

ONLY FOR : 30 MPa CONCRETE , NORMAL WEIGHT
400 MPa REINFORCING BAR

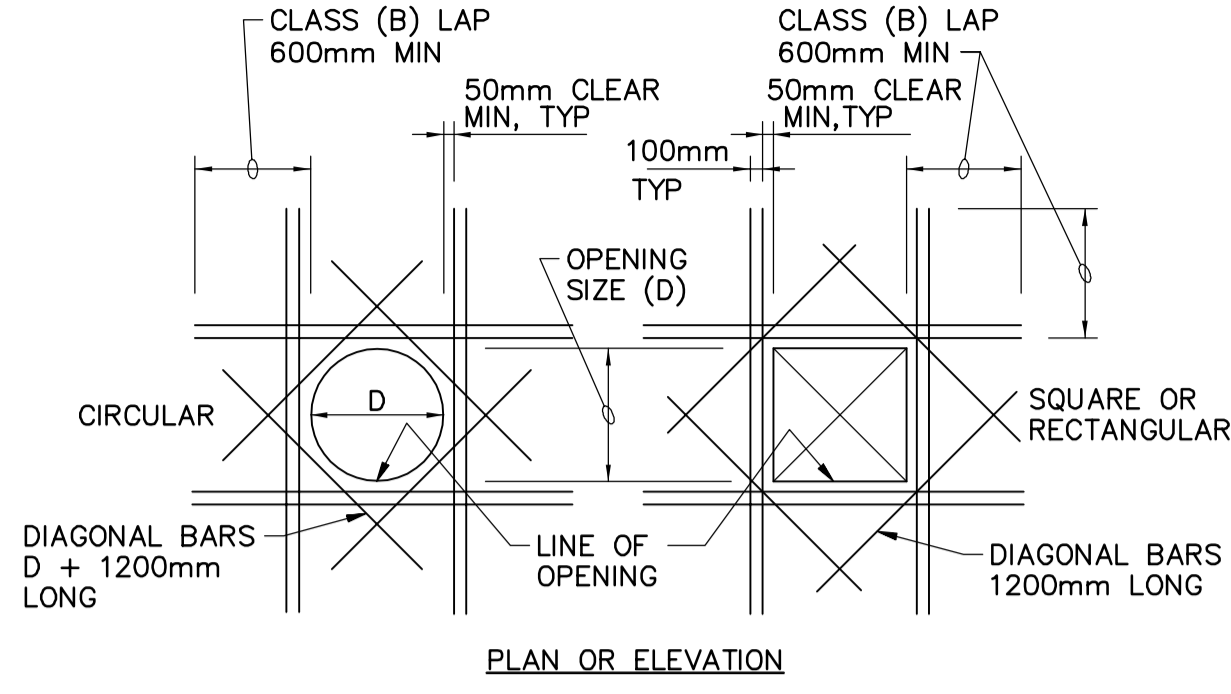
BAR SIZE	TOP BARS (mm)		OTHER BARS (mm)	
	DEVELOPMENT LENGTH	TENSION LAP LENGTH	DEVELOPMENT LENGTH	TENSION LAP LENGTH
10M	350	440	300	350
15M	510	670	400	510
20M	690	890	550	690
25M	1080	1400	830	1080
30M	1290	1670	990	1290
35M	1500	1950	1160	1500

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	DEVELOPMENT LENGTH	TENSION LAP LENGTH	DEVELOPMENT LENGTH	TENSION LAP LENGTH
10M	330	410	300	330
15M	480	620	370	480
20M	640	830	490	640
25M	990	1290	790	990
30M	1200	1550	920	1200
35M	1390	1800	1070	1390

- NOTES:
- TOP BARS ARE:
 - ALL BARS IN CONCRETE WITH MORE THAN 300mm CONCRETE BELOW.
 - ALL HORIZONTAL BARS IN WALLS.
 - TABLE APPLIES UNLESS SHOWN OTHERWISE.

