


KEY PLAN

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United Nation Development Programme
UNDP Lebanon
Social and Local Development Programme
P.O.Box: 11-3216 Beirut, Lebanon
Empowered lives.
Resilient nations.



PROGRAMME: Lebanese Host Communities Support Programme
Support to Integrated Service Provision at the Local Level

PROJECT NAME:
KFARNABRAKH STORMWATER DRAINAGE SYSTEM

LEGEND

 PROPOSED CHANNEL WITH FLOW DIRECTION

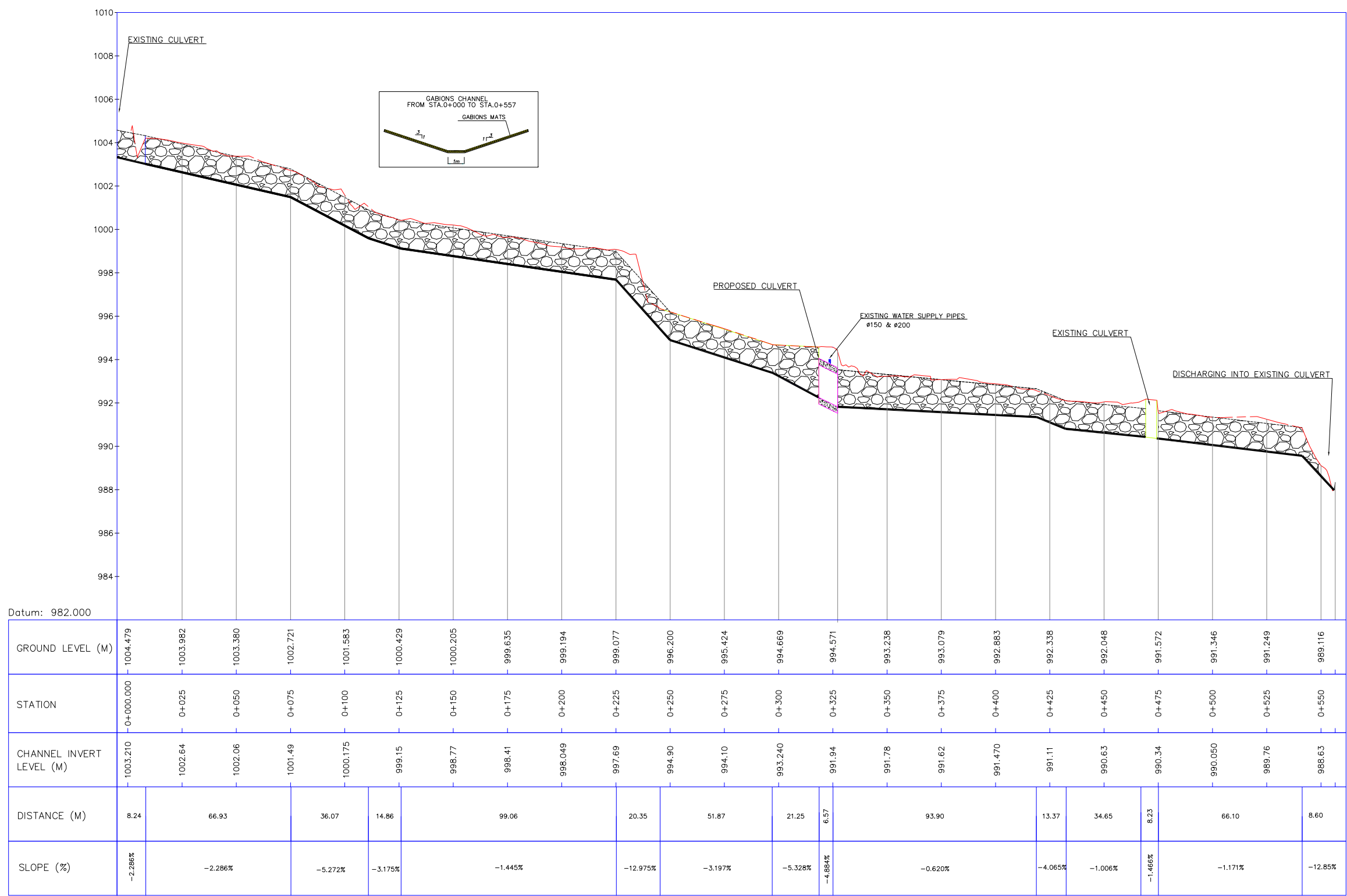
- NOTES
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL OTHER
 - ALL DIMENSIONS ARE IN METERS UNLESS SHOWN OTHERWISE.
 - THE CONTRACTOR SHALL UNDERTAKE TOPOSURVEY FOR THE SITE AND SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR STARTING THE EXECUTION

