NOTE:
Spreadsheet analyzes a given section of wall for flexure based on Mu for required As. Per ACI 350 - 06 - applies Sd factor (per section 9.2.6) to factored loads
Deflections are not calculated in this spreadsheet. Assumes Grade 60 Steel. Assumes single layer of flexural reinforcement. Assumes section is a rectangular beam.
Section profile is only used for checking flexural compression distance relative to flange thickness in T-sections

ENVIROMENTAL EXPOSURE AREA (PER 10.6.4.5)

SEVERE

Conditions in which the limits defining normal environmental exposure are exceeded.

MEMBER TYPE

ONE-WAY

CONCRETE COMPRESSIVE STRENGTH (psi), f'c (SEE TABLE 4.2.2 & 4.3.1)

4500

USER OVER-RIDE (psi), f'c
0
enter 0 if over-ride is not utilized

Exposure Condition	Max. Water-Cement Ratio, By Weight*
Concrete exposed to freezing and thawing in a saturated condition or to corrosive or deicing chemicals	0.42

* A lower water-cementitious material ration or higher strength may be required for durability of concrete exposed to sulfate (Table 4.3.1)

LENGTH BETWEEN MOVEMENT JOINTS (PER TABLE 7.12.2.1)

30 ft to less than 40 ft

Minimum Shrinkage and Temperature Reinf. Ratio for Horz. Reinf.
0.0040

Note: This data applies to spacing between expansion joints and full contraction joints.
When used with partial contraction joints, the minimum reinforcement ratio shall be determined by multiplying the actual length between partial contraction joints by 1.5.

Section Profile =	R	(Enter "R" for rectangular or "T" for T-section - see user notes)
Section Thickness =	12	in
Section Web Width, b_w	12	in
Mx + Mxy Factored Moment	12	ft-kips/ft (per Risa 3D)
Mx + Mxy Service Moment	7	ft-kips/ft (per Risa 3D)
Reinforcement Bar Size	#5	
Bar Spacing =	8	in
Concrete Cover to Flexural Reinf. =	2	in
	3	N/A

USE 12 in. thick wall w/ #5 bars @ 8 o.c. for vertical reinforcement (min. 0.576 sq. in./section design width temp. & shrinkage reinf.)

Flexural Stress Check, fs (actual) =	OK		
d=	9.69	in	
Flexural compression dist. a =	0.5025	in	
Moment Arm =	9.44	in	
ε_T =	0.0108		Tension Controlled
Φ =	0.90		
Strain Gradiant Amplification Factor, β =	1.35		
f'c (design) =	4500	psi	
β1 (design) =	0.825		
Factored / Unfactored (γ)	1.7143		
Total Load Factor =	2.59		(vs. Mu/Ms and with ϕ = 1.0)
Mu w/ Total Load Factor =	18.14	ft. kips	
As (provided) =	0.465	sq. in.	
As (required) =	0.384	sq. in.	OK
As min per 10.3a =	0.390	sq. in.	
As min per 10.3b =	0.388	sq. in.	
As min per 10.5.3 =	0.511	sq. in.	
As (min) =	0.390	sq. in.	OK
As(max) εt<0.004 ?	OK		OK
As horz. (min) =	0.58	sq. in.	
Lateral Ties for Vert. Reinf. 0.1Ag =	1.44	sq. in.	Not Needed

Normal Environment			
fs (actual)=	19.14	ksi	OK
fs max (lower bound) =	20	ksi	ONE-WAY
fs max =	25.65	ksi	
fs (permissible) =	25.65	ksi	
Sd =	1.23		

Severe Environment			
fs (actual)=	19.14	ksi	OK
fs max (lower bound) =	17	ksi	ONE-WAY
fs max =	20.84	ksi	
fs (permissible) =	20.84	ksi	
Sd =	1.51		

Sd (design) =	1.51	SEVERE