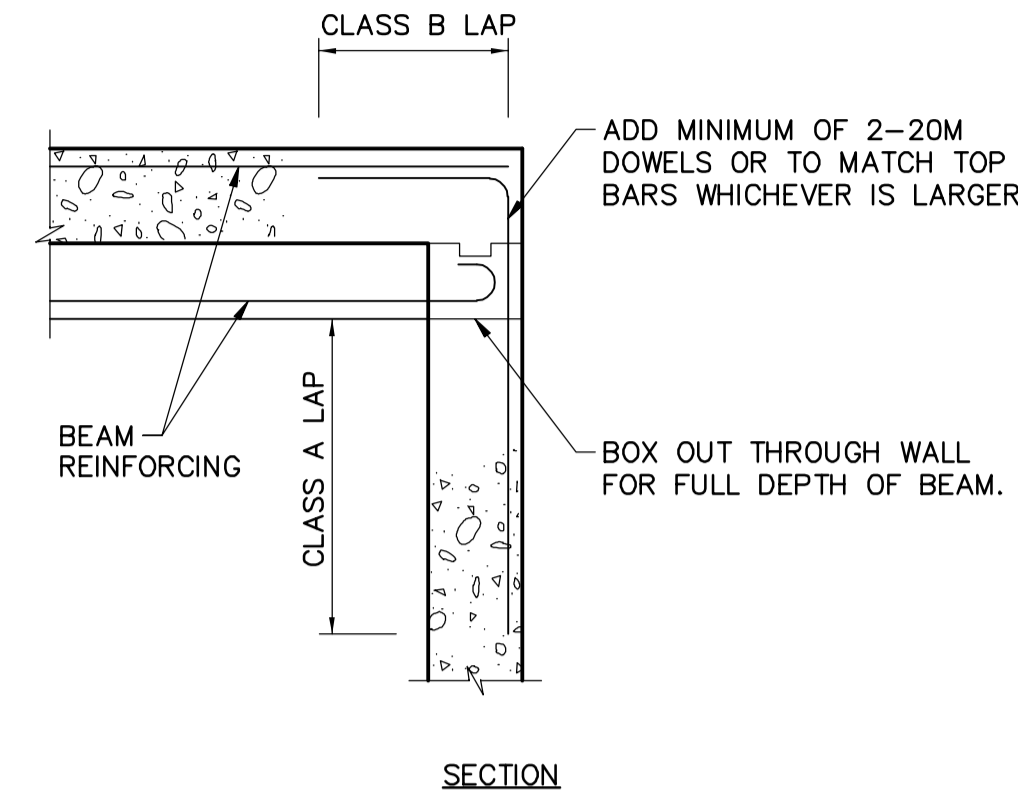
1 REINFORCEMENT DEVELOPMENT LENGTH AND TENSION LAP LENGTH FOR SLABS AND WALLS
N.T.S.



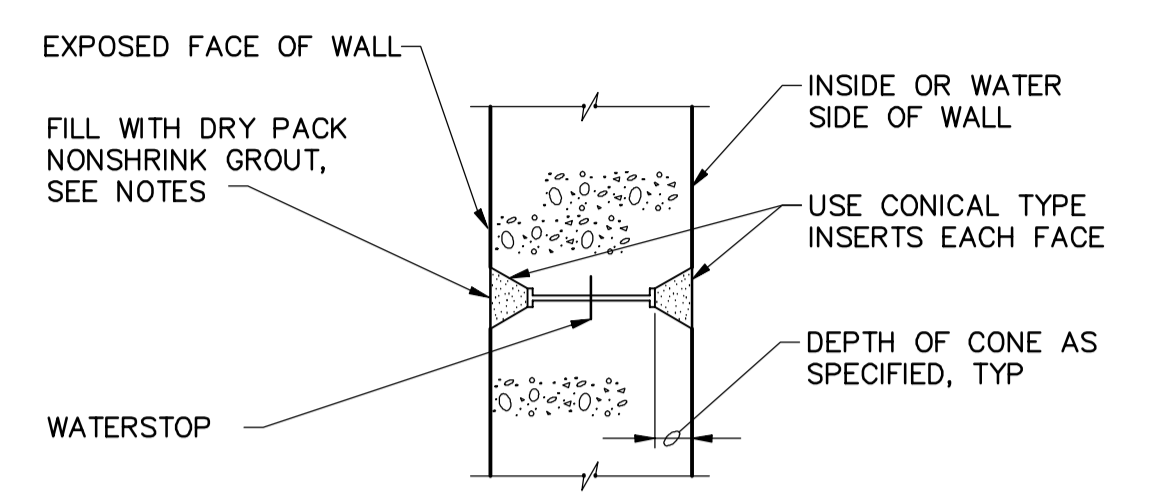
- NOTES:
- FOR OPENINGS D=400mm OR LARGER: ADD EXTRA BARS ON EACH SIDE OF THE OPENING, EQUIVALENT TO HALF THE TOTAL AREA OF REINFORCING CUT IN EACH DIRECTION, EACH FACE, UNLESS NOTED OTHERWISE.
 - FOR OPENINGS LESS THAN 400mm: NO EXTRA BARS ARE REQUIRED ADJUST REGULAR REINFORCING AROUND OPENINGS.