0	--	--	GENERAL REVISION	--
REV	BY	Date	Description	Appr.
PROJECT NBR.			LB1701	
PROJECT PHASE			TENDER	
DISCIPLINE			CIVIL ENGINEERING	
SECTOR			-	
BUILDING			-	
DESIGNED			A.H.	
DRAWN			A.H.	
CHECKED			A.H.	
APPROVED			A.H.	
DATE			7/1/2017	
SCALE			1/1000	
SHEET SIZE			A1	

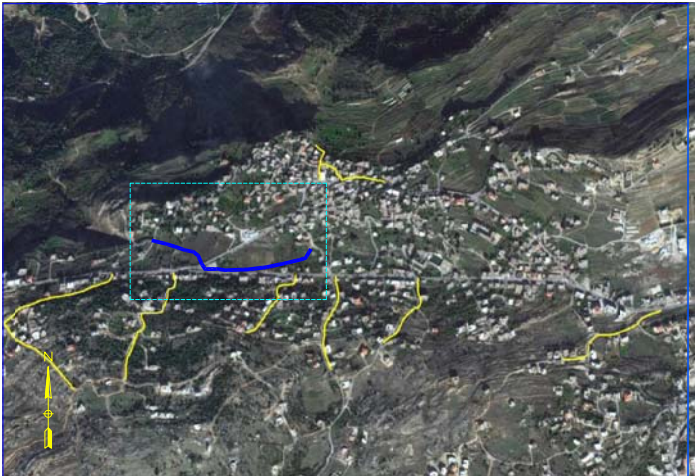
Title

TOPOGRAPHIC SURVEY DATA
&
STORMWATER LAYOUT PLAN
CHANNEL K8

LB1701-KN-SD-010-REV 0



PROFILE K8



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Social and Local Development Programme
P.O.Box: 11-3216 Beirut, Lebanon
Tel: 961 1 962491

PROGRAMME: Lebanese Host Communities Support Programme
Support to Integrated Service Provision at the Local Level

PROJECT NAME: KFARNABRAKH STORMWATER DRAINAGE SYSTEM

- LEGEND
- GABIONS CHANNEL
 - NATURAL GROUND LEVEL

- NOTES
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL OTHER ENGINEERING DRAWINGS.
 - ALL DIMENSIONS ARE IN METERS UNLESS SHOWN OTHERWISE.

