TABLE 5—STAINLESS STEEL KWIK BOLT 3 ALLOWABLE TENSION AND SHEAR VALUES IN NORMAL-WEIGHT CONCRETE [in pounds)**

Anchor diameter (inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tension		f'c = 6,000 psi Tension		Shear[1]
		With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	
1/4	1 1/8	235	118	289	144	343	171	422	211	560
	2	493	247	567	283	640	320	785	392	599
	3	588	294	632	316	677	339	785	392	599
3/8	1 5/8	546	273	601	301	657	328	855	427	825
	2 1/2	1,170	585	1,301	650	1,432	716	1,716	858	1,451
	3 1/2	1,385	692	1,488	744	1,591	795	1,729	865	1,451
1/2	2 1/4	922	461	1,120	560	1,318	659	1,474	737	1,757
	3 1/2	1,313	657	1,800	900	2,288	1,144	2,413	1,207	2,702
	4 3/4	1,809	905	2,045	1,023	2,281	1,140	2,716	1,358	2,702
5/8	2 3/4	1,470	735	1,564	782	1,657	829	2,082	1,041	2,697
	4	2,210	1,105	2,609	1,304	3,008	1,504	3,959	1,979	4,283
	5 1/2	3,163	1,581	3,531	1,766	3,900	1,950	5,337	2,668	4,283
3/4	3 1/4	1,450	725	1,825	913	2,200	1,100	2,450	1,225	2,700
	4 3/4	2,350	1,175	2,990	1,495	3,625	1,813	4,375	2,188	4,225
	8	2,750	1,375	3,500	1,750	4,250	2,125	4,800	2,400	4,500
1	4 1/2	2,300	1,150	2,850	1,425	3,400	1,700	4,500	2,250	5,700
	6	3,740	1,870	4,930	2,465	6,120	3,060	6,875	3,438	7,000
	9	5,250	2,625	7,025	3,513	8,800	4,400	8,800	4,400	7,000

For SI: 1 inch=25.4mm, 1 psi=6.9 kPa, 1 lb=4.45 N.
'see Table 3 for footnotes.

TABLE 6—CARBON STEEL KWIK BOLT 3 ALLOWABLE TENSION AND SHEAR VALUES (in pounds), STRUCTURAL LIGHTWEIGHT CONCRETE**

Anchor diameter (inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tension		Shear[4]
		With Sp. Insp.[4]	Without Sp. Insp.	With Sp. Insp.[4]	Without Sp. Insp.	With Sp. Insp.[4]	Without Sp. Insp.	
1/4	1 1/8	275	138	337	169	399	200	397
	2	594	297	665	333	737	368	397
3/8	1 5/8	586	293	686	343	787	393	889
	2 1/2	1,119	560	1,339	670	1,560	780	1,255
1/2	2 1/4	1,049	524	1,284	642	1,519	759	1,745
	3 1/2	1,810	905	2,048	1,024	2,286	1,143	1,867
5/8	2 3/4	1,560	780	1,815	908	2,071	1,035	2,578
	4	2,483	1,242	2,828	1,414	3,172	1,586	3,151
3/4	3 1/4	1,922	961	2,242	1,121	2,562	1,281	3,834
	4 3/4	3,037	1,519	3,996	1,998	4,955	2,477	4,701

For SI: 1inch=25.4 mm, 1lbf=4.45 N, 1 psi=6.9 kPa.
'The tabulated tension values are lor anchors installed in structural lightweight aggregale concrete having the minimum indicated compressive strength at the time of installation. Concrele aggregate shall comply with ASTM C 330.
'Allowable loads or applied loads may be modified in accordance with Section 5.5 of Ihis reporl due to short-lerm wind or seismic loads.
[3]These lension values are only applicable when anchors arb inslalled with special inspeclion in accordance with Seclion 4.3 of this report.
[4]The tabulaled shear values are for anchors installed in structural lightweighl concrete having a minimum2,000 psi compressive strength al (he time of installation. The concrete aggregale shall comply with ASTM C330.

TABLE 7—STAINLESS STEEL KWIK BOLT 3 ALLOWABLE TENSION AND SHEAR VALUES (in pounds), STRUCTURAL LIGHTWEIGHT CONCRETE'"

Anchor diameter (inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tension		Shear[4]
		With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	
1/4	1 1/8	245	122	301	150	357	179	547
	2	509	254	584	292	660	330	599
3/8	1 5/8	562	281	623	311	684	342	825
	2 1/2	920	460	1,198	599	1,476	738	1,258
1/2	2 1/4	951	475	1,155	578	1,359	680	1,757
	3 1/2	1,354	677	1,853	926	2,351	1,176	2,702
5/8	2 3/4	1,471	736	1,607	804	1,744	872	2,697
	4	2,301	1,151	2,717	1,358	3,132	1,566	4,219

For SI: 1inch=25.4 mm, 1lbf=4.45 N, 1 psi=6.9 kPa.
'See Table 6 for footnotes.

TABLE 3—CAREON STEEL KWIK BOLT 3 ALLOWABLE TENSION AND SHEAR VALUES IN NORMAL-WEIGHT CONCRETE (in pounds)[1,2,4]

Anchor diameter (Inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tension		f'c = 6,000 psi Tension		Shear[4]
		With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	
1/4	1 1/8	276	138	338	169	399	200	510	255	449
	2	594	297	669	335	745	372	766	383	449
	3	661	331	714	357	766	383	766	383	449
3/8	1 5/8	678	339	846	423	1,013	506	1,013	506	1,062
	2 1/2	1,179	590	1,424	712	1,669	835	1,846	923	1,255
	3 1/2	1,450	725	1,560	780	1,669	835	1,846	923	1,255
1/2	2 1/4	1,049	524	1,284	642	1,519	759	1,853	927	1,745
	3 1/2	1,810	905	2,048	1,024	2,286	1,143	3,035	1,518	1,867
	4 3/4	2,000	1,000	2,207	1,103	2,414	1,207	3,083	1,541	1,832
5/8	2 3/4	1,766	883	1,898	949	2,029	1,015	2,601	1,300	2,578
	4	2,469	1,235	2,805	1,402	3,141	1,570	3,825	1,912	3,324
	5 1/2	3,079	1,539	3,462	1,731	3,845	1,923	4,992	2,496	3,324
3/4	3 1/4	1,949	974	2,230	1,115	2,510	1,255	3,475	1,738	3,834
	4 3/4	3,007	1,503	3,956	1,978	4,905	2,452	5,714	2,857	4,701
	6 1/2	4,173	2,087	5,369	2,685	6,565	3,283	6,565	3,283	4,701
1	4 1/2	2,930	1,465	3,650	1,825	4,375	2,188	4,360	2,180	6,625
	6	3,990	1,995	5,310	2,655	6,625	3,313	7,875	3,938	8,625
	9	6,040	3,020	7,050	3,525	8,055	4,028	10,000	5,000	8,625

For SI: 1 inch=25.4 mm, 1 psi=6.9 kPa, 1 lbf=4.45 N

[1]The tabulated lension values are for Kwik Bolt 3 inslalled in stone aggregale normal weight concrete having the tabulaled compressive slrenglh at the Ume of installation. Concrele aggregale shall comply with ASTM C 33.

[2]Allowable loads or applied loads may be modified in accordance with Section 5.5 of Ihir report due lo short-lerm wind or seismic loads.

[3]These lension values are only applicable when anchors are inslalled wlth special inspeclion in accordance with Section 4.3 of Ihis report.

[4]The tabulaled shear values are lor Kwik Boll 3 installed in normal-weight concrete having a minimum 2,000 psi compressive slrenglh at the time of installation. Concrele aggregale shall comply with ASTM C 33.

TABLE 4—HOT-DIPPED GALVANIZED KWIK BOLT 3 ALLOWABLE TENSION AND SHEAR VALUES IN NORMAL-WEIGHT CONCRETE [in pounds)[1,2]

Anchor diameter (inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tension		f'c = 6,000 psi Tension		Shear[4]
		With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	
1/2	2 1/4	1,055	528	1,185	592	1,314	657	1,553	776	1,673
	3 1/2	1,775	887	1,983	991	2,191	1,095	2,912	1,456	1,745
	4 3/4	2,078	1,039	2,373	1,187	2,669	1,334	3,375	1,687	1,745
5/8	2 3/4	1,639	820	1,803	902	1,967	984	2,522	1,261	2,690
	4	2,363	1,182	2,929	1,464	3,495	1,747	4,900	2,450	3,324
	5 1/2	3,163	1,581	3,778	1,889	4,394	2,197	5,327	2,663	3,324
3/4	3 1/4	2,175	1,088	2,344	1,172	2,513	1,257	2,597	1,298	3,834
	4 3/4	3,463	1,732	4,037	2,019	4,612	2,306	5,387	2,694	4,701
	6 1/2	4,794	2,397	5,442	2,721	6,089	3,044	6,956	3,478	4,701

For SI: 1 inch=25.4 mm, 1 psi=6.9 kPa, 1 lb=4.45 N

[1]See Table 3 for footnotes.

TABLE 2—ANCHOR SPACING AND EDGE DISTANCE REQUIREMENTS[9]

DESCRIPTION		ANCHOR DIAMETER (in.)																	
		1/4			3/8			1/2			5/8			3/4			1		
Embedment: minimum/nominal/deep (in.)		1 1/8	2	3	1 5/8	2 1/2	3 1/2	2 1/4	3 1/2	4 3/4	2 3/4	4	5 1/2	3 1/4	4 3/4	6 1/2	4 1/2	6	9
NORMAL-WEIGHT CONCRETE[1,7]																			
Spacing required to obtain maximum load S_{cr} (in.)	Tension Shear	2 1/2	4 1/2	5	3 5/8	5 5/8	5 3/4	5 1/8	7 7/8	7 7/8	6 1/4	9	9 1/8	7 3/8	10 3/4	10 3/4	10 1/8	13 1/2	15
Minimum allowable spacing between anchors S_{min} (in.)	Tension[3] Shear[4]	1 1/8	2	3	1 5/8	2 1/2	3 1/2	2 1/4	3 1/2	4 3/4	2 3/4	4	5 1/2	3 1/4	4 3/4	6 1/2	4 1/2	6	9
Edge distance required to obtain maximum load C_{cr} (in.)	Tension	2	3 1/2	3 7/8	2 7/8	4 3/8	4 1/2	4	6 1/8	6 1/8	4 7/8	7	7	5 3/4	8 3/8	8 3/8	7 7/8	10 1/2	11 1/2
	Shear	3 3/8	3 3/8	3 3/8	4 7/8	4 7/8	4 7/8	6 3/4	6 3/4	6 3/4	8 1/4	8 1/4	8 1/4	9 3/4	9 3/4	9 3/4	13 1/2	13 1/2	13 1/2
Minimum allowable edge distance C_{min} (in.)	Tension[5]	1 1/8	2	3	1 5/8	2 1/2	3 1/2	2 1/4	3 1/2	4 3/4	2 3/4	4	5 1/2	3 1/4	4 3/4	6 1/2	4 1/2	6	9
	Shear[6]	1 3/4	1 3/4	1 3/4	2 1/2	2 1/2	2 1/2	3 3/8	3 3/8	3 3/8	4 1/8	4 1/8	4 1/8	4 7/8	4 7/8	4 7/8	6 3/4	6 3/4	6 3/4
STRUCTURAL LIGHTWEIGHT CONCRETE[2,7,8]																			
Spacing required to obtain maximum load S_{cr} (in.)	Tension Shear	3 3/8	6	6 5/8	4 7/8	7 1/2	7 3/4	6 3/4	10 1/2	10 1/2	8 1/4	12	12 1/8	9 3/4	14 1/4	14 1/2	13 1/2	18	19 7/8
Minimum allowable spacing between anchors S_{min} (in.)	Tension[3] Shear[4]	1 1/2	2 5/8	4	2 1/8	3 3/8	4 5/8	3	4 5/8	6 3/8	3 5/8	5 3/8	7 3/8	4 3/8	6 3/8	8 5/8	6	8	12
Edge distance required to obtain maximum load C_{cr} (in.)	Tension	2 5/8	4 5/8	5 1/8	3 3/4	5 7/8	6	5 1/4	8 1/8	8 1/8	6 3/8	9 3/8	9 3/8	7 5/8	11 1/8	11 1/8	10 1/2	14	15 3/8
	Shear	4 1/2	4 1/2	4 1/2	6 1/2	6 1/2	6 1/2	9	9	9	11	11	11	13	13	13	18	18	18
Minimum allowable edge distance C_{min} (in.)	Tension[5]	1 1/2	2 5/8	4	2 1/8	3 3/8	4 5/8	3	4 5/8	6 3/8	3 5/8	5 3/8	7 3/8	4 3/8	6 3/8	8 5/8	6	8	12
	Shear[6]	2 1/4	2 1/4	2 1/4	3 1/4	3 1/4	3 1/4	4 1/2	4 1/2	4 1/2	5 1/2	5 1/2	5 1/2	6 1/2	6 1/2	6 1/2	9	9	9

For SI: 1 inch = 25.4 mm, 1 lb = 4.45 N.

[1]Data in this section of the table and the footnotes apply to Tables 3, 4, and 5 for normal weight concrete.
[2]Data in this section of the table and the footnotes apply to Tables 6, 7, and 10 for lightweight concrete.
[3]When using S_{min} for a load in tension, reduce allowable load by 40%.
[4]When using S_{min} for a load in shear, reduce allowable load by 10%.
[5]When using C_{min} for a load in tension, reduce allowable load by 20%.
[6]When using C_{min} for a load in shear, reduce allowable load by 50%.
[7]For edge and anchor spacings between minimum and critical values, allowable loads may between linearly interpolated between the allowable loads at minimum and critical spacings.
[8]Anchor and edge spacing guidelines may be divided by 1.13 for sand lightweight concrete.
[9]Load reductions are multiplied when considering simultaneous reductions due to C_{min} and S_{min}.

Design of Connections; back wall at floor.

$V := R_2$ $V = 1.445 \times 10^3\ lbf$ $Num := 6$

$V_U := LF_H \cdot R_2 \cdot \frac{L}{Num \cdot ft}$ $V_U = 5.393 \times 10^3\ lbf$ $P_u := V_U \cdot \frac{1.25 \cdot in}{\quad}$ $P_u = 4.494\ kip$

$L_p := 3 \cdot in$ 3" x 3" x 3/8" thick plate w/ (2) 1/2" diameter x 3" long headed studs.

$l_e := 3 \cdot in - \frac{5}{16} \cdot in$ $d_b := 0.5 \cdot in$ $l_e = 2.687\ in$ $x := 1.5 \cdot in$ $y := 1.5 \cdot in$

$d_h := 1 \cdot in$ $A_b := \pi \cdot d_b^2 \cdot 0.25$ $A_b = 0.196\ in^2$ $f_y := 50000 \cdot psi$ $d_e := 8.25 \cdot in$

Tensile capacity of multiple headed studs in floor using punching shear (PCI 6.5.2.1)

$A_{long} := \frac{x + (x + 2 \cdot l_e)}{2} \cdot l_e$ $A_{short} := \frac{y + (y + 2 \cdot l_e)}{2} \cdot l_e$ $A_{long} = 11.254\ in^2$ $A_{short} = 11.254\ in^2$

$A_{slope} := 2 \cdot (A_{long} + A_{short})$ $A_{slope} = 45.016\ in^2$

$A_{flat} := x \cdot (d_h + y)$ $A_{flat} = 3.75\ in^2$

$\phi P_c := \phi_v \cdot \frac{2}{3} \cdot psi \cdot \sqrt{\frac{f'_c}{psi}} \cdot (2.8 \cdot A_{slope} + 4 \cdot A_{flat})$ $\phi P_c = 4.987 \times 10^3\ lbf$

Tensile capacity of multiple headed studs in floor using steel yield.

$\phi P_y := 4 \phi_m \cdot A_b \cdot f_y$ $\phi P_y = 3.534 \times 10^4\ lbf$

Concrete govers.

Shear capacity of multiple headed studs due to concrete strength.

$\phi V'_c := \left(\phi_v \cdot 12.5 \cdot ft^{\frac{1}{2}} \cdot d_e^{1.5} \cdot \sqrt{\frac{f'_c}{psi}} \cdot psi \right)$ $\phi V'_c = 5.442 \times 10^4\ lbf$

$C_w := 1 + \frac{1.5 \cdot in}{\quad}$ $C_w = 1.052$ $C_c := 1.0$

$C_t := \frac{t_{floor}}{1.3 \cdot d_e}$ $C_t = 0.559$

$\phi V_c := C_w \cdot C_c \cdot C_t \cdot \phi V'_c$ $\phi V_c = 3.202 \times 10^4\ lbf$

Shear capacity of multiple headed studs to to steel strength

$\phi V_y := \phi_m \cdot 0.9 f_y \cdot A_b \cdot 2$ $\phi V_y = 1.59 \times 10^4\ lbf$

Oldcastle Precast, Inc.

Project: Peaks Island Public Toilet
Product: 14' x 11'-6" x 8'-9" Panel Building
Customer: Portland P.W.
Date: 3/29/2005

Geometry

$L := 14 \cdot ft$ $W := 10 \cdot ft + 10 \cdot in$ $H := 8 \cdot ft + 9 \cdot in$ L, W & H are exterior dimensions.

$t_{roof} := 6 \cdot in$ $t_{floor} := 6 \cdot in$ $t_{w1} := 6 \cdot in$ $t_{w2} := 8 \cdot in$ $t_{para} := 6 \cdot in$

$S_x := L - t_{w1}$ $S_y := W - t_{w1} - t_{w2}$ $S_z := H - t_{floor} - t_{roof}$

Material Properties

Reinforcing to be ASTM A615 Grade 60 Deformed Billet Reinforcing Bars.

$f'_c := 5000 \cdot psi$ $f_y := 60000 \cdot psi$ $\gamma_c := 150 \cdot \frac{lbf}{ft^3}$ $c_c := 1 \cdot in$ except on surfaces in contact with earth (1 1/4")

Design Parameters

- ACI 318-02 Building Code Requirements for Structural Concrete
- International Building Code 2003 including 2004 supplements.
- ASCE 7-02 Minimum Design Loads for Buildings and Other Structures

Loading

$w_{Lr} := 100 \cdot \frac{lbf}{ft^2}$ From IBC 2003 table 1607.1 Occupancy 40. Yards and terraces, pedestrians

$w_{snow} := 50 \cdot \frac{lbf}{ft^2}$ From IBC 2003 Figure 1608.2

$w_{Lf} := 100 \cdot \frac{lbf}{ft^2}$

STATE OF MAINE
JOEL M. DICKINSON
NO. 10874
REGISTERED PROFESSIONAL ENGINEER
3/17/2005

Soil Properties

$\gamma_d := 120 \cdot \frac{lbf}{ft^3}$ $k := 0.4$ For structural design execpt parapet.

$H_{cover} := 2.1 \cdot ft$ $k_a := 0.33$ For stability check and parapet design.

Ground water assumed to be below bottom of foundation.

Load Factors (Per ACI 318-02)

$LF_H := 1.6$ $LF_D := 1.2$ $LF_L := 1.6$

Strength Reduction Factors (Per ACI 318-02)

$\phi_m := 0.9$ $\phi_v := 0.75$

Top Slab Desiqn (Use Plate Case I 0 **from PCA** "Desiqn of Rectangular Concrete **Tanks")**

$w_d := \gamma_c \cdot t_{roof}$ $w_d = 75\ \frac{lbf}{A}$ $k := \frac{S_x}{S_y}$ $k = 1.397$ use b/a from design of concrete tanks as 1.5.

Design Coefficients

$K_{My} := 45$ $K_{Mx} := 63$

$w_u := LF_D \cdot w_d + LF_H \cdot (H_{cover} \cdot \gamma_d) + LF_L \cdot (w_{Lr} + w_{snow})$ $w_u = 733.2\ \frac{lbf}{ft^2}$

$M_{ux} := \frac{K_{Mx} \cdot w_u \cdot S_y^2}{1000} \cdot b$ $M_{ux} = 51.796\ kip \cdot in$

$M_{uy} := \frac{K_{My} \cdot w_u \cdot S_y^2}{1000} \cdot b$ $M_{uy} = 36.997\ kip \cdot in$

$B_1 := 4$ $D_{b1} := \frac{B_1}{8} \cdot in$ $A_{b1} := \frac{\pi \cdot D_{b1}^2}{4}$ $S_1 := 9 \cdot in$ $A_{s1} := \frac{A_{b1} \cdot 12 \cdot in}{S_1}$ $A_{s1} = 0.262\ in^2$

$S_2 := 12 \cdot in$ $A_{s2} := \frac{A_{b1} \cdot 12 \cdot in}{S_2}$ $A_{s2} = 0.196\ in^2$

$d_{eff1} := t_{roof} - c_c - \frac{D_{b1}}{2}$ $d_{eff1} = 4.75\ in$ $d_{eff2} := d_{eff1} - D_{b1}$ $d_{eff2} = 4.25\ in$

$a := \frac{A_{s1} \cdot f_y}{0.85 \cdot b \cdot f'_c}$ $a = 0.308\ in$ $\phi M_{nx} := \phi_m \cdot A_{s1} \cdot f_y \cdot \left(d_{eff1} - \frac{a}{2}\right)$ $\phi M_{nx} = 64.974\ kip \cdot in$

$a_y := \frac{A_{s2} \cdot f_y}{0.85 \cdot b \cdot f'_c}$ $a_y = 0.231\ in$ $\phi M_{ny} := \phi_m \cdot A_{s2} \cdot f_y \cdot \left(d_{eff2} - \frac{a_y}{2}\right)$ $\phi M_{ny} = 43.838\ kip \cdot in$

$V_u := w_u \cdot \left(\frac{S_y}{2} - d_{eff1}\right) \cdot b$ $V_u = 3.254\ kip$

$\phi V_c := \phi_v \cdot 2 \cdot psi \cdot \sqrt{\frac{f'_c}{1 \cdot psi}} \cdot b \cdot d_{eff1}$ $\phi V_c = 6.046\ kip$

Backwall Design (Design wall to span from floor to **ceiling only - conservative)**

$P_1 := k \cdot \gamma_d \cdot (H_{cover} + t_{roof})$ $P_1 = 124.8 \frac{lbf}{ft^2}$ Lateral Pressure at top of wall.

$P_2 := k \cdot \gamma_d \cdot (H_{cover} + H - t_{floor})$ $P_2 = 496.8 \frac{lbf}{ft^2}$ Lateral Pressure at bottom *of* wall.

$W_a := \frac{P_1 + P_2}{2} \cdot S_z \cdot b$ $W_a = 2.409 \times 10^3 lbf$ Total Lateral Pressure per foot *of* wall (Resultant).

$c := \frac{S_z \cdot (2 \cdot P_2 + P_1)}{3 \cdot (P_2 + P_1)}$ $c = 4.648\ ft$ Location of Resultant force from lateral pressure.

$R_2 := \frac{c \cdot W_a}{S_z}$ $R_2 = 1.445 \times 10^3 lbf$ $R_1 := W_a - R_2$ $R_1 = 964.1\ lbf$ Reactions

$V_0 := R_1$ $m := k \cdot \gamma_d$ $m = 48 \frac{lbf}{ft^3}$ Slope of force diagram.

$x := 0.5 \cdot ft$

$f(x) := \frac{m \cdot x^2}{2} \cdot b + P_2 \cdot x \cdot b - R_2$

$x_{v0} := root(f(x), x)$ $x_{v0} = 3.499\ ft$ Location of shear equal to zero for determination *of* maximum moment.

$M_2 := \frac{R_2 \cdot x_{v0}}{2}$ $M_2 = 30.331\ kip \cdot in$ Maximum moment.

$M_u := LF_H \cdot M_2$ $M_u = 48.53\ kip \cdot in$ Ultimate Design Moment.

$B_2 := 4$ $D_{b2} := \frac{B_2}{8} \cdot in$ $A_{b2} := \frac{\pi \cdot D_{b2}^2}{4}$ $S_2 := 12 \cdot in$ $A_{s2} := \frac{A_{b2} \cdot 12 \cdot in}{S_2}$ $A_{s2} = 0.196\ in^2$

$d_{eff2} := t_{w1} - c_c - \frac{D_{b2}}{2}$ $d_{eff1} = 4.75\ in$

$a := \frac{A_{s2} \cdot f_y}{0.85 \cdot b \cdot f'_c}$ $a = 0.231\ in$ $\phi M_{n2} := \phi_m \cdot A_{s2} \cdot f_y \cdot \left(d_{eff2} - \frac{a}{2}\right)$ $\phi M_{n2} = 49.139\ kip \cdot in$

$P_v := P_2 - m \cdot d_{eff2}$ $P_v = 477.8 \frac{lbf}{ft^2}$

$V_u := R_2 - \frac{P_2 + P_v}{2} \cdot b \cdot d_{eff2}$ $V_u = 1.252\ kip$ Ultimate Shear

$\phi V_c := \phi_v \cdot 2 \cdot psi \cdot \frac{1}{1\ psi} \cdot b \cdot d_{eff2}$ $\phi V_c = 6.046\ kip$ Allowable Shear

Since sidewalls are half covered by soil and front wall only has wind, backwall governs.

Bottom Slab Design

Design bottom slab as though all force from top slab and walls transfers to bottom slab and is directed upwards due to contact with CIP foundation slab. In addition; design area on East side of slab to support slab live load over **5'** clear pit under slzb (downward bending).

$W_{top} := (14.ft + 4.in) \cdot 11.ft \cdot t_{roof} \cdot \gamma_c$ $W_{top} = 1.183 \times 10^4$ lbf

$W_{para} := t_{para} \cdot 2.ft \cdot (14.ft + 4.in + 7.ft + 2.in + 10.5.ft) \cdot \gamma_c$ $W_{para} = 4.8 \times 10^3$ lbf

$W_{walls} := [(10.ft + 10.in) \cdot 14.ft - 13.ft \cdot (9.ft + 8.in)] \cdot 7.75.ft \cdot \gamma_c$ $W_{walls} = 3.022 \times 10^4$ lbf

$W_{soil} := (14.ft + 2.in) \cdot 11.ft \cdot H_{cover} \cdot \gamma_d$ $W_{soil} = 3.927 \times 10^4$ lbf

$W_{st} := W_{top} + W_{para} + W_{walls}$ $W_{st} = 4.685 \times 10^4$ lbf

$W_{snow} := w_{snow} \cdot (14.ft + 2.in) \cdot 11.ft$ $W_{snow} = 7.792 \times 10^3$ lbf

$W_{live} := w_{Lr} \cdot (14.ft + 2.in) \cdot 11.ft$ $W_{live} = 1.558 \times 10^4$ lbf

$W_U := LF_L \cdot (W_{live} + W_{snow}) + LF_H \cdot W_{soil} + LF_D \cdot W_{st}$ $W_U = 1.565 \times 10^5$ lbf

$$w_u := \frac{W_U}{14.ft \cdot 10.83.ft - (5.ft)^2} \qquad w_u = 1.2367 \cdot 10^3 \ \frac{lbf}{ft^2}$$

Floor **Slab Upward Bending** - Use PCA table from top slab for design.

$$M_{ux} := \frac{K_{Mx} \cdot w_u \cdot S_y^{\,2}}{1000} \cdot b \qquad M_{ux} = 87.255\ \text{kip} \cdot \text{in}$$

$$M_{uy} := \frac{K_{My} \cdot w_u \cdot S_y^{\,2}}{1000} \cdot b \qquad M_{uy} = 62.349\ \text{kip} \cdot \text{in}$$

$B_1 := 4 \qquad D_{b1} := \frac{B_1}{8} \cdot \text{in} \qquad A_{b1} := \frac{\pi \cdot D_{b1}^{\,2}}{4} \qquad S_1 := 6 \cdot \text{in} \qquad A_{s1} := \frac{A_{b1} \cdot 12 \cdot \text{in}}{S_1} \qquad A_{s1} = 0.393\ \text{in}^2$

$S_2 := 9 \cdot \text{in} \qquad A_{s2} := \frac{A_{b1} \cdot 12 \cdot \text{in}}{S_2} \qquad A_{s2} = 0.262\ \text{in}^2$

$d_{eff1} := t_{floor} - c_c - \frac{D_{b1}}{2} \qquad d_{eff1} = 4.75\ \text{in} \qquad d_{eff2} := d_{eff1} - D_{b1} \qquad d_{eff2} = 4.25\ \text{in}$

$a := \frac{A_{s1} \cdot f_y}{0.85 \cdot b \cdot f_c} \qquad a = 0.462\ \text{in} \qquad \phi M_{nx} := \phi_m \cdot A_{s1} \cdot f_y \cdot \left(d_{eff1} - \frac{a}{2} \right) \qquad \phi M_{nx} = 95.829\ \text{kip} \cdot \text{in}$

$a_y := \frac{A_{s2} \cdot f_y}{0.85 \cdot b \cdot f} \qquad a_y = 0.308\ \text{in} \qquad \phi M_{ny} := \phi_m \cdot A_{s2} \cdot f_y \cdot \left(d_{eff2} - \right. \qquad \phi M_{ny} = 57.906\ \text{kip} \cdot \text{in}$

$$V_u := w_u \cdot \left(\frac{S_y}{2} - d_{eff1} \right) \cdot b \qquad V_u = 5.483\ \text{kip}$$

$$\phi V_c := \phi_v \cdot 2 \cdot \text{psi} \cdot \sqrt{\frac{f_c}{1 \cdot \text{psi}}} \cdot b \cdot d_{eff1} \qquad \phi V_c = 6.046\ \text{kip}$$

Floor **Slab** Downward **Bending**

$w_{Lf} = 100 \frac{lbf}{ft^2}$ $w_{floor} := t_{floor} \cdot \gamma_c$ $w_{floor} = 75\ ft \frac{lbf}{ft^3}$

$w_u := \left(LF_L \cdot w_{Lf} + LF_D \cdot w_{floor}\right)$ $w_u = 250 \frac{lbf}{ft^2}$

$M_u := \frac{w_u \cdot (5 \cdot ft)^2}{8} \cdot b$ $M_u = 9.375 kip \cdot in$

$B_1 := 4$ $D_{b1} := \frac{B_1}{8} \cdot in$ $A_{b1} := \frac{\pi \cdot D_{b1}^2}{4}$ $S_1 := 12 \cdot in$ $A_{s1} := \frac{A_{b1} \cdot 12 \cdot in}{S_1}$ $A_{s1} = 0.196\ in^2$

$d_{eff1} := t_{floor} - c_c - \frac{D_{b1}}{2}$ $d_{eff1} = 4.75\ in$

$a := \frac{A_{s1} \cdot f_y}{0.85 \cdot b \cdot f_c}$ $a = 0.231\ in$ $\phi M_{nx} := \phi_m \cdot A_{s1} \cdot f_y \cdot \left(d_{eff1} - \frac{a}{2}\right)$ $\phi M_{nx} = 49.139 kip \cdot in$

12 inch spacing on bottom mat is okay each way, this will cover temperature and shrinkage.

Parapet Design

$P_l := k_a \cdot H_{cover} \cdot \gamma_d$ $\quad P_l = 83.16 \frac{lbf}{ft^2}$

$P_{sur} := k_a \cdot \gamma_d \cdot 2 \cdot ft$ $\quad P_{sur} = 79.2 \frac{lbf}{ft^2}$

$M := \left(\frac{P_l \cdot H_{cover}^2}{6} + \frac{P_{sur} \cdot H_{cover}^2}{2} \right) \cdot b$ $\quad M = 2.829\,kip \cdot in$

$M_u := LF_H \cdot M$ $\quad M_u = 4.527\,kip \cdot in$

$t_{para} = 6\,in$ $\quad c_{para} := 1.25 \cdot in$

$B := 4$ $\quad D_b := \frac{B}{8} \cdot in$ $\quad A_b := \frac{\pi \cdot D_b^2}{4}$ $\quad S := 12 \cdot in$ $\quad A_s := \frac{A_b \cdot b}{S}$ $\quad A_s = 0.196\,in^2$

$d_{eff} := t_{para} - c_{para} - \frac{D_b}{2}$ $\quad d_{eff} = 4.5\,in$ $\quad a := \frac{A_s \cdot f_y}{0.85 \cdot b \cdot f'_c}$ $\quad a = 0.231\,in$

$\phi M_n := \phi_m \cdot A_s \cdot f_y \cdot \left(d_{eff} - \frac{a}{2} \right)$ $\quad \phi M_n = 46.488\,kip \cdot in$

$V_U := LF_H \cdot \left(\frac{P_l}{2} + P_{sur} \right) \cdot H_{cover} \cdot b$ $\quad V_U = 405.821\,lbf$

$\phi V_c := \phi_v \cdot 2 \cdot psi \cdot \sqrt{\frac{f'_c}{psi}} \cdot b \cdot d_{eff}$ $\quad \phi V_c = 5.728 \times 10^3\,lbf$

This is to certify that the quality control procedures of

Superior Concrete Co

Auburn, Maine

were audited during an on-site plant inspection.
This facility has successfully met the requirements stated in the NPCA Quality Control Manual

Participation in the NPCA Plant Certification Program affirms an ongoing commitment to producing quality precast concrete products. This includes a dedication to continuous improvement in product design, raw materials, manufacturing processes, safety, employee education and customer service.

This certificate is valid August 8, 2004 through August 8, 2005 pending successfully passing an unannounced re-inspection during that time.

NPCA

Vernon C. Wehrung, Chairman of the Board

Ty E. Gable, NPCA President

Paul D. Krauss, Wiss, Janney, Elstner Associates Inc.

