

Swimming Pool and Wading Pool

PRPO20251217

TABLE OF CONTENTS

BASIS FOR DESIGN	2
POOL WALL ANALYSIS	3-5
STRUCTURAL DETAILS	See Plans

These calculations must be on site and made available by the Permittee for all inspections.

**City of Puyallup
Building
REVIEWED
FOR
COMPLIANCE**

BSnowden
09/22/2025
8:00:02 AM



03-21-25



Project: East Town Crossing
2902 E Pioneer
Puyallup, WA
Job No: 2252761

Date: March 21, 2025 Page: 2
Parcel No. 0420264053 & 0420264054
Contractor: Pleasure Pools & Spas
Engineer: Engineering Consultants Northwest Inc.

PRPO20251217

BASIS FOR DESIGN

BUILDING CODE: International Building Code, 2021
LOADS: Active Earth Pressure = 35 PCF (Equivalent Fluid Pressure)
CONCRETE: Minimum 28 Day Strength = 2500 psi
REINFORCING: Bars #5 and Larger; FY = 40000 psi
Bars #3 and Larger; FY = 40000 psi

ASSUMPTIONS

1. Pool full case is okay by inspection.
2. Bars placed in the center of the wall.
3. Lap splices in reinforcing bars
 - a. Non-contact splices shall have 2 inch minimum clear between bars.
 - b. Contact splices must be constructed with the bars aligned so that a line through the center of the two spliced bars is perpendicular to the surface of the concrete wall.

CASE ONE ANALYSIS

Analyze the pool shallow end:

$$\text{Vertical Wall Height} = 3.00 \text{ feet}$$

$$\text{Radius} = 2.00 \text{ feet}$$

$$\begin{aligned} \text{Simplified Conservative} & 3.00 \text{ feet} \\ \text{Depth Assumption:} & \frac{+2.00/2}{4.00} \text{ feet} \\ & 4.00 \text{ feet} \end{aligned}$$

$$\gamma h = 35 \text{ pcf (4.00 ft)} = 140.00 \text{ psf}$$

$$P = 140.00 \text{ psf (4.00 ft)(1/2)} = 280.0 \text{ plf}$$

$$y = 1/3 (4.00 \text{ ft}) = 1.33 \text{ ft}$$

$$M_A = 1.33 \text{ ft (280.00 ft)} = 373.2 \text{ lb-ft/ft}$$

Determine the Ultimate Moment M_U :

$$M_U = 1.7 (373.2 \text{ lb-ft/ft}) = 634.4 \text{ lb-ft/ft}$$

$$A_s = \text{Area of steel per foot for \#4 Bars at 12 inch spacing (A Bars)}$$

$$\text{Rebar Cross-Sectional Area} = 0.1963 \text{ square inches}$$

$$A_s = (0.1963 \text{ sq. inches}) (12 / 12) = 0.1963 \text{ square inches/ft}$$

$$a = \frac{A_s F_y}{0.85 f_c b} = \frac{(0.1963) (40000)}{0.85 (2500) (12)} = 0.3079 \text{ inches}$$

Determine the Allowable Moment ϕM_N :

$$\phi M_N = \phi A_s F_y (d - a/2) = 0.90 (0.1963) (40000) (3 - 0.3079 / 2) (1/12) = 1676.0 \text{ lb-ft/ft}$$

$$\phi M_N > M_U \quad 1676.0 > 634.4 \quad \text{OK}$$

Steel is acceptable for a wall height up to 5.00 feet

Steel is also acceptable for wading pools