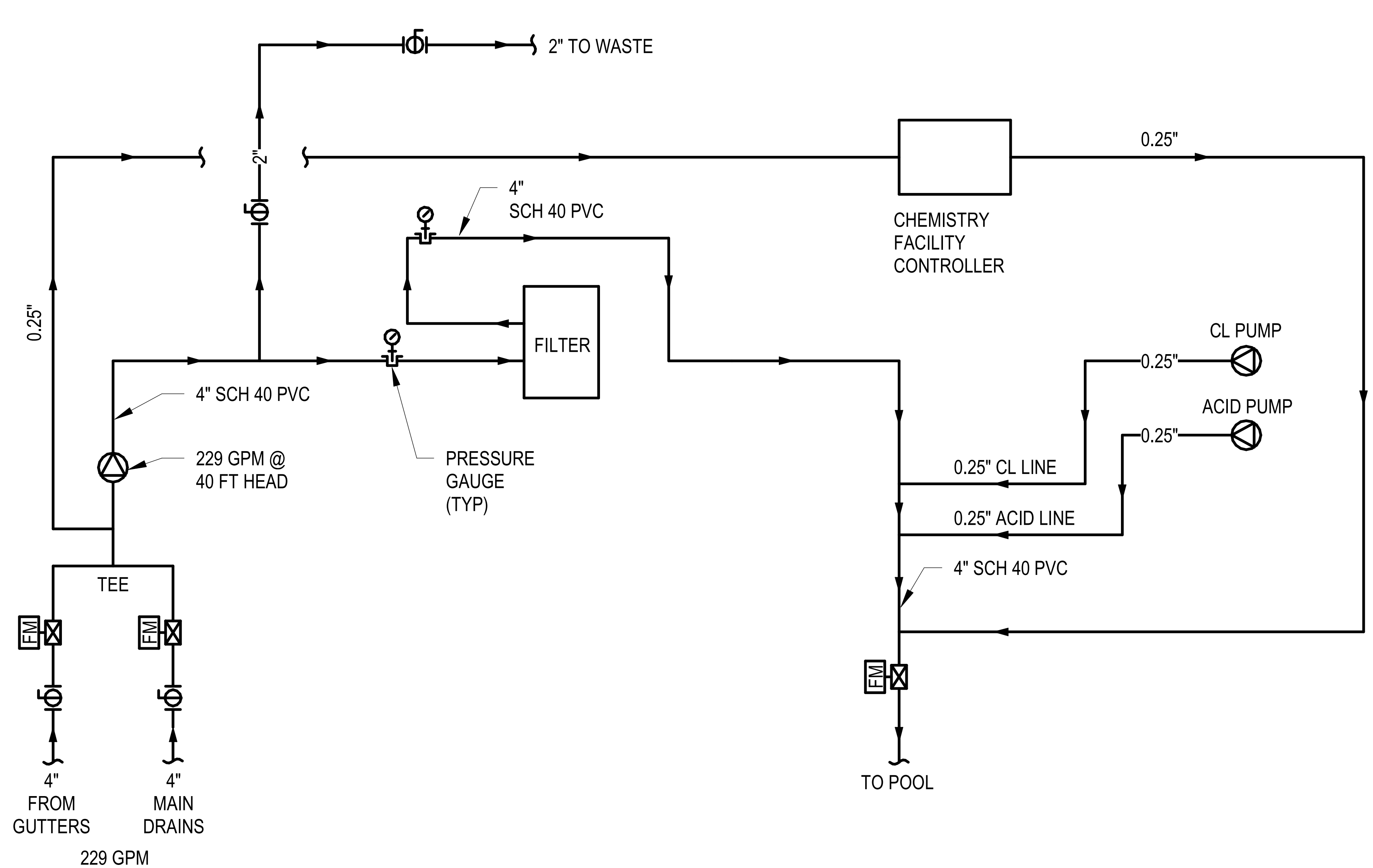
Drawn by: SMO

Checked by: RCA

Drawing Title: PIPING PLAN

Drawing No.: P-101

2/3/2025 1:30:26 PM



1
P-701

PUMP ROOM PIPING SCHEMATIC

SCALE: 12" = 1'-0"

PLAN NORTH TRUE NORTH

No.	Revision	Date

Seal

UNAUTHORIZED ALTERATION OF THIS DRAWING IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, SECTION 7209, SUBDIVISION 2.