RE: SPECIAL INSPECTIONS / QUALITY ASSURANCE / PRECAST PUBLIC TOILET

5.23.05

Whitten + Winkelman, Architects

Date: 4-11-05

Project:

Transmittal

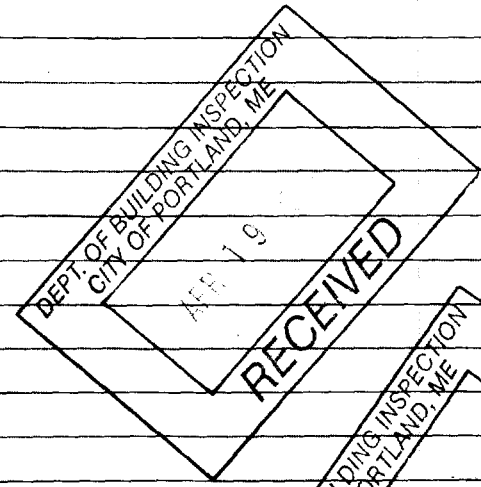
To: BOB COOK @ DPW - CITY OF PORTLAND

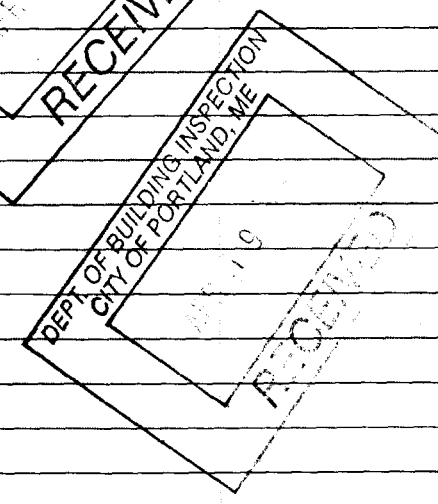
From: WILL WINKELMAN x102

Re: PEAKS PUBLIC TOILET

No.	Date	Description
	4.4.05	PERMIT / CONSTRUCTION SET
*		+ MISC FIXTURE + SPEC. SHEETS

Remarks:





CC:

COVER SHEET: MISC FIXTURE + SPEC CUTS.

37 Silver Street Portland, ME 04112 • p: 207.774.0111 • f: 207.774.1668 • www.ww-architects.com

Redlon & Johnson

COMMERCIAL DEPARTMENT FAX TRANSMITTAL SHEET

TO: ROBERT GROVER	FROM: JIM WATTS
COMPANY: CITY OF PORTLAND	DATE: 2/24/2005
FAX NUMBER: 874-8473	TOTAL NO. OF PAGES INCLUDING COVER: 6
PHONE NUMBER: 874-8508	RE: SPEC

☐ URGENT ☑ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

ROBERT,
ANY QUESTIONS PLEASE GIVE ME A CALL.

THANKS,

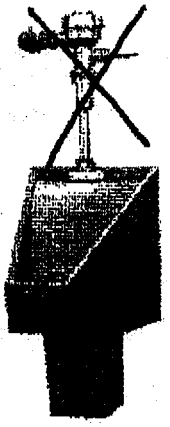
REDLON & JOHNSON
172-174 ST. JOHN STREET
PORTLAND,ME 04104
PHONE # 1-(207)-773-4755
COMMERCIAL FAX # 1-(207)-773-3589

PLUMBING SUPPLIER .....

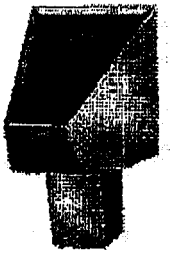
Penal-Ware®

1707 Series

Straddle - Washout Urinal - ADA Compliant



1707-T-1-FV



1707-W-1

Fixture May Show Some Available Options

Please visit *www.acorneng.com* for most current specifications.

Straddle - Washout Urinal - ADA Compliant

Fixture is arranged to be installed on finished wall and serviced from an accessible pipe chase. Optional Wall Sleeve or Metal Template is recommended for all installations for required wall openings. Unit conforms with ANSI, UFAS and ADA requirements for accessibility. Compliance is subject to the interpretation and requirements of the local code authority. Fixture is fabricated from 14 gage, type 304 stainless steel and is seamless welded construction. Exterior has a satin finish. Interior has a matte finish. Fixture is back wall washdown type, and is optionally available with a continuous flushing rim that washes all four walls. Corners are coved to facilitate cleaning. P-trap is fully enclosed. Back of fixture is sound-deadened with fire-resistant material. There are no accessible voids or crevices where contraband can be concealed.

Urinal is washout type. Flushing connection is 3/4" NPT male. Bottom is sloped to an integrally welded high capacity stainless steel beehive dome strainer. P-trap has a minimum of 2" seal.

Mounting Hardware is furnished for walls up to 8" thick.

GUIDE SPECIFICATION

Provide and install Acorn Penal-Ware Straddle - Washout Urinal (specify model number and options). Urinal shall be back wall washdown type. Fixture shall be fabricated from 14 gage, type 304 stainless steel and shall have coved corners to facilitate cleaning. Bottom shall be sloped to an integrally welded high capacity stainless steel beehive dome strainer. Construction shall be seamless welded and exterior surfaces shall have a satin finish. P-trap shall be fully enclosed. Fixture shall be furnished with necessary fasteners for proper installation. Units to conform with ANSI, UFAS and ADA requirements for accessibility.

STAINLESS ACORN 3 C

Acorn Engineering Company • 15125 Proctor Avenue • P.O. Box 3527 • City of Industry, CA 91744-0527 U.S.A.
Tel: (800) 488-8999 • (626) 336-4561 • Fax: (626) 961-2200 • www.acorneng.com • E-mail: info@acorneng.com

Penal-Ware®: 1707 Straddle-Washout Urinal - ADA Compliant

WALL THICKNESS AND TYPE (Must Specify)
Thickness _____ Type: __ Concrete __ Block __ Steel

MODEL NUMBER AND OPTIONS SELECTION

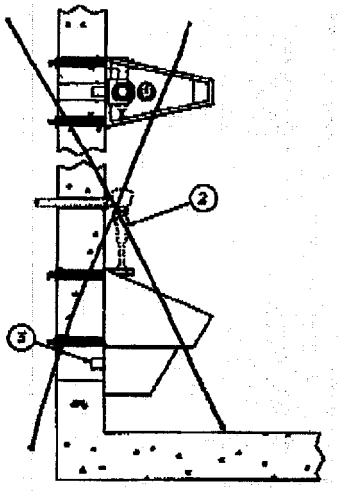
BASE MODEL NUMBER
●-1707 Straddle - Washout Urinal

SUPPLY (Must Specify)
☐-T Top (Exposed)
●-W Wall (Concealed)

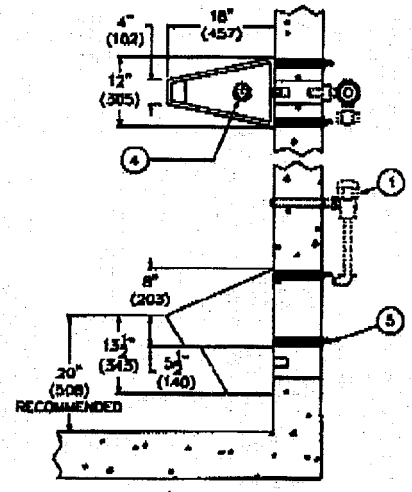
FIXTURE MOUNTING AND WASTE (Must Specify)
●-1 Off-Floor, Wall Outlet

Product Options
●-ADA ADA Compliant - 17" Rim Height
●-CFR Continuous Flushing Rim
☐-EG Enviro-Glaze, Specify Color:_____
☐-FV Flush Valve __ 1.0 GPF __ 1.5 GPF
☐-FVC Flush Valve Cover
(w/ Flush Valve)__1.0 GPF__1.5 GPF
☐-FVT Flush Valve Thru Wall Connector
☐-MT Metal Template (Only 1 Required Per Project)
●-SW Wall Sleeve
☐-TW2 Thru-Wall Waste Connection with Cleanout

Please visit *www.acorneng.com* for most current specifications.



1707-T-1



1707-W-1

NOTES:
1. Optional -FV Flush Valve - Wall Supply.
2. Optional -FV Flush Valve - Top Supply.
3. Urinal Waste Outlet.
4. Beehive Strainer.
5. Wall Mounting Hardware.

Important: Installation instructions and current rough-in are furnished with each fixture. Do not rough in without certified dimensions.

Selection Summary	Approved for Manufacturing
Model No. & Option_____	Company_____ Title_____
Quantity_____	Signature_____ Date_____

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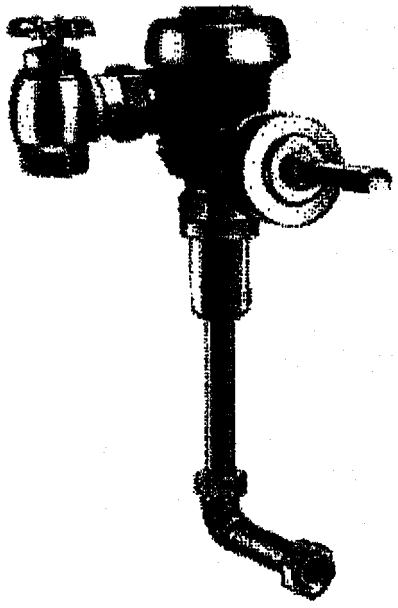
2 of 3 STAINLESS URINAL



Regal Pro™ Model Flushometer

~~195~~
195-1
~~195-0.5~~

Description
Concealed Urinal Flushometer, for ¾" back spud urinals.

Flush Cycle
☐ Model 195 Water Saver (1.5 gpf/5.7 Lpf)
☑ Model 195-1 Low Consumption (1.0 gpf/3.8 Lpf)
☐ Model 195-0.5 (0.5 gpf/1.9 Lpf)

Specifications
Quiet, Concealed, Diaphragm Type, Rough Brass Urinal Flushometer for either left or right hand supply with the following features:

- PERMEX™ Synthetic Rubber Diaphragm with Linear Filtered Bypass with Vortex Cleansing Action™
- ADA Compliant Metal Oscillating Handle
- ¾" I.P.S. Wheel Handle Bak-Chek™ Angle Stop
- Adjustable Tailpiece
- Vacuum Breaker
- Elbow Flush Connection and Spud Coupling for ¾" Concealed Back Spud
- Sweat Solder Adapter
- High Copper, Low Zinc Brass Castings for Dezincification Resistance
- Non-Hold-Open Handle and No External Volume Adjustment to Ensure Water Conservation
- Low Consumption Flush Accuracy Controlled by Para-Flo™ Technology
- Diaphragm, Handle Packing, Stop Seat and Vacuum Breaker to be Molded from PERMEX™ Rubber Compound for Chloramine Resistance
- Exposed Parts Chrome Plated

Valve Body, Cover, Tailpiece and Control Stop shall be in conformance with ASTM Alloy Classification for Semi-Red Brass. Valve shall be in compliance to the applicable sections of ASSE 1037, ANSI/ASME 112.18.6, and Military Specification V-29193.

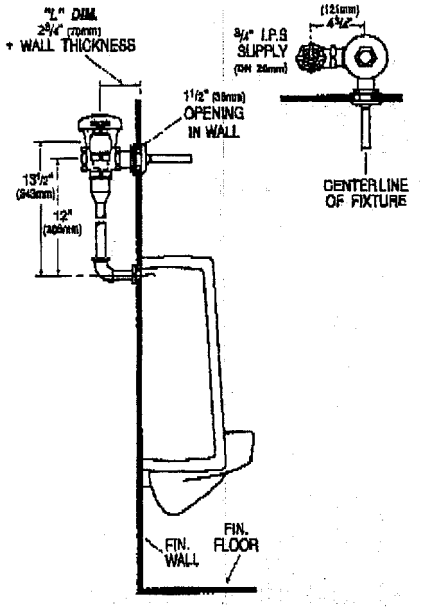
L Dimension
Specify the "L" Dimension for the proper length of the Handle Assembly and Flush Connection. The "L" Dimension is equal to the Wall Thickness (to the nearest whole inch) plus 2 ¾" (70 mm).

Variations
[redacted]

See Accessories Section of the Sloan catalog for details on these and other Flushometer variations.

CSA® Certified ICC® Listed by I.A.P.M.O.

This space for Architect/Engineer approval



The information contained in this document is subject to change without notice.

SLOAN.

Made in the U.S.A.

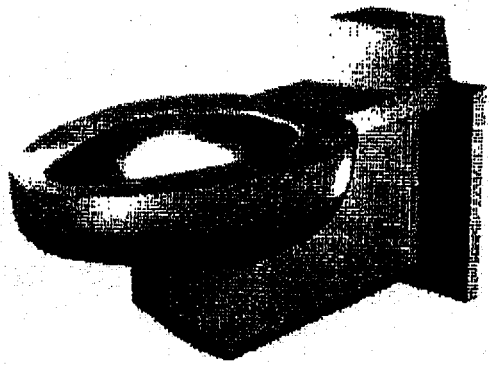
SLOAN VALVE COMPANY • 10500 SEYMOUR AVE. • FRANKLIN PARK, IL. 60131
Ph: 1-800-9-VALVE-9 or 1-847-671-4300 • Fax: 1-800-447-8329 or 1-847-671-4380
http://www.sloanvalve.com

URINAL VALVE
1 of 3

Penal-Ware®

1680 Series

Siphon Jet Toilet - Off-Floor



1680-W-1

Fixture May Show Some Available Options

Please visit *www.acorneng.com* for most current specifications.

1 of 3 STAINLESS TOILET

Siphon Jet Toilet - Off-Floor

Fixture is arranged to be installed on finished wall and serviced from an accessible pipe chase. Optional Wall Sleeve or Metal Template is recommended for all installations for required wall openings. Fixture is fabricated from 14 gage, type 304 stainless steel and is seamless welded construction. Wall flange is structurally reinforced. Exterior is polished to a satin finish, except for the integral contoured toilet seat, which has a sanitary high polish finish. The inside of the toilet bowl has a matte finish. There are no accessible voids or crevices where contraband can be concealed.

Toilet is a siphon jet type with an elongated bowl manufactured to ANSI 112.19.2M requirements and requires a minimum of 25 PSI flow pressure. Toilet uses a water consumption of 1.6 gallons per flush or less. Trap has a minimum 3-1/2" seal and will pass a 2-1/8" ball. Toilet waste outlet is 2-3/8" diameter plain end.

Regularly Furnished items include mounting hardware for walls up to 8" thick.

GUIDE SPECIFICATION

Provide and install Acorn Penal-Ware Siphon Jet Toilet (specify model number and options). Fixture shall be fabricated from 14 gage, type 304 stainless steel. Construction shall be seamless welded and exposed surfaces shall have a satin finish, except the integral contoured seat which shall have a sanitary high polish finish. Toilet shall be concealed siphon jet type with an elongated bowl and a self-draining flushing rim. Toilet shall meet ANSI 112.19.2M requirements, using an average water consumption of 1.6 gallons per flush or less. Toilet trap shall have a minimum 3-1/2" seal that shall pass a 2-1/8" diameter ball and be fully enclosed. Fixture shall withstand loadings of 3,000 pounds without permanent damage. Fixture shall be furnished with necessary fasteners for proper installation.

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Penal-Ware®: 1680 Siphon Jet Toilet - Off-Floor

WALL THICKNESS AND TYPE (Must Specify)
Thickness _____ Type: __ Concrete __ Block __ Steel

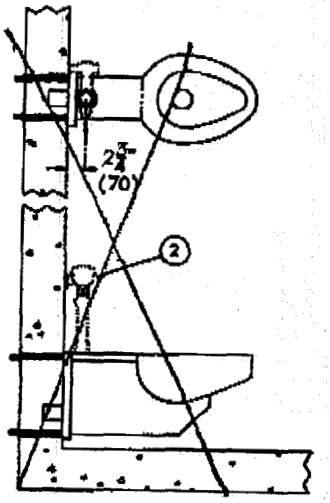
MODEL NUMBER AND OPTIONS SELECTION
BASE MODEL NUMBER
● -1680 Siphon Jet Toilet

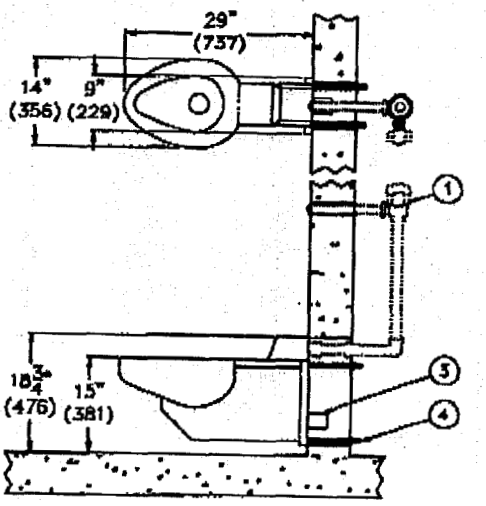
SUPPLY (Must Specify)
☐ -T Top (Exposed)
● -W Wall (Concealed)

FIXTURE MOUNTING AND WASTE (Must Specify)
● -1 Off-Floor, Wall Outlet

Product Options
● -ADA ADA Compliant - 18" Integral Seat Height
☐ -CO1 Cleanout w/O-Ring, Connecting to No-Hub__ 3"__ 4"
☐ -EG Enviro-Glaze, Specify Color:_____
☐ -FT Flood-Trol (Manual Reset)
☐ -FTA Flood-Trol Auto-reset
☐ -FTE Flood-Trol Electronic
☐ -FV Flush Valve __ 1.6 GPF __ 3.5 GPF
☐ -FVC Flush Valve Cover (w/ Flush Valve)__1.6 GPF__3.5 GPF
☐ -FVT Flush Valve Thru Wall Connector
☐ -GW Gasketed Toilet Waste
☐ -HS Hinged Seat
☐ -MT Metal Template (Only 1 Required Per Project)
☐ -PC Pinned Cleanout Plug
☐ -PH Paper Holder (Available Only with -FVC)
● -SW Wall Sleeve
☐ -TG 12-Gage Cabinet
☐ -TSC Toilet Shipping Cover
☐ -WO3 3" Toilet P-Trap (3.5 GPF Only)

Please visit *www.acorneng.com* for most current specifications.





NOTES:
1. Optional -FV Flush Valve - Wall Supply.
2. Optional -FV Flush Valve - Top Supply.
3. Toilet Waste Outlet.
4. Wall Mounting Hardware.

Important: Installation instructions and current rough-in are furnished with each fixture. Do not rough in without certified dimensions.
Dimensions are subject to manufacturer's tolerance of plus or minus 1/4" and change without notice. Acorn assumes no responsibility for use of void or superseded data.

Selection Summary
Model No. & Option_____
Quantity_____

Approved for Manufacturing
Company_____ Title_____
Signature_____ Date_____

 Revised: 9/10/03

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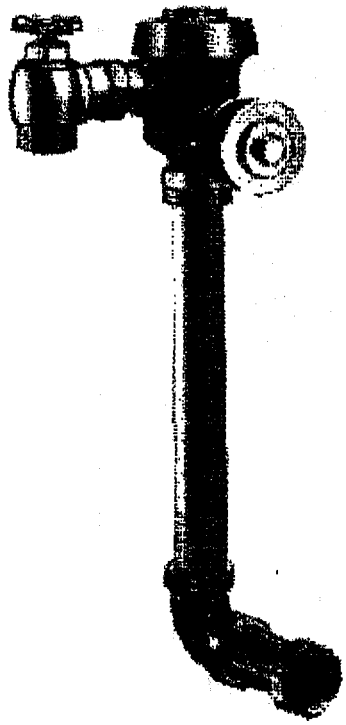
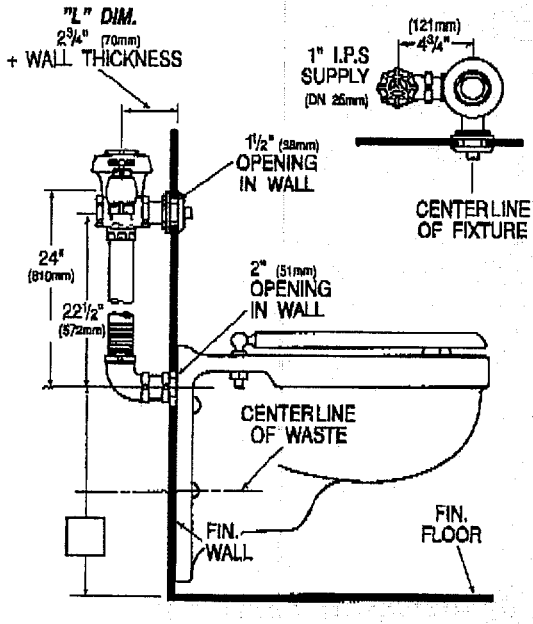
Tel: (800) 488-8999 • (626) 336-4561 • Fax: (626) 961-2200 • www.acorneng.com • E-mail: info@acorneng.com

2 of 3 STANDARDS Manual

Royal® Model Flushometer

~~152~~
152-1.6





Description
Concealed Water Closet Flushometer, for wall hung back spud bowls.

Flush Cycle
[redacted]
☐ Model 152-1.6 Low Consumption (1.6 gpf/6.0 Lpf)

Specifications
Quiet, Concealed, Diaphragm Type, Rough Brass Closet Flushometer for either left or right hand supply with the following features:

- PERMEX™ Synthetic Rubber Diaphragm with Dual Filtered Fixed Bypass
- Metal Direct Acting, Non-Hold-Open Push Button with Triple Seal Handle Packing
- 1" I.P.S. Wheel Handle Bak-Chek™ Angle Stop
- Adjustable Tailpiece
- Sweat Solder Adapter
- Elbow Flush Connection for 1½" Concealed Back Spud
- Exposed parts Chrome Plated
- High Copper, Low Zinc Brass Castings for Dezincification Resistance
- Non-Hold-Open Push Button, Fixed Metering Bypass and No External Volume Adjustment to Ensure Water Conservation
- Flush Accuracy Controlled by CID™ Technology
- Diaphragm, Handle Packing, Stop Seat and Vacuum Breaker to be molded from PERMEX™ Rubber Compound for Chloramine Resistance

Valve Body, Cover, Tailpiece and Control Stop shall be in conformance with ASTM Alloy Classification for Semi-Red Brass. Valve shall be in compliance to the applicable sections of ASSE 1037, ANSI/ASME 112.19.6, and Military Specification V-29193.

L Dimension
Specify the "L" Dimension for the proper length of the Push Button Assembly and Flush Connection. The "L" Dimension is equal to the Wall Thickness (to the nearest whole inch) plus 2¾" (70 mm).

Variations
[redacted]

See Accessories Section of the Sloan catalog for details on these and other Flushometer variations.

® Certified ® Listed by I.A.P.M.O.

This space for Architect/Engineer approval

The information contained in this document is subject to change without notice.

SLOAN.

Made in the U.S.A.

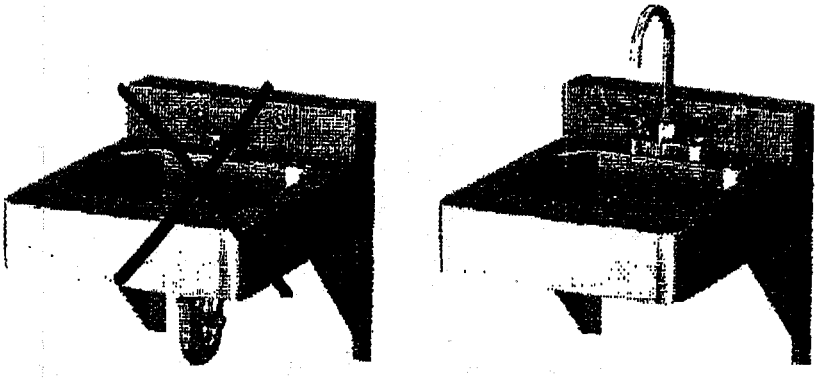
SLOAN VALVE COMPANY • 10500 SEYMOUR AVE. • FRANKLIN PARK, IL. 60131
Ph: 1-800-9-VALVE-9 or 1-847-671-4300 • Fax: 1-800-447-8329 or 1-847-671-4380
http://www.sloanvalve.com

Royal 152 S.S. — Rev. 1 (12/01)

3 of 3 TOILET VALVES

Dura-Ware® 1953 Series

18" Lavatory - ADA Compliant



1953-ADA-1-~~CMS-4-GT-TPT~~ | 1953-ADA-1-CSG

Fixture May Show Some Available Options

Please visit *www.acorneng.com* for most current specifications.

18" Lavatory - ADA Compliant

Fixture is designed to be installed and serviced on the front side of a finished wall. The fixture is fabricated from 16 gage, type 304 stainless steel and is seamless welded construction. Exterior has a satin finish. Unit conforms with ANSI, UFAS and ADA requirements for accessibility. Compliance is subject to the interpretation and requirements of the local code authority.

Lavatory Rectangular Bowl is 14" x 12" x 5" deep. The deck has an integral, self-draining soap dish. The lavatory has a 1-5/8" diameter drain hole to receive optional suffix -GE or -GT grid strainer. Lavatory angle braces and fasteners for securing the braces to the lavatory are furnished, unless option -LC is specified. Wall fasteners by others.

Lavatory Valves (ADA compliant) available are:

1. Air control pushbutton valves using atmospheric air; metering non-hold open type. Timing is from 5 to 60 seconds. Air control valves can be remotely located up to 10 feet from the operating pushbutton.

2. Electronic valve system using Modular Valve Controller for water metering through precise electronic control of a solenoid valve. Valve timing is from 1 second to 9 minutes. Modular Valve Controller can be remotely located up to 100 feet from the operating pushbutton.

3. Centerset with gooseneck spout and wristblade handles, suffix -CSG.

Regularly furnished are angle braces and fasteners. Mounting screws and anchor shields are furnished by others.

GUIDE SPECIFICATION

Provide and install an Acorn Dura-Ware, 18" wide ADA Compliant Lavatory (specify model number and options). Fixture shall be fabricated from heavy gage, type 304 stainless steel. Construction shall be seamless welded with a satin finish exterior. Lavatory deck shall have an integral air-circulating, self-draining soap dish. Lavatory angle braces and fasteners shall be furnished by manufacturer(Except With -LC Option). Installation shall be made in accordance with manufacturer's recommendation and details. Units to conform with ANSI, UFAS and ADA requirements for accessibility.

Acorn Engineering Company • 15125 Proctor Avenue • P.O. Box 3527 • City of Industry, CA 91744-0527 U.S.A.
Tel: (800) 488-8999 • (626) 336-4561 • Fax: (626) 961-2200 • www.acorneng.com • E-mail: info@acorneng.com

LAV
1953-CSG
1953-ADA-1

Dura-Ware®: 1953 18" Lavatory - ADA Compliant

WALL THICKNESS AND TYPE (Must Specify)
Thickness _____ Type _____

MODEL NUMBER AND OPTIONS SELECTION

BASE MODEL NUMBER
● 1953 ADA 18" x 22" Handicapped Lavatory

FIXTURE MOUNTING AND WASTE (Must Specify)
● -1 Off-Floor, Wall Outlet

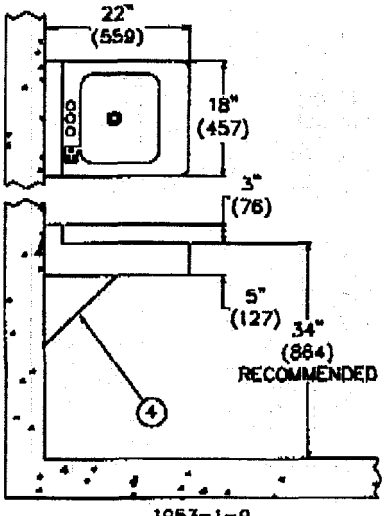
BUBBLER OR SPOUT SELECTION (Must Specify)
● -CSG Centerset with Gooseneck Spout and Wrist Blade Handles
☐ -DMS Deck Mounted Spout

VALVE SELECTION (Must Specify)
☐ -3 Air-Control, Single Temperature
☐ -4 Air-Control, H & C
● -9 Without Valves
(Standard Punching is (3) 1-5/16" Diameter Holes for 4" Centers)
☐ -EVS1 Electronic Valve System - Single Temp
☐ -EVS2 Electronic Valve System - Hot & Cold
☐ -MVC1 Time-Trol - Single Temp
☐ -MVC2 Time-Trol - Hot & Cold

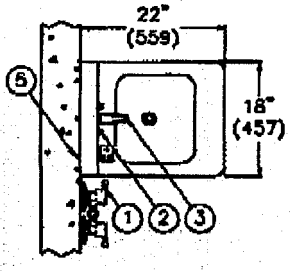
DECK PUNCHING
☐ -H1 Single Hole Centered
☐ -H24 Two Holes 4" Centered
☐ -H28 Two Holes 8" Centered
☐ -H38 Three Holes 8" Centerset

Product Options
☐ -EE Elbow Enclosure
☐ -EG Enviro-Glaze Color, Specify:_____
☐ -FG 14 Gage Housing
☐ -GE Grid Strainer w/Close Elbow 1-1/4"
☐ -GT Grid Strainer w/Tailpiece 1-1/4"
☐ -LC Lavatory Carrier - Makes Unit 20" Wide (Punched Only, Carrier Not Provided)
☐ -MA Manifolded Valve __2
● -OF Lavatory Overflow
☐ -TE Trap Enclosure (Conceals Air-control Valve)
● -TPT Tubular P-Trap 1-1/4" x 1-1/2"

Please visit *www.acorneng.com* for most current specifications.



1953-1-9



1953-1-DMS-4

NOTES:
1. Optional -4 Air-Control Valve.
2. Lavy Valve Pushbuttons.
3. Optional -DMS Deck Mounted Spout.
4. Standard Angle Brace.
5. Wall Mounting Anchors (By Others).

Important: Installation instructions and current rough-in are furnished with each fixture. Do not rough in without certified dimensions.

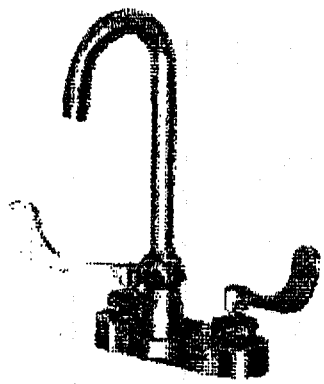
Selection Summary	Approved for Manufacturing
Model No. & Option_____	Company_____ Title_____
Quantity_____	Signature_____ Date_____

Acorn Engineering Company • 15125 Proctor Avenue • P.O. Box 3527 • City of Industry, CA 91744-0527 U.S.A.
Tel: (800) 488-8999 • (626) 336-4561 • Fax: (626) 961-2200 • www.acorneng.com • E-mail: info@acorneng.com

ZURN — 4" CENTERSET GOOSENECK

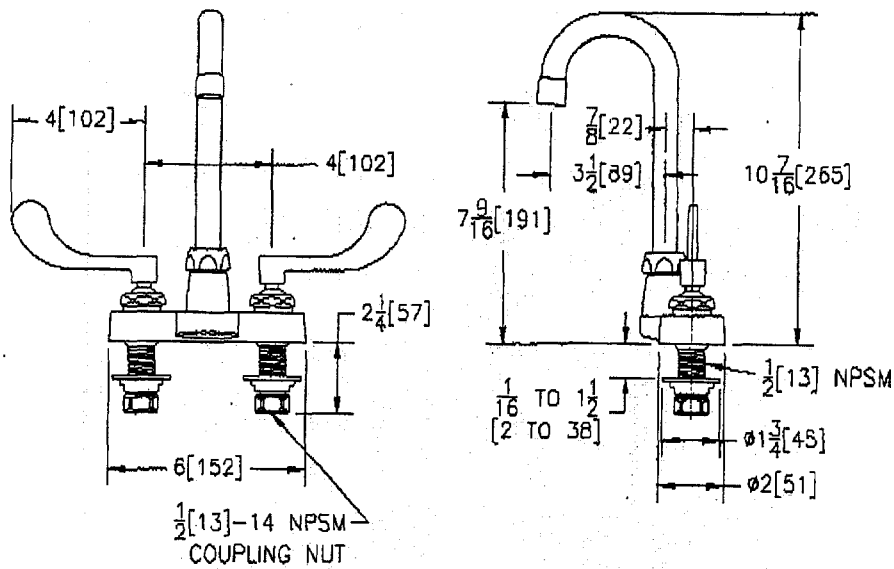
Z-812A4

TAG _____



Engineering Specifications: Zurn AquaSpec® Z-812A4
Polished chrome-plated cast brass faucet body with integral shanks, quarter turn ceramic disc cartridges and a 3-1/2" [89mm] centerline rigid or swing gooseneck spout. Unit is furnished with a 2.0 GPM [7.6 L] variable orifice aerator (complying with ANSI A112.18.1 Standard for flow), 4" [102mm] vandal-resistant color-coded brass wrist blade handles, mounting hardware and 1/2" [13mm] NPSM coupling nuts for standard lavatory risers.