WALL OR SLAB THICKNESS t (mm)	DIAGONAL REINFORCING		
	t < 200	t < 250	t ≥ 250
LAYERS OF REINFORCING	1	1	2
REINFORCING FOR OPENINGS D ≥ 600mm	1-15M IN EACH CORNER IN CENTRE OF WALL OR SLAB (4 TOTAL)	1-15M IN CENTER OF WALL OR SLAB (4 TOTAL)	2-15M IN EACH CORNER IN EACH LAYER WALL OR SLAB (8 TOTAL)

2 EXTRA REINFORCING AT OPENINGS IN WALLS AND SLABS
N.T.S.

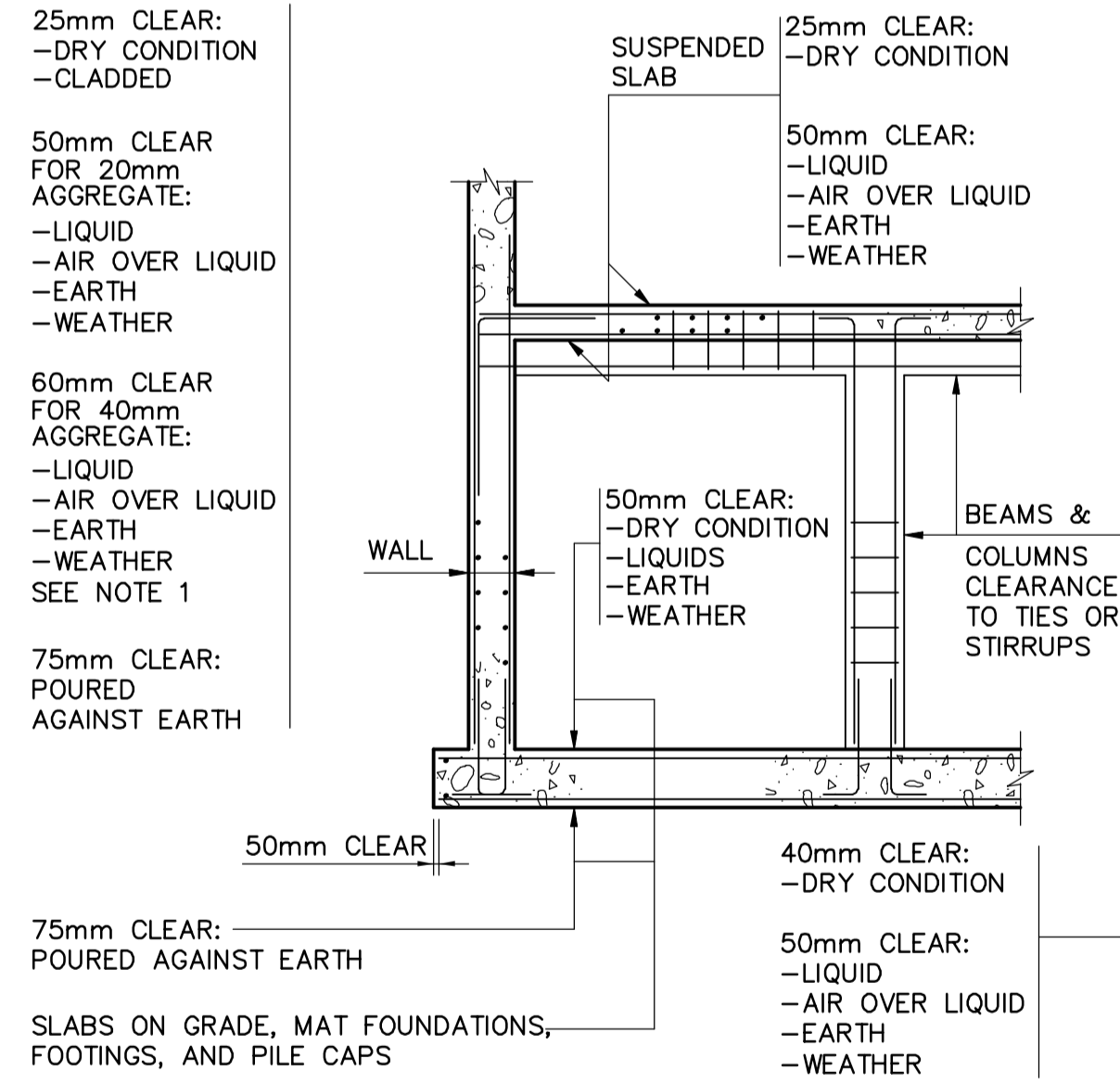


