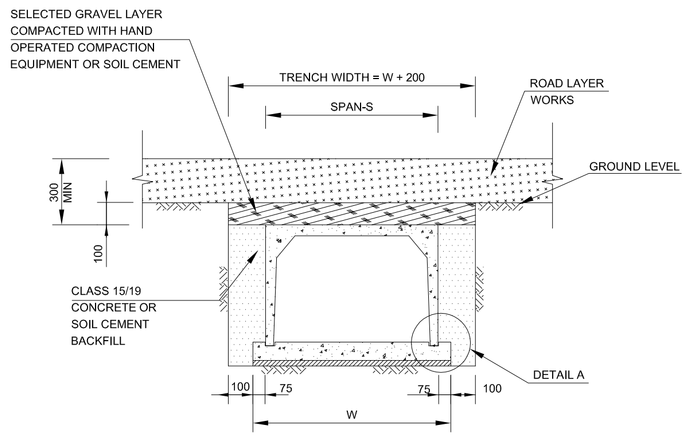
PRECAST PORTAL CULVERT INSTALLATION DETAILS

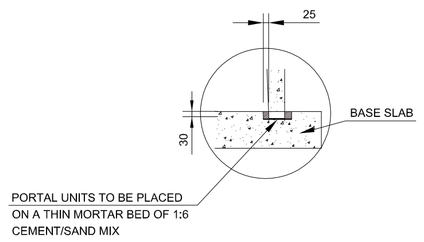


TRENCHED INSTALLATION
NTS

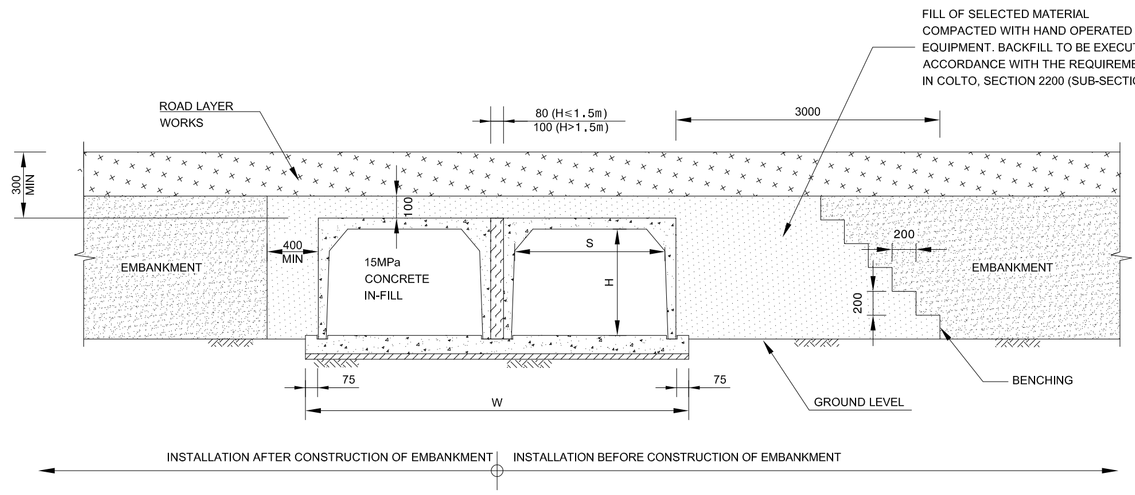
NOTES:

SURFACE FINISH OF CONCRETE WORK:
- FORMED SURFACES - F1
- UNFORMED SURFACES - U2

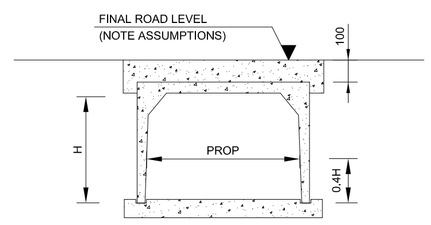
(REFER TO COLTO SECTION 6200 - SUB-SECTIONS 6207 AND 6209)



DETAIL A
NTS

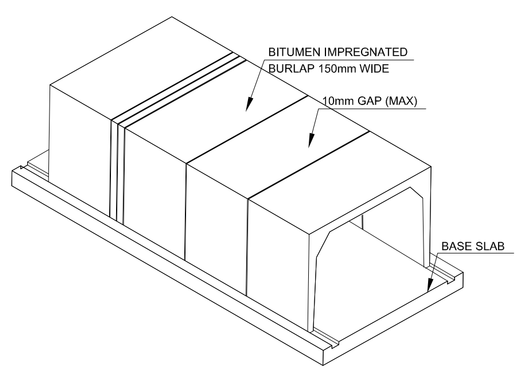


EMBANKMENT INSTALLATION
NTS



NOTE :
FOR H ⩾ 1.5m PROVIDE HORIZONTAL PROPS AT 0.4 x HEIGHT ABOVE BASE DURING BACKFILLING AND COMPACTION. ONE PROP PER PRECAST UNIT