ADA DESIGNED



Note: *All dimensions are for reference only. Do not use for pre-plumbing*

OPTIONAL ACCESSORIES

Suffix	Description
___ -C	2.0 GPM [7.6 L] Laminar Flow Control in Base of Spout
___ -G	1-1/4" [32mm] Grid Strainer Drain
___ -GH	1-1/4" [32mm] Offset Handicap Grid Drain
___ -P	1-1/4" [32mm] Pop-up Drain
___ -PT	1-1/4" [32mm] Cast Brass P-Trap with a 7-1/2" [191mm] Long 17-Gauge Wall Bend
___ -2F	2.0 GPM [7.6 L] Vandal-Resistant Female Aerator
___ -3F	0.5 GPM [1.9 L] Vandal-Resistant Female Aerator
___ -4F	2.0 GPM [7.6 L] Vandal-Resistant Female Laminar Flow
___ -5F	2.0 GPM [7.6 L] Female Spray Outlet
___ -14	2.5 GPM [9.5 L] Vandal-Resistant Female Aerator

ZURN INDUSTRIES, INC. ♦ COMMERCIAL BRASS OPERATION ♦ 2855 GIRTS ROAD ♦ JAMESTOWN NY 14701
Phone: 1-716-665-1132 ♦ Fax: 1-716-665-1135 ♦ World Wide Web: www.zurn.com
In Canada: ZURN INDUSTRIES LIMITED ♦ 3544 Nashua Drive ♦ Mississauga, Ontario L4V1L2 ♦ Phone: 905/405-8272 Fax: 905/405-1292

Rev. E Date: 11/20/00 C.N. No. 86533
Dwg. No. 60762 Product No. Z-812A4

3 of 3 LAV. FAUCET

ZURN

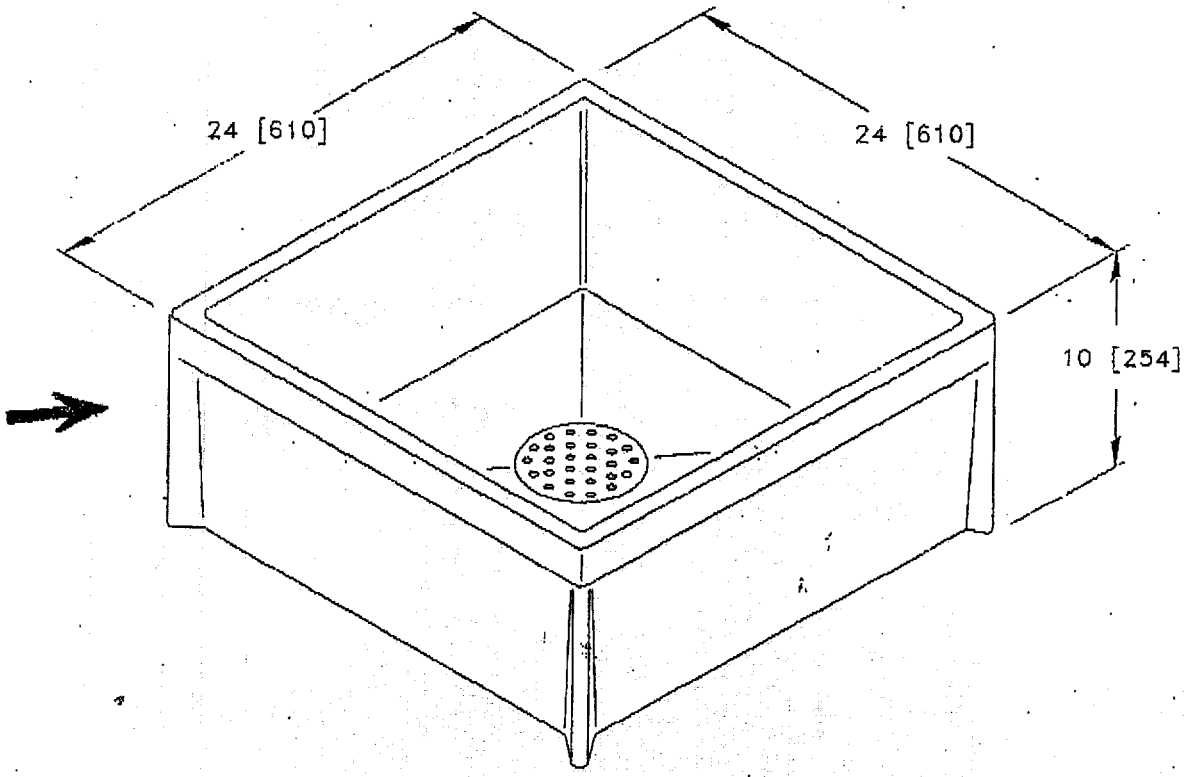
Z-1996-24

MOP SERVICE BASIN
24" X 24" [610 X 610]

SPECIFICATION SHEET

TAG P-4

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



1 of 2 MOP BASIN

Mop Basin Size	Approx. Wt. Lbs. [kg]
24 x 24 x 10 [610 x 610 x 254]	50 [23]

ENGINEERING SPECIFICATION: ZURN Z-1996 24 x 24 x 10 [610 x 610 x 254] Mop Service Basin. Molded high density composite basin, PVC drain body and stainless steel dome strainer/lint basket.

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

REV. A DATE: 04/10/01 C.N. NO. 87853

DWG. NO. 59354 PRODUCT NO. Z-1996-24 x 24

ZURN INDUSTRIES, INC. • HYDROMECHANICS DIV., • 1801 Pittsburgh Ave. • Erie, PA 16514 • Phone: 814/455-0921 Fax: 814/454-7929
In Canada: ZURN INDUSTRIES LIMITED • 6540 Gottardo Court • Mississauga, Ontario L5T 2A2 • Phone: 905/795-8844 Fax: 905/795-8850

ZURN

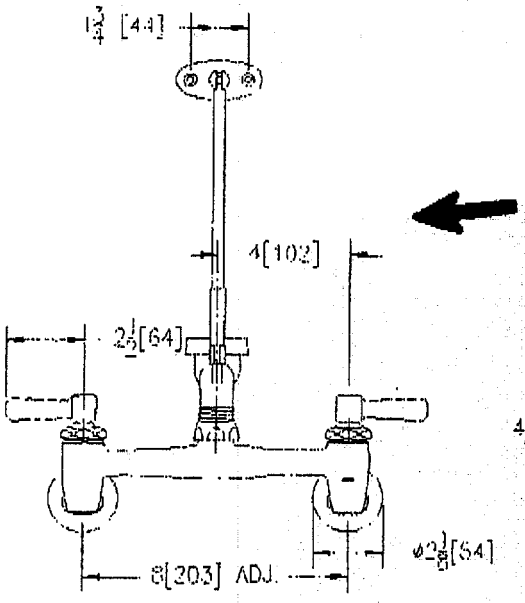
SINK FAUCET

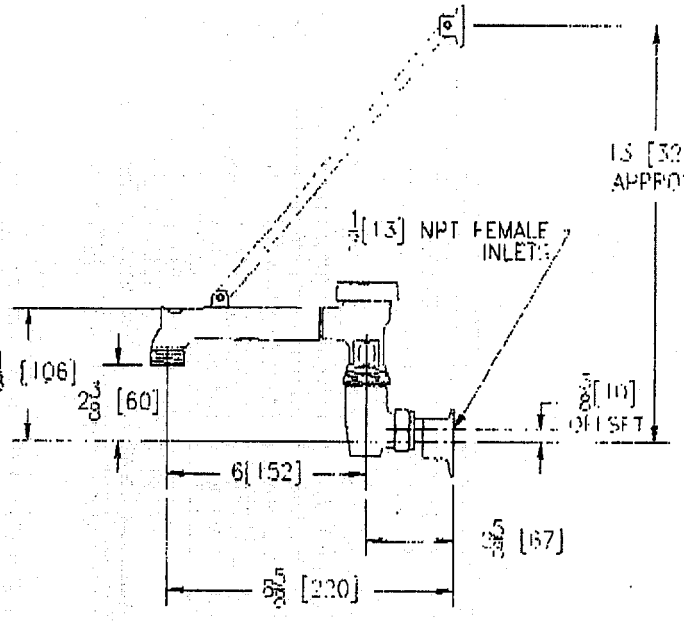
Z-843M1-RC

TAG P-4

Engineering Specifications: Zurn AquaSpec® Z-843M1-RC
Rough chrome-plated cast brass 8" [203mm] sink faucet with quarter turn ceramic disc cartridges, 3/8" [10mm] short swivel inlets providing adjustable centers from 7-1/4" [184mm] to 8-3/4" [222mm], integral service stops and a 6" [152mm] centerline cast brass spout with chemical resistant vacuum breaker, 3/4" [19mm] hose threaded outlet, pail hook and adjustable wall brace. Unit is furnished with 2-1/2" [64mm] vandal-resistant color-coded brass lever handles.

ADA DESIGNED





Note: *All dimensions are for reference only. Do not use for pre-plumbing*

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Phone: 1-716-665-1132 ♦ Fax: 1-716-665-1135 ♦ World Wide Web: www.zurn.com
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Rev. A Date: 12/18/02 C.N. No. 88892
Dwg. No. 69756 Product No. Z-843M1-RC

PRICE QUOTATION

REDLON & JOHNSON
172-174 ST. JOHN STREET
PORTLAND, ME 04102-3080

Printed At : 07:31:41 29 MAR 2005

Quote Date	Quote No.	Quote Expiration Date	Writer	Slsm	WH	
03/29/05	278160	04/28/05	JMW	020	4	

Quoted To:1PORTPUBL
PORTLAND PUBLIC WORKS
52 HANOVER ST
PORTLAND ME 04101

Ship To:1PORTPUBL
PORTLAND PUBLIC WORKS
52 HANOVER ST
PORTLAND ME 04101

Quotation Note:
WATER FOUNTIAN, PEAKS ISLAND

Ln		Order Quant		EDP Code / Description	Net Price	UM	Price
1							
2				* OUTSIDE WATER FOUNTIAN *			
3							
4				PLEASE NOTE THIS UNIT CAN BE			
5				REMOVED DURING WINTER AND RE-			
6				HUNG IN SPRING IF NEEDED			
7							
8		1		HALSEY TAYLOR #5701 W/V.R.K.		EA	
9							
10							
11				SUBTOTAL LINE			
12							
13				PRICES BASED ON APPROVED			
14				SUBMITTALS. ANY MATERIAL			
15				REJECTED WILL BE SUBJECT			
16				TO A REQUOTE.			
17							
18				PLEASE NOTE SOME QUOTED			
19				ITEMS ARE PLUS FREIGHT			

WATER FOUNTIAN 1 of 3

Halsey Taylor.
Satisfying Thirsts Since 1912

Wall-Mounted

MODEL: ☐ **5701**

This fountain is certified to NSF/ANSI 61.

GENERAL
One-piece backsplash and basin made of non-corrosive stainless steel. Anti-splash ridge to reduce splatter. Contour design insures proper drainage and prevents standing waste water. Satin finish resists stains and corrosion and is easy to maintain. Model meets state and federal requirements as designed by the Americans with Disabilities Act for side/parallel approach.

BUBBLER
Exclusive two-stream mound-building bubbler with non-removable anti-squirt feature insures a more comfortable and satisfying drink of water. One-piece, chrome-plated unit has integral hood guard design to prevent contamination.

PUSHBAR ACTUATION MECHANISM
Self closing light touch push bars with raised letters for the visually impaired.

AUTOMATIC STREAM HEIGHT REGULATOR
Self-closing assembly is located inside unit to prevent tampering. Unit resists corrosion and liming. A constant stream height is automatically maintained under line pressures that vary from 20 to 105 psi.

INLET STRAINER
Easily cleaned in-line strainer screen traps particles of 140 microns or larger before they enter the waterway.

WATER INLET
3/8" *O.D.* Tubing

DRAIN OUTLET
1-1/4" tube outlet for 1-1/4" slip joint connection.

SUGGESTED SPECIFICATIONS
Fountain shall include pushbutton on the front, contour-formed basin to eliminate splashing and standing water, and shall have rounded corners and edges. Projector shall be two-stream, mound-building type with integral hood guard and anti-squirt feature. *Fountain shall comply with **ADA for parallel approach only.** The manufacturer shall certify the unit to meet the requirements of NSF/ANSI 61, and the Safe Drinking Water Act.

Note: Continued product improvement makes specifications subject to change without notice. See Halsey Taylor website for *most* current spec sheet.

Standard finish is Stainless Steel

Optional Accessories (extra cost)
☐ Vandal-Resistant Kit
☐ Easy-Flex™ Bubbler

Each 5701 consists of 1 carton of the following:
Fountain and Misc. Parts

Trap and service stop not included.

Copper tube to water supply connection not furnished

Shipping weight: 21 lbs.

WATER FOUNTAIN 2 OF 3

ADA* LEAD NSF/ANSI 61

* For parallel approach only

Wall-Mounted Drinking Fountain
(CONTINUED)

MOUNTING INSTRUCTIONS
Refer to diagrams for rough-in of plumbing. For wall support required locations see installation instructions provided with fountain. Water service line and waste line are to be assembled as required. Final check for leaks and correct functions of fountain should be made. (For details see the installation instructions.)

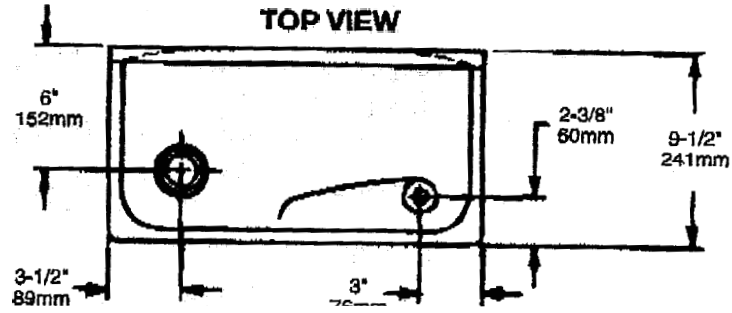
Trap and service stop nut included.

CAUTION - Fountain must be securely bolted to wall

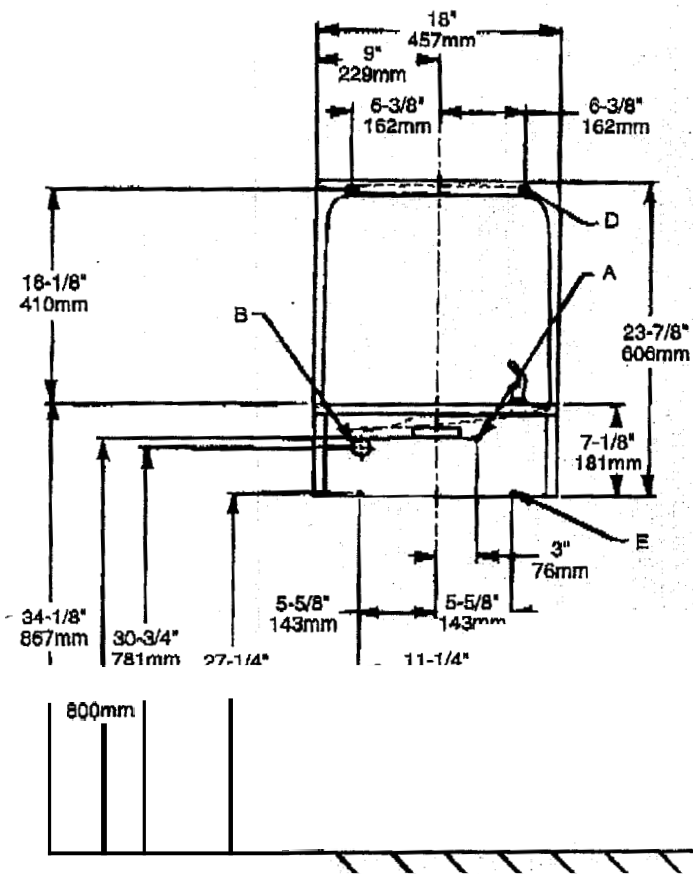
OPERATING **PRESSURES**
Supply water-105 psi maximum

NOTE: A service supply stop (not included) must be installed at the fountain inlet line.

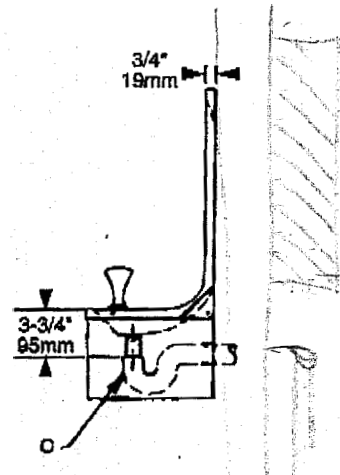
TOP VIEW



FRONT VIEW / WALL LAYOUT



SIDE VIEW



B = RECOMMENDED LOCATION FOR WASTE OUTLET, 1-1/4" O.D. DRAIN
C = 1-1/4" TRAP NOT FURNISHED
D = MOUNTING HOLES FOR BASIN HANGER STRAP
E = MOUNTING HOLES FOR FOUNTAIN

FINISHED FLOOR

WATER FOUNTAIN 9 of 9

Halsey Taylor®

Printed in the U.S.A.

PRICE QUOTATION

REDLON & JOHNSON
172-174 ST. JOHN STREET
PORTLAND, ME 04102-3080

Page : 1 Printed At : 07:48:44 29 MAR 2005

Quote Date	Quote No.	Quote Expiration Date	Writer	Slsm	WH
03/29/05	278162	04/28/05	JMW	020	4

Quoted To:1PORTPUBL
PORTLAND PUBLIC WORKS
52 HANOVER ST
PORTLAND ME 04101

Ship To:1PORTPUBL
PORTLAND PUBLIC WORKS
52 HANOVER ST
PORTLAND ME 04101

1 of 2

Quotation Note:
PEAKS ISLAND ,TRENCH DRAIN

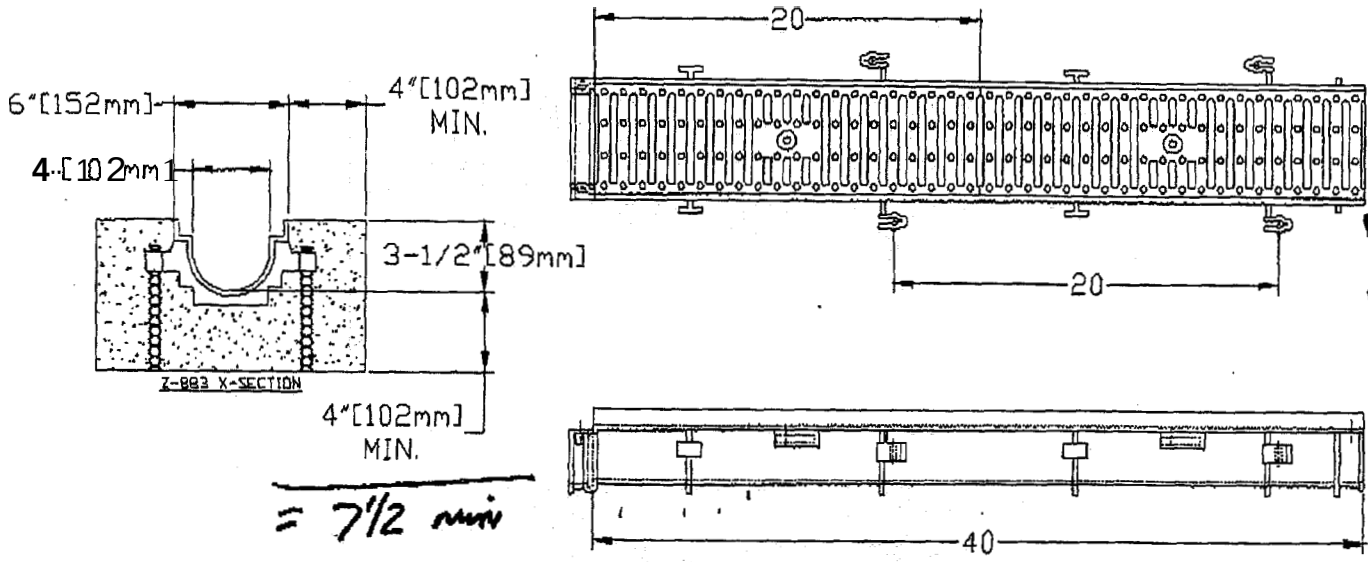
Ln		Order Quant		EDP Code / Description	Net Price	UM	Ext Price
1							
2				* **TRENCH DRAIN 40" LONG** *			
3							
4				**PLEASE NOTE** MANUFACTURER			
5				RECOMMENDS A SLAB **DEPTH OF**			
6				7-1/2" **MINIMUM**			
7							
8		1		ZURN Z-883-VP-E1(2)-U4 TRN DRN			
9				SUBTOTAL **LINE**			
10							
11							
12							
13				* TRENCH DRAIN 80" LONG *			
14							
15				**PLEASE** NOTE MANUFACTURER			
16				RECOMMENDS SLAB DEPTH OF			
17				7-1/2" MINIMUM			
18							
19		1		ZURN Z883-VP-E1(2)-U4 80" T/D			
20				SUBTOTAL **LINE**			
21							
22							
23				**PLEASE NOTE TRENCH DRAIN IS**			
24				**PLUS** FREIGHT F/ NEW YORK			

TRENCH DRAIN

Z-883 6" WIDE SHALLOW TRENCH DRAIN SYSTEM

TAG _____

Dimensions Subject to Manufacturing Tolerances



2 of 2

TRENCH DRAIN

ENGINEERING SPECIFICATION: Zurn Z-883 Channels shall be 40" long, 6" wide and have a 4" wide throat. Modular sections shall be made of HDPE, have interlocking ends, end radiused bottom. Channels shall be provided flat (neutral) with a 3-1/2" invert. Channels shall have clips molded into the sides of the channel to accommodate vertical re-bar for positiong and anchoring purposees. Choices of class A, B, and C grate shall be available with H-26 and/or ADA compliance with mechanical Lockdown devices. End caps and catch basins shall be available to complement Mc channels end grates. End outlets in 2" diameter and bottom outlets in 2", 3", and 4" diameters shall be available, Trench shall be Flo-Thru model 883.

OPTIONS (Check/specify appropriate options)

PREFIXES

Z- Structural Composite Channel with Dura-Coated Cast Iron Grate

Note:

+ Actual channel length is 41 1/4" to allow for overlap.

SUFFIXES

____	-BG	Galvanized Ductile Iron Cast Bat Grate
____	-BC	Black Acid Resistant Coated Cast Iron Grate
____	-CG	Cast Iron Grate
____	-CSG	Cast Iron Center Slot Grate
____	-DB	Dome Bottom Strainer
____	-DBG	Ductile Iron Cast Bar Grate
____	-DC	Ductile Iron Solid Cover
____	-DG	Ductile Iron Slotted Grate
____	-E2	Closed End Cap
____	-FG	Fabricated Galvanized Steel Slotted Grate
____	-FS	Fabricated Stainless Steel Slotted Grate
____	-GC	Galvanized Cast Iron Grate
____	-GD	Galvanized Ductile Iron Grate
____	-GG	Fiberglass Grate
____	-GL	Grate Lockdown Assembly
____	-HGG	Heavy Duty Fiberglass Grate
____	-HPD	Heel Proof Ductile Iron Grate
____	-HPP	Heel Proof Polyethylene Grate
____	-LD	Ductile Iron Longitudinal Slotted Grate
____	-PG	Perforated Galvanized Steel Grate
____	-PS	Perforated Stainless Steel Grate
____	-RFG	Reinforced Galvanized Steel Slotted Grate
____	-RFS	Reinforced Steinless Steel Slotted Grate
____	-RPG	Reinforced Perforated Galvanized Steel Grate
____	-RPS	Reinforced Perforated Steinless Steel Grate
____	-SBG	Stainless Steel Cast Bar Grate
____	-U2	2" No-Hub Bottom Outlet
____	-U3	3" No-Hub Bottom Outlet
____	-U4	4" No-Hub Bottom Outlet
____	-VP	Vandal Proof Secured Grate/Cover
____	-WC	White Acid Resistant Coated Cast Iron Grate

HAVE TO BE PRE-ASSEMBLED + PROVIDED TO PRE-CAST PROVIDER FOR THEIR PART!

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

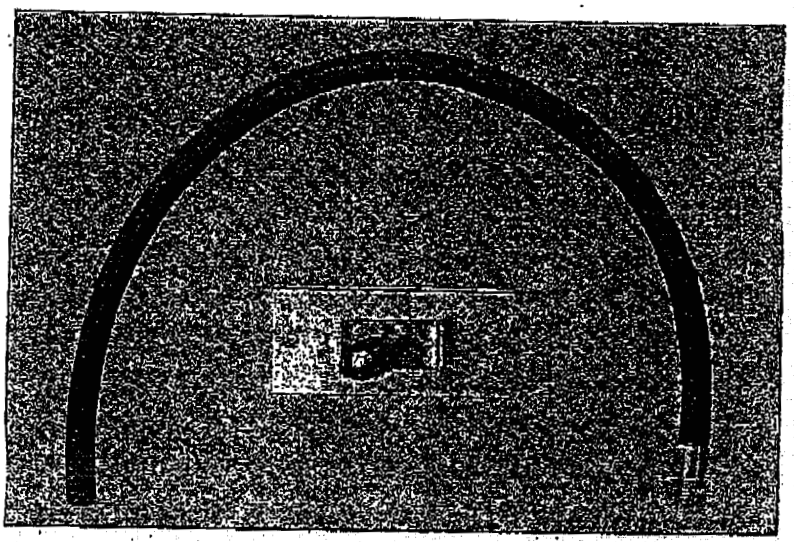
REV. E DATE: 03/12/04 C.N. NO. 101226

DWG. NO. 62209 PRODUCT NO. Z-883

ZURN INDUSTRIES, INC., FLO-THRU DIV., 2640 South Work Street, Falconer, NY 14733
Phone: 716/665-1132, Fax: 716/665-1135, World Wide Web: www.zurn.com
In Canada: ZURN INDUSTRIES LIMITED, 3544 Nashua Drive, Mississauga, Ontario L4V1L2, Phone: 905/405-8272 Fax:

P-4

FIAT

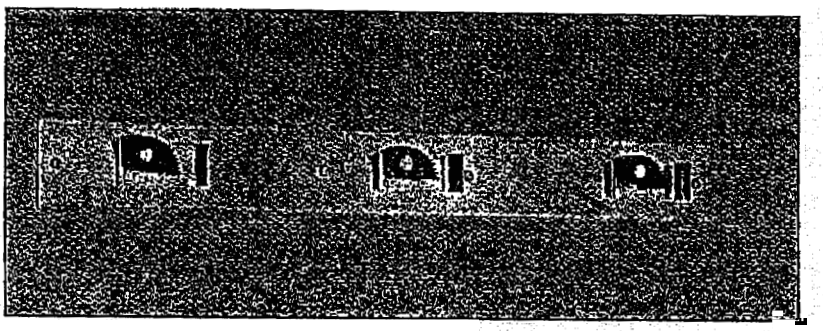


832-AA – Hose & Bracket

30" long flexible heavy duty 5/8" rubber hose, cloth reinforced with 3/4" chrome coupling at one end. Bracket is 5" long x 3" wide stainless steel with rubber **grip.**

FIAT

ACCESSORIES



889 CC - Mop Bracket

24" long x 3" wide, stainless steel with three *(3)* rubber tool grips.

FIAT PRODUCTS"

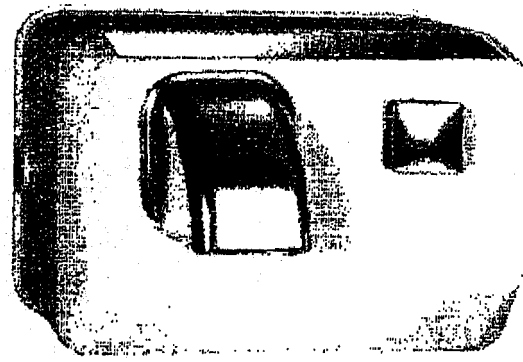
A CRANE PLUMBING *COMPANY*

HAND DRYER

SLOAN®
OPTIMA ACCESSORIES

Push Button Activated
Surface Mounted Electronic Hand Dryer

EHD-302



HAND DRYER 1 of 2

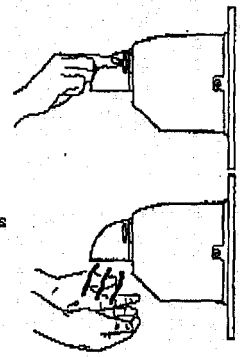
▶ **Description**
Push Button Activated Hand Dryer for surface mounting.

▶ **Specifications**
- Maintenance free brushless motor with self-lubricating bearings, capacitor initiated for quick starts
- State-of-the-art electronic timer with adjustable time cycle (set at 30 seconds)
- Air delivery of approximately 150 CFM at an outlet temperature of 145°F/63°C at a 72°F/22°C ambient room temperature
- Decibel Rating of 74 dB
- Heating element constructed of Nichrome wire and protected by an automatic resetting thermostat
- Vandal resistant metal protective grill to prevent the entry of foreign objects into the blower housing
- One piece heavy-duty rib reinforced die cast zinc alloy housing
- Bright chrome plate or chip-proof electrostatically-applied epoxy finish
- Chrome plated die-cast zinc alloy push button and air nozzle
- Air nozzle rotates 360 degrees to facilitate hand and face drying
- Tamper-proof cover fasteners are included

▶ **Electrical Specifications**
~~☐ Model EHD-301: 110/120 VAC, 2.0 Amp, 60 Hz~~
☐ Model EHD-302: 208/230 VAC, 10 Amp, 60 Hz

▶ **Color**
☐ -W white

▶ **Operation**
- Press the Hand Dryer Push Button to activate the Hand Dryer. A powerful flow of warm air dries hands within thirty (30) seconds.
- After thirty (30) seconds of continuous operation, the Hand Dryer automatically stops. It is then ready for the next user.



▶ **ADA Compliant**

▶ **Push Button Activated**
Sloan OPTIMA® EHD-301, EHD-302 and EHD-304 Push Button Activated Hand Dryers operate by means of a state-of-the-art electronic timing device. Once the user presses the Push Button, the Hand Dryer will activate for thirty (30) seconds of continuous operation.

▶ **Maintenance Free Motor**
Sloan OPTIMA® EHD-301, EHD-302 and EHD-304 Push Button Activated Hand Dryers come equipped with a maintenance free brushless motor with self-lubricating bearings, capacitor initiated for quick starts.

▶ **Rotating Air Nozzle**
The Air Nozzle rotates a full 360 degrees to facilitate hand and face drying. It can also be secured in a stationary downward position.

▶ **Warranty**
10 year (limited)

▶ **Made in the U.S.A.**

UL® Listed

This space for Architect/Engineer approval

Job Name _____ Date _____

Model Specified _____ Quantity _____

Variations Specified _____

Customer/Wholesaler _____

Contractor _____

Architect _____

The information contained in this document is subject to change without notice.

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Optima EHD-301, EHD-302 & EHD-304 S.S. — Rev. 0b (02/04)

Printed in the U.S.A.

EHD-302

Electrical Requirements

Model	Voltage	Amps	Hz	Watts
~~EHD-301~~	~~110/120 VAC~~	~~20~~	~~60~~	~~2400~~
EHD-302 †	208/230 VAC	10	60	2300
~~EHD-304~~	~~277 VAC~~	~~8~~	~~60~~	~~2216~~

† Model EHD-302 can operate on 208 VAC through 230 VAC per the requirements listed.

Install electrical line in the location shown in the Wiring Diagram below.

Electrical Connection Specifications

Connect 110/120 VAC dryer to not more than a 20 Amp branch circuit using #12 gauge or larger wire, and a 208/230/277 VAC dryer to not more than a 15 Amp branch circuit using #14 gauge or larger wire. DO NOT attach any other electrical devices to this branch circuit.

Important:
ALL ELECTRICAL WIRING SHOULD BE INSTALLED IN ACCORDANCE WITH NATIONAL/LOCAL CODES AND REGULATIONS.

Recommended Mounting Heights (from floor to bottom of dryer)

User	Height
Men	40 inches (1016 mm)
Women	38 inches (965 mm)
Teenagers	36 inches (914 mm)
Children	30 inches (762 mm)
Handicapped	32 inches (813 mm)

Prepare wall to receive mounting fasteners as shown in the rough-in diagram. Refer to Installation Instructions for recommended fasteners.

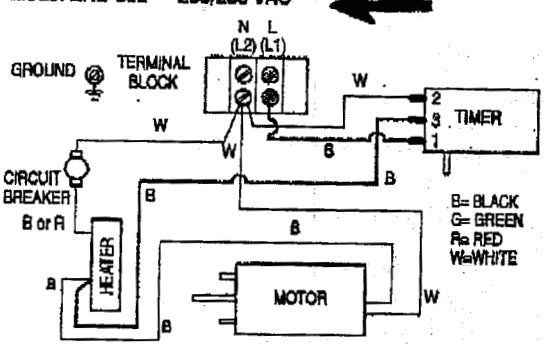
Installation Precautions

- Mounting surface should be smooth and flat.
- Mount dryer at least 24 inches (610 mm) away from basins and at least 20 inches (508 mm) away from corners.
- Mount multiple hand dryers a minimum separation distance of 20 inches (508 mm) (measured center to center).
- Avoid installing hand dryers in narrow hallways and behind swinging doors.