3 CONCRETE BEAM END DETAIL
N.T.S.



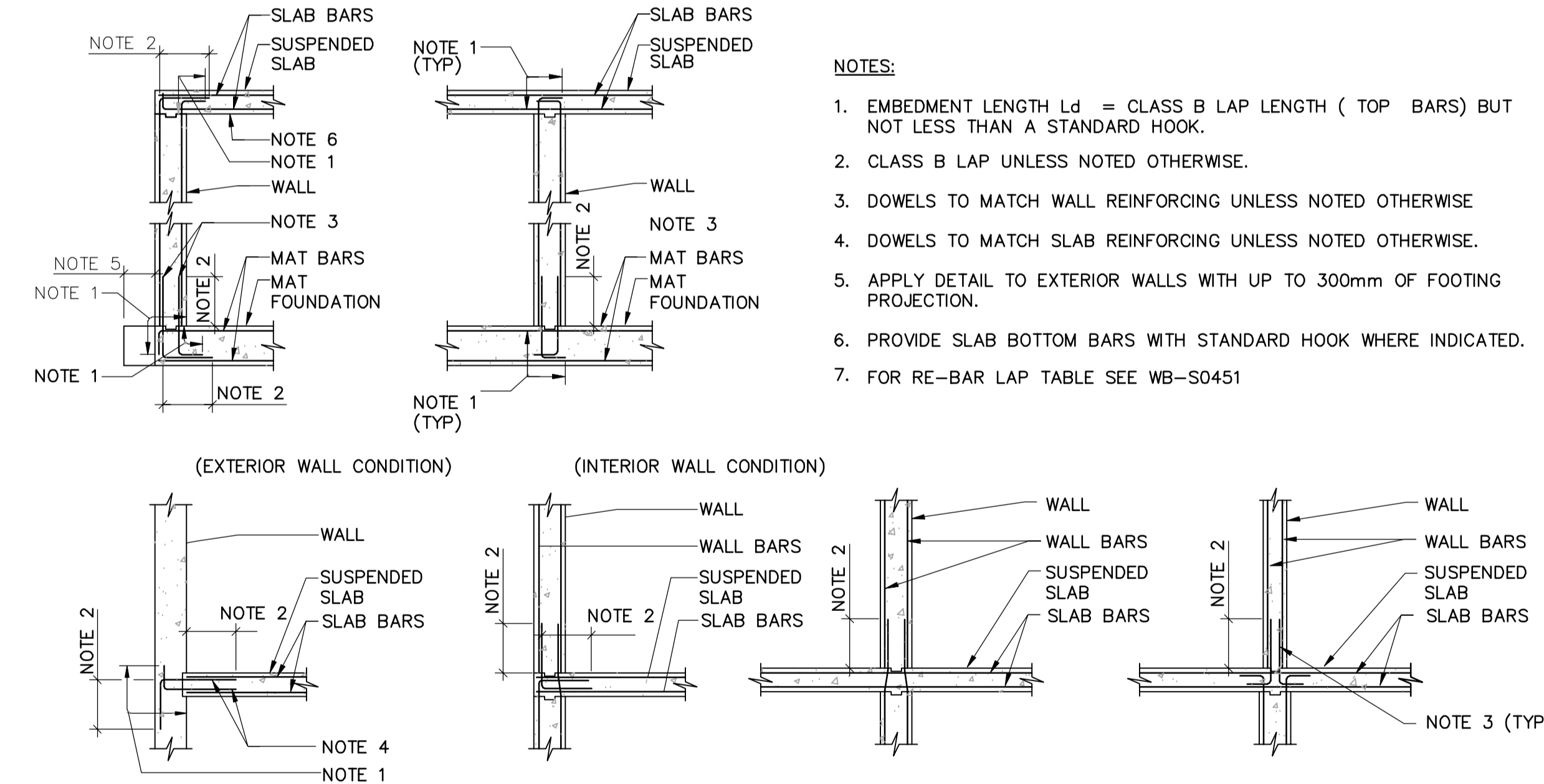
- NOTES:
- THE SPACING OF FORM TIES ON EXPOSED PORTIONS OF WALLS SHALL BE APPROXIMATELY EQUAL HORIZONTALLY AND VERTICALLY AND SHALL BE UNIFORM IN EACH DIRECTION.
 - DRY PACK METHOD SHALL BE AS SPECIFIED USING STEEL TOOLS.
 - SEE SPECIFICATION FOR TYPE OF FORM TIE TO BE USED BASED ON APPLICATION.