Project Name

TOWN OF ONEONTA POOL

DELTA
ENGINEERS, ARCHITECTS, & SURVEYORS
860 Hooper Road
Endwell, New York 13760
Tel: 607.231.6600
Fax: 907.231.6650
Email: mail@delta-eas.com.com
www.delta-eas.com
CERTIFICATE OF AUTHORIZATION #: 019598

Phase: DOH-1309 SUBMISSION

Project No.: 2024.515.001

Date: 2025.02.03

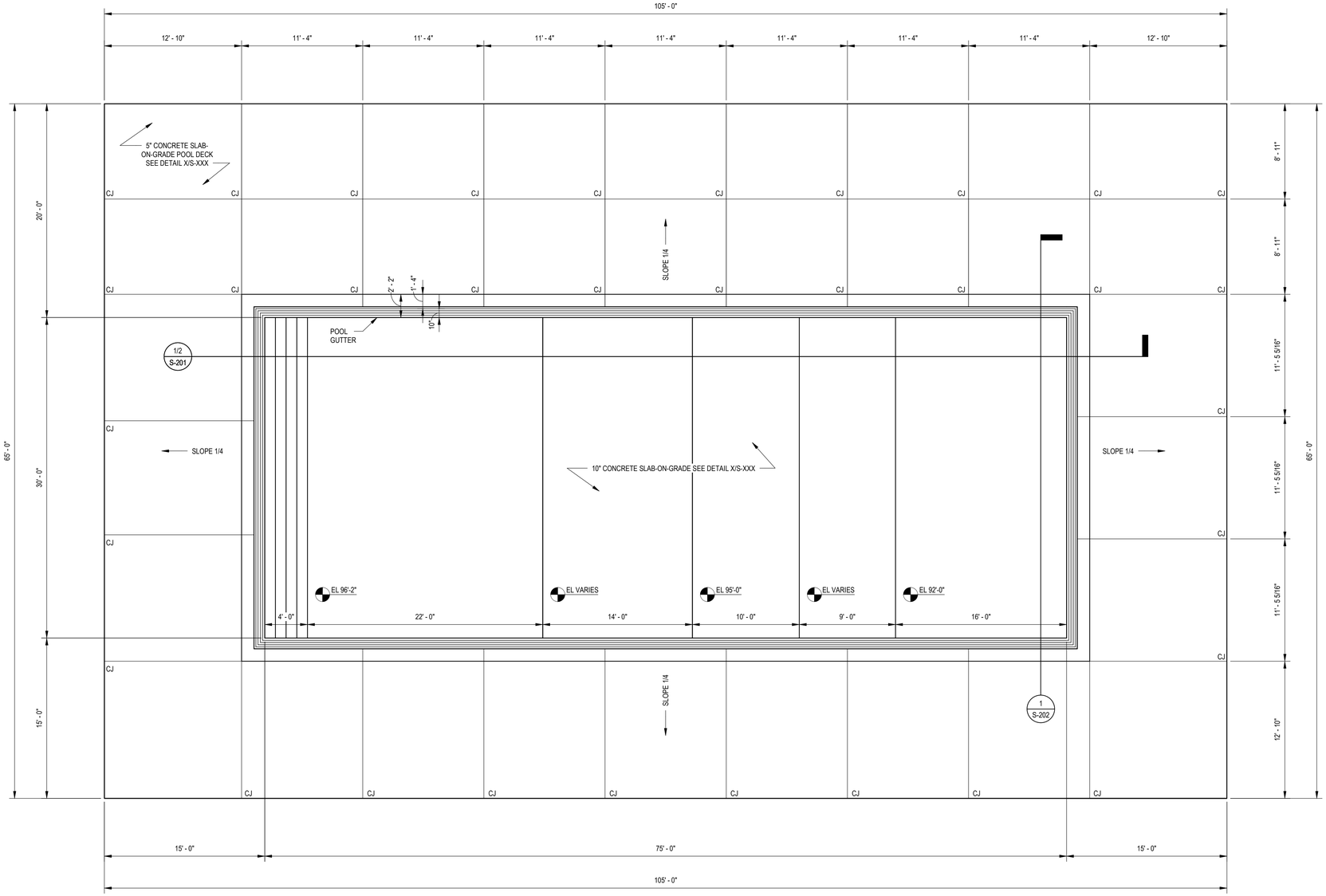
Drawn by: SMO

Checked by: RCA

Drawing Title: SCHEMATIC

Drawing No.: P-701

2/3/2025 1:30:30 PM



NOTES:

1. DATUM ELEVATION FOR PLAN IS AT 100'-0"
2. TOP OF POOL DECK ELEVATION AT 100'-0"
3. TOP OF POOL SLAB INDICATED ON PLAN.