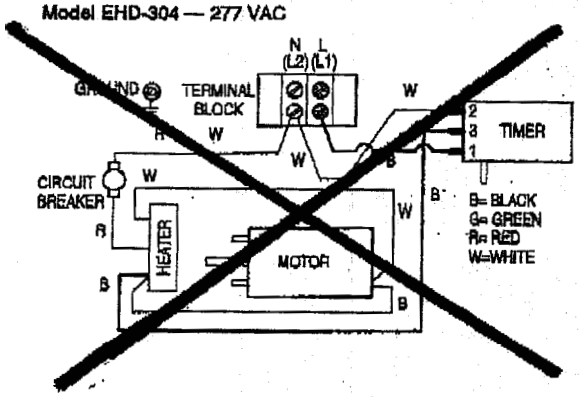
WIRING DIAGRAM

~~Model EHD-301 — 110/120 VAC~~

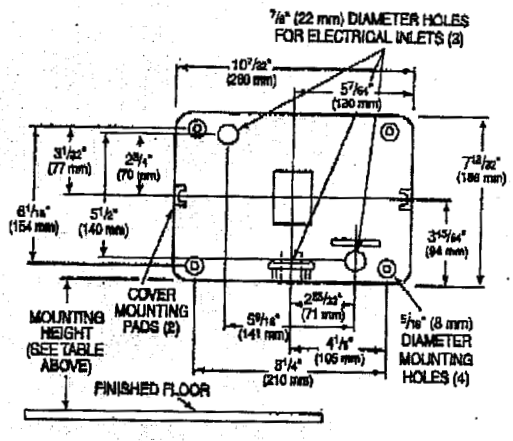
Model EHD-302 — 208/230 VAC

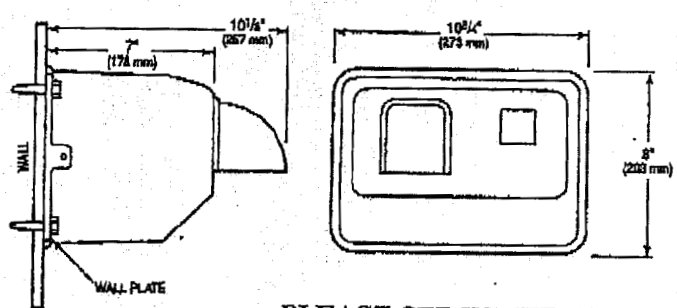


Model EHD-304 — 277 VAC



ROUGH-IN





PLEASE SEE WRITTEN SPECIFICATIONS FOR PROPER MOUNTING HEIGHT

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PRODUCT INFORMATION

TO ORDER, PLEASE CALL: 800-719-2000

SCI, Inc., 999 McBride Avenue, Suite 2098, West Paterson, NJ 07424

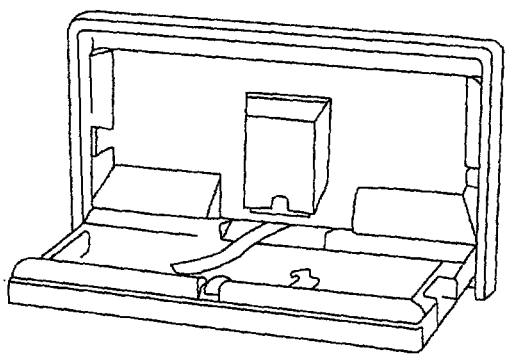
1 of 1

BABY CHANGING STATION

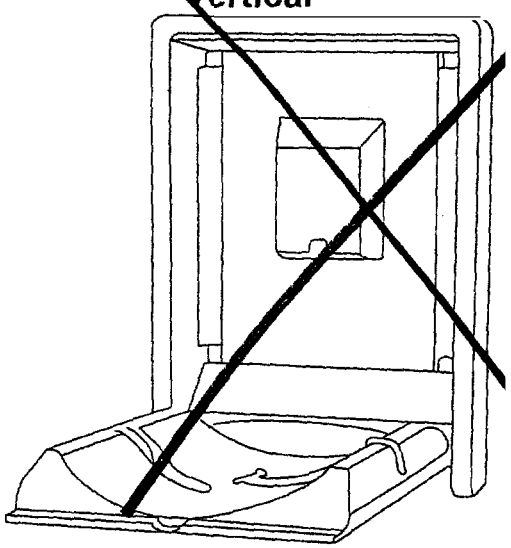
Baby Changing Station

Provides a practical place for parents to attend *to* their children's dirty diapers without leaving your business

Horizontal



Vertical



Horizontal
Unit dimensions:
Height: 20 in (508 mm) **width:** 35 in (889 mm)
Depth: 4 in (102 mm) closed; 20 in (508 mm) opened
Changing surface: 442 sq in (2873 sq mm)
Weight: 30 lbs (13.64 kilos)

Vertical
Unit dimensions:
Height: 36 in (914 mm) **width:** 22 in (559 mm)
Depth: 5 in (127 mm) closed; 35 in (889 mm) opened
Changing surface: 420 sq in (2730 sq mm)
Weight: 30 lbs (13.64 kilos)

Product features:

- Rugged design withstands static loads up to 400 pounds (182 kilos)
- Steel-on-steel hinges with 10 gauge (3.42 mm squared) steel mounting supports for durability
- Hidden pneumatic gas spring to ensure smooth, safe open and close motions: closes fully after each use
- Child protection strap features snap-lock fastener to hold child secure
- Sanitary bed liner dispenser holds 25 liners to promote good hygiene
- High-impact polyethylene resists odors, has no sharp corners, and cleans easily
- Chemical-free sanitary liners are made from 3-ply biodegradable paper for protection and easy disposal
- Molded-in safety and usage instructions in 6 languages
- Door plaque clearly identifies family friendly restrooms
- Includes step-by-step instructions and all mounting hardware for easy installation
- Optional factory-installed lock secures station from vandalism
- Available in off-white and light gray

Additional Features:

- **5-year manufacturers limited warranty**
- **Made in the USA**

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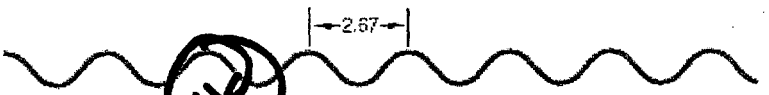
sequentia Corrugated Panels

- Products
  - NEW! Super600 Sunglass Colors
  - Poly300
  - WeatherGlaze
  - WeatherTuf
- Product Comparison
- Installation Instructions
- Claim Information
- Technical Data Sheets
- Test Reports
- Build a Patio Cover
- Build a Greenhouse
- More Information
- Structoglas
- E-Mail Sequentia
- Call Sequentia

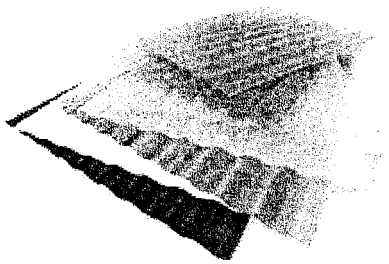
Sequentia Super 600® Sunglass Colors

Super600 corrugated fiberglass panels are now available in popular sunglass colors!

The Super600 Sunglass Colors line was inspired by actual sunglasses and to provide options for the customer that were not previously available.



The line now includes seven translucent color choices: Terra Cotta 1838, Sky Blue 1456, Clear 700, Yellow 1608, Graphite 725, White 920, and Hunter Green 1307.



Super600 combines strength and the options of color choices for use with residential home and commercial applications such as: patio covers, gazebos, greenhouses, sheds, and pool covers. The heavy-duty fiberglass reinforcement adds strength and will provide protection against scratches and dents. The panel will withstand temperature changes, precipitation, UV exposure, heavy snow, and high winds.

Plus, Super600 panels are backed by a 20-year warranty which makes them the number-one choice for do-it-yourself, professional-quality building projects.

Made in the USA

ROOFING / PANELS 1 OF 3

SEQUENTA SUPER 600 COLOR: CLEAR 700

STORE PANELS PROPERLY: While a single panel easily withstands exposure to sunlight and the elements, a stack of fiberglass panels will trap heat and moisture causing clouding to the panels. To avoid this irreversible effect, panels should be stored in a dry, shaded, well-ventilated area. Store panels on edge or on end. Skids should be elevated at one end with wood spacers.

FRAMING: Provide purlin member at recommended maximum intervals required for corrugation selected. See LOAD/SPAN CHART on first column.

CUTTING: Cut fiberglass, PVC, and Polycarbonate panels using hand or power saws. Saw blade should be fine-toothed carbide tipped, or safety fabric reinforced abrasive disc. Face shields and appropriate safety equipment should be worn.

DRILLING: All panels should be pre-drilled not less than 1-1/2" from panel ends and holes drilled a minimum of 1/16" larger for fiberglass panels and 1/8" larger for PVC and Polycarbonate panels than the fastener diameter. Panels may be drilled singly or several at a time.

INSTALLING: For best protection against prevailing winds and weather, install panels beginning at leeward end of run and work to windward. See RECOMMENDED OVERLAP drawing at bottom of first column.

1. Provide a minimum of one corrugation overlap at sides.
2. Provide 8" end-lap for roof with pitch of less than 4" in 12". 4" end-laps for pitches of more than 4" in 12".
3. Fasten panels through crowns at every second corrugation. Fasteners with armored Neoprene washers are recommended. Space fasteners 6" to 8" on center at panel ends; 12" to 16" on center for intermediate purlins and siding applications.

CONSTRUCTION NOTES:

1. To avoid deflection of panels, tighten screws until washers will not rotate, then tighten one more turn.
2. Avoid excess burrs on drilled or punched holes to protect Neoprene sealing face.
3. Drill for and fasten extreme bolts, with full support below all valleys, then drill for and fasten in-between points.

CLEANING INSTRUCTIONS: Panels may we washed either mild detergent-type cleaners or by steam and high pressure spray systems. Apply cleaners with sponge or soft brush and rinse thoroughly in cold water to eliminate cleaning agent film build-up. Always follow cleaning agent manufacturer's instructions. Test small area before applying over entire surface. Hard water deposits may be removed with a 10% solution of acetic acid in COLD water. Rinse thoroughly.

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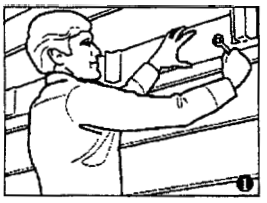
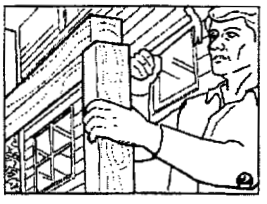
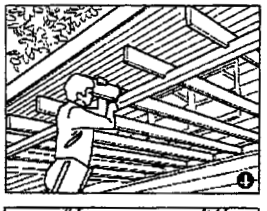
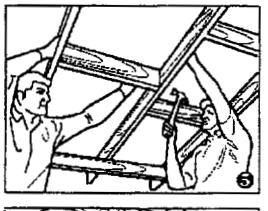
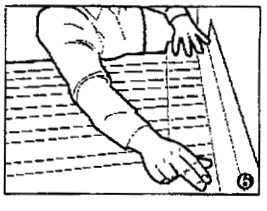
Form 2517 Rev. 02 (354)

2 of 3 ROOFING - MISC.

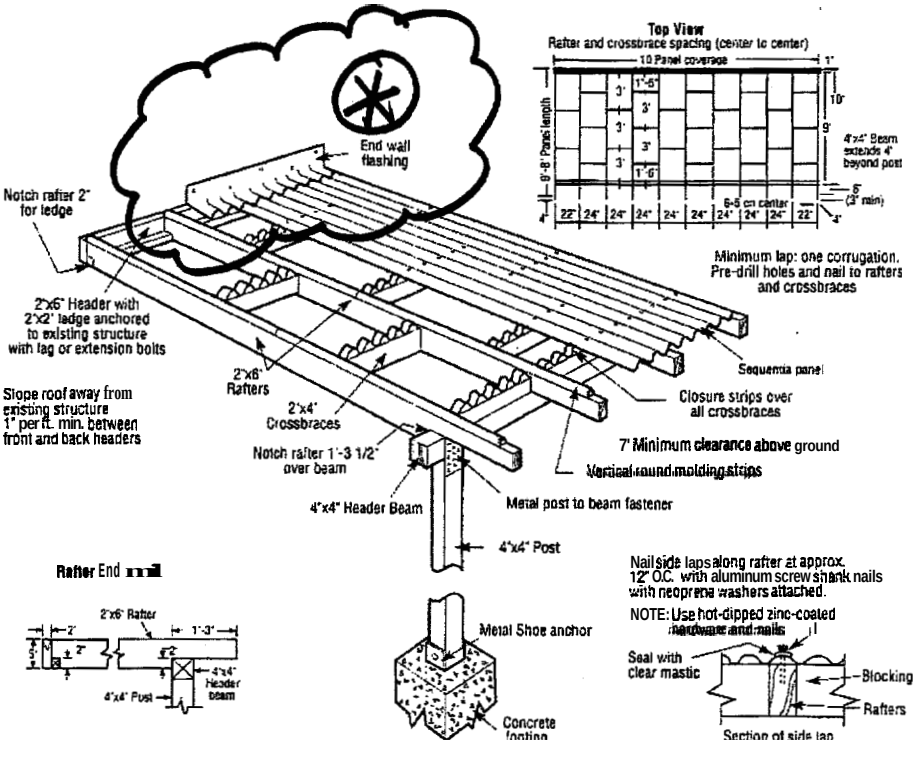



Building a Patio Cover

No special tools or skills are needed. Just keep in mind common dimension lumber and standard size panels when laying out your design.

1. Post foots should be approximately **14"** deep and 12" across. Set 8 x 3/8" bolt about 3" deep into poured concrete for post anchors. Wood posts may also be secured with **4"** angle brackets. Attach 2" **x** 6" rafter hangers to header, then attach header to house studs with lag screws.
2. Drill posts and set on pins. Toenail crossbeam to post. NOTE: allow 7' **4"** from floor to bottom of front header for best ventilation.
3. Pre-notch rafters to compensate for slope. Allow a 1" minimum pitch per foot for adequate drainage.
4. Attach rafters to header and crossbeam with 1" screws and nails.
5. For ease of installation and an attractive design, nail crossbraces between rafters using alternate spacing. Nail round and corrugated molding strips to framing, then paint or stain wood before installing panels.
6. Lay panels on rafters with one corrugation overlap and fasten with aluminum screw nails. Holes should be predrilled. Attach flashing at same time.



Patio Cover Materials List			
	8' x 10'	10' x 12'	12' x 12'
Corrugated Panels	4-26" x 10'	5-26" x 10'	6-26" x 10'
Wood Filler Strips	5 strips	6 strips	6 strips
Flashing	4 flashing	5 flashing	6 flashing
Nails	2 boxes	2 boxes	3 boxes
Caulk	4 tubes	5 tubes	5 tubes

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Rod vs. Samsung: 3 of 3

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Phone : (732) 388-0300
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Manufacturing and Warehousing :
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229 AR Elastomeric

DESCRIPTION

Karnak #229AR-Elastomeric is a single component, rubber reinforced asphalt which forms a highly elastomeric waterproof coating. The dried film cures to a tough flexible finish and will resist variations in temperature and weather. Karnak #229 AR-Elastomeric has excellent resistance to acids, alkalies and salts in the soil and will not deteriorate.

MSDS | Codes & Specs. | Guidance Specs.

USES

Karnak #229 AR-elastomeric is available in brush/spray and trowel grades. Karnak #229AR-Elastomeric is used as a waterproofing coating on primed exterior above or below grade surfaces such as masonry, metal, wood, stone, brick and concrete. Karnak #229 AR Elastomeric can also be used as a vapor barrier when applied to interior above grade surfaces.

ADVANTAGES

Easy to apply.
Tough, flexible, elastic, rubber-like film.
Excellent adhesion to most surfaces including primed concrete, masonry, metal and sprayed urethane foam. Weathered asphalt may not need primlng.
Excellent water and water vapor resistance.
Excellent weather resistance.
One year shelf life.
One component, needs no intermixing.
Good resistance to salts and alkalies.
Compatible with many highway and bridge specifications.

SPECIFICATION

ASTM D-4586 Type I
ASTM D-3409

SURFACE PREPARATION

Surfaces must be dean, dry and free from oil, grease, release agents, laitance, dirt, dust and debris. All cracks and holes should be fiiied with Karnak #229AF AR-Elastomeric trowel grade prior tu surface coating. It is recommended that Karnak #96 Elastomeric Primer be utilized tu provide a firm film base prior to the coating application.

APPLICATION

Kamak #229 AR-Elastomeric should be mechanically mixed thoroughly, prior to application. Karnak #229 AR-Elastomeric, **brush** grade should not be **applied** to vertical surfaces.

Apply Karnak #229 AR-Elastomeric

KARNAK 229 AF

BRUSH APP

1 of 4 VERTICAL SURFACE WATERPROOFING: ASTM B

brush grade to horizontal surfaces using a wide, fibered roof brush at the rate of 2 to 4 gallons per 100 sq. ft..

TROWEL APP →

Karnak #229 AR-Elastomeric trowel grade may be applied to either vertical or horizontal surfaces using a smooth edge trowel. Coverage amount will vary depending on desired thickness. To achieve a 1/16" thickness apply at the rate of 4 gallons per 100 sq. ft.; 1/8" apply at the rate of 8 gallons per 100 sq. R.; 1/4" thickness apply at the rate of 15 gallons per 100 sq. ft.

CARE OF TOOLS

Tools and other equipment should be thoroughly cleaned with mineral spirits, taking necessary precautions when handling combustible material.

PHYSICAL PROPERTIES

Hardness, Shore A: 55 ASTM D-2240
Elongation - Brush: 700% ASTM D-412
Elongation - Trowel: 500% ASTM D-412
Tensile Strength, PSI: 400 ASTM D-412
Moisture Vapor: 0.03 ASTM D-1653
Transmission: ASTM D-6171
Water Absorption: 0.07
Weight per Gallon: 8.60 lbs.
Solids: Caulk 68%
Solids:Trowel 65%
Solids:Brush 60%
Solids:Spray 50%

CAUTION

Do not use near open flame. Avoid breathing solvent fumes and prolonged mntact with skin. Do not take internally. If swallowed, do not induce vomiting. Call a physician Immediately. Keep out of reach of children. Keep container covered when not in use. Do not thln. Dispose of in an environmentally safe manner.

PACKAGING

Available in 5 gallon pails and 55 gallon drums.

WATER PROOFING - APP : B

2 x 4

229AR Elastomeric

KARNAK

3 of 4 WATER PROOFING - ART: B

DESCRIPTION

Kamak #229AR-Elastomeric is a single component, rubber reinforced asphalt which forms a highly elastomeric waterproof coating as well as an air barrier. The dried film cures to a tough 40-mil flexible finish and will resist variations in temperature and weather. When applied to interior above grade surfaces, the protective coating helds to control moisture and inhibit air leakage in buildings as specified in a number of building codes. ***Kamak*** #229AR Elastomeric has excellent resistance to acids, alkalies and salts in the soil and will not deteriorate.

USES:

Karnak #229AR Elastomeric is available in brush/spray and trowel grades. *Karnak* #229AR-Elastomeric is used as a waterproofing coating on exterior above or below grade surfaces such as masonry, metal, wood, stone, brick and concrete. Kamak #229AR Elastomeric can also be used as an air barrier/vapor barrier when applied to exterior/interior above grade surfaces.

SPECIFICATIONS:

ASTM D-4586 Type I
ASTM D-4479 Type I

SURFACE PREPARATION:

Surfaces must be clean, dry and free from oil, grease, release agents, laitance, dirt, dust and debris. All cracks and holes should be filled with *Kamak* #229AR-Elastomeric trowel grade prior to surface coating.

APPLICATION:

Karnak #229AR Elastomeric Brush Grade should be mechanically mixed thoroughly, prior to application. For vertical applications use only 229AR Elastomeric Trowel Grade.

EXAMPLES:

A. Exterior Vertical Surfaces - Apply Karnak #229AR Elastomeric, trowel grade in one coat. If applying two, allow the first coat to dry. Coating must be continuous and free of pinholes or holidays. Cover all slots, joints and grooves and into all chases and corners. Apply at the rate of 4 to 5 gallons per 100 sq. ft.

B. Membrane Vertical Surfaces - Apply 1 coat of Karnak #229AR Elastomeric, trowel grade at the rate of 2 to 3 gallons per 100 sq. ft. Place Kamak #3036 Poly-Mat or *Kamak* #3 1 Fiberglass Membrane vertically over surfaces of coating making sure all edges are overlapped at least 3 inches. Smooth membrane firmly into place and eliminate all wrinkles. Apply second coat at the rate of 2 to 3 gallons per 100 sq. ft. In areas where hydrostatic pressure is known to occur, a 229AR Elastomeric membrane system should be applied to all exterior foundation walls and floor, both below or on grade.

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• 800-526-4236• FAX: 732-388-9422 WEB:
http://www.karnakcorp.com

METRO-DADE APPROVED

229AR Elastomeric

C. Horizontal Surface: Karnak #229AR Elastomeric brush/spray grade can be used as a waterproofmg layer between the surface course and base structural concrete slab above and below grade. Apply at a rate of 4 to 5 gallons per 100 sq. ft.

NOTE:

A protection board is highly recommended to protect the film during backfilling or while pouring the concrete topping slab.

***CARE* OF TOOLS:**

Tools and other equipment should be thoroughly cleaned with mineral spirits, taking necessary precautions when handling combustible material.

PHYSICAL PROPERTIES:

Weight Per Gallon:	8.6 lbs.
Hardness, Shore A:	55 ASTM D-2240
Elongation:	700% ASTM D-412
Tensile **Strength,** PSI:	400 ASTM D-412
Color:	Black
Water Vapor Permeance:	0.017 perm ASTM **E-96**
Air Permeability (Leakage):	0.000 L/(s·m^2) @ pressure difference of 75 Pa
Service Temp. Range:	-40°F to **160°F**
Solids:	Trowel 70%
	Brush **63%**
	Spray 60%

CAUTION:

Do not use near open flame. Avoid breathing solvent fumes and prolonged contact with skin. Do not take internally. If swallowed, **do not induce vomiting.** Call a physician immediately. Keep out of reach of children. Keep container covered when not in use. **Do not thin.** Dispose of in an environmentally safe manner.

PACKAGING:

Available in 5 gallon pails, 55 gallon drums and 10 oz. cartridges.

If further information is needed, contact Karnak Technical Services at 1-800-526-4236.

4 of 4 WATERPROOFING - AVT: B

KARNAK 330 CENTRAL AVENUE, CLARK, NJ 07066 732-388-0300 • 800-526-4236 • FAX: 732-388-9422 WEB: http://www.karnakcorp.com

METRO-DADE APPROVED

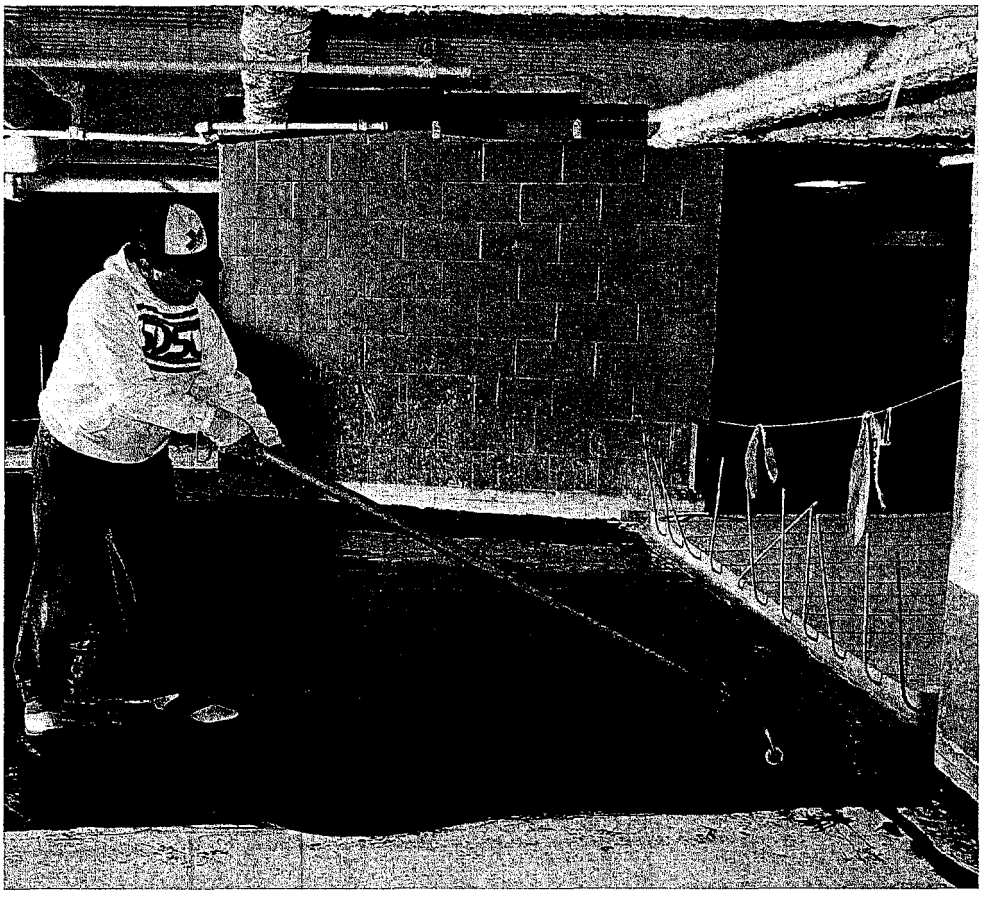
CH0105

Sonneborn®
Waterproofing Systems

SONOSHIELD®

HLM 5000®

Liquid cold-applied elastomeric waterproofing membrane system



Where to Use HLM 5000®

- Above grade between two-course concrete and within cavity walls
- Exterior below grade on masonry, concrete, and incidental metal
- Parking garages
- Plaza decks and malls
- Fountains and pools
- Balconies and planters
- Bridges and highways
- Below-grade slabs
- Walls and culverts
- Sea walls, dams and reservoirs
- Concrete tanks
- Exterior plywood

Features

- Standard and high-build systems...
- Waterproofs concrete...
- Elastomeric...
- Wide service temperature range...
- Chemical resistant...
- Seamless cold-applied membrane...
- Asphalt-modified polyurethane...

Benefits

- Specification versatility
- Protects structure from water penetration
- Permits expansion and contraction
- Suitable for all climates
- Resists bacterial attack, and many acids, alkalis, and salts
- Eliminates lapping, seaming, and precutting
- No hot-melt equipment required

1 OF 2 / VERTICAL SURFACE WATER PROOFING : ALT A

Order Information

HLM 5000® comes in a variety of grades for different applications.

- HLM 5000® SL (self-leveling) is formulated for application by squeegee to horizontal areas.
- HLM 5000® T (trowel) is formulated for application by trowel to vertical surfaces.
- HLM 5000® S (spray) is a specially formulated version of 5000T for spray application.
- HLM 5000® R (roller) is formulated for application by roller to vertical and some horizontal surfaces.
- Companion products to HLM 5000® are Primer 733 or 766 (see Form No. SJ-431), used for priming metal to be covered by HLM 5000®, and Reducer 990, used to clean tools and equipment.

Packaging

HLM 5000® SL, HLM 5000® S, and HLM 5000® R

- 5 gallon (19 L) pails; 55 gallon (208 L) drums are available on special order.

HLM 5000" T

- 5 gallon (19 L) pails only

Sonoshield® Reinforcing Fabric
300 ft. by 37-1/2 ft. (91 by 11.4m) rolls (937 sq. ft. or 87 m²)

Protection Course II

- 50 mil (1.3 mm) by 40" by 48' (1.0 by 1.2 m)
  500 sheets per pallet (13-1/3 sq. ft. [1.2 m²] per sheet) 6,665 sq. ft. 1619 m²)
- 120 mil (1/8" or 3 mm) by 40" by 48" 500 sheets per pallet (13-1/3 sq. ft. I 1.2 m²] per sheet) 6,665 sq. ft. (619 m²)
- 1/4" (6 mm) protection board is available on special order

Shelf Life of HLM 5000® is 6 months in unopened containers when stored in dry conditions between 40°F and 80°F (4°C and 27°C). During storage. an easily removed skin of HLM 5000® may form, which does not affect performance of the product.

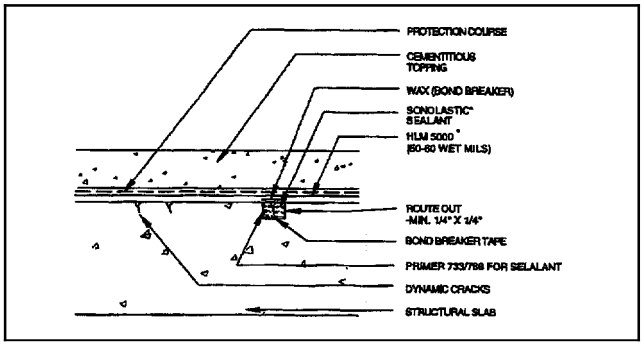
Coverage

Wet mil thickness	Sq. ft. per gallon
55 - 65	25 to 30

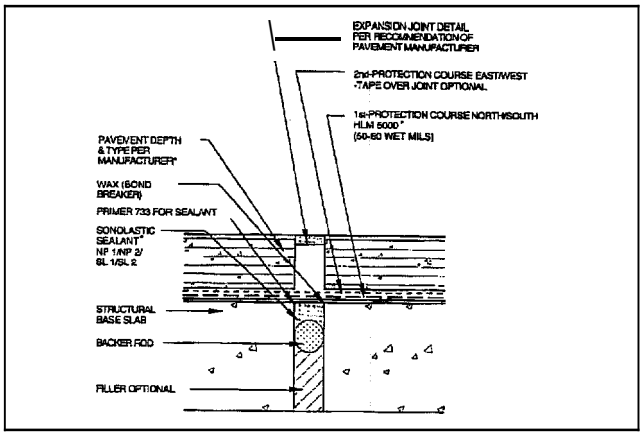
Dry mil thickness	Sq. ft. per gallon
45 - 55	25 to 30

Note: Coverage may vary with the application technique used. Actual coverage rate and mil thickness depend on finish and porosity of the substrate

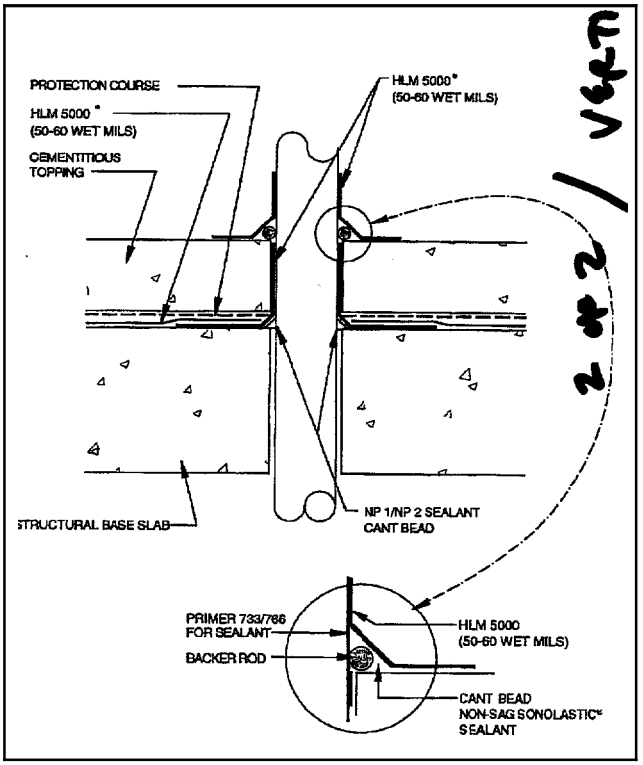
Detail Drawings



Dynamic Crack Detail



Asphalt Pavement Topping/Expansion Joint



Vent/Drain/Pipe/Post Penetration Detail

TUFF II

ICF & Foundation Insulation Coating

PRODUCT DATA SHEET

Pre-Mixed Ready To Use - Trowel On - Super Durable - Variety of Textures & Colors

DESCRIPTION

Tuff II is a premixed, ready-to-use protective and decorative coating for ICF (Insulated Concrete Forms) & rigid foundation insulation sheathing.

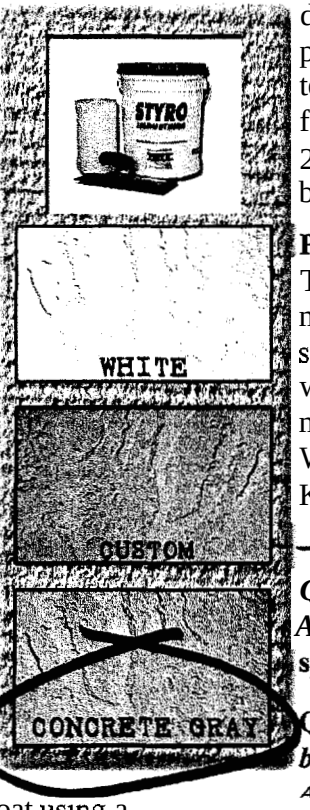
***Tuff** II* protects the ICF or rigid polystyrene insulation board from exposure and physical damage and produces the final attractive texture and color.

Tuff II is incredibly strong, durable, easy to use and environmentally friendly.

APPLICATION

Materials Needed:

Open a new 5-gallon pail of *Tuff II*. No mixing is necessary, although it is optional to ***mix*** with a low speed mixer or by hand for about 30 seconds or until the product is homogeneous. If necessary, add up to **8** ounces of water to adjust workability (especially helpful if spraying on Tuff II). Final consistency should be a creamy light and easily trowelable mixture.



Cover the entire above grade surface of the ICF or rigid foam insulation boards with Styro self-sticking mesh (at least cover all seams and corners). Continue the mesh around any corners. Overlap any runs of mesh by 1 inch. If necessary, indentations in the foam from counter-sunk fasteners etc., can be pre-treated with Tuff II and left to *dry* prior to meshing.

Tuff II *can* be applied and textured in a single coat using a stainless steel trowel or sprayer. Or, first apply a tight coat of Tuff 11 over the mesh. Use the mesh to gauge the thickness. Allow to set for at least 30 minutes. Trowel-apply a second pass of Tuff II to a 1/8" total thickness. No mesh pattern should be visible at this point. Immediately add the desired texture using a brush, trowel, float or other acceptable method. Immediately texture the *Tuff II* using a brush, float, or skip-trowel technique as desired to create any attractive appearance.

Quality. Innovation. Guaranteed Satisfaction.

STYRO INDUSTRIES

TECHNICAL DATA

pH (wet) —— **Approx. 10.5**
Density (wet).....**12 lbs per gallon**
Chemistry —— **Polymer based 100% acrylic**
Coverage 80 square feet per 5-gallon pail.

Handling and Storage

Keep from freezing. Do not apply to frosted or deteriorated insulation boards. Protect from precipitation for 12 hours. Do not apply if the temperature cannot be maintained above 40° for 24 hours. Shelf life in unopened pails is 24-36 months when stored under cover between 50 to 90 degrees fahrenheit.

Precautions

This product is a mildly alkaline-based material. Do not ingest. Avoid contact with skin and eyes. In case of contact, flush with water. For contact with eyes, get immediate medical attention in addition to flushing. Wear safety glasses and protective clothing. Keep out of reach of children and pets.

F.A.Q.

Q: Can Tuff 11 be sprayed on?
A: **Yes! With a Hopper Gun or small sprayer.**

Q: *Can YouApply TuffII to Other Surfaces besides ICF & Rigid Foam Insulation?*
A: **Yes! Tuff II also bonds to brick, plywood, drywall, concrete, cement board and other surfaces.**

Q: *Will Tuff II Hold Up to Normal Wear & Tear?*
A: **Yes. Tuff II is a 100% acrylic coating designed to withstand chipping, flaking, cracking, and regular every day abuse including Weed Eater damage!**

Q: Can the Tuff 11 Coating be repaired if damaged?
A: **Yes. Damaged areas can be meshed if necessary and re-coated and re-textured.**

Styro Industries Inc.
888-702-9920 ext 227
www.styro.net

Foundation Insulation And ICF Coatings!

Easy to apply coatings designed to coat, protect and beautify!