4 FORM TIE HOLE
N.T.S.



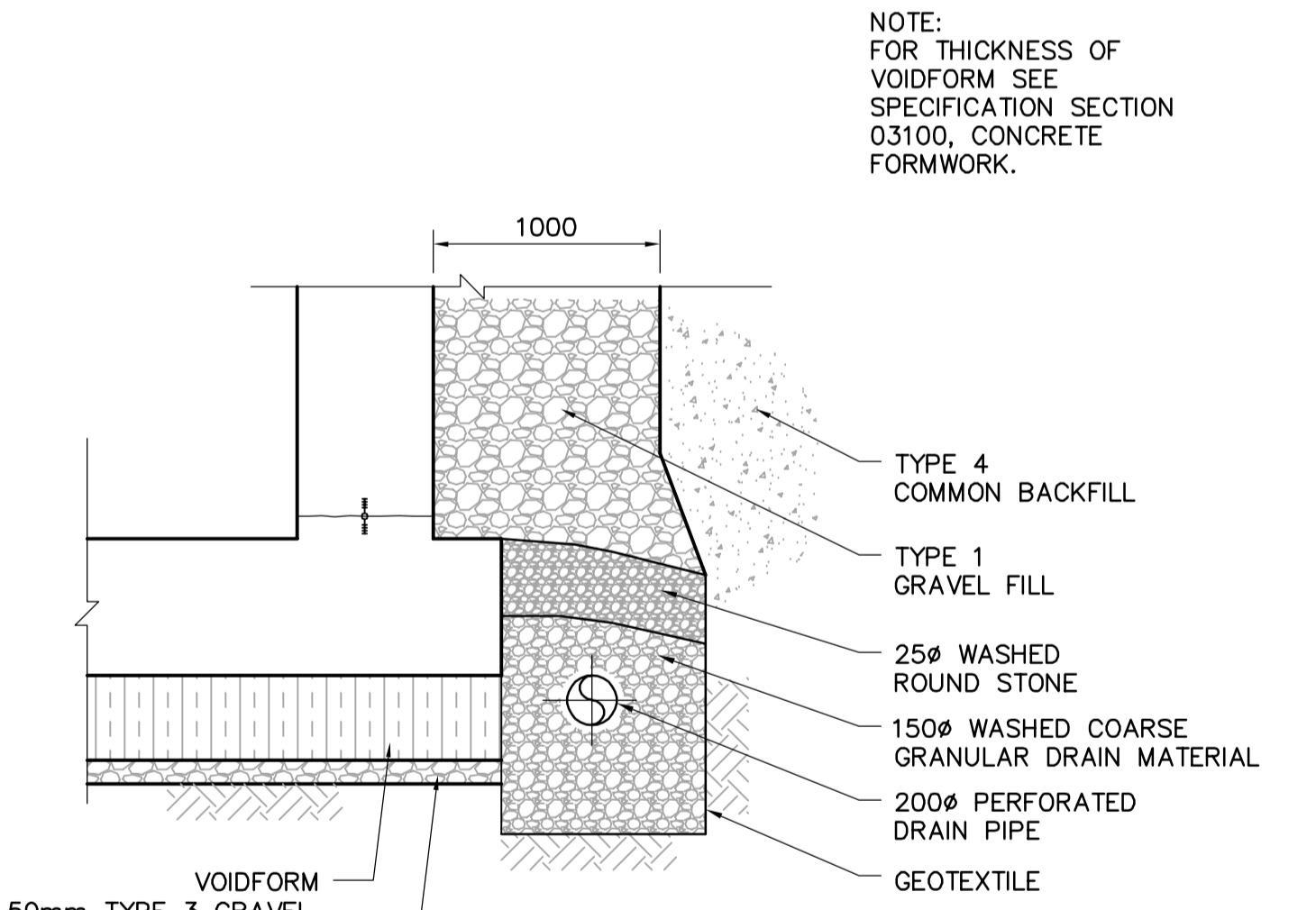
- NOTE:
- PROVIDE 50mm CLEAR COVER ON FACE EXPOSED TO DRY CONDITION.