2. CJ INDICATES LOCATION OF CONSTRUCTION OR CONTROL JOINT IN CONCRETE SLAB-ON-GRADE (POOL DECK). SEE DETAIL 1/S-501

1 / S-101 **FOUNDATION PLAN**

SCALE: 3/16" = 1'-0"

PLAN NORTH

0' 1' 2' 4' 8'

SCALE: 1/4" = 1'-0"

Key Plan

SCALE: X'-X"

NOT FOR CONSTRUCTION

No.	Revision	Date

Project Name

TOWN OF ONEONTA POOL

DELTA
ENGINEERS, ARCHITECTS, & SURVEYORS

Email: mail@delta-eas.com
www.delta-eas.com
CERTIFICATE OF AUTHORIZATION #: 019598

Seal

Phase: DOH-1309 SUBMISSION

Project No.: 2024.515.001

Date: 2025.02.03

Dsg By: KMH

Ckd By: NRN

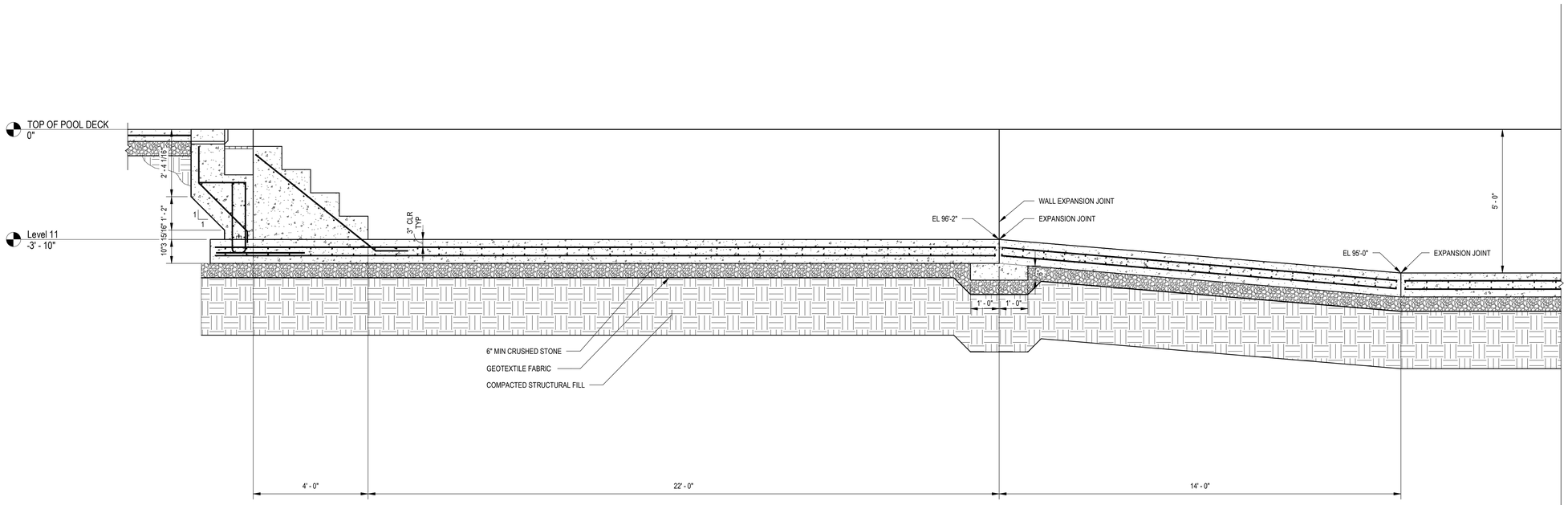
Drawing Title

FOUNDATION PLAN

Drawing No.

