

TIEBACK SOLDIER BEAM BULKHEAD (cont'd)

TIEBACK LOADS

HORIZONTAL SPACING	FEET	8
HORIZ FORCE-upper	KIPS	68.74
HORIZ FORCE-lower	KIPS	65.86
TIEBACK ANGLE-upper	DEGREES	22.5
TIEBACK ANGLE-lower	DEGREES	22.5
TIEBACK ANGLE-upper	RADIANS	0.3927
TIEBACK ANGLE-lower	RADIANS	0.3927
TIEBACK TENSION-upper	KIPS	74.4
TIEBACK TENSION-lower	KIPS	71.3
TIEBACK RESISTANCE-upper (primary)	LBS/SQ FT	900
TIEBACK RESISTANCE-lower (primary)	LBS/SQ FT	1000
TIEBACK (GROUT) DIAMETER	INCHES	6
ALLOWABLE RESISTANCE/FT GROUT-upper	LB/LIN FT	1414
ALLOWABLE RESISTANCE/FT GROUT-lower	LB/LIN FT	1571
ANCHOR LENGTH-upper (primary)	FEET	52.6
ANCHOR LENGTH-lower (primary)	FEET	45.4
ANCHOR LENGTH-total/beam	FEET	98.0

CAISSON

TIEBACK LOAD-vertical (upper)	KIPS	28.5
TIEBACK LOAD-vertical (lower)	KIPS	27.3
TIEBACK FORCE @ TEST-upper	KIPS	39.9
TIEBACK FORCE @ TEST-lower	KIPS	38.2
TOTAL VERTICAL FORCE @ TEST	KIPS	78.0
FRICITION FACTOR @ STEEL	-	0.20
FORCE DISSIPATED @ STEEL BY LAGGING	KIPS	15.61
REMAINING FORCE @ STEEL	KIPS	62.44
CAISSON SHAFT SURFACE AREA	SF	43.98
ALLOW SHAFT UNIT RESISTANCE-friction	PSF	1250
SHAFT RESISTANCE	KIPS	54.98
NET VERT FORCE @ TEST	KIPS	7.46
CAISSON BEARING AREA	SF	3.14
BEARING PRESSURE @ TEST	PSF	2374

RESULT: Use W14x38 soldier beams 40'-0" long, embed 7'-0" in 24" caissons (structural concrete), spaced at 8'. Lean concrete to grade. Double row of tiebacks at 6' and 20' from top of steel. Lag behind front flanges to 20' below top of steel w/pressure treated wood. All steel components to be double corrosion protected. Concrete wall 21' high w/1' freeboard above top of steel.

These calculations are based on a hinge below subgrade.

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