PRE-MIXED

Tuff II

Tuff II is a pre-mixed trowel / spray on acrylic coating sold in 5 gallon pails. Tuff II is tintable and easy to texture with a brush or trowel. Super Strong & Weed Eater Proof!
Colors = White, Concrete Gray, Foundation Gray, Custom


FlexCoat

FlexCoat is a pre-mixed acrylic coating sold in 2 and 5 gallon pails. FlexCoat is tint-able and easy to texture with a brush.
Colors = White, Foundation Gray, Concrete Gray, Lt Gray, Custom

Insulating Concrete Form Association

FOUNDATION SYSTEM COATING

Don't Forget to Check Out the Foundation Panels On Back ⇨

JUST ADD WATER


Complete Kit

Brush On Coating Kit ST is a just add water polymer modified coating. The Brush On Coating Kit ST can be brushed or sprayed on. Kit includes Pail, Dry Mix, Brush and Sticky Mesh Tape (for seams and corners). Colors = Gray & White

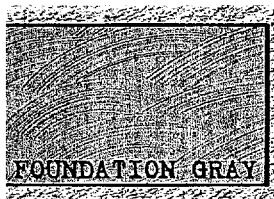
Bulk Mix

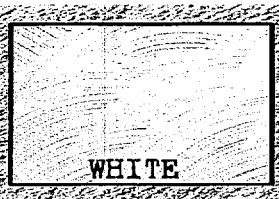
Brush On Coating ST Bulk Mix is identical to the ST Coating Kit only it is sold in 50 pound bags without the Brush and Mesh. Colors = Gray & White

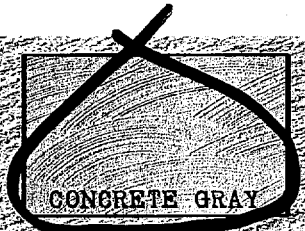
2 of 2

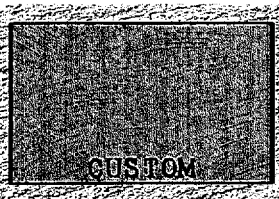
With building code changes, mold concerns, and an increased need for energy efficient buildings more and more structures feature exterior foundation insulation that needs to be coated above grade!

For an Easy to Apply, Durable and Attractive Solution Turn to Styro Industries!


FOUNDATION GRAY


WHITE

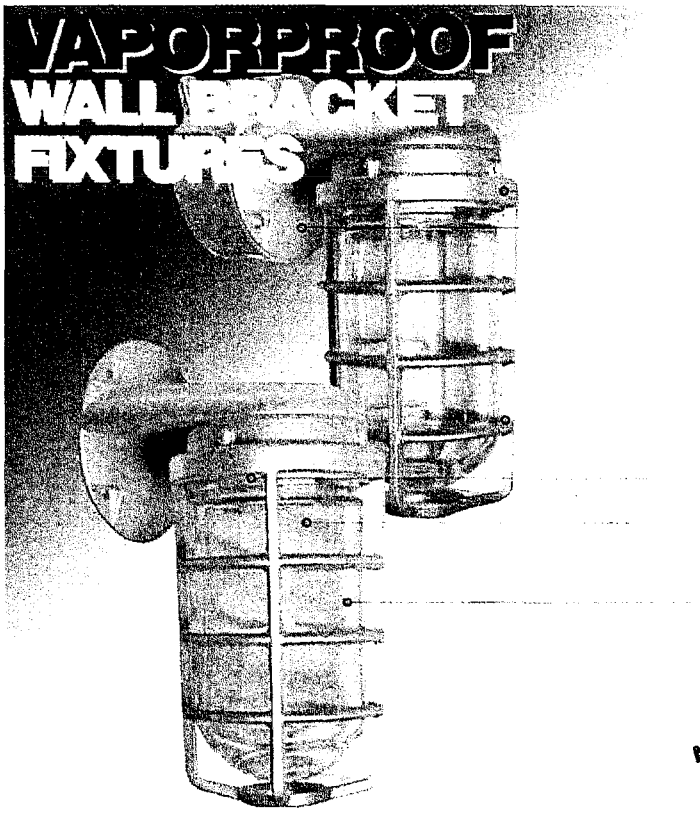

CONCRETE GRAY


CUSTOM

888-702-9920
www.styro.net

STYRO INDUSTRIES

VAPORPROOF WALL BRACKET FIXTURES



Durable, versatile and economical vaporproof incandescent or fluorescent lighting for non-hazardous locations.

*Die **cast** aluminum **for** superior **durability***

Set screw keeps guard securely in place

*Junction **box** with sturdy **mounting lugs***

*All **brass** hardware*

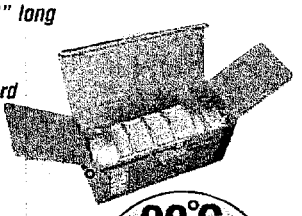
*Close-up **plugs allow** Phillips or **slotted** screwdrivers far easy installation*

One piece die cast aluminum guards threaded for secure fit

High temperature silicone internal gaskets

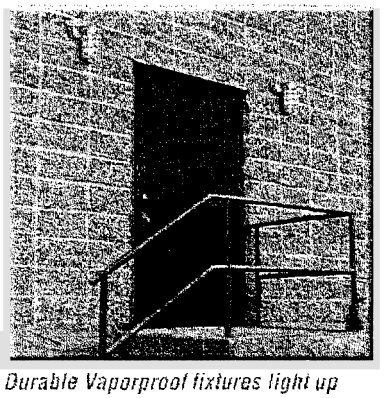
Premium porcelain socket with 150°C 8" long leads attached

Clear heat resistant glass globes standard
Polycarbonate Permaglobes available



*Packed **partially unassembled** for easy **installation***

New!
***UL Listed** for use with **90°C** supply wiring OK lor use **in** dwellings and **wet** locations*



Durable Vaporproof fixtures light up entrances in industrial locations

A VX100DG in a scene from the movie "Mystic Pizza" starring Julia Roberts. In Hollywood, they install fixtures upside down. You should always install fixture lamp base up.

Best Supporting Prop in a movie! Here's a RAB Vaporproof in a scene from Ron Howard's "The Paper" starring Michael Keaton and Glenn Close. (When using outdoors, always install lamp base up.)

Specifications c UL us

UL *Listing:*
Suitable lor wet locations.
Suilable for use in dwellings.
Suitable lor use with 90°C supply wiring.
Complies with UL Standard 1598. For non-hazardous locations where Ihe lamp. socket and wiring require protection Irom rain, corrosive fumes, non-combustible dusts moislure. non-explosive vapors and gases.

Wattage:
See catalog number chart lor maximum wattage with clear glass. colored glass and Permaglobes.

Hub Size:
1/2" or 3/4" **NPS .** Metric size hub laps available. Consult factory.

Construction:
Die cast aluminum with brass screws.

Globes:
Clear heal resistant glass slandard. Colored and while glass globes available Unbreakable **RAB Permaglobes** available in clear and in color. See page **136**

Reflectors:
Highly reflective while baked polyester epoxy powder finish over a heavy gauge aluminum base Reflectors Ihread onto fixtures See page 138.

Finish:
Natural unpainted finish standard. Painted finishes of Silver Gray (add suffix S), White (add **Wj** and Black (add B). Other finish colors available Consult factory

Guard:
One piece **die** cast aluminum with set screw.

Wire Guard:
8 GA. steel *wire* with silver powder coat.

Socket:
Premium porcelain with 150°C 8" leads atlached. Fastened with 2 brass screws.

CFL Lamp Base:
13Watt: GX23 | 22Watt: GX32d

CFL Ballast:
NPF 120V

Fax Info on Demand 24/7
Call RAB FaxBack at 688 722-1236.
Enter document numbers shown below:

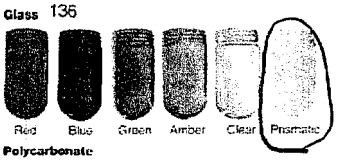
	Catalog Page	Installation Manual
VBR, VXBR, & VA	480	471

For more info on RAB FaxBack see p 170

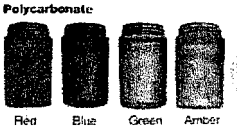
Cross References:
On pages 162-163, on FaxBack (Doc #723) and on www.rabweb.com

Special Globes

Colored (While Red, Blue, Green or Amber) Prismatic or Ball shaped globes are available in glass or polycarbonate Heal resistant glass globes are also available. Order a vaporproof fixture less globe and combine it with a Globe from Page **Glass** 136



Polycarbonate



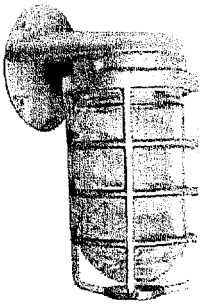
RAB TEL 888 RAB 1000
FAX 888 RAB 1232
www.rabweb.com

top 4 LIGHT fixtures: Wall mount

VBR Bracket

Die cast aluminum construction with sturdy **wall** mounting bracket. Medium base socket and a variety of globes. Incandescent up to 200 watts CFL 13 or **22 waits. Fits** 4' box. CFL lamp supplied. Incandescent lamp not supplied.

Finish
- Natural
- Silver Gray
- White
- Black

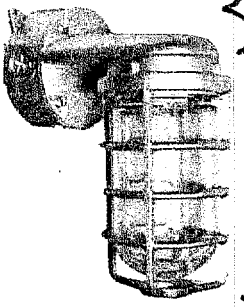


VBR100DG
shown in Natural

VXBR Bracket & Box

Die cast aluminum construction. Wall bracket plus junction box with sturdy mounting lugs. Medium base socket, 1/2" or 3/4" NPS hub size and a variety of globes. Incandescent up to 300 watts. CFL 13 or 22 watts. CFL lamp supplied. Incandescent lamp not supplied.

Finish:
- Natural
- Silver Gray
- White
- Black



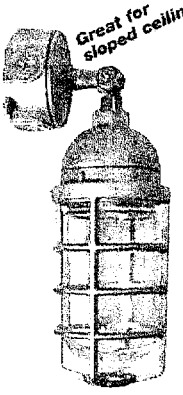
VXBR100DG
shown in Natural

Adjustable Pendant

Universal swivel permits mounting at any angle and locks in **place** Die cast aluminum construction Medium base socket and a variety of globes. Incandescent up to 300 watts. CFL 13 or 22 watts. CFL lamp supplied. Incandescent lamp not supplied.

Finish. **Natural**

Great for sloped ceilings



VA100DG
shown in Natural

Product Information

Natural Fixture with:

- clear glass & die cast guard
- clear glass & wire clamp guard
- clear glass **globe**
- clear Permaglobe
- white Perinagiobe

- Fixture **less** globe
- 13 watt Fluorescent, 120Volt
- 22 **watt** Fluorescent, 120 Volt
  Lamp included **CFL**
- 3/4" tapped **hubs**

Finish Add suffix
- Silver Gray
- White
- Black

COLD START
WARM WHITE

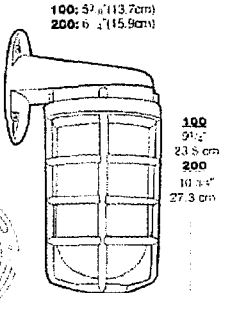
Catalog Numbers

100 Series Max Watts	200 Series Watts	100 Series Max Watts	200 Series Max Watts	100 Series Max Watts	200 Series Max Watts
150w Clear Glass 100w Colored Glass 75w Permaglobe	200w Clear Glass 150w Colored Glass 100w Permaglobe	150w Clear Glass 100w Colored Glass 75w Permaglobe	300w Clear Glass 200w Colored Glass 100w Permaglobe	150w Clear Glass 100w Colored Glass 75w Permaglobe	300w Clear Glass 200w Colored Glass 100w Permaglobe
VBR100DG	VBR200DG	VXBR100DG	VXBR200DG	VA100DG	VA200DG
VBR100G	VBR200G	VXBR100G	VXBR200G	VA100G	VA200G
VBR100	VBR200	VXBR100	VXBR200	VA100	VA200
VBR100P	VBR200P	VXBR100P	VXBR200P	VA100P	VA200P
VBR100PW	VBR200PW	VXBR100PW	VXBR200PW	VA100PW	VA200PW
VBR1	VBR2	VXBR1	VXBR2	VA1	VA2
add /F13	add /F22	add /F13	add /F22	add /F13	add /F22
		add -3/4	add -3/4	add -3/4	add -3/4
add S add W add B Natural, no suffix	add S add W add B	add S add W add B Natural E 1/2' hubs no suffix	add S add W add B		

12w compact Fluor.

Dimensions

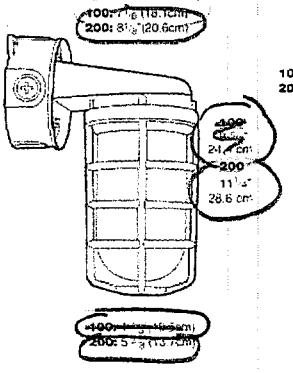
VBR100DG E VBR200DG



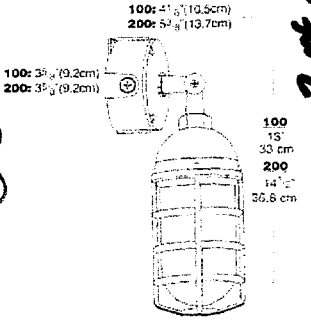
VCADPLT
Adapter plate
(VC fixtures only)

100: 4 1/8" (10.5cm)
200: 5 1/8" (13.7cm)

VXBR100DG & VXBR200DG



VA100DG E VA200DG

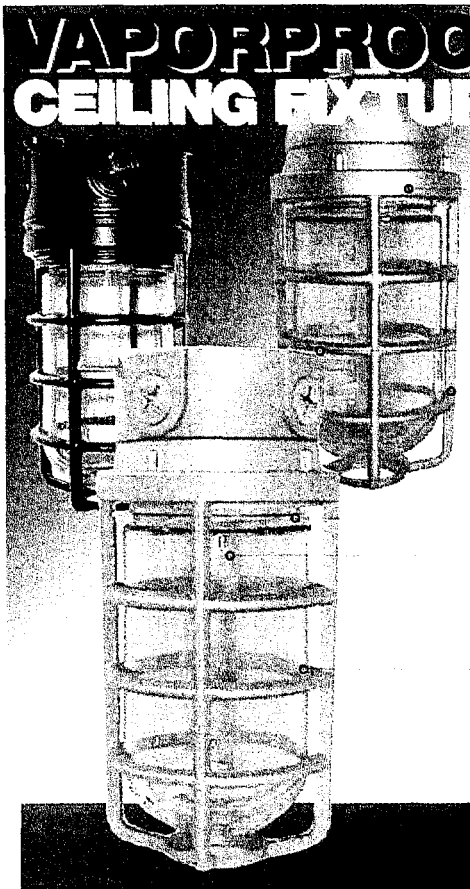


2 or 4 light fixture: wall mount

VAPORPROOF

TEL 866 RAB 1000
FAX 888 RAB 1232
www.rabweb.com
RAB

VAPORPROOF CEILING FIXTURE



Durable, versatile and economical. Use RAB vaporproof incandescent or fluorescent lighting for non-hazardous locations

Die cast aluminum forsuperior durability

Sei screw keeps guard securely in place

All brass hardware

Close-up plugs allow Phillips or slotted screwdrivers far easy installation

Junction box with sturdy mounting lugs

One piece die cast aluminum guards threaded for secure fit

UL Listed for use with 90°C supply wiring OK for use in dwellings and wet locations

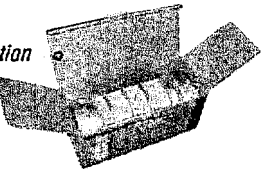
High temperature silicone internal gaskets

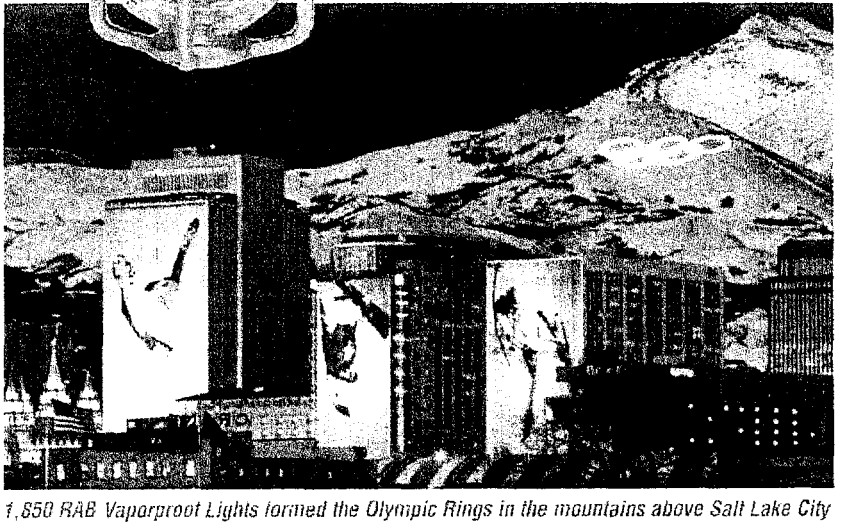
Premium porcelain socket wiih 150°C 8" long leads

Adapter plate included with VC fixtures

Clear heat resistant glass globes standard Polycarbonale Permaglobes available

Packed partially assembled for fast installation





1,850 RAB Vaporproof Lights formed the Olympic Rings in the mountains above Salt Lake City

Product Information

Natural Fixture with:

clear glass & die *cast* guard

clear glass & wire clamp guard

clear glass globe

clear Permaglobe

white Permaglobe

Fixture less globe

13 watt Fluorescent, 120 Volt Lamp included — CFL

22 watt Fluorescent 120 Volt Lamp included — CFL

3/4" tapped hubs

Finish- Add suffix:

Silver **Gray**
White
● Black

Specifications

UL Listing:
Suitable for wet locations.
Suitable for use in dwellings.
Suitable for use with 90°C supply **wiring.**
Complies with UL Standard 1598. For lion-hazardous locations where the lamp. socket and wiring require protection from rain. corrosive fumes, non-combustible dusts, moisture non-explosive vapors and gases. For lamp base up inslallation only when outdoors.

Wattage:
See catalog *number chart* lor maximum wattage with clear glass. colored glass and Permaglobes.

Hub sire:
1/2" or 3/4" NPS. Metric size **hub** taps available. Consult factory.

Globes:
Clear thermal shock resistant soda lime glass slandard. Colored and while glass globes available. Unbreakable RAB Permaglobes available in clear and in color. See page 136.

Reflectors:
Highly reflective white baked polyester epoxy powder finish over a heavy gauge aluminum bass. Reflectors thread onto fixtures. See page 138.

Finish:
Natural *unpainted* finish slandard Painted finishes ll Silver Grav (add suffix S) While (add W) and Black (add B). Other finish colors available Consult factory.

Construction:
Die cast aluminum with brass screws

Guard:
One piece die *cast* aluminum with set screw

Wire Guard:
8 gauge **steel** wire with silver powder coat

Socket:
Incandescent: Premium porcelain with 150% 8" leads atlached. Fastened with 2 brass screws.
CFL: 13w = **GX23-2** Base
22w = GX32d-2 Base

Fax Info on Demand 24/7
Call RAB FaxBack at 888 722-1236.
Enter document numbers shown below:

	Catalog Page	Installation Manual
VX, VP, VC & VLX	470	471

For mare info on **RAB** FaxBack see p.170

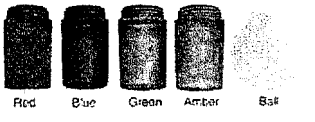
Cross References:
Available on pages **162** and *at* www.rabweb.com

Special Globes

Coloredglobes (White. **Red Blue.** Green or Amber) in cylindrical *or* ball shapes are available in glass or polycarbonate Order a vaporproof fixture less globe and combine it with a **Globe** from page 136

Glass

Polycarbonate



3 or 4 LIGHT fixture: ceiling MOUNT

RAB TEL 888 RAB 1000
FAX 888 RAB 1232
www.rabweb.com

VX 4" Box

Box mount, die cast aluminum with built-in junction box and sturdy mounting lugs Medium base socket, 1/2" or 3/4" NPS hub size and a variety of globes Incandescent up to 300 watts (lamp not supplied)
CFL. 13 or 22 watts (lamp included).

Finish: Natural
Silver Gray
White
● Black

VX100DG shown in natural, silver gray, white and black

VP Pendant

Pendant mount, die cast aluminum construction. Medium base socket. 1/2" or 3/4" NPS pendant thread and a variety of globes. Incandescent up to 200 watts (lamp nor supplied).
CFL: 13 or 22 watts (lamp included).

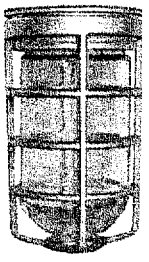
Finish: Natural
Silver Gray
White
● Black

VP100DG shown in natural

VC Ceiling

Die cast aluminum construction. Mounts to existing surface or recessed 4" boxes. Adapter plate provided Medium base socket and a variety of globes Incandescent up to 150 watts (lamp not supplied).
CFL 13 or 22 watts (lamp included).

Finish Natural
Silver Gray
White
● Black

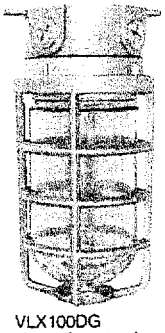


VC100DG shown in natural

VLX 3" Box

Die cast aluminum with built-in 3" junction box and sturdy mounting lugs Medium base socket. 1/2" or 3/4" NPS hub size and a variety of globes Incandescent up to 150 watts (lamp not suppled).
CFL: 13 or 22 watts (lamp included).

Finish: Natural



VLX100DG shown in natural

Catalog Numbers

100 Series Max Watts 150w Clear Glass 100w Colored Glass 75w Permaglobe	200 Series Max Watts 300w Clear Glass 200w Colored Glass 100w Permaglobe
VX100DG	VX200DG
VX100G	VX200G
VX100	VX200
VX100P	VX200P
VX100PW	VX200PW
VX1	VX2
add /F13	add /F22
add -3/4	add -3/4
add S	add S
add W	add W
add B	add B

For Natural & 1/2" taps. no suffix needed

100 Series Max Watts 150w Clear Glass 100w Colored Glass 75w Permaglobe	200 Series Max Watts 200w Clear Glass 150w Colored Glass 100w Permaglobe
VP100DG	VP200DG
VP100G	VP200G
VP100	VP200
VP100P	VP200P
VP100PW	VP200PW
VP1	VP2
add /F13	add /F22
add -3/4	add -3/4
add S	add S
add W	add W
add B	add B

For Natural & 1/2" taps. no suffix needed

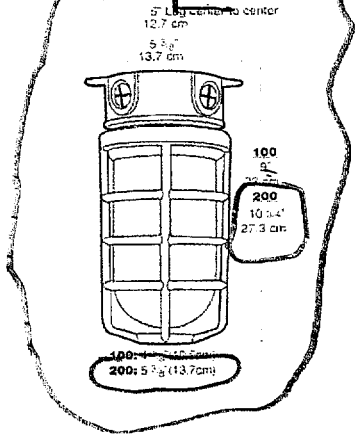
100 Series Max Watts 100w Clear Glass 100w Colored Glass 75w Permaglobe	200 Series Max Watts 150w Clear Glass 100w Colored Glass 100w Permaglobe
VC100DG	VC200DG
VC100G	VC200G
VC100	VC200
VC100P	VC200P
VC100PW	VC200PW
VC1	VC2
add /F13	add /F22
add -3/4	add -3/4
add S	add S
add W	add W
add B	add B

For Naiural. no suffix needed.

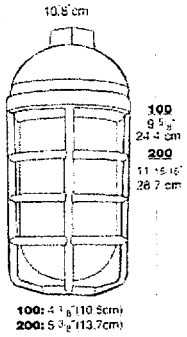
100 Series Max Watts 150w Clear Glass 100w Colored Glass 75w Permaglobe
VLX100DG

Dimensions

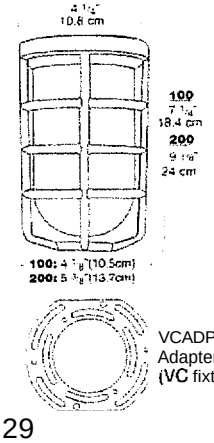
VX100DG & VX200DG



VP100DG & VP200DG

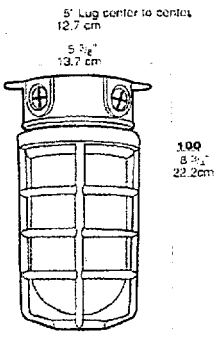


VC100DG & VC200DG



VCADPLT
Adapter plate
(VC fixtures only)

VLX100DG & VLX200DG



VAPORPROOF 4 & 4 LIGHT fixture: ceiling mount

TEL 888 RAB 1000
FAX 888 RAB 1232
www.rabweb.com
RAB

AB/ABA/ABE/ABU/PBS ADJUSTABLE AND STANDOFF POST BASES

SIMPSON Strong-Tie CONNECTORS

The AB is a fully-adlustable post base which offers moisture protection and finished hardware appearance.

Post Bases provide tested capacity. They feature 1" standoff height above concrete floors, code-required when supporting permanent structures that are exposed to the weather or water splash, or in basements. They reduce the potential for decay at post and column ends.

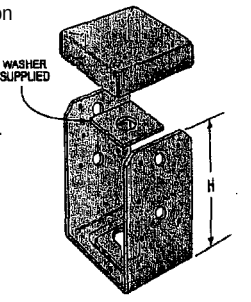
MATERIAL. AB—12 ga plates; 16 ga base cover; all others—see table.

FINISH. Galvanized. Some products available in Z-MAX; see Corrosion-Resistance, page 5.

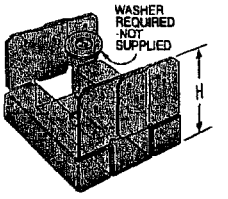
INSTALLATION • Use all specified fasteners. See General Notes.

- Not recommended for non-top-supported installations such as fences
- PBS embed into wet concrete up to the bottom of the 1" standoff base plate. A 2" minimum side cover is required to obtain the full load for PBS. Holes in the bottom of the PBS straps allow for free concrete flow.
- AB—Post nail holes are sized for 10d commons. Rectangular adjustment plate assumes ½" dia anchorage. Supplied as shown, position the post, secure the easy-access nut, then bend up the fourth side.
- AB, ABA, ABE and ABU—for pre-pour installed anchors. For epoxy or wedge anchors, select and install according to anchor manufacturer's recommendations; anchor diameter shown in table. Install required washer, which is not included for ABAs.
- See Simpson Anchor Systems for tested, load-rated anchors.

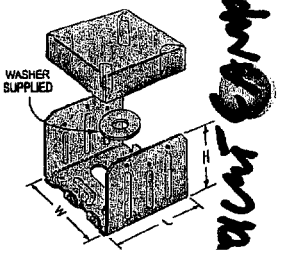
CODES: BOCA, ICBO, SBCCI NER-393, NER-422, NER-432, NER-469, NER-499; **ICBO 5670; City of LA. RR 24818.** RR 25064,25074,25158; Dade Co FL **99-0713.05 (ABA, ABE), 00-0512.11 (ABU).**



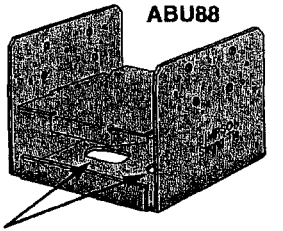
ABU44
(other sizes similar)



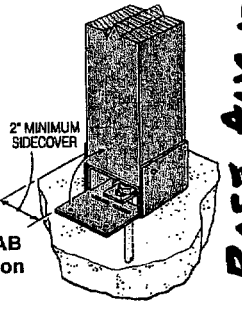
ABA44
(other sizes similar)
U.S. Patent 5,333,435



ABE44
ABE46,46R,66 and 66R supplied with rectangular washer.



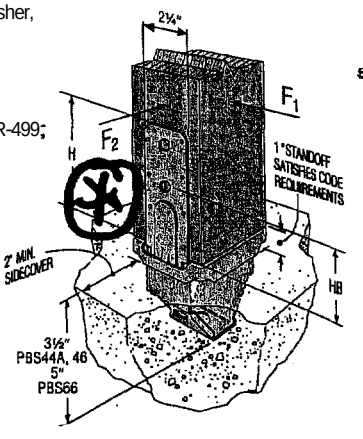
ABU88
2 load transfer plates supplied



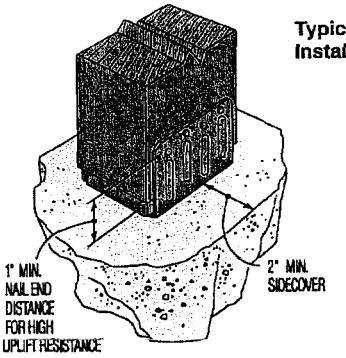
Typical AB Installation

Model No.	Dimensions W	Dimensions L	Allowable Downloads (100)
AB44	3⅜	3⅜	4065
AB44R	4	4⅛	4065
AB46	3⅜	5⅜	4165
AB46R	4	6	4165
AB66	5½	5⅜	5335
AB66R	6	6	5335

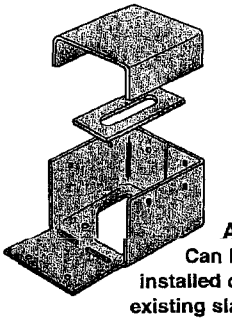
1. Loads may not be increased for short-term loading



Typical **PBS44A** Installation



Typical **ABE46R** Installation for rough lumber (ABE similar)