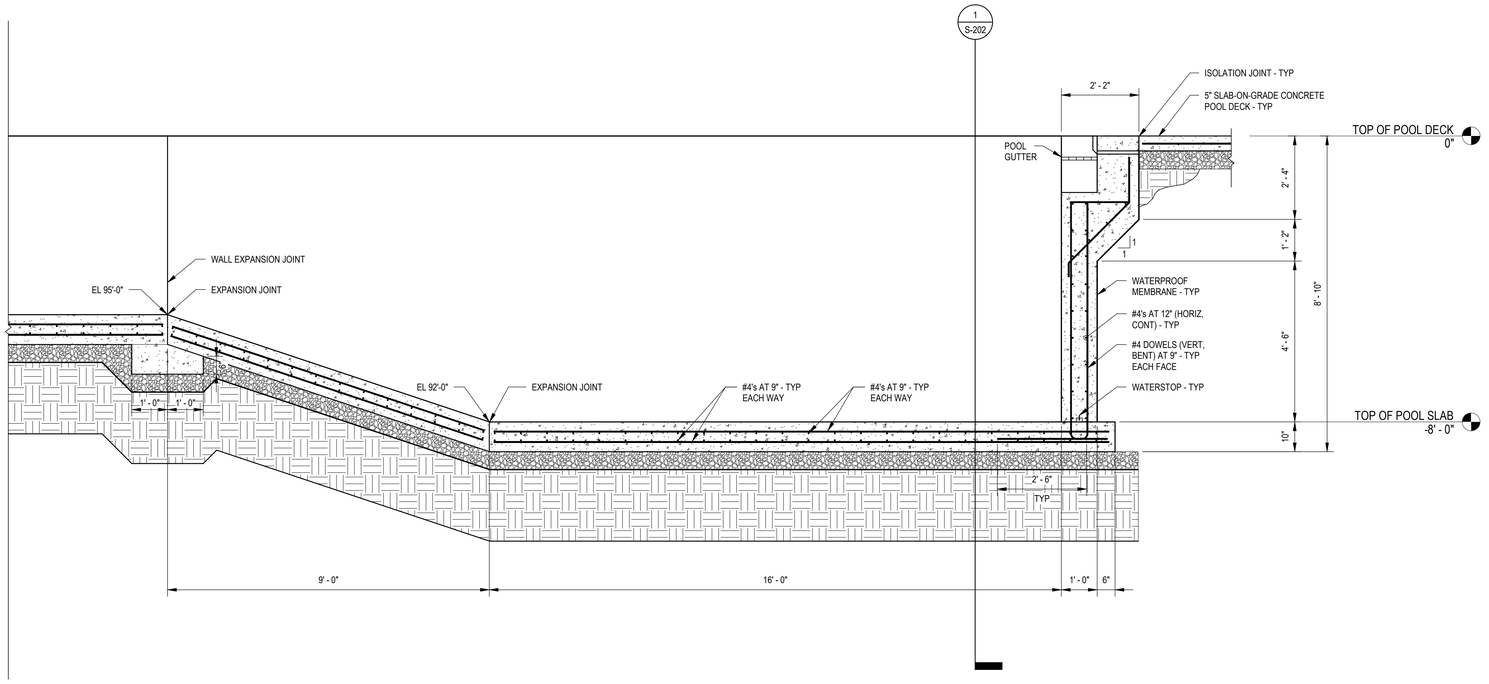
S-101

2/3/2025 1:26:02 PM



1 / S-201 **LONGITUDINAL SECTION 1**

SCALE: 1/2" = 1'-0"



2 / S-201 **LONGITUDINAL SECTION 2**

SCALE: 1/2" = 1'-0"