TEMPORARY PROPPING ARRANGEMENT
NTS



CULVERT AND BASE CONFIGURATION
NTS

TABLE 1. Maximum fill height on S-load culverts under SNABC traffic loading

CULVERT SIZE.			FOUNDATION CONDITIONS			
			1 & 2		3 & 4	
SPAN		HEIGHT	CLASS	FILL	CLASS	FILL
(mm)	x	(mm)		(m)		(m)
600	x	300		10.2		5.6
600	x	450	200 S	11.0	200 S	6.0
600	x	600		12.0		6.4
750	x	300		8.7		4.9
750	x	450	175 S	9.2	175 S	5.2
750	x	600		10.0		5.5
750	x	750		10.5		5.8
900	x	300		8.6		4.8
900	x	450		9.0		5.1
900	x	600	175 S	9.5	175 S	5.3
900	x	750		10.0		5.6
900	x	900		10.2		5.8
1200	x	300		7.1		4.1
1200	x	450		7.4		4.3
1200	x	600	150 S	7.7	150 S	4.4
1200	x	900		8.2		4.7
1200	x	1200		8.8		5.0
1500	x	300		4.5		2.9
1500	x	450		4.7		3.0
1500	x	600	100 S	4.9	100 S	3.1
1500	x	900		5.3		3.3
1500	x	1200		5.6		3.5
1500	x	1500		6.0		3.7
1800	x	600		3.3		2.4
1800	x	900		3.6		2.5
1800	x	1200	75 S	3.8	75 S	2.7
1800	x	1500		4.0		2.8
1800	X	1800		4.3		2.9
2100	x	600		3.3		2.4
2100	x	900		3.5		2.6
2100	x	1200	75 S	3.7	75 S	2.7
2100	x	1500		3.9		2.8
2100	x	1800		4.1		2.9
2100	x	2100		4.3		3.0
2400	x	600		3.2		2.4
2400	x	900		3.4		2.5
2400	x	1200	75 S	3.5	75 S	2.1
2400	x	1500		3.7		2.9
2400	x	1800		3.8		2.8
2400	x	2400		4.0		3.0
3000	x	600		3.1		2.4
3000	x	900		3.2		2.5
3000	x	1200		3.3		2.6
3000	x	1500	75 S	3.4	75 S	2.7
3000	x	1800		3.5		2.7
3000	x	2400		3.7		2.9
3000	X	3000		3.1		2.7
3600	x	600		3.1		2.4
3600	x	900		3.1		2.5
3600	x	1200		3.2		2.6
3600	x	1500	75 S	3.3	75 S	2.6
3600	x	1800		3.3		2.7
3600	x	2400		3.5		2.8
3600	X	3000		3.5		2.7

NOTES

PERMISSIBLE FILL HEIGHTS

THE RELATIONSHIP BETWEEN THE S-LOAD CULVERT CLASSES DEFINED IN SANS 986 AND THE CORRESPONDING MAXIMUM PERMISSIBLE FILL HEIGHTS TO MEET THE TMH7 REQUIREMENT WAS CALCULATED AND IS GIVEN IN TABLE 1. IF CULVERTS ARE TO BE PLACED UNDER HIGHER FILLS THAN THOSE GIVEN IN THIS TABLE THEN A HIGHER S-LOAD CLASS MUST BE SPECIFIED.

DEFINITIONS

YIELDING FOUNDATION CONDITIONS OCCUR WHEN THE FOUNDING MATERIAL AND THE FILL MATERIAL ARE EXPECTED TO SETTLE AT EQUAL RATES (COMPRESSIBLE MATERIAL). THE LOADING IS CALCULATED IN ACCORDANCE WITH TMH7 PART 2 CLAUSE 2.3.3.2(2).

UNYIELDING FOUNDATION CONDITIONS OCCUR WHEN THE FOUNDATION MATERIAL IS INCOMPRESSIBLE (SOFT ROCK OR OTHER HARDER MATERIAL). THE LOADING IS CALCULATED IN ACCORDANCE WITH TMH7 PART 2 CLAUSE 2.3.3.2(3) AND (4).

TRENCH CONDITION OCCURS WHEN CULVERTS ARE LAID IN A NARROW EXCAVATION AND BACKFILLED TO GROUND LEVEL

EMBANKMENT (UNTRENCHED) CONDITION OCCURS WHEN CULVERTS ARE LAID AT GROUND LEVEL AND BACKFILLED TO FINAL FORMATION LEVEL

THE COMBINATIONS OF FOUNDATION AND INSTALLATION CONDITIONS USED IN TMH7 ARE DEFINED AS:
CONDITION 1: CULVERTS IN TRENCH IN UNYIELDING FOUNDATION WITH NO PROJECTION.
CONDITION 2: CULVERTS UNTRENCHED ON YIELDING FOUNDATION.
CONDITION 3: CULVERTS UNTRENCHED ON UNYIELDING FOUNDATION FOR h > 1.7b
CONDITION 4: CULVERTS UNTRENCHED ON UNYIELDING FOUNDATION FOR h ⩽ 1.7b

WHERE h = FILL HEIGHT IN METRES (ABOVE UNIT)
b = OVERALL TRENCH WIDTH OR, IF UNTRENCHED, OVERALL CULVERT WIDTH, IN METRES.

ASSUMPTIONS

THE FOLLOWING ASSUMPTIONS AND CLAUSES OF TMH7 PART 1 AND 2 WERE USED TO COMPILE TABLE 1

- A MINIMUM FILL HEIGHT OF 300mm OVER THE CULVERT UNITS. WHERE THIS CANNOT BE ACHIEVED A 100mm REINFORCED CONCRETE SLAB MUST BE USED.
- STANDARD TRAFFIC LOADING (SNABC) AS DESCRIBED IN CLAUSE 2.6.1.2.
- FILL MATERIAL UNIT WEIGHT 20kN/m³[CLAUSE 2.3.1]
- CONCRETE UNIT WEIGHT 24kN/m³[CLAUSE 2.2.1]
- HORIZONTAL EARTH PRESSURE 7.8kN/m² PER METRE DEPTH [CLAUSE 2.4.2]
- ULTIMATE LIMIT STATE LOAD FACTORS TABLE 7.

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NOTES

ISSUED FOR TENDER

LEGEND

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