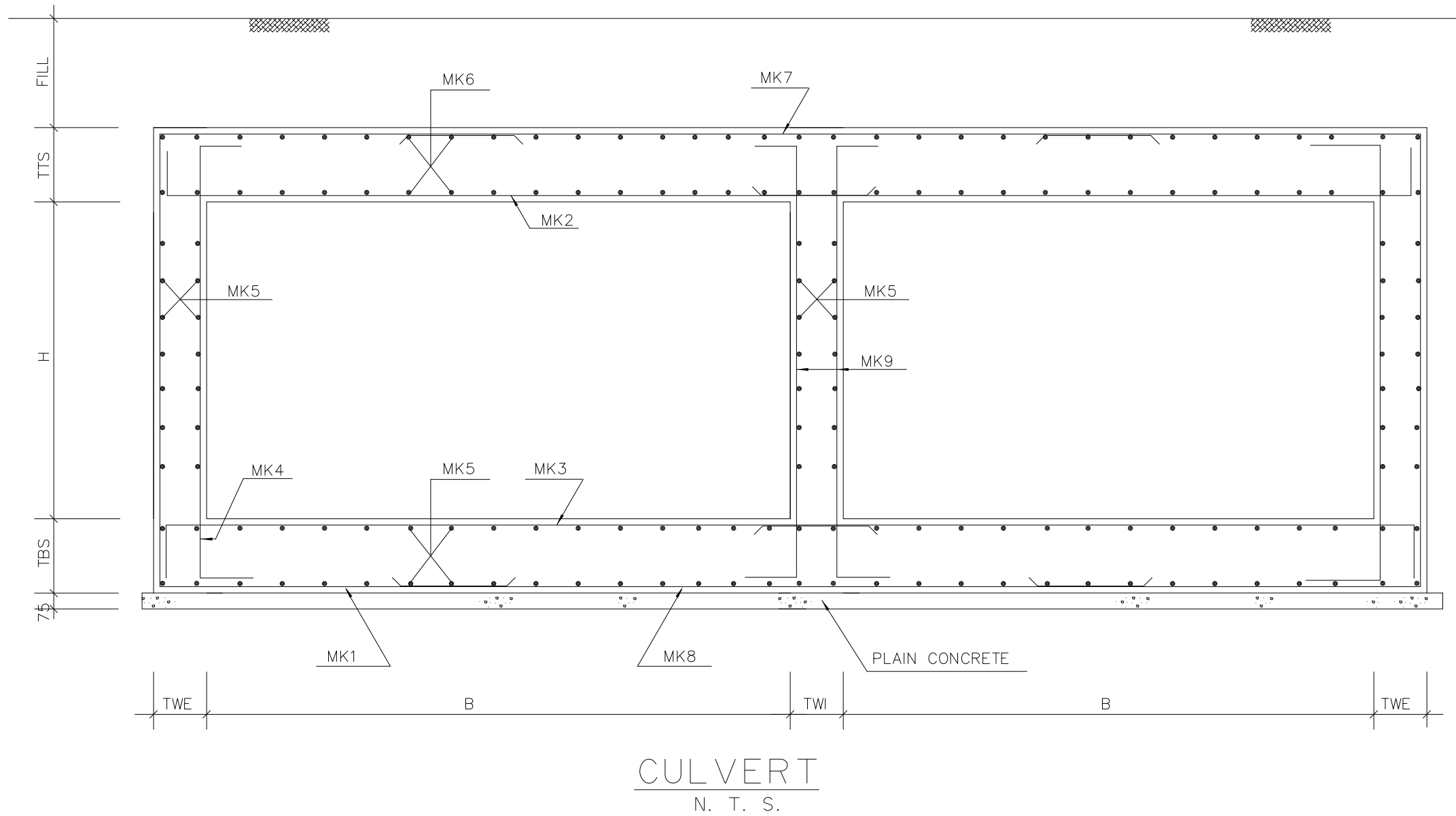
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REV	BY	Date	Description	Appr.
PROJECT NBR.		LB1701		
PROJECT PHASE		TENDER		
DISCIPLINE		CIVIL ENGINEERING		
SECTOR		-		
BUILDING		-		
DESIGNED		A.H.		
DRAWN		A.H.		
CHECKED		A.H.		
APPROVED		A.H.		
DATE		7/1/2017		
SCALE		H= 1/1000 V= 1/100		
SHEET SIZE		A1		