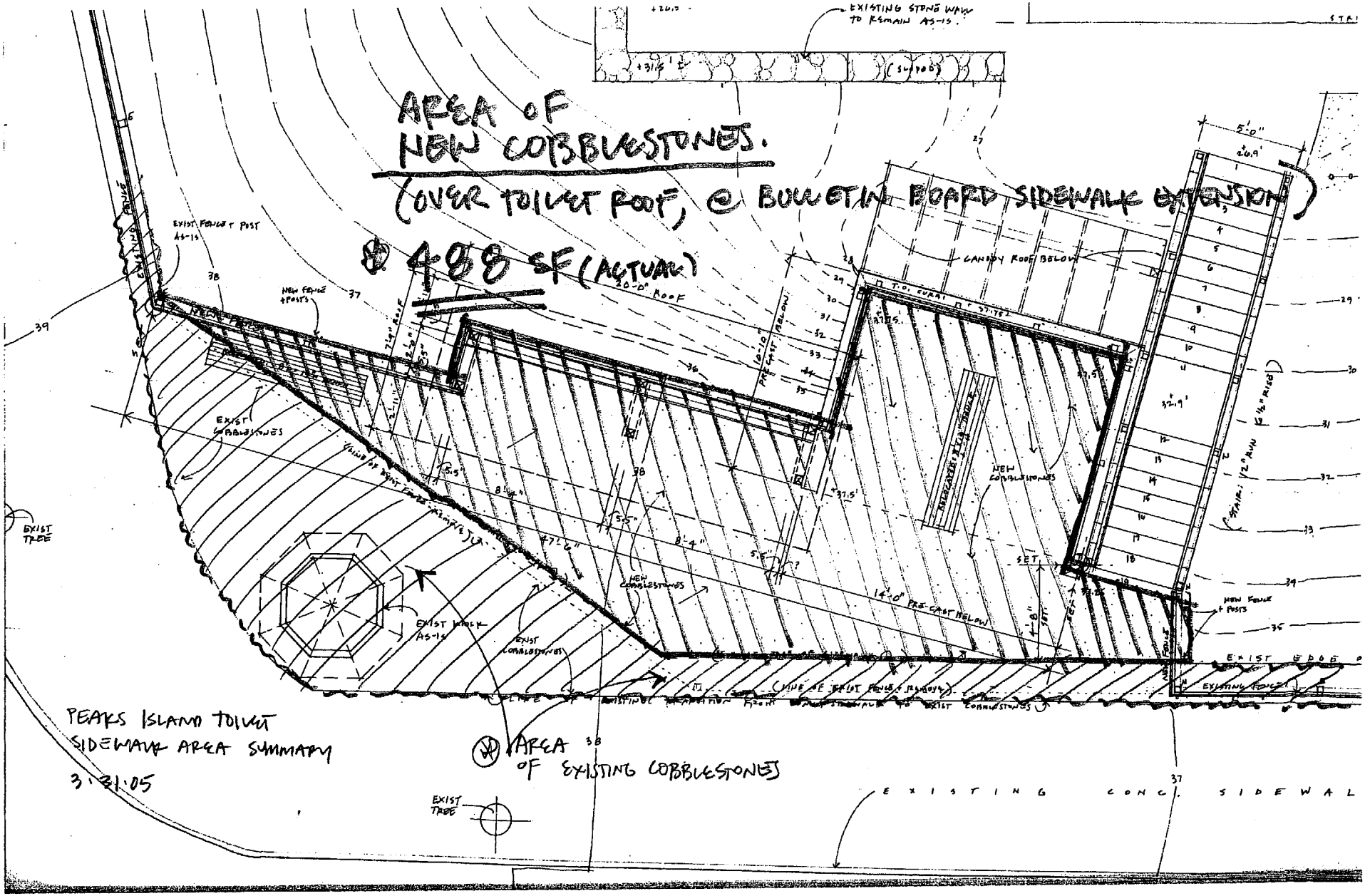


AB
Can be installed on existing slab

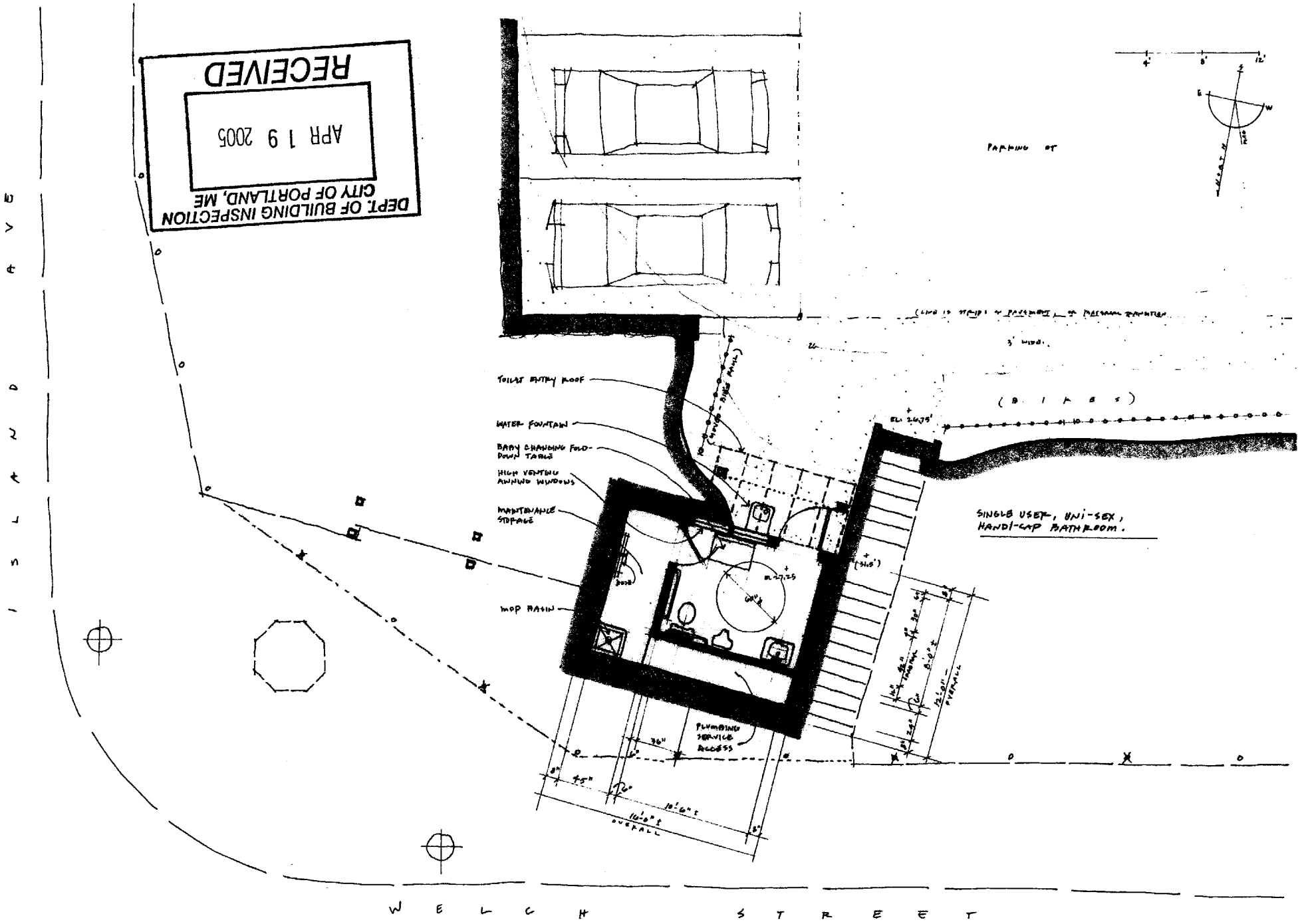
Model No.	Nominal Post Size	Material Base (Ga)	Material Strap (Ga)	Dimensions W	L	H	HB	Fasteners Anch. Dia	Post Nails	Post Bolts Qty	Post Bolts Dia	Uplift Avg Ult	Allowable Loads Uplift (133) Nails	Uplift (133) Bolts	Uplift (160) Nails	Uplift (160) Bolts	F_1 (133 & 160) Nails	F_1 (133 & 160) Bolts	F_2 (133 & 160) Nails	F_2 (133 & 160) Bolts	Down (100)
ABA44	4x4	16	16	3⅜	3⅛	3¹⁄₁₆	—	½	6-10d	—	—	2120	555	—	555	—	—	—	—	—	6000
ABE44	4x4	16	16	3⅜	3½	2¾	—	½	6-10d	—	—	1893	520	—	520	—	—	—	—	—	6665
ABU44	4x4	16	12	3⅜	3	5½	1¾	⅝	12-16d	2	½	7833	2200	1800	2200	2160	—	—	—	—	6665
PBS44A	4x4	12	14	3⅜	2¼	6¼	3⅛	—	14-16d	2	½	7733	2400	2400	2400	2400	1165	230	885	885	6665
ABA44R	RGH 4x4	16	16	4⅛	3⅛	2¹⁵⁄₁₆	—	½	6-10d	—	—	2120	555	—	555	—	—	—	—	—	8000
ABE44R	RGH 4x4	16	16	4	3½	2⅝	—	½	6-10d	—	—	1893	400	—	400	—	—	—	—	—	6665
ABE46	4x6	12	16	3⅜	5⅞	4⅛	—	⅝	8-16d	—	—	5167	810	—	810	—	—	—	—	—	7335
PBS46	4x6	12	14	3⅜	2¼	6⅜	3⅜	—	14-16d	2	½	7733	2400	2400	2400	2400	1165	360	885	885	9335
ABA46	4x6	14	14	3⅜	5⅜	3⅛	—	⅝	8-16d	—	—	2967	700	—	700	—	—	—	—	—	9435
ABU46	4x6	12	12	3⅜	5	7	2⅝	⅝	12-16d	2	½	8633	2255	2300	2300	2300	—	—	—	—	10335
ABE46R	RGH 4x6	12	16	4⅛	5⅛	3⅜	—	⅝	8-16d	—	—	5167	810	—	810	—	—	—	—	—	7335
ABA46R	RGH 4x6	14	14	4⅛	5⅜	2⅞	—	⅝	8-16d	—	—	2967	935	—	935	—	—	—	—	—	12000
PBS66	6x6	12	12	5½	2¼	6½	3¹⁄₁₆	—	14-16d	2	½	13100	2630	3560	3160	4000	1865	570	1700	1700	9335
ABA66	6x6	14	14	5½	5¼	3⅛	—	⅝	8-16d	—	—	3050	720	—	720	—	—	—	—	—	10665
ABE66	6x6	12	14	5½	5⅛	3⅛	—	⅝	8-16d	—	—	4833	900	—	900	—	—	—	—	—	12000
ABU66	6x6	12	10	5½	5	6⅛	1¾	⅝	12-16d	2	½	8900	2300	2300	2300	2300	—	—	—	—	12000
ABA66R	RGH 6x6	14	14	6	5⅜	2⅛	—	⅝	8-16d	—	—	3050	985	—	985	—	—	—	—	—	12665
ABE66R	RGH 6x6	12	14	6⅛	5⅛	2⅛	—	⅝	8-16d	—	—	4833	900	—	900	—	—	—	—	—	12000
ABU88[4]	8x8	12	14	7½	7	7	—	2-⅝	18-16d	—	—	12893	2320	—	2320	—	—	—	—	—	24335
ABU88R[4]	RGH 8x8	12	14	8	7	7	—	2-⅝	18-16d	—	—	12893	2320	—	2320	—	—	—	—	—	24335

1. Uplift and lateral loads have been increased 33% and 60% for earthquake or wind loading; no further increase allowed. Reduce by 33% and 60% for normal loading.
2. Downloads may not be increased for short-term loading.
3. Specifier to design concrete for shear capacity.
4. ABU88 and ABU88R may be installed with 8-SDS¼X3 wood screws for the same table load.

Caps & Bases



COBBLE STONE AREA SUMMARY .....



PEAKS PUBLIC TOILET - WHITTEN ARCHITECTS 774-0111 x102 - 10.26.04

PARKING LOT / LOWER LEVEL PLAN

Statement of Special Inspections

Project: *Peaks Island Public Toilet*

Location: *Welch Street, Peaks Island, Portland*

Owner: *City of Portland*

Design Professional in Responsible Charge: *William Winkelman AIA*

This *Statement of Special Inspections* is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the Building Code. It includes a schedule of Special Inspection services applicable to this project as well as the name of the Special Inspection Coordinator and the identity of other approved agencies to be retained for conducting these inspections and tests. This *Statement of Special Inspections* encompass the following disciplines:

☒ Structural ☐ Mechanical/Electrical/Plumbing
☐ Architectural ☒ Other: *precast*

The Special Inspection Coordinator shall keep records of all inspections and shall furnish inspection reports to the Building Official and the Registered Design Professional in Responsible Charge. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and the Registered Design Professional in Responsible Charge. The Special Inspection program does not relieve the Contractor of his or her responsibilities.

Interim reports shall be submitted to the Building Official and the Registered Design Professional in Responsible Charge.

A *Final Report of Special Inspections* documenting completion of all required Special Inspections, testing and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Use and Occupancy.

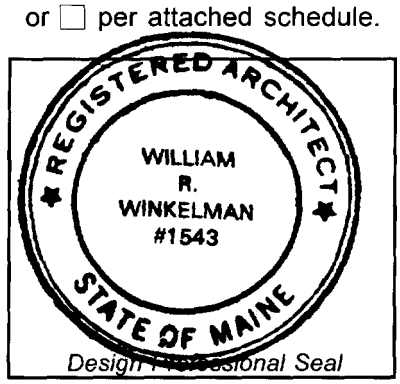
Job site safety and means and methods of construction are solely the responsibility of the Contractor

Interim Report Frequency: *As required* or ☐ per attached schedule.

Prepared by:

William Winkelman
(type or print name)

Signature



Design Professional Seal

TOM: PLEASE SIGN HERE, THEN FORWARD TO MIKE. THANKS

Owner's Authorization:

Signature Date

Building Official's Acceptance:

Signature Date

Schedule of Inspection and Testing Agencies

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- ☒ Soils and Foundations
- ☒ Cast-in-Place Concrete
- ☒ Precast Concrete
- ☐ Masonry
- ☐ Structural Steel
- ☐ Cold-Formed Steel Framing
- ☐ Spray Fire Resistant Material
- ☐ Wood Construction
- ☐ Exterior Insulation and Finish System
- ☐ Mechanical & Electrical Systems
- ☐ Architectural Systems
- ☐ Special Cases

Special Inspection Agencies	Firm	Address, Telephone, e-mail
1. Special Inspection Coordinator **William Winkelman AIA**	***Whitten + Winkelman***	***37 Silver Street*** ***Portland, ME 04101*** ***207-774-0111 x102*** *will@ww-architects.com*
2. Inspector Curtis Stuart, ACI-CFTT grade **1**	***Superior Concrete***	***982 Minot Ave*** ***Auburn, ME 04211*** ***207-781-9144*** ***mutt.bourgoin@oldcastleprecast.com***
3. Inspector		
4. Testing Agency		
5. Testing Agency		
6. Other		

Note: The inspectors and testing agencies shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. **Anv conflict of interest must be disclosed to the Building Official,** prior to commencing work.

MIKE, PLEASE NOTE RE THE ABOVE: SUPERIOR HAS PROVIDED THE STRUCTURAL ENGINEERING FOR THE PRECAST STRUCTURE AS WELL AS THE FABRICATION. THE PROPOSED SPECIAL INSPECTOR IS WITH SUPERIOR. AN ACI-CFTT GRADE **1** CERTIFIED INDIVIDUAL.

RE SOILS / FOUNDATIONS, AND CAST-IN-PLACE CONCRETE: BECAUSE OF OUR CIRCUMSTANCE WHERE THE CAST CONCRETE FOUNDATION IS IN PLACE, AND IS THUS OVER THE SOILS, I IN FACT KNOW MORE (A PRODUCT OF MY COMMUTING BY THE SITE TWICE A DAY, KEEPING MY NOSE IN THINGS) ABOUT WHAT REINFORCING WAS PLACED IN THE CONCRETE, THE QUALITY OF THE MIX, AND ABOUT THE SOILS CONDITIONS THAN THE FOUNDATION'S DESIGNING STRUCTURAL ENGINEER DOES (CAROLYN BIRD OF CASCO BAY ENGINEERING). THUS, I HAVE WRITTEN A STATEMENT OF INSPECTION RE THOSE ITEMS SEPARATILY AND STAMPED THEM.

Quality Assurance Plan

Quality Assurance for Seismic Resistance

Seismic Design Category

Quality Assurance Plan Required (Y/N) *N*

Description of seismic force resisting system and designated seismic systems:
Bulletin board is comprised of braced frames in one direction and inverted cantilever moment connected via tube steel into the foundation in the opposite direction.

Precast Bathroom is comprised of concrete shear walls and diaphragm.

Quality Assurance for Wind Requirements

Basic Wind Speed (3 second gust) *100 mph*

Wind Exposure Category *C*

Quality Assurance Plan Required (Y/N) *N*

Description of wind force resisting system and designated wind resisting components:
Bulletin board is comprised of braced frames in one direction and inverted cantilever moment connected via tube steel into the foundation in the opposite direction.

Precast Bathroom is comprised of concrete shear walls and diaphragm.

Statement of Responsibility

Each contractor responsible for the construction or fabrication of a system or component designated above must submit a Statement of Responsibility.

Qualifications of Inspectors and Testing Technicians

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Key for Minimum Qualifications of Inspection **Agents:**

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Agency **Number*** on the Schedule.

PE/SE	Structural Engineer – a licensed SE or PE specializing in the design of building structures
PE/GE	Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT	Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination

American Concrete Institute (ACI) Certification

ACI-CFTT	Concrete Field Testing Technician – Grade 1
ACI-CCI	Concrete Construction Inspector
ACI-LTT	Laboratory Testing Technician – Grade **1&2**
ACI-STT	Strength Testing Technician

American Welding Society (AWS) Certification

AWS-CWI	Certified Welding Inspector
AWS/AISC-SSI	Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Certification

ASNT	Non-Destructive Testing Technician – Level II or III.

International Code Council (ICC) Certification

ICC-SMSI	Structural Masonry Special Inspector
ICC-SWSI	Structural Steel and Welding Special Inspector
ICC-SFSI	Spray-Applied Fireproofing Special Inspector
ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector

National Institute for Certification in Engineering Technologies (NICET)

NICET-CT	Concrete Technician – Levels I, II, III & IV
NICET-ST	Soils Technician - Levels I, II, III & IV
NICET-GET	Geotechnical Engineering Technician - Levels I, II, III & IV

Exterior Design Institute (EDI) Certification

EDI-EIFS	EIFS Third Party Inspector

Other

Precast Concrete

Item	Agency # (Qualif.)	Scope
1. Plant Certification / Quality Control Procedures ☐ Fabricator Exempt	I	*See NPCA certificate: review of quality control procedures.*
2. Mix Design	2	*All batches are inspected for conformance within specified control tolerances with all ASTM and NPCA standards.*
3. Material Certification	2	*Inspect all materials for consistency w/ specifications*
4. Reinforcement Installation	2 ACI-CCI ICC-RCSI	*Inspect size, spacing, position and grade of reinforcing steel. Verify that reinforcing bars are free of form oil or other deleterious materials. Conforms to ASTM A615 grade 60.*
5. Prestress Operations	ICC-PCSI	*N/A*
6. Connections / Embedded Items	2	*Inspect for conformance w/ plans and specs (for floor drains, plumbing mounts, lifting inserts, weld plates, etc.*
7. Formwork Geometry	2	*Inspect proper layout, square ness, length and width.*
8. Concrete Placement	2 ACI-CCI ICC-RCSI	*Inspect placement of concrete. Verify that concrete conveyance and depositing avoids segregation or contamination. Verify that concrete is properly consolidated and finished.*
9. Sampling and Testing of Concrete	2 ACI-CFTT ACI-STT	*Test concrete compressive strength (ASTM C31 & C39), slump (ASTM C143), air-content (ASTM C231 or C173) and temperature (ASTM C1064).*
10. Curing and Protection	2 ACI-CCI ICC-RCSI	*Inspect curing, cold weather protection and hot weather protection procedures.*
11. Erected Precast Elements	- PE/SE	*N/A*
12. Other:		

Item	Agency # (Qualif.)	Scope
1. Shallow Foundations	I	*Observe soils existing conditions.*
2. Controlled Structural Fill	I	*Observe that correct fill will be installed.*
3. Deep Foundations	-	
4. Load Testing		
4. Other:		

Whitten + Winkelman, Architects

37 Silver Street
Portland, Maine 04101

207.774.0111
207.774.1668

1 June 2005

To: Michael Nugent, Inspection Services Manager
City of Portland
389 Congress Street
Portland, ME 04101

Project: Peaks Island Public Toilet: Welch Street, Peaks Island

From: Will Winkelman @ Whitten + Winkelman, Architects

Re: Foundations/ Cast-in-place Concrete Special Inspections Report

---

The foundation in place was observed in progress twice daily as it progressed (I live on island, walk by commuting and have more than a passing interest as it is very much in the public eye).

The construction crew formed and poured in three phases over a one week period, w/ the #4 bar cast-in and tied-off as detailed. The site built forms were solid and true. Through all the cast concrete work, adherence to the engineering details appeared to be thorough and deliberate.

I observed two of the three pours. No abnormal signs were seen of a poor concrete mix.

Will Winkelman, AIA

Concrete in place just after final pour.

REGISTERED ARCHITECT
WILLIAM
R
WINKELMAN
#1543
STATE OF MAINE

Whitten + Winkelman, Architects

37 Silver Street
Portland, Maine 04101

p: 207.774.0117
f: 207.774.1686

www.ww-architects.com

1 June2005

To: Michael Nugent, Inspection Services Manager
City of Portland
389 Congress Street
Portland, ME **04101**

Project: Peaks Island Public Toilet: Welch Street, Peaks Island

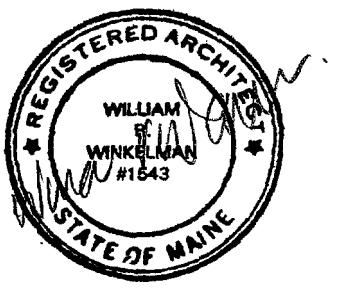
From: Will Winkelman @ Whitten + Winkelman, Architects

Re: Soils / Geotechnical Report

This note is regarding the soil conditions observed at the foundation site for the Peaks Island Public Toilet.

Upon completion of excavation for the structure, **I** observed (with Cook) the condition of the undisturbed soil on which footings were to be cast. They appeared to be a hard-pan surface (sandy gravel to gravel), suitable for 3,000psf foundation loads. No unexpected water courses, questionable soils, or ledge was encountered.

Will Winkelman, **AIA**



Whitten + Winkelman, Architects

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Portland, Maine 04101

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27 May 2005

To: Michael Nugent, Inspection Services Manager
City of Portand
389 Congress Street
Portland, **ME 04101**

Project: Peaks Island Public Toilet: Welch Street, Peaks Island

From: Will Winkelman @ Whitten + Winkelman, Architects

Re: Permitting follow-up items

Mike:

The attached pdf of additional filled out forms, stamped engineering structurals, guard system w/ engineering letter, and stair nosing correction should address your outstanding concerns.

The NPCA certification for Superior's Plant quality control addresses the special inspections, per 1704.2.2. At completion of fabrication a certificate of compliance needs to be submitted by Superior stating the work was performed in accordance with the approved construction documents.

Thanks

Will Winkelman

CITY OF PORTLAND
BUILDING CODE CERTFICATE
389 Congress St., Room 315
Portland, Maine 04 101

TO: Inspector of Buildings City of Portland, Maine
Department of Planning & Urban Development
Division of Housing & Community Service

FROM: WILL WINKELMAN OF WHITTEN + WINKELMAN, ARCHITECTS

RE: Certificate of Design

DATE: 5.23.05

These plans and/ or specifications covering construction work on:
PEAKS ISLAND PUBLIC TOILET: 11X14 SINGLE/PARTLY BURIED UNISEX TOILET OF PRECAST CONCRETE W/ ADJACENT EXTENSION OF COVERED STAIR + COMMUNITY BULLETIN BOARD

Have been designed and drawn up by the undersigned, a Maine registered Architect / Engineer according to the ~~2003 International Building Code~~ and local amendments.

(SEAL)

REGISTERED ARCHITECT
WILLIAM R. WINKELMAN #1543
STATE OF MAINE

As per Maine State Law

$50,000.00 or more in new construction, repair expansion, addition, or modification for Building *or* Structures, shall be prepared by a registered design Professional.

Signature:

Title: PRINCIPAL

Firm: WHITTEN + WINKELMAN

Address: 37 SILVER ST
PORTLAND, ME 04101

ACCESSIBILITY CERTIFICATE

Designer: WILL WINKELMAN

Address of Project: WELCH ST, PEAKS ISLAND

Nature of Project: PUBLIC TOILET (SINGLE ROOM / UNISEX W/ RELATED UTILITY.) ~ STAND-ALONE 14X14 BUILDING, HALF BURIED.

The technical submissions covering the proposed construction work as described above have been designed in compliance with applicable referenced **standards** found in the Maine Human Rights Law **and Federal** Americans with Disability **Act.**

Signature:

Title: PRINCIPAL

(SEAL)

REGISTERED ARCHITECT
WILLIAM R. WINKELMAN #1543
STATE OF MAINE

Firm: WHITTEN + WINKELMAN, ARCHITECTS

Address: 37 SILVER ST
PORTLAND, ME 04101

Phone: 774-0111 - X102

NOTE: If this project is a new Multi Family Structure of 4 units or more, this **project must also be designed in compliance with the Federal Fair Housing Act. On a separate submission, please explain in narrative form the method of compliance.**

This is to certify that the quality control procedures of

Superior Concrete Co

Auburn, Maine

were audited during an on-site plant inspection.
This facility has successfully met the requirements stated in the NPCA Quality Control Manual.

Participation in the NPCA Plant Certification Program affirms an ongoing commitment to producing quality precast concrete products. This includes a dedication to continuous improvement in product design, raw materials, manufacturing processes, safety, employee education and customer service.

This certificate is valid August 8, 2004 through August 8, 2005 pending successfully passing an unannounced re-inspection during that time.

NPCA

Vernon C. Wehrung, Chairman of the Board

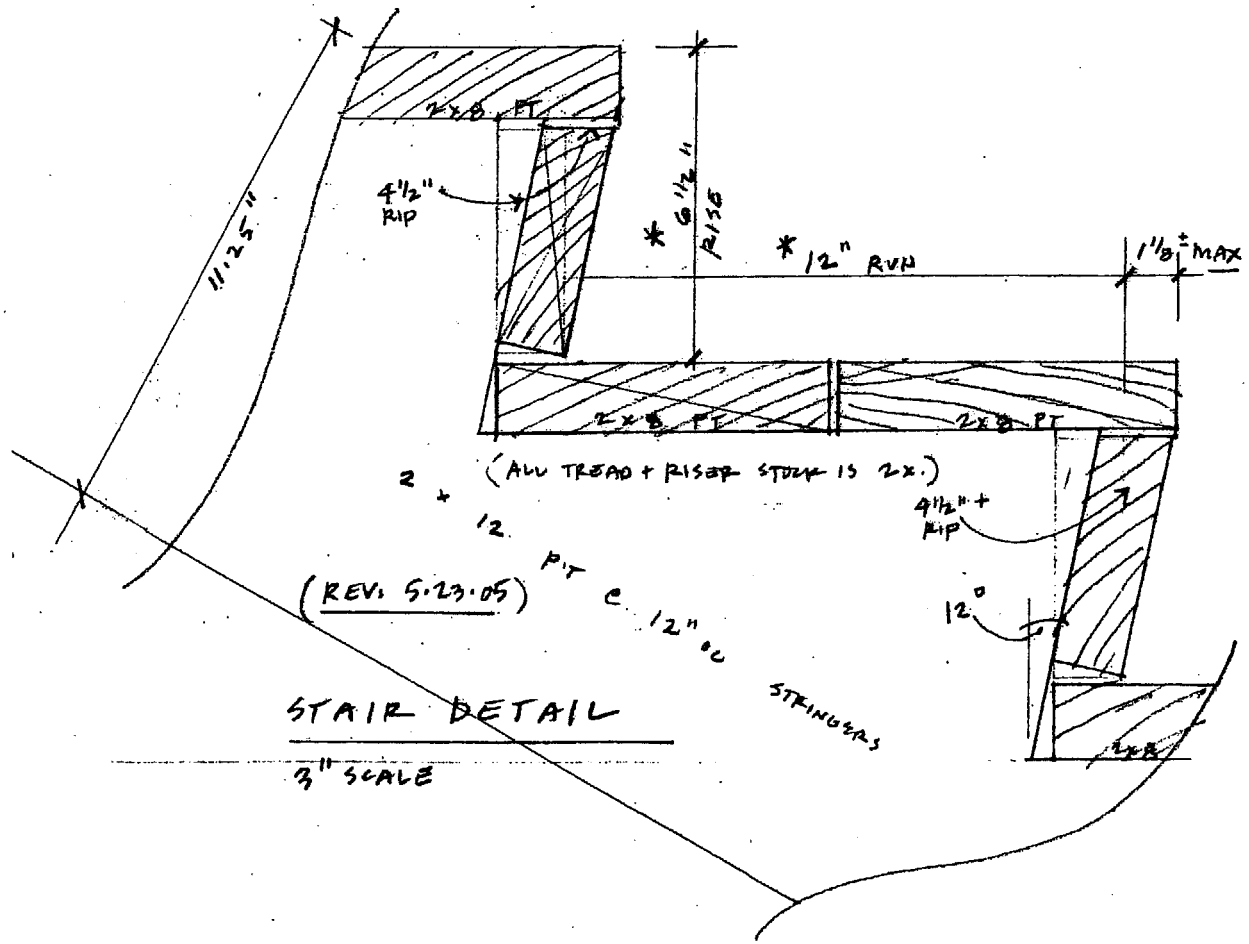
Ty E. Gable, NPCA President

Paul D. Krauss, Wiss, Janney, Elstner Associates Inc.

RE: SPECIAL INSPECTIONS / QUALITY ASSURANCE PLANS PLANS PUBLIC TOWN 5.23.05

5.23.05
REVISED STAIR NOSINGS.

WHITTEN + WINGELMAN, ARCHITECTS.



STAIR DETAIL

3" SCALE

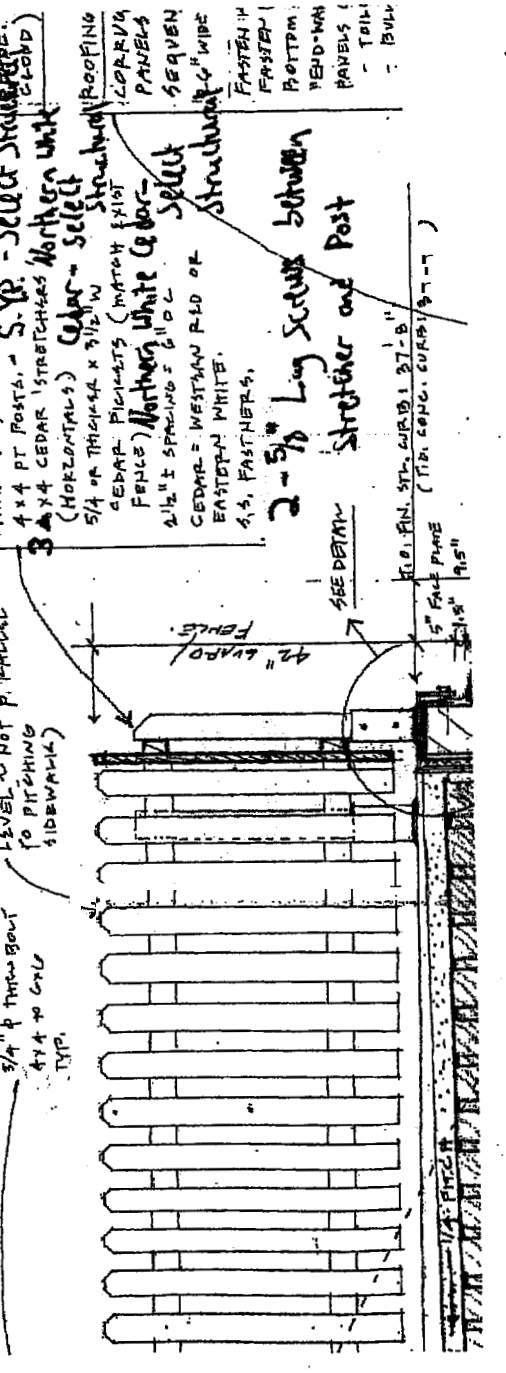
DEAKS PUBLIW TOILET

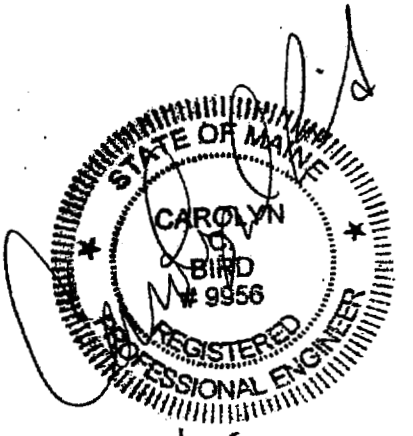
WHITTEN + WINKELMAN, ARCHITECTS
774-0111

GUARD RAIL - * STRUCTURAL REVIEW / PEAKS PUBLIC TOILET (1) of 2

5.23.05

REVISED AS NOTED:



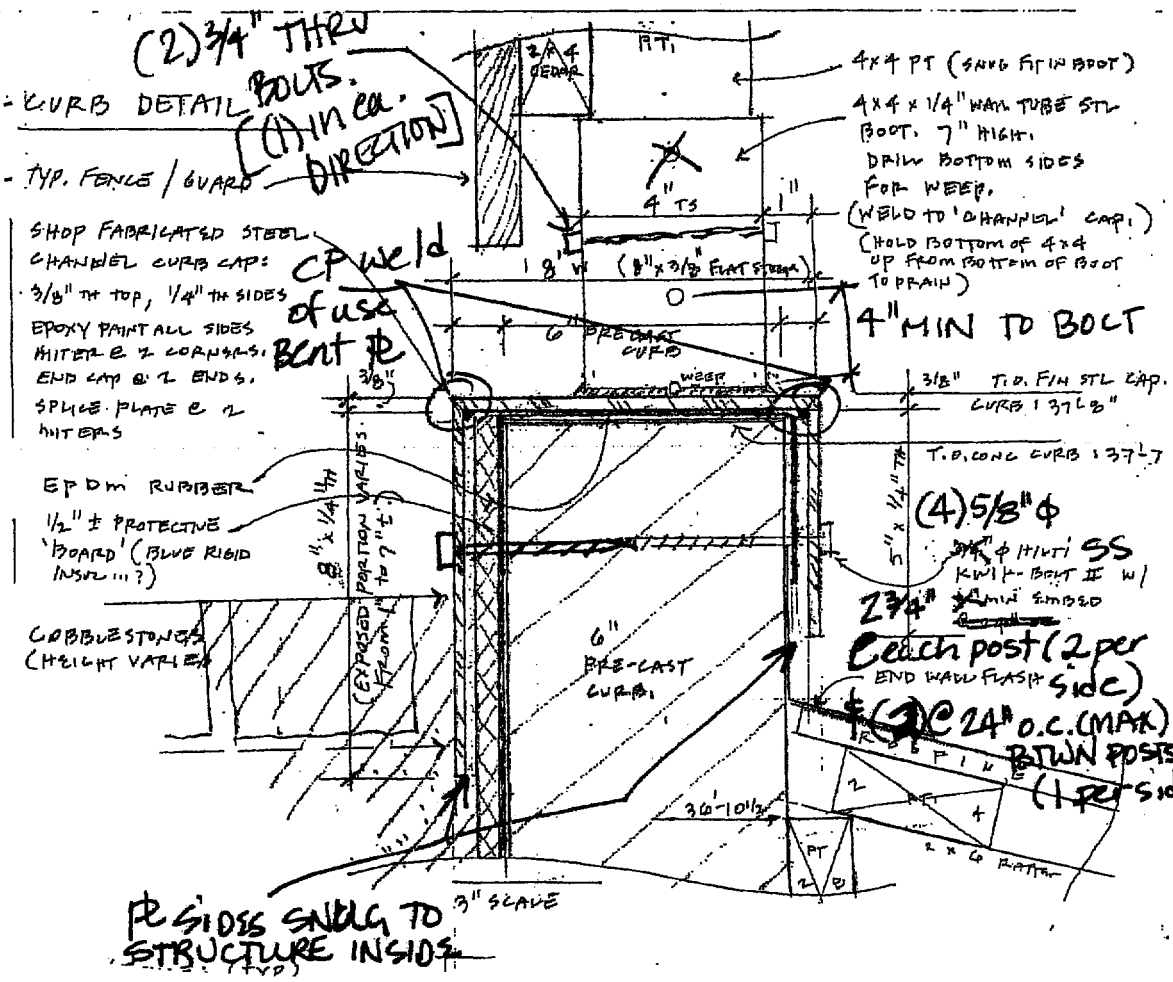


5/24/05
SEE P.1 FOR NOTE BY C.B.E
P.2

WHITTEN + WINKELMAN, ARCHITECTS
774-0111

GUARD RAIL / STRUCTURAL REVIEW / PEAKS PUBLIC TOILET 5.23.05

REVISED AS NOTED:



NOTE

CASCO BAY ENGINEERING IS RESPONSIBLE FOR ANALYZING THE STRUCTURAL INTEGRITY OF THE FENCE / HANDRAIL STRUCTURE ONLY. PLEASE REFER TO WHITTEN + WINKELMAN ARCHITECTURAL DRAWINGS FOR OTHER INFORMATION

STATE OF MAINE
CAROLYN
BURD
9956
REGISTERED PROFESSIONAL ENGINEER

5/24/05

P.1

FROM DESIGNER: WILL WINKELMAN / WHITTEN + WINKELMAN ARCHITECTS

DATE: 5.23.05

Job Name: PEAKS ISLAND PUBLIC TOILET

Address of Construction: WELCH ST, PEAKS ISLAND

2003 *International Building Code*

Construction project was designed according to the building code criteria listed below:

Building Code and Year: 2003 IBC Use Group Classification(s): STAND ALONE PUBLIC TOILET: B* (CAMDEN GROUP: U)

Type of Construction: TYPE: I-B

Will the Structure have a Fire suppression system in Accordance with Section 903.3.1 of the 2003 IRC: NO

Is the Structure mixed use? NO if yes, separated or non separated (see Section 302.3) —

Supervisory alarm system? NO Geotechnical/Soils report required?(See Section 1802.2) NO

STRUCTURAL DESIGN CALCULATIONS

✓ Submitted for all structural members *(106.1, 106.1.1)*

DESIGN LOADS ON CONSTRUCTION DOCUMENTS (1603)

Uniformly distributed floor live loads *(1603.1.1, 1607)*

Floor Area Use	Loads Shown
9. Corridors	100psf

Wind loads *(1603.1.4, 1609)*

- 1609.6 — Design option utilized (1609.1.1, 1609.6)
- 110 mph — Basic wind speed *(1609.3)*
- II — Building category and wind importance factor, I_w (Table 1604.5, 1609.5)
- C — Wind exposure category *(1609.4)*
- N/A — Internal pressure coefficient *(ASCE 7)*
- N/A — Component and cladding pressures *(1609.1.1, 1609.6.2.2)*
- ★ N/A — Main force wind pressures (1603.1.1, 1609.6.2.1)

Earthquake design data *(1603.1.5, 1614 - 1623)*

- N/A — Design option utilized *(1614.1)*
- N/A — Seismic use group ("Category") *(Table 1604.5, 1616.2)*
- N/A — Spectral response coefficients, S_{DS} & S_{D1} *(1615.1)*
- N/A — Site class *(1615.1.5)*

— Live load reduction *(1603.1.1, 1607.9, 1607.10)*

100 psf — Roof live loads *(1603.1.2, 1607.11)*

Roof snow loads *(1603.1.3, 1608)*

50 psf — Ground snow load, P_g *(1608.2)*

— If P_g > 10 psf, flat-roof snow load, P_f *(1608.3)*

— If P_g > 10 psf, snow exposure factor, C_e *(Table 1608.3.1)*

— If P_g > 10 psf, snow load importance factor, I_s *(Table 1604.5)*

— Roof thermal factor, C_t *(Table 1608.3.2)*

— Sloped roof snowload, P_s *(1608.4)*

— Seismic design category *(1616.3)*

— Basic seismic-force-resisting system *(Table 1617.6.2)*

— Response modification coefficient, R_I and deflection amplification factor, C_d *(Table 1617.6.2)*

— Analysis procedure *(1616.6, 1617.5)*

— Design base shear (1617.4, 1617.5.1)

Flood loads *(1603.1.6, 1612)*

N/A — Flood hazard area (1612.3)

— Elevation of structure

Other loads

— Concentrated loads (1607.4)

— Partition loads (1607.5)

— Impact loads *(1607.8)*

★ — Misc. loads (Table 1607.8, 1607.8.1, 1607.9, 1607.12, 1607.13, 1610, 1611, 2404)

★ WALLS DESIGN FOR SOIL PRESSURE $(\gamma_d)(k_a) = 120(0.4) = 48$ PSF/FT

ROOF DESIGNED FOR 2.1 FT SOIL COVER.

