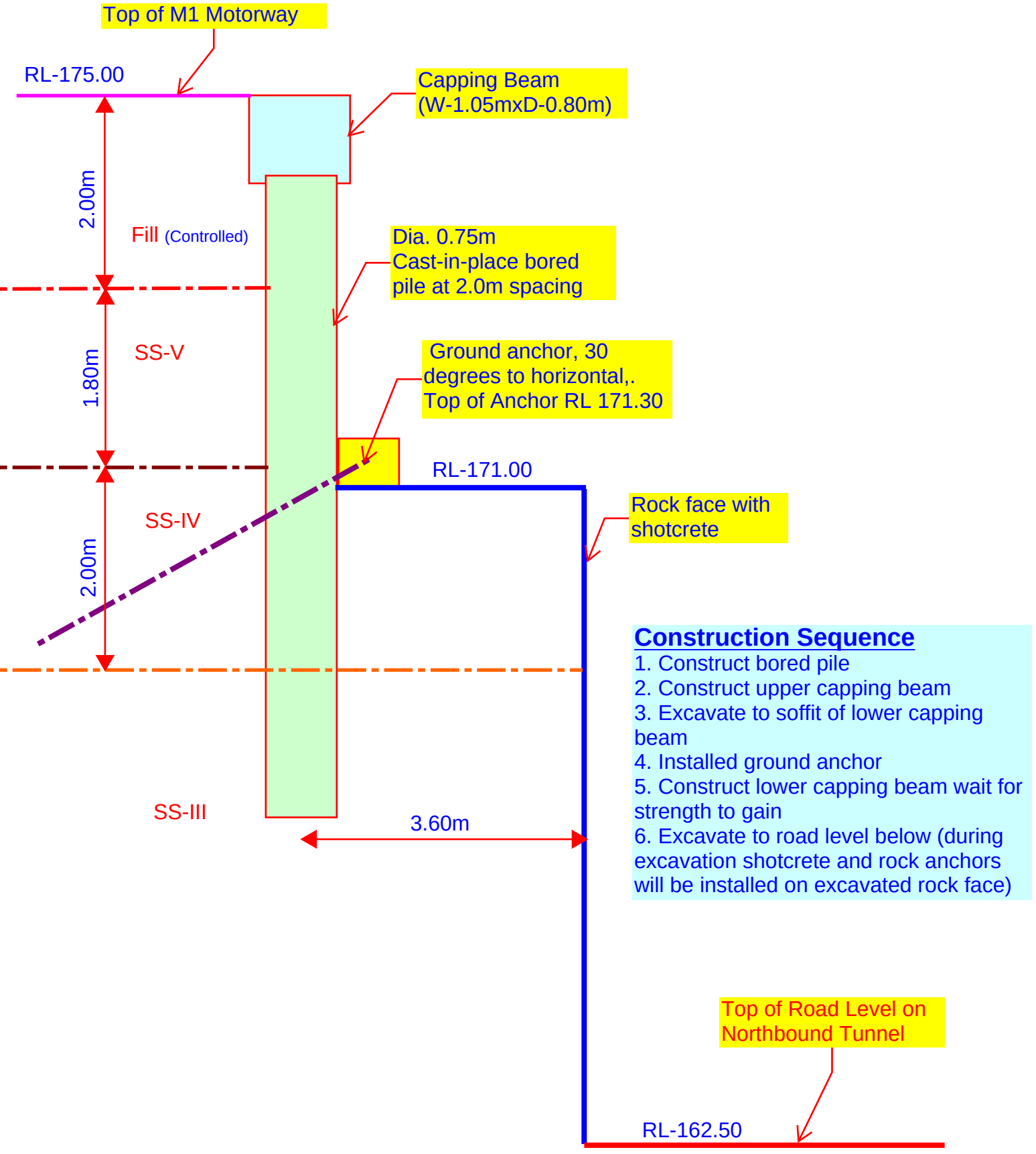
Anchored Pile Wall in a Dive Structure



Construction Sequence

1. Construct bored pile
2. Construct upper capping beam
3. Excavate to soffit of lower capping beam
4. Installed ground anchor
5. Construct lower capping beam wait for strength to gain
6. Excavate to road level below (during excavation shotcrete and rock anchors will be installed on excavated rock face)

Soil Parameters for detailed design

Soil Types - Class		Soil Unit	γ	s_u	c'	ϕ'	ν'	E'	K_h	Ultimate Bond Stress**
			kN/m³	kPa	kPa	°	-	MPa	MPa/m	kPa
Fill-Uncontrolled	Existing Fill	Fill-un	18	25	2	22	0.3	10	10	-
Fill-Poorly Compacted	Existing Fill	Fill-pc	18	3N*	5	25	0.3	10	10	20
Fill-Well Compacted	Existing Fill	Fill-wc	20	6N*	6	28	0.3	2N*	E'	30
Engineered Fil#	New Fill	Fill-Eng	20	100	10	28	0.3	30	30	-
Residual-Firm		RES-f	18	25	3	26	0.3	8	8	20
Residual-Stiff		RES-st	19	50	5	28	0.3	15	15	30
Residual-Very Stiff		RES-vst	20	100	8	28	0.3	30	30	40
Residual-Hard		RES-h	20	200	10	28	0.3	60	60	50

*N= SPT values

**In granular soils where bond is required within 3 m of the finished ground surface, effective stress methods for determining bond stress should be considered.

#New Engineered Fill refers to general fill, and parameters are provided for a general fill with a cohesive description, should a granular general fill be proposed in the design alternate parameters can be adopted. Additionally appropriate parameters will be required for other fill material such as selected fill.

Rock mass design parameter for surface structures

Rock unit	γb (kN/m³)	E'(MPa)	ν	c' (kPa)	ϕ' (degrees)	ψ' (degrees)
SH-V	22	100	0.3	30	28	0
SH-IV	23	200	0.3	50	30	0
SH-III	24	300	0.3	100	30	0
SH-II	25	1000	0.2	250	30	0
SH-I	25.5	2000	0.2	250	30	0
SS-V	22	300	0.3	30	35	5
SS-IV	23	600	0.3	100	35	5
SS-III	23.5	1500	0.3	300	35	5
SS-II	24	2500	0.2	400	37	7
SS-I	24	4000	0.2	500	37	7

Rock mass design parameters for piles

Rock unit	Ultimate skin friction (kPa)*	Ultimate end bearing (MPa)*	Serviceability end bearing (MPa)*
SH-V	100	1.5	0.75
SH-IV	150	5	2
SH-III	400	20	3.5
SH-II	800	60	5
SH-I	1000	120	8
SS-V	200	3	1.2
SS-IV	800	10	2.5
SS-III	1500	40	5
SS-II	2000	100	8
SS-I	2500	150	12

*For use to suit the requirements of AS 2159 for Limit State Pile Design

Ultimate skin friction values based on clean socket of roughness category R2 or better