Title

STORMWATER PROFILE
CHANNEL K8

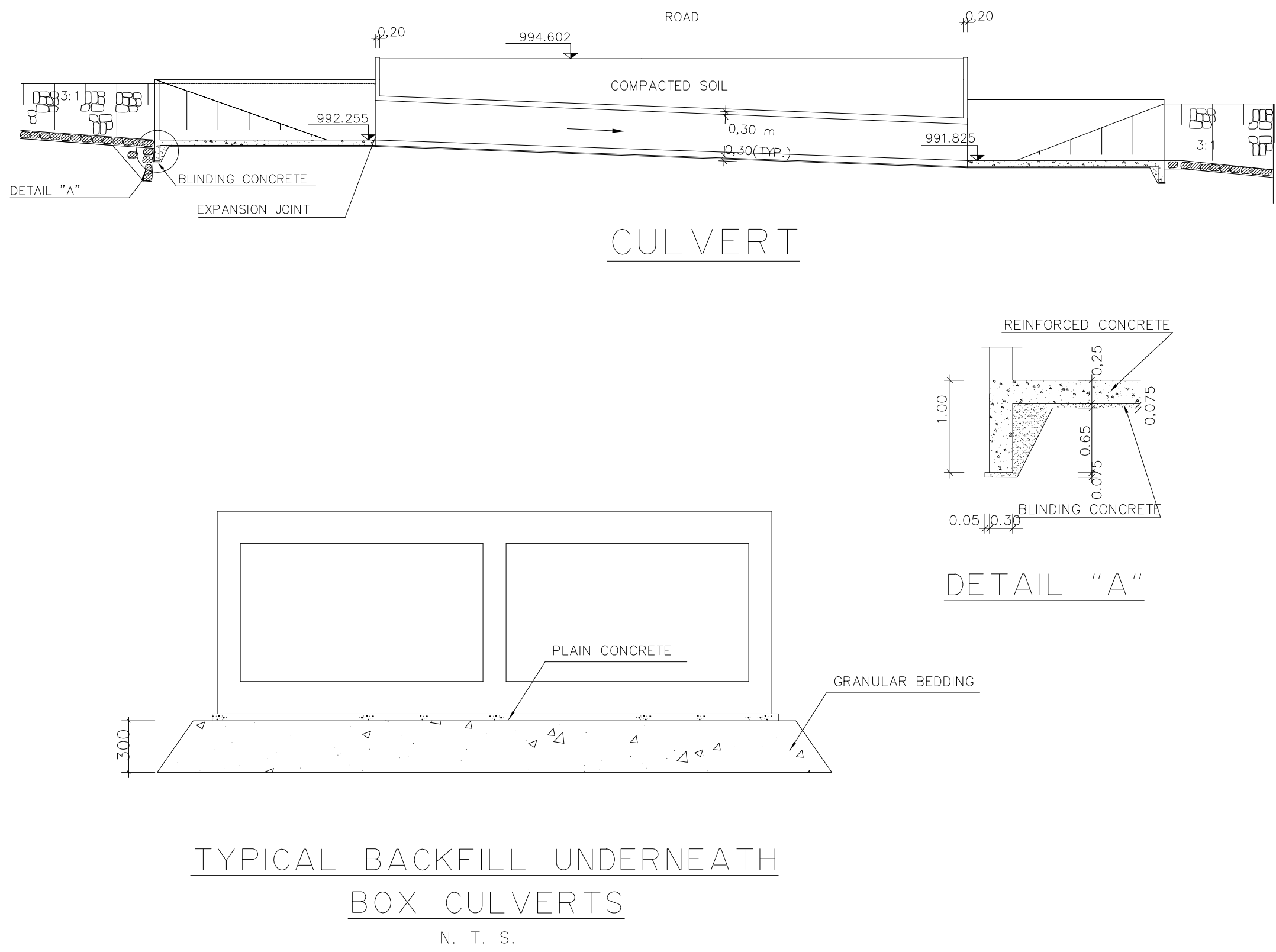
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LB1701 || TENDER || DWG || KN-SD-011 || 0