Oldcastle Precast, Inc.

Project: Peaks Island Public Toilet
Product: 14' x 11'-6" x 8'-9" Panel Building
Customer: Portland P.W.
Date: 312912005

Geometry

$L := 14 \cdot ft$ $W := 10 \cdot ft + 10 \cdot in$ $H := 8 \cdot ft + 9 \cdot in$ L, W & H are exterior dimensions.

$t_{roof} := 6 \cdot in$ $t_{floor} := 6 \cdot in$ $t_{w1} := 6 \cdot in$ $t_{w2} := 8 \cdot in$ $t_{para} := 6 \cdot in$

$S_x := L - t_{w1}$ $S_y := W - t_{w1} - t_{w2}$ $S_z := H - t_{floor} - t_{roof}$

Material Properties

Reinforcing to be ASTM A615 Grade 60 Deformed Billet Reinforcing Bars.

$f'_c := 5000 \cdot psi$ $f_y := 60000 \cdot psi$ $\gamma_c := 150 \cdot \frac{lbf}{ft^3}$ $c_c := 1 \cdot in$ except on surfaces in contact with earth (1 1/47

Design Parameters

- ACI 318-02 Building Code Requirements for Structural Concrete
- International Building Code 2003 including 2004 supplements.
- ASCE 7-02 Minimum Design Loads for Buildings and Other Structures

Loading

$w_{Lr} := 100 \cdot \frac{lbf}{ft^2}$ From IBC 2003 table 1607.1 Occupancy 40. Yards and terraces, pedestrians.

$w_{snow} := 50 \cdot \frac{lbf}{ft^2}$ From IBC 2003 Figure 1608.2

$w_{Lf} := 100 \cdot \frac{lbf}{ft^2}$

STATE OF MAINE
JOEL M. DICKINSON NO. 10874
REGISTERED PROFESSIONAL ENGINEER
3/17/2005

Soil Properties

$\gamma_d := 120 \cdot \frac{lbf}{ft^3}$ $k := 0.4$ For structural design execpt parapet.

$H_{cover} := 2.1 \cdot ft$ $k_a := 0.33$ For stability check and parapet design.

Ground water assumed to be below bottom of foundation.

Load Factors (Per ACI 318-021

$LF_H := 1.6$ $LF_D := 1.2$ $LF_L := 1.6$

Strength Reduction Factors (Per ACI 318-02)

$\phi_m := 0.9$ $\phi_v := 0.75$

Top Slab Design (Use Plate Case 10 from PCA "Design of Rectangular Concrete Tanks")

$w_d := \gamma_c \cdot t_{roof}$ $w_d = 75 \frac{lbf}{ft^2}$ $k := \frac{S_x}{S_y}$ $k = 1.397$ use b/a from design of concrete tanks as 1.5.

Design Coefficients

$K_{My} := 45$ $K_{Mx} := 63$

$w_u := LF_D \cdot w_d + LF_H \cdot (H_{cover} \cdot \gamma_d) + LF_L \cdot (w_{Lr} + w_{snow})$ $w_u = 733.2 \frac{lbf}{ft^2}$

$M_{ux} := \frac{K_{Mx} \cdot w_u \cdot S_y^2}{1000} \cdot b$ $M_{ux} = 51.796 kip \cdot in$

$M_{uy} := \frac{K_{My} \cdot w_u \cdot S_y^2}{1000} \cdot t$ $M_{uy} = 36.997 kip \cdot in$

$B_1 := 4$ $D_{b1} := \frac{B_1}{8} \cdot in$ $A_{b1} := \frac{\pi \cdot D_{b1}^2}{4}$ $S_1 := 9 \cdot in$ $A_{s1} := \frac{A_{b1} \cdot 12 \cdot in}{S_1}$ $A_{s1} = 0.262 in^2$

$S_2 := 12 \cdot in$ $A_{s2} := \frac{A_{b1} \cdot 12 \cdot in}{S_2}$ $A_{s2} = 0.196 in^2$

$d_{eff1} := t_{roof} - c_c - \frac{D_{b1}}{2}$ $d_{eff1} = 4.75 in$ $d_{eff2} := d_{eff1} - D_{b1}$ $d_{eff2} = 4.25 in$

$a := \frac{A_{s1} \cdot f_y}{0.85 \cdot b \cdot f'_c}$ $a = 0.308 in$ $\phi M_{nx} := \phi_m \cdot A_{s1} \cdot f_y \cdot \left(d_{eff1} - \frac{a}{2}\right)$ $\phi M_{nx} = 64.974 kip \cdot in$

$a_y := \frac{A_{s2} \cdot f_y}{0.85 \cdot b \cdot f'_c}$ $a_y = 0.231 in$ $\phi M_{ny} := \phi_m \cdot A_{s2} \cdot f_y \cdot \left(d_{eff2} - \frac{a_y}{2}\right)$ $\phi M_{ny} = 43.838 kip \cdot in$

$V_u := w_u \cdot \left(\frac{S_y}{2} - d_{eff1}\right) \cdot b$ $V_u = 3.254 kip$

$\phi V_c := \phi_v \cdot 2 \cdot psi \cdot \sqrt{\frac{f'_c}{1 \cdot psi}} \cdot b \cdot d_{eff1}$ $\phi V_c = 6.046 kip$

Backwall Design (Design **wall to span from** floor **to** ceiling only **~ conservative)**

$P_1 := k \cdot \gamma_d \cdot (H_{cover} + t_{roof})$ $P_1 = 124.8 \frac{lbf}{ft^2}$ Lateral Pressure at top of wall.

$P_2 := k \cdot \gamma_d \cdot (H_{cover} + H - t_{floor})$ $P_2 = 196.8 \frac{lbf}{ft^2}$ Lateral Pressure at bottom of wall.

$W_a := \frac{P_1 + P_2}{2} \cdot S_z \cdot b$ $W_a = 2.409 \times 10^3$ lbf Total Lateral Pressure per foot ***of*** wall (Resultant).

$c := \frac{S_z \cdot (2 \cdot P_2 + P_1)}{3 \cdot (P_2 + P_1)}$ **c = 4.648 ft** Location of Resultant force from lateral pressure.

$R_2 := \frac{c \cdot W_a}{S_z}$ $R_2 = 1.445 \times 10^3$ lbf $R_1 := W_a - R_2$ $R_1 = 964.1$ lbf Reactions

$V_0 := R_1$ $m := k \cdot \gamma_d$ $m = 48 \frac{lbf}{ft^3}$ Slope of force diagram.

$x := 0.5 \cdot ft$

$f(x) := \frac{m \cdot x^2}{2} \cdot b + P_2 \cdot x \cdot b - R_2$

$x_{v0} := root(f(x), x)$ $x_{v0} = 3.499$ ft Location of shear equal to zero for determination of maximum moment.

$M_2 := \frac{R_2 \cdot x_{v0}}{2}$ $M_2 = 30.331$ kip·in Maximum moment.

$M_u := LF_H \cdot M_2$ $M_u = 48.53$ kip-in Ultimate Design Moment.

$B_2 := 4$ $D_{b2} := \frac{B_2}{8} \cdot in$ $A_{b2} := \frac{\pi \cdot D_{b2}^2}{4}$ $S_2 := 12 \cdot in$ $A_{s2} := \frac{A_{b2} \cdot 12 \cdot in}{S_2}$ $A_{s2} = 0.196\ in^2$

$d_{eff2} := t_{w1} - c_c - \frac{Db2}{2}$ $d_{eff1} = 4.75$ in

$a := \frac{A_{s2} \cdot f_y}{0.85 \cdot b \cdot f'_c}$ $a = 0.231$ in $\phi M_{n2} := \phi_m \cdot A_{s2} \cdot f_y \cdot \left(d_{eff2} - \frac{a}{2}\right)$ $\phi M_{n2} = 49.139$ kip·ir

$P_v := P_2 - m \cdot d_{eff2}$ $P_v = 477.8 \frac{lbf}{ft^2}$

$V_u := R_2 - \frac{P_2 + P_v}{2} b \cdot d_{eff2}$ $V_u = 1.252$ kip Ultimate Shear

$\phi V_c := \phi_v \cdot 2 \cdot psi \cdot \sqrt{\frac{f_c}{1 \cdot psi}} \cdot b \cdot d_{eff2}$ $\phi V_c = 6.046$ kip Allowable Shear

Since sidewalls are half covered by soil and front wall only has wind, backwall governs.

Bottom Slab **Design**

Design bottom slab as though all force from top slab and walls transfers to bottom slab and is directed upwards due to contact with CIP foundation slab. In addition; design area **on** East side of slab to support slab live load over 5' clear pit under slab (downward bending).

$W_{top} := (14 \cdot ft + 4 \cdot in) \cdot 11 \cdot ft \cdot t_{roof} \cdot \gamma_c$ $W_{top} = 1.183 \times 10^4$ lbf

$W_{para} := t_{para} \cdot 2 \cdot ft \cdot (14 \cdot ft + 4 \cdot in + 7 \cdot ft + 2 \cdot in + 10.5 \cdot ft) \cdot \gamma_c$ $W_{para} = 4.8 \times 10^3$ lbf

$W_{walls} := [(10 \cdot ft + 10 \cdot in) \cdot 14 \cdot ft - 13 \cdot ft \cdot (9 \cdot ft + 8 \cdot in)] \cdot 7.75 \cdot ft \cdot \gamma_c$ $W_{walls} = 3.022 \times 10^4$ lbf

$W_{soil} := (14 \cdot ft + 2 \cdot in) \cdot 11 \cdot ft \cdot H_{cover} \cdot \gamma_d$ $W_{soil} = 3.927 \times 10^4$ lbf

$W_{st} := W_{top} + W_{para} + W_{walls}$ $W_{st} = 4.685 \times 10^4$ lbf

$W_{snow} := w_{snow} \cdot (14 \cdot ft + 2 \cdot in) \cdot 11 \cdot ft$ $W_{snow} = 7.792 \times 10^3$ lbf

$W_{live} := w_{Lr} \cdot (14 \cdot ft + 2 \cdot in) \cdot 11 \cdot ft$ $W_{live} = 1.558 \times 10^4$ lbf

$W_U := LF_L \cdot (W_{live} + W_{snow}) + LF_H \cdot W_{soil} + LF_D \cdot W_{st}$ $W_U = 1.565 \times 10^5$ lbf

$$w_u := \frac{W_U}{14 \cdot ft \cdot 10.83 \cdot ft - (5 \cdot ft)^2} \qquad w_u = 1.236 \cdot 10^3 \frac{lbf}{ft^2}$$

Floor **Slab Upward Bending** - Use PCA table from top slab for **design.**

$$M_{ux} := \frac{K_{Mx} \cdot w_u \cdot S_y^{\,2}}{1000} \cdot b \qquad M_{ux} = 87.288\,\text{kip}\cdot\text{in}$$

$$M_{uy} := \frac{K_{My} \cdot w_u \cdot S_y^{\,2}}{1000} \cdot b \qquad M_{uy} = 62.349\,\text{kip}\cdot\text{in}$$

$B_1 := 4$ $\quad D_{b1} := \frac{B_1}{8}\cdot\text{in}$ $\quad A_{b1} := \frac{\pi \cdot D_{b1}^{\,2}}{4}$ $\quad S_1 := 6\cdot\text{in}$ $\quad A_{s1} := \frac{A_{b1}\cdot 12\cdot\text{in}}{S_1}$ $\quad A_{s1} = 0.393\,\text{in}^2$

$S_2 := 9\cdot\text{in}$ $\quad A_{s2} := \frac{A_{b1}\cdot 12\cdot\text{in}}{S_2}$ $\quad A_{s2} = 0.262\,\text{in}^2$

$d_{eff1} := t_{floor} - c_c - \frac{D_{b1}}{2}$ $\quad d_{eff1} = 4.75\,\text{in}$ $\quad d_{eff2} := d_{eff1} - D_{b1}$ $\quad d_{eff2} = 4.25\,\text{in}$

$a := \frac{A_{s1}\cdot f_y}{0.85\cdot b\cdot f_c}$ $\quad a = 0.462\,\text{in}$ $\quad \phi M_{nx} := \phi_m \cdot A_{s1}\cdot f_y \cdot \left(d_{eff1} - \frac{a}{2}\right)$ $\quad \phi M_{nx} = 95.829\,\text{kip}\cdot\text{in}$

$a_y := \frac{A_{s2}\cdot f_y}{0.85\cdot b\cdot f_c}$ $\quad a_y = 0.308\,\text{in}$ $\quad \phi M_{ny} := \phi_m \cdot A_{s2}\cdot f_y \cdot \left(d_{eff2} - \frac{a_y}{2}\right)$ $\quad \phi M_{ny} = 57.906\,\text{kip}\cdot\text{in}$

$V_u := w_u \cdot \left(\frac{S_y}{2} - d_{eff1}\right)\cdot b$ $\quad V_u = 5.483\,\text{kip}$

$\phi V_c := \phi_v \cdot 2\cdot\text{psi}\cdot\sqrt{\frac{f_c}{1\cdot\text{psi}}}\cdot b\cdot d_{eff1}$ $\quad \phi V_c = 6.046\,\text{kip}$

Floor **Slab Downward Bending**

$w_{Lf} = 100 \frac{lbf}{ft^2}$ $w_{floor} := t_{floor} \cdot \gamma_c$ $w_{floor} = 75\ ft \frac{lbf}{ft^3}$

$w_u := \left(LF_L \cdot w_{Lf} + LF_D \cdot w_{floor}\right)$ $w_u = 250 \frac{lbf}{ft^2}$

$M_u := \frac{w_u \cdot (5 \cdot ft)^2}{8} \cdot b$ $M_u = 9.375\ \mathbf{kip \cdot in}$

$B_1 := 4$ $D_{b1} := \frac{B_1}{8} \cdot in$ $A_{b1} := \frac{\pi \cdot D_{b1}^2}{4}$ $S_1 := 12 \cdot in$ $A_{s1} := \frac{A_{b1} \cdot 12 \cdot in}{S_1}$ $A_{s1} = 0.196\ in^2$

$d_{eff1} := t_{floor} - c_c - \frac{D_{b1}}{2}$ $d_{eff1} = 4.75\ in$

$a := \frac{A_{s1} \cdot f_y}{0.85 b \cdot f'_c}$ $a = 0.231\ in$ $\phi M_{nx} := \phi_m \cdot A_{s1} \cdot f_y \cdot \left(d_{eff1} - \frac{a}{2}\right)$ $\phi M_{nx} = 49.139\ kip \cdot in$

12 inch spacing on bottom mat *is* okay each way, this will cover temperature and shrinkage.

Parapet Design

$P_l := k_a \cdot H_{cover} \cdot \gamma_d$ $\quad P_l = 83.16 \frac{lbf}{ft^2}$

$P_{sur} := k_a \cdot \gamma_d \cdot 2 \cdot ft$ $\quad P_{sur} = 79.2 \frac{lbf}{ft^2}$

$M := \left(\frac{P_l \cdot H_{cover}^2}{6} + \frac{P_{sur} \cdot H_{cover}^2}{2} \right) \cdot b$ $\quad M = 2.829\,kip.in$

$M_u := LF_H \cdot M$ $\quad M_u = 4.527\,kip \cdot in$

$t_{para} = 6\,in$ $\quad c_{para} := 1.25 \cdot in$

$B := 4$ $\quad D_b := \frac{B}{8} \cdot in$ $\quad A_b := \frac{\pi \cdot D_b^2}{4}$ $\quad S := 12 \cdot in$ $\quad A_s := \frac{A_b \cdot b}{S}$ $\quad A_s = 0.196\,in^2$

$d_{eff} := t_{para} - c_{para} - \frac{D_b}{2}$ $\quad d_{eff} = 4.5\,in$ $\quad a := \frac{A_s \cdot f_y}{0.85 \cdot b \cdot f'_c}$ $\quad a = 0.231\,in$

$\phi M_n := \phi_m \cdot A_s \cdot f_y \cdot \left(d_{eff} - \frac{a}{2} \right)$ $\quad \phi M_n = 46.488\,kip \cdot in$

$V_U := LF_H \cdot \left(\frac{P_l}{2} + P_{sur} \right) \cdot H_{cover} \cdot b$ $\quad V_U = 405.821\,lbf$

$\phi V_c := \phi_v \cdot 2 \cdot psi \cdot \sqrt{\frac{f'_c}{psi}} \cdot b \cdot d_{eff}$ $\quad \phi V_c = 5.728 \times 10^3\,lbf$

Design of Connections; back wall at **floor.**

$V := R_2$ $V = 1.145 \times 10^3$ lbf $Num := 6$

$V_U := LF_H \cdot R_2 \cdot \frac{L}{Num \cdot ft}$ $V_U = 5.393 \times 10^3$ ibf $P'' := V_U \cdot \frac{1.25 \cdot in}{1.5 \cdot in}$ $P_u = 4.494$ kip

$L_p := 3 \cdot in$ **3" x 3"** x 3/8" thick plate w/ **(2)** 1/2" diameter **x 3"** long headed studs.

$l_e := 3 \cdot in - \frac{5}{16} \cdot in$ $d_b := 0.5 \cdot in$ $l_e = 2.687$ in $x := 1.5 \cdot in$ $y := 1.5 \cdot in$

$d_h := 1 \cdot in$ $A_b := \pi \cdot d_b^2 \cdot 0.25$ $A_b = 0.196$ in^2 $f_y := 50000 \cdot psi$ $d_e := 8.25$-in

Tensile capacity of multiple headed studs in floor using punching shear (PCI 6.5.2.1)

$A_{long} := \frac{x + (x + 2 \cdot l_e)}{2} \cdot l_e$ $A_{short} := \frac{Y + (Y + 2 \cdot l_e)}{2} \cdot l_e$ $A_{long} = 11.254$ in^2 $A_{short} = 11.254$ in^2

$A_{slope} := 2 \cdot (A_{long} + A_{short})$ $A_{slope} = 45.016$ in^2

$A_{flat} := x \cdot (d_h + y)$ $A_{flat} = 3.75$ in^2

$\phi P_c := \phi_v \cdot \frac{2}{3} \cdot psi \cdot \sqrt{\frac{f'_c}{psi}} \cdot (2.8 \cdot A_{slope} + 4 \cdot A_{flat})$ $\phi P_c = 4.987 \times 10^3$ lbf

Tensile capacity of multiple headed studs in floor using steel yield.

$\phi P_y := 4 \phi_m \cdot A_b \cdot f_y$ $\phi P_y = 3.534 \times 10^4$ lbf

Concrete govers.

Shear capacity of multiple headed studs due to concrete strength.

$\phi V'_c := \left(\phi_v \cdot 12.5 \cdot ft^{\frac{1}{2}} \cdot d_e^{1.5} \cdot \sqrt{\frac{f'_c}{psi}} \cdot psi \right)$ $\phi V'_c = 5.442 \times 10^4$ lbf

$C_w := 1 + \frac{1.5 \cdot in}{3.5 \cdot d_e}$ $C_w = 1.052$ $C_c := 1.0$

$C_t := \frac{t_{floor}}{1.3 \cdot d_e}$ $C_t = \mathbf{0.559}$

$\phi V_c := C_w \cdot C_c \cdot C_t \cdot \phi V'_c$ $\phi V_c = 3.202 \times 10^4$ lbf

Shear capacity of multiple headed studs to to steel strength

$\phi V_y := \phi_m \cdot 0.9 f_y \cdot A_b \cdot 2$ $\phi V_y = 1.59 \times 10^4$ lbf

Check combined shear and tension

$P_c := \frac{\phi P_c}{\phi_v}$ $P_y := \frac{\phi P_y}{\phi_m}$ $V_c := \frac{\phi V_c}{\phi_v}$ $V_y := \frac{\phi V_y}{\phi_m}$

$P_c = 6.649 \times 10^3$ lbf $P_y = 3.927 \times 10^4$ lbf $V_c = 4.27 \times 10^4$ lbf $V_y = 1.767 \times 10^4$ lbf

$Check_{conc} := if\left[1 > \frac{1}{\phi_v}\left[\left(\frac{P_u}{P_c}\right)^2 + \left(\frac{V_U}{V_c}\right)^2\right], "okay", "not okay"\right]$ $Check_{conc} = "okay"$

$Check_{steel} := if\left[1 > \frac{1}{\phi_m}\left[\left(\frac{P_u}{P_y}\right)^2 + \left(\frac{V_U}{V_y}\right)^2\right], "okay", "not okay"\right]$ $Check_{steel} = "okay"$

Check Weld Design

$w := 0.125 \cdot in$ $F_{EXX} := 70$ $F_w := 0.6 \cdot F_{EXX} \cdot \frac{kip}{in^2}$ $F_w = 42 \frac{kip}{in^2}$

$q_u := \phi_v \cdot F_w \cdot 0.707 \cdot w$ $q_u = 2.784 \frac{kip}{in}$

$l_h := 2 \cdot in$ $l_h = 2$ in

$I_x := \frac{2 \cdot l_h^3}{12}$ $I_x = 1.333 in^3$ $e := \frac{2 \cdot in - 0.5 \cdot in}{2}$ $e = 0.75$ in

$V_v := \frac{V_U}{2 \cdot l_h}$ $V_v = 1.348 \frac{kip}{in}$

$H_e := \frac{V_U \cdot e \cdot \frac{l_h}{2}}{I_x}$ $H_e = 3.034 \frac{kip}{in}$

$R_i := \sqrt{}$ $R_i = 3.32 \frac{kip}{in}$

$D := \frac{R_i}{q_u}$ $D = 1.193$ $w := \frac{D}{16} \cdot in$ $w = 0.075$ in

1/8th inch fillet weld on each side of angle **is** acceptable.
For top of wall try less connections.

$V := R_1$ $V = 964.1$ lbf $Num := 4$

$V_U := LF_H \cdot R_1 \cdot \frac{L}{Num \cdot ft}$ $V_U = 5.399 \times 10^3$ lbf $P'' := V_U \cdot \frac{1.25 \cdot in}{1.5 \cdot in}$ $P_u = 4.499$ kip

$Num\_short := Num \cdot \frac{S_y}{S_x}$ $Num\_short = 2.864$

Four connections at top slab produces same load **as** 6 connection at bottom slab.
Since other walls have less load than back **wall it is** acceptable **to** base quantity on short walls off of top connections.

Check Sliding and Overturning *of* Building Due to Soil Pressure

$P_{1a} := k_a \cdot \gamma_d \cdot (H_{cover} + t_{roof})$ $P_{1a} = 102.96 \frac{lbf}{ft^2}$

$P_{2a} := k_a \cdot \gamma_d \cdot (H_{cover} + H - t_{floor})$ $P_{2a} = 409.86 \frac{lbf}{ft^2}$

$W_a := \frac{P_{1a} + P_{2a}}{2} \cdot S_z \cdot L$ $W_a = 2.782 \times 10^4 lbf$

$c := \frac{S_z \cdot (2 \cdot P_{2a} + P_{1a})}{3 \cdot (P_{2a} + P_{1a})}$ $c = 4.648 ft$

$M_o := W_a \cdot c$ $M_o = 129.31 kip \cdot ft$

$W_{st} := W_{st} + L \cdot W \cdot t_{floor} \cdot \gamma_c$ $W_{st} = 5.822 \times 10^4 lbf$

$W_{soil} = 3.927 \times 10^4 lbf$

$W_{resist} := W_{st} + W_{soil}$ $W_{resist} = 97.495 kip$

$M_{r1} := \frac{W}{2} \cdot W_{resist}$ $M_{r1} = 528.098 kip \cdot ft$

$FS_{over} := \frac{M_{r1}}{M_o}$ $FS_{over} = 4.084$

Pins, := if($FS_{over} \geq 1.5$, "No **pins** required for overturning" , "**Pins** Required for overturning")

Pins, = "No **pins** required for overturning"

$V_{HILTI} := 4283 \cdot lbf$ CIP Concrete f_c=3000 psi.

$Num := ceil\left(1.5 \cdot \frac{W_a}{V_{HILTI}}\right)$ Num = 10

Need (10) 5/8" diameter x 2 1/2" embedment HILTI Kwik Bolt 3 Stainless Steel Expansion anchors.
Use **(4)** on each long wall and (1) on each short wall.
This is conservative since as friction between foundation and bottom slab will add additional resistance.
Anchors to have minium edge distance *of* 8 1/4".

Rectangular Concrete Tanks

Revised Fifth Edition

by Javeed A. Munshi

PORTLAND CEMENT ASSOCIATION

5420 Old Orchard Road, Skokie, Illinois 60077-1083
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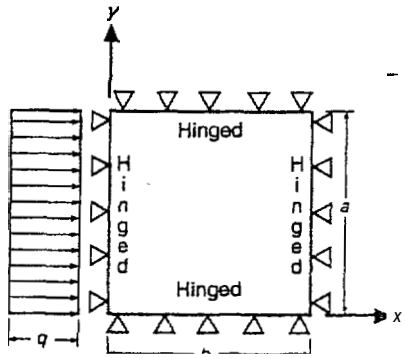
An organization of cement manufacturers to improve and extend the uses of portland cement and concrete through market development, engineering, research, education, and public affairs work.

CASE 10

$$\text{Shear} = C_s \times q \times a$$

$$\text{Deflection} = \frac{C_d q a^4}{1000 D}$$

$$D = \frac{Et}{12(1-\mu^2)}$$



Shear Coefficients, C_s

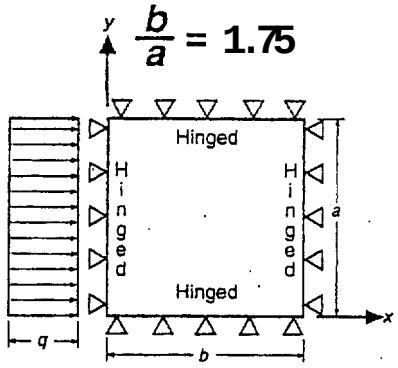
LOCATION \ b/a	4.0	3.0	2.5	2.0	1.75	1.5	1.25	1.0	0.75	0.5
Bottom edge — midpoint	0.50	0.49	0.48	0.46	0.45	0.42	0.39)	0.34	0.27	0.18
Side edge — maximum	0.37	0.37	0.37	0.37	0.37	0.36	0.36	0.34	0.30	0.23
Side edge — midpoint	0.37	0.37	0.37	0.37	0.37	0.36	0.36	0.34	0.30	0.23
Top edge — midpoint	0.50	0.49	0.48	0.46	0.45	0.42	0.39	0.34	0.27	0.18

Deflection Coefficients, C_d

x / b/a	END	0.1b	0.2b	0.3b	0.4b	0.5b
		0.9b	0.8b	0.7b	0.6b	
4.0	0	7.00	10.60	12.10	12.70	12.80
3.0	0	5.50	9.10	11.10	12.00	12.20
2.5	0	4.70	8.10	10.10	11.20	11.50
2.0	0	3.80	6.70	8.70	9.80	10.10
1.75	0	3.20	5.80	7.70	8.70	9.10
1.5	0	2.60	4.90	6.50	7.40	7.70
125	0	2.00	3.70	5.00	5.80	6.00
1.0	0	1.30	2.50	3.30	3.90	4.10
0.75	0	0.70	1.30	1.70	2.00	2.10
0.5	0	0.20	0.40	0.50	0.60	0.60

y / b/a	BOT.	0.1a	0.2a	0.3a	0.4a	0.5a	0.6a	0.7a	0.8a	0.9a	TOP
4.0	0	4.00	7.60	10.40	12.20	12.80	12.20	10.40	7.60	4.00	0
3.0	0	3.80	7.30	9.90	11.60	12.20	11.60	9.90	7.30	3.80	0
2.5	0	3.60	6.80	9.40	10.90	11.50	10.90	9.40	6.80	3.60	0
2.0	0	3.20	6.00	8.20	9.60	10.10	9.60	8.20	6.00	3.20	0
1.75	0	2.90	5.40	7.40	8.70	9.10	8.70	7.40	5.40	2.90	0
1.5	0	2.50	4.60	6.30	7.40	7.70	7.40	6.30	4.60	2.50	0
1.25	0	1.90	3.60	4.90	5.70	6.00	5.70	4.90	3.60	1.90	0
1.0	0	1.30	2.50	3.30	3.90	4.10	3.90	3.30	2.50	1.30	0
0.75	0	0.70	1.30	1.70	2.00	2.10	2.00	1.70	1.30	0.70	0
0.5	0	0.20	0.40	0.50	0.60	0.60	0.60	0.50	0.40	0.20	0

$\frac{b}{a} = 1.75$



Moment = **Coef.** x $qa^2/1000$

M_x

	END	0.1b	0.2b	0.3b	0.4b	0.5b
		0.9b	0.8b	0.7b	0.6b	
TOP	0	0	0	0	0	0
0.9a	0	15	24	30	33	34
0.8a	0	24	41	52	58	60
0.7a	0	30	52	66	75	77
0.6a	0	33	58	75	84	87
0.5a	0	34	60	77	87	91
0.4a	0	33	58	75	84	87
0.3a	0	30	52	66	75	77
0.2a	0	24	41	52	58	60
0.1a	0	15	24	30	33	34
BOT.	0	0	0	0	0	0

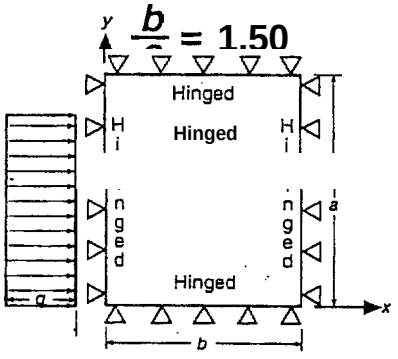
M_y

	END	0.1b	0.2b	0.3b	0.4b	0.5b
		0.9b	0.8b	0.7b	0.6b	
TOP	0	0	0	0	0	0
0.9a	0	10	13	14	14	14
0.8a	0	18	23	25	25	25
0.7a	0	23	31	33	33	33
0.6a	0	26	36	38	38	38
0.5a	0	27	37	40	40	40
0.4a	0	26	36	38	38	38
0.3a	0	23	31	33	33	33
0.2a	0	18	23	25	25	25
0.1a	0	10	13	14	14	14
BOT.	0	0	0	0	0	0

M_{xy}

	END	0.1b	0.2b	0.3b	0.4b	0.5b
		0.9b	0.8b	0.7b	0.6b	
TOP	51	44	33	21	10	0
0.9a	48	42	31	20	10	0
0.8a	39	35	26	17	8	0
0.7a	27	25	19	12	6	0
0.6a	14	13	10	7	3	0
0.5a	0	0	0	0	0	0
0.4a	14	13	10	7	3	0
0.3a	27	25	19	12	6	0
0.2a	39	35	26	17	8	0
0.1a	48	42	31	20	10	0
BOT.	51	44	33	21	10	0

$\frac{b}{a} = 1.50$



Monnent = Coef. × $qa^2/1000$

M_x

	END	0.1b	0.2b	0.3b	0.4b	0.5b
		0.9b	0.8b	0.7b	0.6b	
TOP	0	0	0	0	0	0
0.9a	0	13	21	27	30	31
0.8a	0	20	35	45	51	53
0.7a	0	25	44	57	65	67
0.6a	0	27	49	64	73	76
0.5a	0	28	50	66	75	78
0.4a	0	27	49	64	73	76
0.3a	0	25	44	57	65	67
0.2a	0	20	35	45	51	53
0.1a	0	13	21	27	30	31
BOT.	0	0	0	0	0	0

M_y

	END	0.1b	0.2b	0.3b	0.4b	0.5b
		0.9b	0.8b	0.7b	0.6b	
TOP	0	0	0	0	0	0
0.9a	0	10	13	14	14	14
0.8a	0	17	23	26	26	26
0.7a	0	21	31	34	35	35
0.6a	0	24	35	39	40	41
0.5a	0	25	37	41	42	43
0.4a	0	24	35	39	40	41
0.3a	0	21	31	34	35	35
0.2a	0	17	23	26	26	26
0.1a	0	10	13	14	14	14
BOT.	0	0	0	0	0	0

M_{xy}

	END	0.1b	0.2b	0.3b	0.4b	0.5b
		0.9b	0.8b	0.7b	0.6b	
TOP	49	43	33	22	11	0
0.9a	45	41	31	21	10	0
0.8a	37	34	26	18	9	0
0.7a	26	24	19	13	6	0
0.6a	14	13	10	7	3	0
0.5a	0	0	0	0	0	0
0.4a	14	13	10	7	3	0
0.3a	26	24	19	13	6	0
0.2a	37	34	26	18	9	0
0.1a	45	41	31	21	10	0
BOT.	49	43	33	22	11	0

ESR-1385
Issued September 1, 2004
This report is subject to re-examination in one year.