5 CONCRETE COVER TO REINFORCING
N.T.S.



- NOTES:
- EMBEDMENT LENGTH l_d = CLASS B LAP LENGTH (TOP BARS) BUT NOT LESS THAN A STANDARD HOOK.
 - CLASS B LAP UNLESS NOTED OTHERWISE.
 - DOWELS TO MATCH WALL REINFORCING UNLESS NOTED OTHERWISE
 - DOWELS TO MATCH SLAB REINFORCING UNLESS NOTED OTHERWISE.
 - APPLY DETAIL TO EXTERIOR WALLS WITH UP TO 300mm OF FOOTING PROJECTION.
 - PROVIDE SLAB BOTTOM BARS WITH STANDARD HOOK WHERE INDICATED.
 - FOR RE-BAR LAP TABLE SEE WB-S0451

6 REINFORCING AT WALL AND SLAB INTERSECTIONS
N.T.S.



NOTE:
FOR THICKNESS OF VOIDFORM SEE SPECIFICATION SECTION 03100, CONCRETE FORMWORK.

7 PERIMETER DRAINAGE
N.T.S.

 Certificate of Authorization CH2M HILL Canada Ltd. No. 1441 Expiry: April 30, 2006	B.M. ELEV.	 Frederickson Cooper ARCHITECTS DESIGNED BY DK DRAWN BY PT SCALE: NTS 00 ISSUED FOR TENDER 2006/02/03 DK NO. REVISIONS DATE BY DATE 2005/08/31 DATE 2006/02/08	 A Geo International Ltd. Company CHECKED BY AP APPROVED BY DJT RELEASED FOR CONSTRUCTION BY: R. SOROKOWSKI DATE 2006/02/08	ENGINEER'S SEAL	 THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT ENGINEERING DIVISION WATER TREATMENT PLANT FOUNDATIONS AND CONCRETE STRUCTURES STRUCTURAL STANDARD DETAILS	CITY FILE NUMBER
	ORIGINAL SIGNED BY D. KRUGER			SHEET OF		
	CONSULTANT DRAWING NO. WB-S0451			CITY DRAWING NUMBER 1-060B-A-80451-001-00D		
	2006/02/06					