0' 6" 1' 2' 4'

SCALE: 1/2" = 1'-0"

Key Plan

SCALE: X'-X"

NOT FOR CONSTRUCTION

No.	Revision	Date

Project Name
TOWN OF ONEONTA POOL

DELTA
ENGINEERS, ARCHITECTS, & SURVEYORS

Email: mail@delta-eas.com
www.delta-eas.com
CERTIFICATE OF AUTHORIZATION #: 019598

Seal

Phase
DOH-1309 SUBMISSION

Project No.
2024.515.001

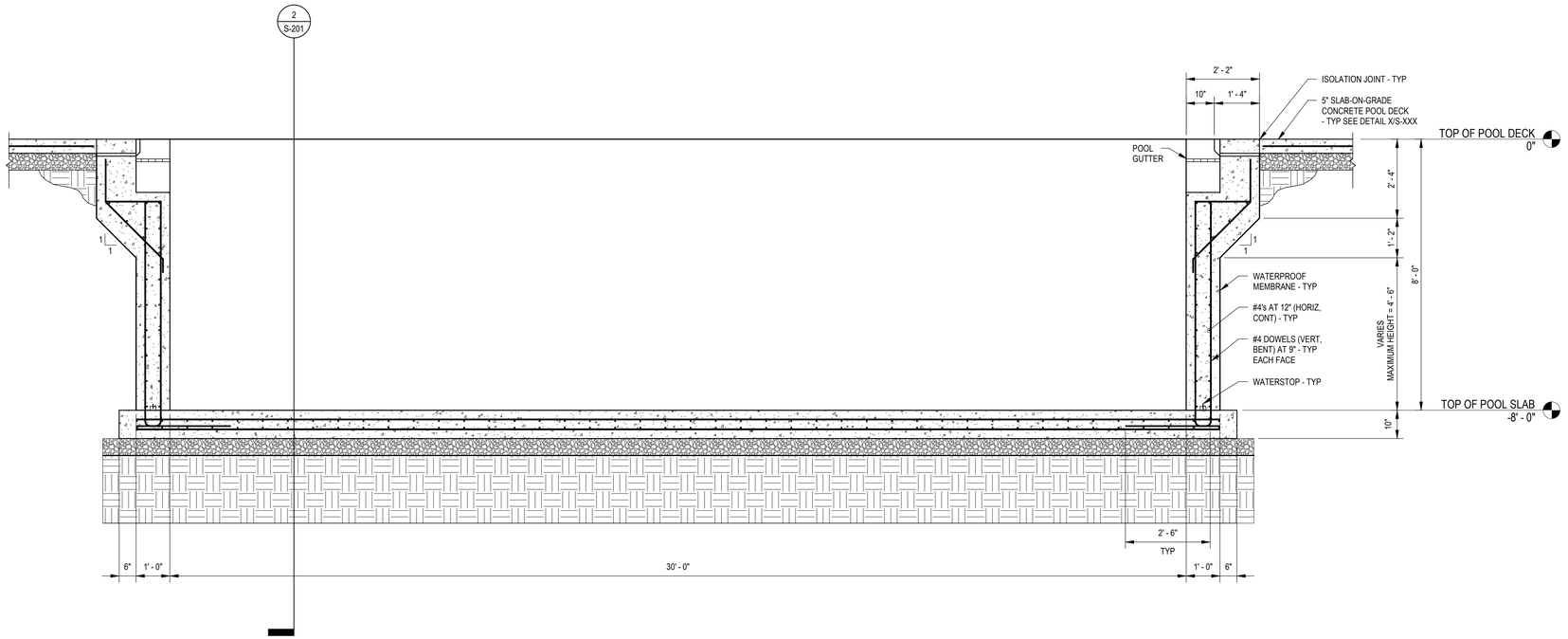
Date
2025.02.03

Dsg By	Ckd By
KMH	NRN

Drawing Title
ELEVATION

Drawing No.
S-201

2/3/2025 1:26:03 PM



1 S-202 **LATITUDINAL SECTION**

SCALE: 1/2" = 1'-0"

0' 6" 1' 2' 4'

