Concrete Sleepers Sydney Pty Ltd ABN: 14 6274 578 152 www.concretesleepers.sydney

A 753-795 Mulgoa Rd, Mulgoa NSW 2745 P 02 7922 3828

info@concretesleepers.sydney

Maximum wall height is 2200mm for 80mm thick sleeper and 2000mm length

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leaner Length -				2000	mm	
Sleeper Length =				and the second se	mm	
Sleeper Width =				2200		
Height of Wall =				and the second se	mm	-
Thickness of Sleeper =						
d=				the second s	mm	
Number of bars=				2		
Steel Bras type			N12			
Parameters						
Compressive strength						
of concrete	f'c =			65	Mpa.	
of concrete	Ec =			37892.61142		
Yield strength of	LC -					
	fer -			500	Mpa.	
steel Reos (N Grade)	fsy =			200000		
Elastic Modulus steel	Es =) mm	
b	b=		26.48	200	/ 111111	
Friction Angle of Soil	Ø=		26.1°	0.00		
Ka=tan(45-Ø/2) ²	Ka=			0.39)	
Bulk Unit Weight						
of Backfill Soil	Ys=				3 KN/m ³	
Surcharge	Q=				Кра.	
no=	KaQ=			1.95	Кра.	
ηju= η_1=	KaYsH-KaYs(b/2)			15.59844	Kpa.	
Wo=					KN/m	
				3.119688		
W1=						
Design Actions				4 4046	1 MALL	
W*=1.25G+1.5Q	1.25W1 + 1.5Wo				1 KN/m	
M*=W*L2/8		M*=		2.24230		
V*=W*L/2		V*=		4.4846	1 KN	
FLEXURAL STRENGTH OF SLEEPER						
CAPACITY REDUCTION			0.00			0.8
FACTOR BENDING	AS 3600 (TABLE2.2.2)		Ø=0.8			0.8
Ast, req=	$f'c^*b/1.2f_{SY}^*(d\text{-}V(d^2\text{-}2.4M^*/(\emptyset bf'c^*b)$			238.310448	5 mm²	
Number of Design		2	,			
Number of Bars						
use N12	- 3			11	3 mm ²	
Area of 1 bar	πr ²				6 mm ²	
area of total 2 bars				22	0 11111	
				0.00044755	-	
		0.197552448	3	0.80244755		
ØMu=ØfsyAstd(1-(0.6Astfsy/(bdf'c))				3.19181538	35	
DUCTILITY CHECK	Ku=(Ast x fsy)/(0.85 x 0.65 x b x d x f'c)			0.35756099	91 < 0.4	it is c
	M* < Ømu, Therefore okay in bending					
Shear Strength of Sleeper						
Capacity reduction factor	Ø			0	.7	
AS3600-Clause 8.2.4.1	© Kv				.1	
	EVV.			7.0947868		
Vuc=Kvbvdv*sqrt(fc)				4.9663507		
				4.9003307		
fVuc						
fVuc						
tVuc	V* < fVuc V* < Øvuc , Therefore no shear reos re		7			

Maximum wall height is 1600mm for 80mm thick sleeper and 2400mm length

Classes Lageth			2400	mm	
Sleeper Length = Sleeper Width =			and a second	mm	
Height of Wall =			1600		
Thickness of Sleeper =				mm	
d=			44	mm	
Number of bars=			2		
Steel Bras type			N12		
Parameters					
Compressive strength					
of concrete	f'c =		65	Mpa.	
	Ec =		37892.61142	Mpa.	
Yield strength of					
steel Reos (N Grade)	fsy =		500	Mpa.	
Elastic Modulus steel	Es =		200000		
b	b=			mm	
Friction Angle of Soil	Ø=		26.1°		
Ka=tan(45-Ø/2)²	Ka=		0.39		
Bulk Unit Weight			10	White 3	
of Backfill Soil	Ys=			KN/m ³	
Surcharge	Q=			Кра. Кра.	
ŋo=	KaQ=		11.34432		
n_1=	KaYsH-KaYs(b/2)			KN/m	
Wo=			2.268864		
W1=			2.20000-	Ki y III	
Design Actions					
W*=1.25G+1.5Q	1.25W1 + 1.5Wo		3.42108	KN/m	
M*=W*L ² /8		M*=	2.4631776	KN.m	
V*=W*L/2		V*=	4.105296	5 KN	
FLEXURAL STRENGTH OF SLEEPER					
CAPACITY REDUCTION					
FACTOR BENDING	AS 3600 (TABLE2.2.2)		Ø=0.8		0.8
PACTOR BENDING	A5 5000 (TABLE2.2.2)		p 010		
Ast, req=	f'c*b/1.2fsy*(d-V(d²-2.4M*/(Øbf'c*b)		238.310451	7 mm²	
Number of Bars		2			
use N12					
Area of 1 bar	πr ²		11	3 mm²	
area of total 2 bars				6 mm ²	
		0.197552448	0.80244755	2	
ØMu=ØfsyAstd(1-(0.6Astfsy/(bdf'c))			3.19181538	5	
DUCTILITY CHECK	Ku=(Ast x fsy)/(0.85 x 0.65 x b x d x f'c		0.35756099	1 < 0.4	it is ok
	M* < Ømu, Therefore okay in bending	g			
Shear Strength of Sleeper					
Canacity reduction factor	Ø		0.	7	
Capacity reduction factor AS3600-Clause 8.2.4.1	Ø Kv		0.		
AS3600-Clause 8.2.4.1 Vuc=Kvbvdv*sqrt(fc)	114		7.09478681		
fVuc			4.96635077		
	V* < fVuc		_		
	V* < Øvuc, Therefore no shear reos	required.			



Professional Engineer RegistrationRegistration number: PRE0001360FairIssue to: Rafic RahmeTradingIssue date: 23 Oct 2021Expiry date: 22 Oct 2024

Principal Design Practitioner Registration

Registration number: PDP0000668 Issue to: Rafic Rahme Issue date: 23 Oct 2021 Expiry date: 22 Oct 2026

Design Practitioner Registration Registration number: DEP0001984 Issue to: Rafic Rahme Issue date: 23 Oct 2021 Expiry date: 22 Oct 2024