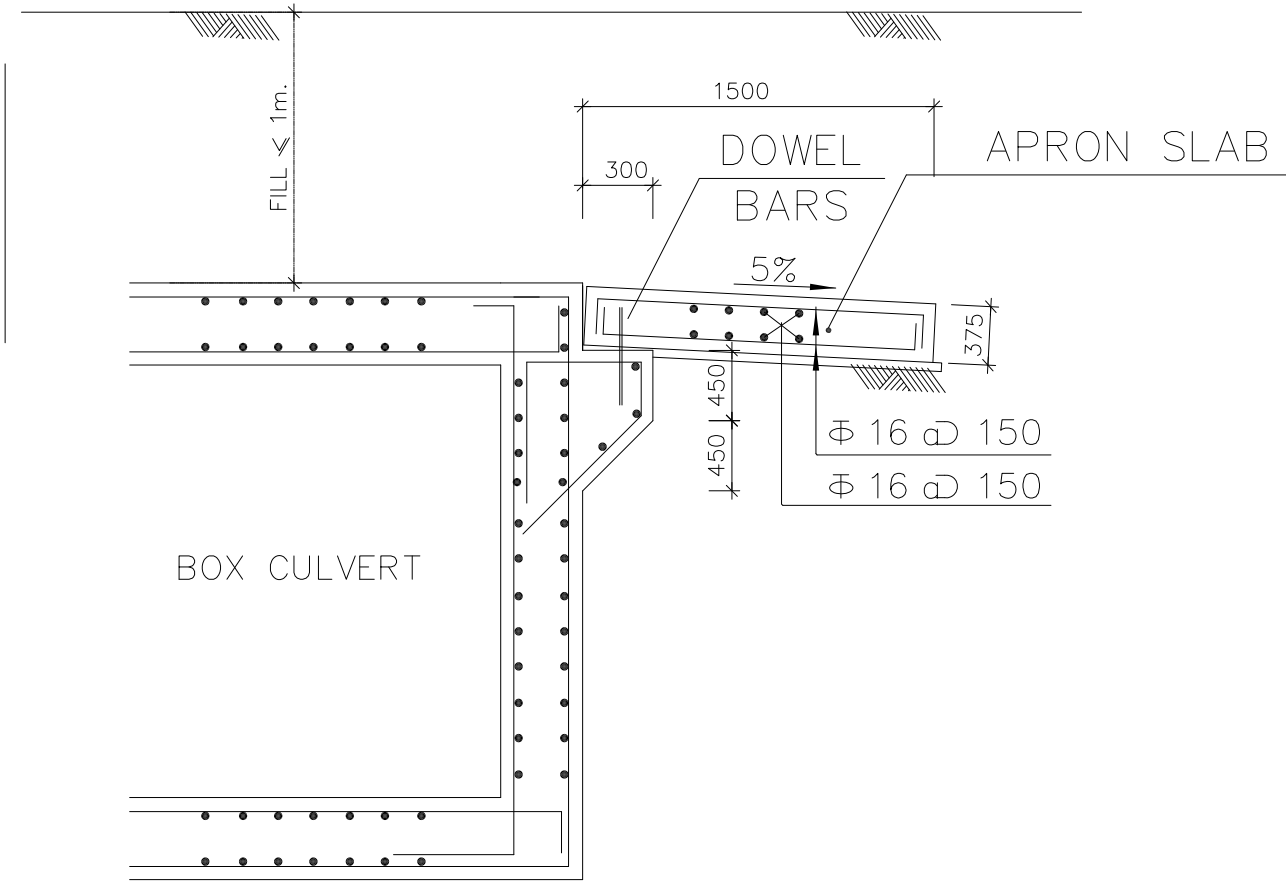


FILL (m.)	TYPE	DIMENSIONS (mm.)						REINFORCEMENT								
		B	H	TBS	TTS	TWE	TWI	MK1	MK2	MK3	MK4	MK5	MK6	MK7	MK8	MK9
0.30 3.00	2	2000	1500	300	300	300	250	⌀ 16 @ 150	⌀ 16 @ 150	⌀ 16 @ 150	⌀ 12 @ 150	⌀ 10 @ 150	⌀ 10 @ 150	⌀ 16 @ 150	⌀ 16 @ 150	⌀ 12 @ 150