ICC Evaluation Service, Inc.
www.icc-es.org

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Regional Office ■ 4051 West Flossmoor Road, Country Club Hills, Illinois 60478 ■ (708) 799-2305

DIVISION: 03—CONCRETE
Section: 03151—Concrete Anchoring

REPORT HOLDER:

HILTI, INC.
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www.us.hilti.com
HiltiTechEng@us.hilti.com

EVALUATION SUBJECT:

KWIK BOLT 3 CONCRETE AND MASONRY ANCHORS

ADDITIONAL LISTEES:

AMS LLC
7400 EAST 42ND STREET
TULSA, OKLAHOMA 74145

1.0 EVALUATION SCOPE

Compliance with the following codes:

- ~~2000 International Building Code® (IBC)~~
- ~~2000 International Residential Code® (IRC)~~
- ~~2002 Accumulative Supplement to the International Codes™~~
- 1997 Uniform Building Code™ (UBC)

Properties evaluated:

Structural

2.0 USES

The Kwik Bolt 3 (KB3) Concrete and Masonry Anchor is used to resist static and transient seismic and wind tension and shear loads in uncracked, normal-weight concrete, structural lightweight concrete, structural lightweight concrete over metal deck, and grout-filled concrete masonry. The anchor system is an alternative to cast-in-place anchors described in Sections 1912 and 2107 of the IBC and Sections 1923.1 and 2107.1.5 of the UBC. The anchor systems may also be used where an engineered design is submitted in accordance with Section R301.1.2 of the IRC.

3.0 DESCRIPTION

The Kwik Bolt 3 expansion anchors consist of a stud, wedge, nut, and washer. The stud is manufactured from carbon or stainless steel material. The carbon steel Kwik Bolt 3 anchors have a 5 µm (0.00002 inch) zinc plating. The anchor is illustrated in Figure 1 of this report.

The wedges for the carbon steel anchors are made from carbon steel, except for all 1/4-inch (6.4 mm) lengths and the 3/4-inch-by-12-inch, 1-inch-by-6-inch, 1-inch-by-9-inch and 1-inch-by-12-inch (19.1 mm by 305 mm, 25 mm by 152 mm, 25 mm by 229 mm, and 25 mm by 305 mm) sizes, which have AISI 316 stainless steel wedges. All carbon steel components are zinc-plated. The 1/2-, 5/8-, and 3/4-inch-diameter (12.7, 15.9, and 19.1 mm) carbon steel Kwik Bolt 3 anchors are available with a hot-dipped galvanized plating complying with ASTM A 153. The studs, nuts and washers of the 304 and 316 stainless steel Kwik Bolt 3 anchors are also made from stainless steel. All 304 stainless steel, 316 stainless steel, and hot-dipped galvanized Kwik Bolt 3 anchors use 316 stainless steel wedges.

The stud consists of a high-strength rod threaded at one end. The standard Kwik Bolt 3 has a thread length equal to or less than three bolt diameters, while the Long Thread Kwik Bolt 3 has a thread length greater than three bolt diameters. The tapered mandrel has an increasing diameter toward the anchor base, and is enclosed by a three-section wedge that freely moves around the mandrel. In the vertical direction, the wedge movement is restrained by the mandrel taper at the bottom and by a collar at the top of the mandrel. When the anchor nut is tightened, the wedge is forced against the wall of the predrilled hole to provide anchorage.

4.0 DESIGN AND INSTALLATION

4.1 Design:

Minimum embedment depth, edge distance, and spacing requirements are set forth in Tables 1 and 2. Allowable stress design tension and shear loads are as noted in Tables 3 through 11. Allowable loads for Kwik Bolt 3 anchors subjected to combined shear and tension forces are determined by the following equation:

$$(P_s/P_t)^{5/3} + (V_s/V_t)^{5/3} \leq 1$$

where:

P_s = Applied service tension load (lbf or N).
P_t = Allowable service tension load (lbf or N).
V_s = Applied service shear load (lbf or N).
V_t = Allowable service shear load (lbf or N).

4.2 Installation Requirements:

Kwik Bolt 3 shall be installed in holes drilled into the base material using carbide-tipped masonry drill bits complying with ANSI B212.15-1994. The nominal drill bit diameter shall be equal to that of the anchor. The drilled hole shall exceed the depth of anchor embedment by at least one anchor diameter to permit over-driving of anchors and to provide a dust collection area. The anchor shall be hammered into the predrilled hole until at least six threads are below the fixture surface. The nut shall be tightened against the washer until the torque values specified in Table 1 are attained.

4.3 Special Inspection:

Special inspection shall be .provided in accordance with Section 1704 of the IBC or Section 1701 of the UBC when design loads are based on special inspections being provided during anchor installation, as *set* forth in Tables 3 through 11. Special inspection in accordance with Section 1704 of the IBC shall be provided under the IRC when special inspection is specified in Tables 3 through 11. The code official shall receive a report, from an approved special inspector, that includes the following details:

1. Anchor description, including the anchor product name, nominal anchor and bolt diameters, and anchor length.
2. Hole description, including verification of drill bit compliance with ANSI 6212.15-1994, hole depth, and cleanliness.
3. Installation description, including verification *of* concrete compressive strength by ASTM C 42 methods, and verification of anchor installation and location (spacing and edge distance) in accordance with Hilti's published installation instructions and this report.

5.0 CONDITIONS **OF USE**

The Kwik Bolt 3 Concrete and Masonry Anchors described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Anchor **sizes,** dimensions, and installation comply with this report and Hilti's published installation instructions.

5.2 Allowable tension and shear loads are as noted in Tables 3 through 11 of this report.

5.3 Calculations and details demonstrating compliance with this report are submitted to the code official for approval.

5.4 The use of anchors **is** limited to installation in uncracked, normal-weight concrete, structural lightweight concrete, structural lightweight concrete over steel deck, and uncracked grout filled masonry concrete. Cracking occurs when $f_t > f_r$ due to service loads or deformations.

5.5 When using the basic load combinations in accordance with IBC Section 1605.3.1.1 or UBC Section 1612.3.1, allowable loads are not permitted to be increased for wind or earthquake loading. When using the alternative basic load combinations in IBC Section 1605.3.2 or UBC Section 1612.3.2 that include wind or seismic loads, the allowable shear and tension loads for anchors are permitted to **be** increased by $33^1/_3$ percent. Alternatively, the basic load combinations may be reduced by a factor of 0.75 when using IBC Section 1605.3.2.

5.6 Anchors are not permitted for use in conjunction with fire-resistance-ratedconstruction. Exceptionswould be:

- Anchors resist wind or seismic loading only.
- For other than wind or seismic loading, special consideration is given to fire exposure conditions.

5.7 **Use** of carbon steel Kwik Bolt 3 anchors is limited to **dry,** interior locations. Hot-dipped galvanized and stainless steel Kwik Bolt 3 anchors are permitted in exterior exposure or damp environments.

5.8 Since an ICC-ES acceptance criteria for evaluating data to determine the performance of expansion anchors subjected to fatigue or shock loading is unavailable at this time, the use of these anchors under these conditions is beyond the scope of this report.

5.9 Special inspection is provided in accordance with Section 4.3 of this report when required by Tables 3 through 11.

5.10 Anchors are manufactured by Hilti, Inc., Feldkircherstrasse 100, Schaan, Liechtenstein, and by AMS, 7400 East 42nd Place, Tulsa, Oklahoma, under a quality control program with inspections conducted by Underwriters Laboratories Inc. (AA-668).

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Expansion Anchors in Concrete and Masonry Elements (ACO1), dated April 2002, including seismic tests, reduced spacing tests and reduced edge distance tests.

6.2 Quality control manuals.

7.0 **IDENTIFICATION**

The anchors shall be identified in the field by dimensional characteristics and packaging. The packaging label indicates the manufacturer's name (Hilti, Inc.) and address, the size and type of anchor, the name of *the* inspection agency (Underwriters Laboratories Inc.), and the ICC-ES report number **(ESR-1385).A** length identification code letter is stamped on the threaded end of the bolt. The length identification system is described in Table 12.

TABLE 1—INSTALLATION SPECIFICATIONS'

SETTING DETAILS		ANCHOR SIZE											
		$^1/_4$ inch		$^3/_8$ inch		$^1/_2$ inch		$^5/_8$ inch		$^3/_4$ inch		1 inch	
Drill bit size = anchor diameter (inches)		$^1/_4$		$^3/_8$		$^1/_2$		$^5/_8$		$^3/_4$		1	
Wedge clearance hole (inches)		$^5/_{16}$		$^7/_{16}$		$^9/_{16}$		$^{11}/_{16}$		$^{13}/_{16}$		$1^1/_8$	
Anchor length (min./max.) (inches)		$1^1/_4$	$4^1/_2$	$2^1/_8$	7	$2^3/_4$	7	$3^1/_2$	10	6	12	6	12
Thread length std./long thread length (inches)		$^3/_4$	3	$^7/_8$	$5^5/_8$	$1^1/_4$	$4^3/_4$	$1^1/_2$	7	$1^1/_2$	6	$2^1/_4$	6
Installation: Torque guide values[1] (ft-lbf)	Stainless steel	6		20		40		85		150		200	
	Carbon steel: Min. embedment	4		20		40		85		150		200	
	Carbon steel: Std. embedment	4		20		40		85		150		325	
Min. base material thickness (inches)		3 inches or 1.5 × embedment depth, whichever is greater											

For **SI:** 1 inch = **25.4** mm, 1 ft-lbf = 1.356 N-m.

'Installation torques are applicable for all anchors installations unless noted otherwise in this report.

TABLE 2—ANCHOR SPACING AND EDGE DISTANCE REQUIREMENTS[9]

DESCRIPTION		ANCHOR DIAMETER (in.)																	
		1/4			3/8			1/2			5/8			3/4			1		
Embedment: minimum/nominal/deep (in.)		1 1/8	2	3	1 5/8	2 1/2	3 1/2	2 1/4	3 1/2	4 3/4	2 3/4	4	5 1/2	3 1/4	4 3/4	6 1/2	4 1/2	6	9
NORMAL-WEIGHT CONCRETE[1,7]																			
Spacing required to obtain maximum load S_{cr} (in.)	Tension Shear	2 1/2	4 1/2	5	3 5/8	5 5/8	5 3/4	5 1/8	7 7/8	7 7/8	6 1/4	9	9 1/8	7 3/8	10 3/4	10 3/4	10 1/8	13 1/2	15
Minimum allowable spacing between anchors S_{min} (in.)	Tension[3] Shear[4]	1 1/8	2	3	1 5/8	2 1/2	3 1/2	2 1/4	3 1/2	4 3/4	2 3/4	4	5 1/2	3 1/4	4 3/4	6 1/2	4 1/2	6	9
Edge distance required to obtain maximum load C_{cr} (in.)	Tension	2	3 1/2	3 7/8	2 7/8	4 3/8	4 1/2	4	6 1/8	6 1/8	4 7/8	7	7	5 3/4	8 3/8	8 3/8	7 7/8	10 1/2	11 1/2
	Shear	3 3/8	3 3/8	3 3/8	4 7/8	4 7/8	4 7/8	6 3/4	6 3/4	6 3/4	8 1/4	8 1/4	8 1/4	9 3/4	9 3/4	9 3/4	13 1/2	13 1/2	13 1/2
Minimum allowable edge distance C_{min} (in.)	Tension[5]	1 1/8	2	3	1 5/8	2 1/2	3 1/2	2 1/4	3 1/2	4 3/4	2 3/4	4	5 1/2	3 1/4	4 3/4	6 1/2	4 1/2	6	9
	Shear[6]	1 3/4	1 3/4	1 3/4	2 1/2	2 1/2	2 1/2	3 3/8	3 3/8	3 3/8	4 1/8	4 1/8	4 1/8	4 7/8	4 7/8	4 7/8	6 3/4	6 3/4	6 3/4
STRUCTURAL LIGHTWEIGHT CONCRETE[2,7,8]																			
Spacing required to obtain maximum load S_{cr} (in.)	Tension Shear	3 3/8	6	6 5/8	4 7/8	7 1/2	7 3/4	6 3/4	10 1/2	10 1/2	8 1/4	12	12 1/8	9 3/4	14 1/4	14 1/2	13 1/2	18	19 7/8
Minimum allowable spacing between anchors S_{min} (in.)	Tension[3] Shear[4]	1 1/2	2 5/8	4	2 1/8	3 3/8	4 5/8	3	4 5/8	6 3/8	3 5/8	5 3/8	7 3/8	4 3/8	6 3/8	8 5/8	6	8	12
Edge distance required to obtain maximum load C_{cr} (in.)	Tension	2 5/8	4 5/8	5 1/8	3 3/4	5 7/8	6	5 1/4	8 1/8	8 1/8	6 3/8	9 3/8	9 3/8	7 5/8	11 1/8	11 1/8	10 1/2	14	15 3/8
	Shear	4 1/2	4 1/2	4 1/2	6 1/2	6 1/2	6 1/2	9	9	9	11	11	11	13	13	13	18	18	18
Minimum allowable edge distance C_{min} (in.)	Tension[5]	1 1/2	2 5/8	4	2 1/8	3 3/8	4 5/8	3	4 5/8	6 3/8	3 5/8	5 3/8	7 3/8	4 3/8	6 3/8	8 5/8	6	8	12
	Shear[6]	2 1/4	2 1/4	2 1/4	3 1/4	3 1/4	3 1/4	4 1/2	4 1/2	4 1/2	5 1/2	5 1/2	5 1/2	6 1/2	6 1/2	6 1/2	9	9	9

For SI: 1 inch = 25.4 mm, 1 lb = 4.45 N.

[1]Data in this section of the table and the footnotes apply to Tables 3, 4, and 5 for normal weight concrete.
[2]Data in this section of the table and the footnotes apply to Tables 6, 7, and 10 for lightweight concrete.
[3]When using S_{min} for a load in tension, reduce allowable load by 40%.
[4]When using S_{min} for a load in shear, reduce allowable load by 10%.
[5]When using C_{min} for a load in tension, reduce allowable load by 20%.
[6]When using C_{min} for a load in shear, reduce allowable load by 50%.
[7]For edge and anchor spacings between minimum and critical values, allowable loads may between linearly interpolated between the allowable loads at minimum and critical spacings.
[8]Anchor and edge spacing guidelines may be divided by 1.13 for sand lightweight concrete.
[9]Load reductions are multiplied when considering simultaneous reductions due to C_{min} and S_{min}.

TABLE 3—CAREON STEEL KWIK BOLT 3 ALLOWABLE TENSION AND SHEARVALUES IN NORMAL-WEIGHT CONCRETE **(in pounds)** ** "

Anchor diameter (inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tension		f'c = 6,000 psi Tension		Shear[4]
		With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	
1/4	1 1/8	276	138	338	169	399	200	510	255	449
	2	594	297	669	335	745	372	766	383	449
	3	661	331	714	357	766	383	766	383	449
3/8	1 5/8	678	339	846	423	1,013	506	1,013	506	1,062
	2 1/2	1,179	590	1,424	712	1,669	835	1,846	923	1,255
	3 1/2	1,450	725	1,560	780	1,669	835	1,846	923	1,255
1/2	2 1/4	1,049	524	1,284	642	1,519	759	1,853	927	1,745
	3 1/2	1,810	905	2,048	1,024	2,286	1,143	3,035	1,518	1,867
	4 3/4	2,000	1,000	2,207	1,103	2,414	1,207	3,083	1,541	1,832
5/8	2 3/4	1,766	883	1,898	949	2,029	1,015	2,601	1,300	2,578
	4	2,469	1,235	2,805	1,402	3,141	1,570	3,825	1,912	3,324
	5 1/2	3,079	1,539	3,462	1,731	3,846	1,923	4,992	2,496	3,324
3/4	3 1/4	1,949	974	2,230	1,115	2,510	1,255	3,475	1,738	3,834
	4 3/4	3,007	1,503	3,956	1,978	4,905	2,452	5,714	2,857	4,701
	6 1/2	4,173	2,087	5,369	2,685	6,565	3,283	6,565	3,283	4,701
1	4 1/2	2,930	1,465	3,650	1,825	4,375	2,188	4,360	2,180	6,625
	6	3,990	1,995	5,310	2,655	6,625	3,313	7,875	3,938	8,625
	9	6,040	3,020	7,050	3,525	8,055	4,028	10,000	5,000	8,625

For SI: 1 inch=25.4 mm, 1 psi=6.9 kPa, 1 lbf=4.45 N

'The tabulaledtension values are for Kwik **Bolt 3** inslalled in slone aggregale normal weight concrele having the tabulated compressive strength at the lime of Installation, Concrele aggregale shall comply wilh ASTM C 33.

'Allowable loads or applied loads may be modified in accordance wilh Seclion 55 of Ihir report due lo short-term wind or seismic loads.

[3]These tension values are only applicablewhen anchors are inslalled with special inspectionin accordance with Section 4.3 of this report.

[4]The tabulated shear values are for Kwik Boil 3 inslalled innormal-weight concrete having a minimum 2,000 psi compressive strength at the lime of installation, Concrele aggregale shall comply wilh ASTM C 33.

TABLE 4—HOT-DIPPED GALVANIZED KWIK BOLT 3 ALLOWABLE TENSION AND SHEAR VALUES IN NORMAL-WEIGHT CONCRETE (in pounds)[1,2]

Anchor diameter (inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tsntion		f'c = 6,000 psi Tension		Shear[4]
		With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	Wilh Sp. Insp.[3]	without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	
1/2	2 1/4	1,055	528	1,185	592	1,314	657	1,553	776	1,673
	3 1/2	1,775	887	1,983	991	2,191	1,095	2,912	1,456	1,745
	4 3/4	2,078	1,039	2,373	1,187	2,669	1,334	3,375	1,687	1,745
5/8	2 3/4	1,639	820	1,803	902	1,967	984	2,522	1,261	2,690
	4	2,363	1,182	2,929	1,464	3,495	1,747	4,900	2,450	3,324
	5 1/2	3,163	1,581	3,778	1,889	4,394	2,197	5,327	2,663	3,324
3/4	3 1/4	2,175	1,088	2,344	1,172	2,513	1,257	2,597	1,298	3,834
	4 3/4	3,463	1,732	4,037	2,019	4,612	2,306	5,387	2,694	4,701
	6 1/2	4,794	2,397	5,442	2,721	6,089	3,044	6,956	3,478	4,701

For SI: 1 inch=25.4 mm, 1 psi=6.9 kPa, 1 lb=4.45 N

'See Table 3 for footnoles.

TABLE 5—STAINLESS STEEL KWIK BOLT 3 ALLOWABLE TENSION AND SHEAR VALUES IN NORMAL-WEIGHT CONCRETE (in pounds)[1,2]

Anchor diameter (inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tension		f'c = 6,000 psi Tension		Shear[4]
		With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	
1/4	1 1/8	235	118	289	144	343	171	422	211	560
	2	493	247	567	283	640	320	785	392	599
	3	588	294	632	316	677	339	785	392	599
3/8	1 5/8	546	273	601	301	657	328	855	427	825
	2 1/2	1,170	585	1,301	650	1,432	716	1,716	858	1,451
	3 1/2	1,385	692	1,488	744	1,591	795	1,729	865	1,451
1/2	2 1/4	922	461	1,120	560	1,318	659	1,474	737	1,757
	3 1/2	1,313	657	1,800	900	2,288	1,144	2,413	1,207	2,702
	4 3/4	1,809	905	2,045	1,023	2,281	1,140	2,716	1,358	2,702
5/8	2 3/4	1,470	735	1,564	782	1,657	829	2,082	1,041	2,697
	4	2,210	1,105	2,609	1,304	3,008	1,504	3,959	1,979	4,283
	5 1/2	3,163	1,581	3,531	1,766	3,900	1,950	5,337	2,668	4,283
3/4	3 1/4	1,450	725	1,825	913	2,200	1,100	2,450	1,225	2,700
	4 3/4	2,350	1,175	2,990	1,495	3,625	1,813	4,375	2,188	4,225
	8	2,750	1,375	3,500	1,750	4,250	2,125	4,800	2,400	4,500
1	4 1/2	2,300	1,150	2,850	1,425	3,400	1,700	4,500	2,250	5,700
	6	3,740	1,870	4,930	2,465	6,120	3,060	6,875	3,438	7,000
	9	5,250	2,625	7,025	3,513	8,800	4,400	8,800	4,400	7,000

For SI: 1 inch=25.4 mm. 1 psi=6.9 kPa, 1 lb=4.45 N.
[1]See Table 3 for footnotes.

TABLE 6—CARBON STEEL KWIK BOLT 3 ALLOWABLE TENSION AND SHEAR VALUES (in pounds), STRUCTURAL LIGHTWEIGHT CONCRETE[1]

Anchor diameter (inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tension		Shear[4]
		With Sp. Insp.[4]	Without Sp. Insp.	With Sp. Insp.[4]	Without Sp. Insp.	With Sp. Insp.[4]	Without Sp. Insp.	
1/4	1 1/8	275	138	337	169	399	200	397
	2	594	297	665	333	737	368	397
3/8	1 5/8	586	293	686	343	787	393	889
	2 1/2	1,119	560	1,339	670	1,560	780	1,255
1/2	2 1/4	1,049	524	1,284	642	1,519	759	1,745
	3 1/2	1,810	905	2,048	1,024	2,286	1,143	1,867
5/8	2 3/4	1,560	780	1,815	908	2,071	1,035	2,578
	4	2,483	1,242	2,828	1,414	3,172	1,586	3,151
3/4	3 1/4	1,922	961	2,242	1,121	2,562	1,281	3,834
	4 3/4	3,037	1,519	3,996	1,998	4,955	2,477	4,701

For SI: 1 inch=25.4 mm, 1 lbf=4.45 N, 1 psi=6.9 kPa.
[1]The tabulated tension values are for anchors installed in structural lightweight aggregate concrete having the minimum indicated compressive strength at the time of installation. Concrete aggregate shall comply with ASTM C 330.
[2]Allowable loads or applied loads may be modified in accordance with Section 5.5 of this report due to short-term wind or seismic loads.
[3]These tension values are only applicable when anchors are installed with special inspection in accordance with Section 4.3 of this report.
[4]The tabulated shear values are for anchors installed in structural lightweight concrete having a minimum 2,000 psi compressive strength at the time of installation. The concrete aggregate shall comply with ASTM C 330.

TABLE 7—STAINLESS STEEL KWIK BOLT 3 ALLOWABLE TENSION AND SHEAR VALUES (in pounds), STRUCTURAL LIGHTWEIGHT CONCRETE[1]

Anchor diameter (inch)	Anchor depth (inches)	f'c = 2,000 psi Tension		f'c = 3,000 psi Tension		f'c = 4,000 psi Tension		Shear[4]
		With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	With Sp. Insp.[3]	Without Sp. Insp.	
1/4	1 1/8	245	122	301	150	357	179	547
	2	509	254	584	292	660	330	599
3/8	1 5/8	562	281	623	311	684	342	825
	2 1/2	920	460	1,198	599	1,476	738	1,258
1/2	2 1/4	951	475	1,155	578	1,359	680	1,757
	3 1/2	1,354	677	1,853	926	2,351	1,176	2,702
5/8	2 3/4	1,471	736	1,607	804	1,744	872	2,697
	4	2,301	1,151	2,717	1,358	3,132	1,566	4,219

For SI: 1 inch=25.4 mm, 1 lbf=4.45 N. 1 psi=6.9 kPa.
[1]See Table 6 for footnotes.

TABLE 8—ALLOWABLE TENSION AND SHEAR VALUES FOR HILTI KWIK BOLT 3 ANCHORS INSTALLED IN THE FACE SHELLS OF GROUT-FILLED CONCRETE MASONRY WALLS [in pounds)[1,2,3,5]

ANCHOR DIAMETER (inches)	EMBEDMENT DEPTH[4] (inches)	MIN. DISTANCE FROM EDGE OF WALL[7] (inches)	TENSION			SHEAR	
			UBC With Sp. Insp.[6]	UBC Without Sp. Insp	IBC/IRC	UBC	IBC/IRC
1/4	1 1/8	4	152	76	121	380	304
		12	152	76	121	380	304
	2	4	540	270	432	427	342
		12	540	270	432	427	342
3/8	1 5/8	4	321	161	257	736	589
		12	342	171	273	938	751
	2 1/2	4	782	391	626	955	764
		12	782	391	626	1317	1054
1/2	2 1/4	4	628	314	502	830	664
		12	667	333	533	1464	1171
	3 1/2	4	905	452	724	1051	840
		12	905	452	724	2317	1853
5/8	2 3/4	4	814	407	651	888	710
		12	866	433	692	2165	1732
	4	4	1242	621	994	929	743
		12	1294	647	1035	2654	2123
3/4	3 1/4	4	1036	518	829	784	627
		12	1036	518	829	3135	2508
	4 3/8	4	1645	823	1316	821	657
		12	1711	855	1368	3283	2627

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 psi = 6.89 kPa.

[1]Values valid for anchors installed in Type 1 Grade N, lightweight. medium-weight, or normal-weigh1concrele masonry units conforming to ASTM C 90 or UBC Standard 21-4. The masonry units must be fully grouted with coarse grout conforming lo IBC 2103.10 and ASTM C 476 or UBC Section 2103.4 and UBC Standard 21-19. Mortar shall comply wih IBC Section 2103.7 and ASTM C 270 or UBC Section 2103.3 and UBC Standard 21-15, Type S, N, or M. Masonry prism compressive strength shall be at least 1,500 psi at the lime of installation when tested in accordance wilh IBC Section 2105.2.2.2 and ASTM C 1314 or UBC Section 2105.3.2 and UBC Standard 21-17.

[2]Anchors must be installed a minimum of 1-3/8 inches from any vertical mortar joint in accordance with Figure 2.

[3]Anchor locations are limited to one per masonry cell wilh a minimum spacing of 8 inches on center.

[4]Embedment depth is measured from Ihe outside face of h e concrete masonry unit.

[5]Allowable loads or applied loads may be modified in accordance with Section 5.5 of this report due lo short-term wind or seismic loads.

[6]These lension values are only applicable when anchors are inslalled with special inspeclion in accordance with Section 4.3 of this report.

[7]For intermediate edge distances. allowable loads may be determined by linearly interpolating between h e allowable loads at the lwo labulated edge distances.

ANCHOR DIAMETER (inches)	EMBEDMENT DEPTH[4] (inches)	TENSION			SHEAR			
					Perpendicular to wall		Parallel to wall	
		UBC With Sp. Insp.[6]	UBC Without Sp. Insp.	IBC/IRC	ICC-ES	IBC/IRC	ICC-ES	IBC/IRC
1/2	3	646	**323**	517	311	249	614	491
5/8	3 1/2	852	426	682	311	249	614	491

TABLE 10 – KWIK BOLT 3 CARBON STEEL ALLOWABLE TENSION AND SHEAR VALUES (in pounds), STRUCTURAL LIGHTWEIGHT CONCRETE OVER METAL PROFILE DECK[1,2,3,4,5]

ANCHOR DIAMETER (inches) / Material	MINIMUM EMBEDMENT DEPTH (inches)	f'c = 3,000 psi		
		Tension (lb)		
		With Sp. Insp.[6]	Without Sp. Insp.	Shear[7]
1/4 Carbon Steel	2	619	310	574
3/8 Carbon Steel	2 1/2	1,033	517	813
1/2 Carbon Steel	3 1/2	1,600	863	1,264
5/8 Carbon Steel	4	2,221	1,111	2,118
1/4 Stainless Steel	2	617	308	574
3/8 Stainless Steel	2 1/2	1,016	508	994
1/2 Stainless Steel	3 1/2	1,476	738	1,602
5/8 Stainless Steel	4	2,202	1,101	2,118

For SI: 1 inch=25.4 mm, 1 lbf=4.45 N. 1 psi=6.9 kPa

[1]The tabulated tension or shear values are for anchors installed in structural sand-lightweight concrete having the minimum indicated compressive strength of 3,000 psi at the time of installation. Refer to Figure 3 for minimum dimensions of the composite deck. Concrete aggregate shall comply with ASTM C 330.

[2]The minimum distance from the center of the bolt to the edge of the lower flute is 1 1/4 inches.

[3]Allowable loads or applied loads may be modified in accordance with Section 5.5 of this report due to short-term wind or seismic loads.

[4]Anchors are permitted to be installed in the lower or upper flute of the composite steel deck/concrete fill assembly, provided the installation procedures are maintained.

[5]For anchor spacing, refer to Table 2, footnotes 2, 3.4, 7 and 8.

[6]These tension values are only applicable when anchors are installed with special inspection in accordance with Section 4.3 of this report.

[7]There is no restriction on the direction of shear loading.

TABLE 11 - KWIK BOLT 3 CARBON STEEL AND HOT DIPPED GALVANIZED ALLOWABLE TENSION AND SHEAR VALUES (in pounds), NW CONCRETE, 1-3/4 INCH EDGE DISTANCE[1,2,3]

ANCHOR DIAMETER	ANCHOR EMBED.	$f'_c \geq 2000$ psi			
		Tension		Shear Perpendicular to Edge	Shear Parallel to Edge
		With Sp. Insp.[4]	Without Sp. Insp.		
3/8	3	956	478	409	916
1/2	3	**932**	466	376	1001
	4 1/2	1287	**643**	447	1415

TABLE 12 - LENGTH IDENTIFICATION SYSTEM

STAMP ON ANCHOR		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Length of anchor (inches)	From	1 ½	2	2 ½	3	3 ½	4	4 ½	5	5 ½	6	6 ½	7	7 ½	8	8 ½	9	9 ½	10	11	12	13	14	15	16	17	18
	Up to but not including	2	2 ½	3	3 ½	4	4 ½	5	5 ½	6	6 ½	7	7 ½	8	8 ½	9	9 ½	10	11	12	13	14	15	16	17	18	18

For SI: 1 inch = 25.4 mm.

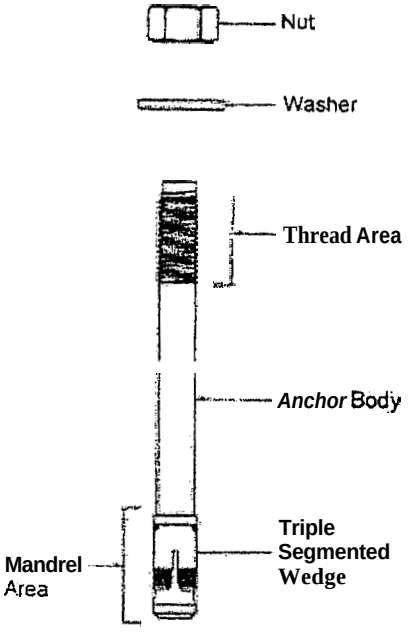

FIGURE 1—KWIK BOLT 3

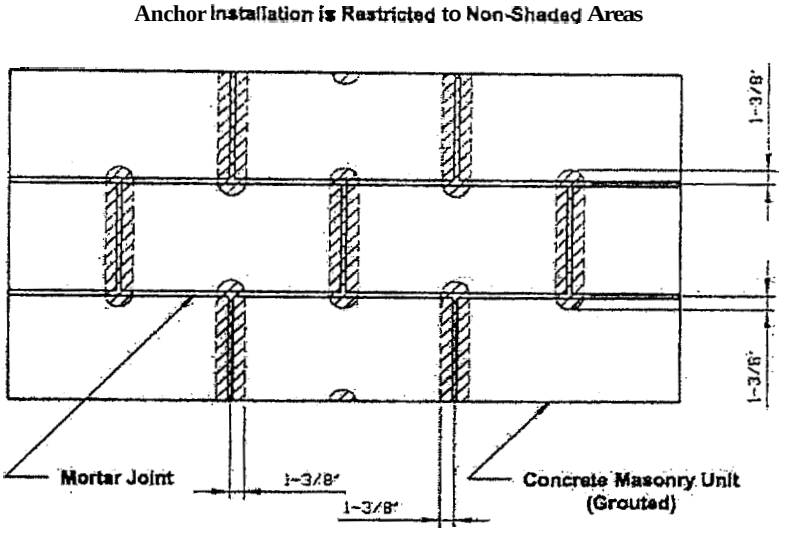

FIGURE 2—ACCEPTANCE LOCATIONS (NON-SHADED AREAS) FOR HILTI KWIK BOLT 3 ANCHORS IN GROUT-FILLED CONCRETE MASONRY UNIT

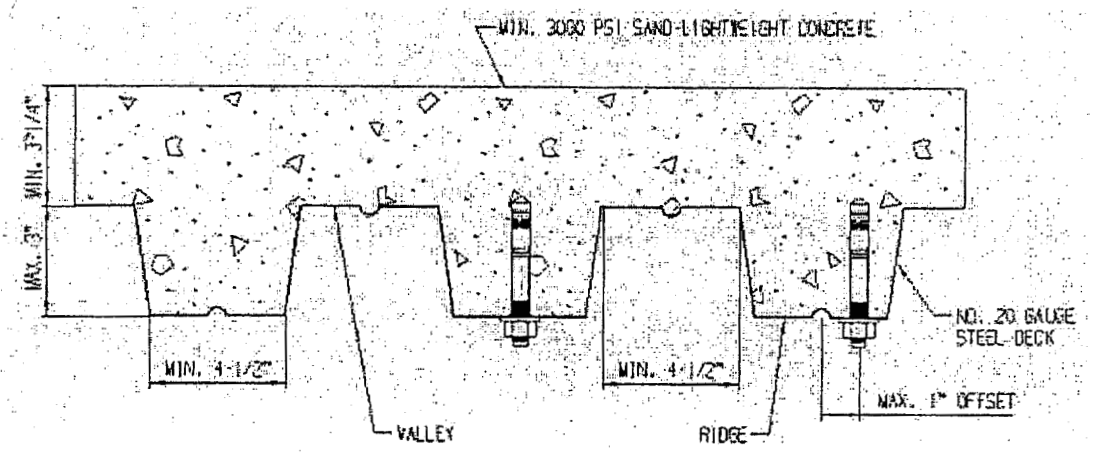

FIGURE 3—PROFILE OF STRUCTURAL-LIGHTWEIGHT CONCRETE OVER METAL DECK