SCALE: 1/2" = 1'-0"

Key Plan

SCALE: X'-X"

NOT FOR CONSTRUCTION

No.	Revision	Date

Project Name
TOWN OF ONEONTA POOL

DELTA
ENGINEERS, ARCHITECTS, & SURVEYORS

Email: mail@delta-eas.com
www.delta-eas.com
CERTIFICATE OF AUTHORIZATION #: 019598

Seal

Phase
DOH-1309 SUBMISSION

Project No.
2024.515.001

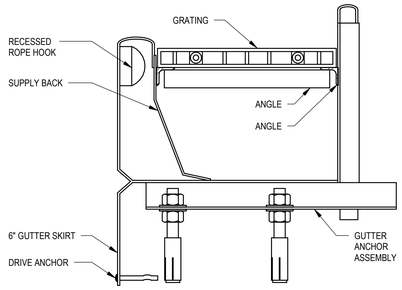
Date
2025.02.03

Dsg By	Ckd By
KMH	NRN

Drawing Title
ELEVATION

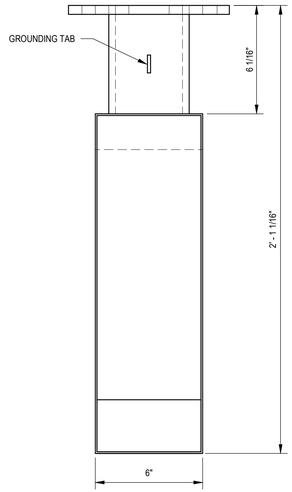
Drawing No.
S-202

2/3/2025 1:26:03 PM

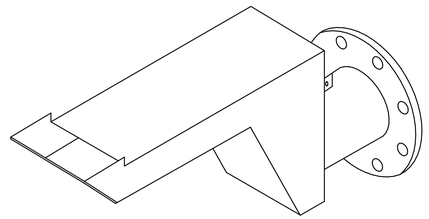


1 / S-501 **GUTTER ASSEMBLY**

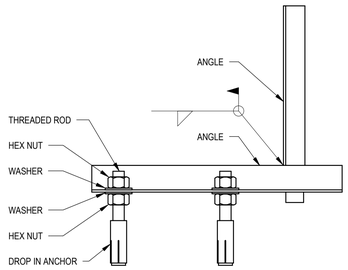
SCALE: 3" = 1'-0"



TOP VIEW

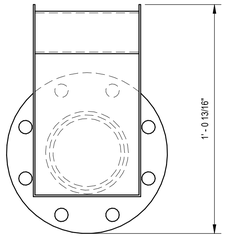


ISOMETIC VIEW

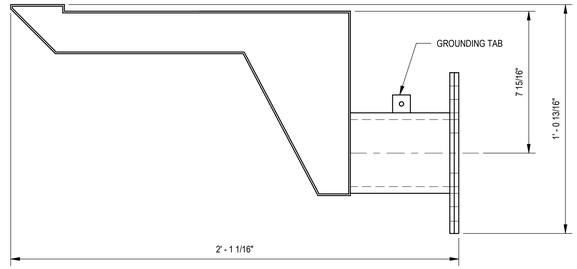


2 / S-501 **GUTTER ANCHOR ASSEMBLY**

SCALE: 3" = 1'-0"



FRONT VIEW



RIGHT ELEVATION

3 / S-501 **4" SS SUPPLY BOX**

SCALE: 3" = 1'-0"

0' 2" 4" 8"

SCALE: 3" = 1'-0"

Key Plan

SCALE: X'-X"

NOT FOR CONSTRUCTION

No.	Revision	Date

Project Name

TOWN OF ONEONTA POOL

DELTA
ENGINEERS, ARCHITECTS, & SURVEYORS

Email: mail@delta-eas.com
www.delta-eas.com
CERTIFICATE OF AUTHORIZATION #: 019598

Seal

Phase DOH-1309 SUBMISSION

Project No. 2024.515.001

Date 2025.02.03

Dsg By	Ckd By
KMH	NRN

Drawing Title

DETAILS

Drawing No.

S-501

2/3/2025 1:29:41 PM