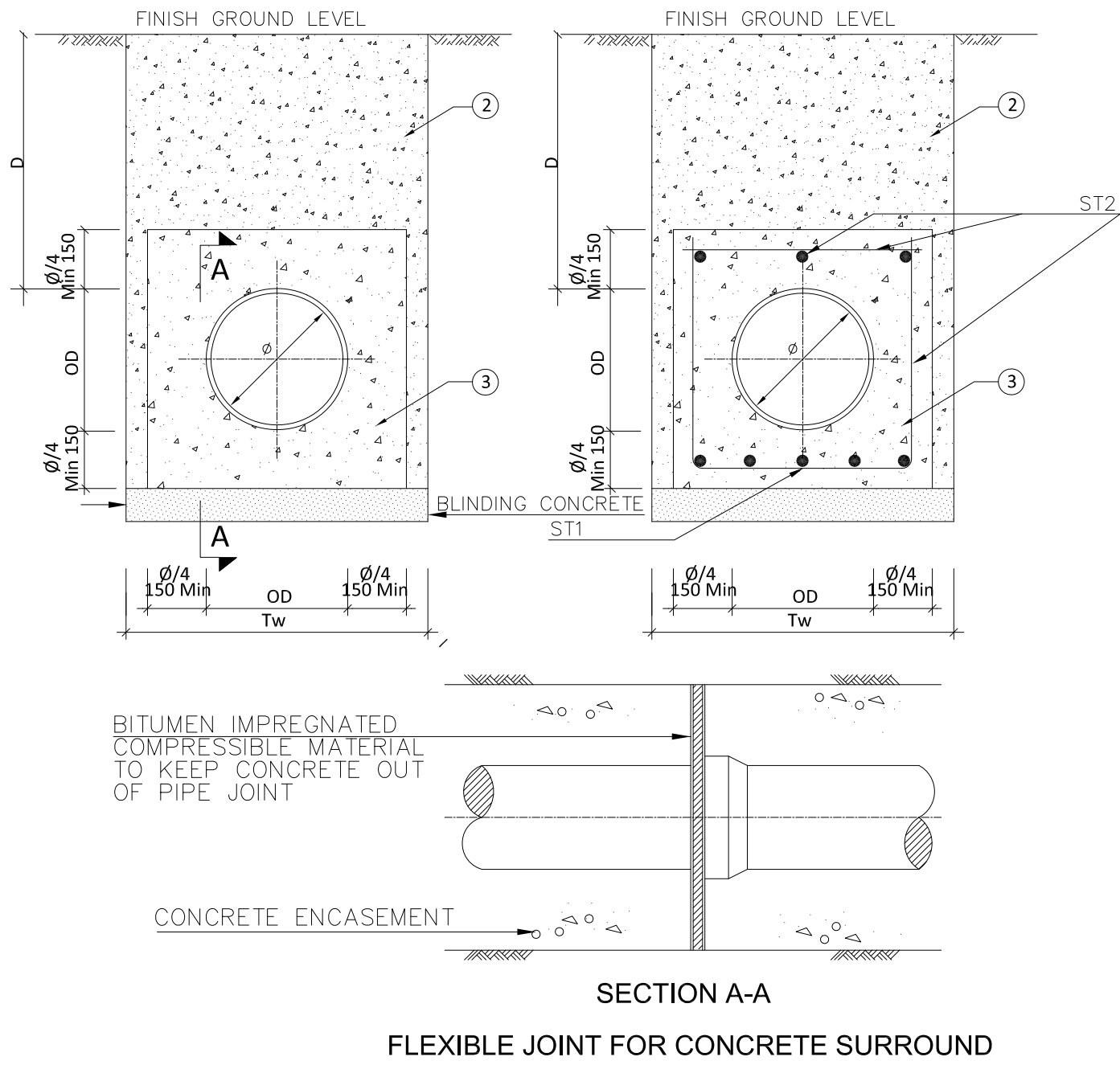
CULVERT R.C. DETAILS



TYPICAL BACKFILL UNDERNEATH
BOX CULVERTS
N. T. S.



TYPICAL APRON SLAB
FOR FILL LESS THAN 1m.
N.T.S



NOTES

- OD = EXTERNAL DIAMETER OF PIPE
- D = DEPTH OF COVER (m) REFER TO PROFILES TO PROFILES
- WHEN POURING CONCRETE THE PIPE MUST BE RESTRAINED AGAINST MOVEMENT BY STRAPPING IT TO A BASE SLAB, OR ANCHOR.

PIPE DIAMETER ø mm	ST1	ST2
ø≤600	T10@150mm	ø8@200mm
600<ø≤1000	T12@120mm	ø8@200mm
1000<ø≤1200	T16@120mm	ø8@200mm

CONCRETE ENCASEMET DETAILS

GENERAL

- ALL DETAILS TO BE READ IN CONJUNCTION WITH SPECIFICATION.
- DO NOT SCALE FROM DRAWINGS , ALL DIMENSIONS SHOULD BE READ OR COMPUTED.
- ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHOULD PREPARE & SUBMIT DRAWINGS INDICATING THE LOCATION OF THE PROPOSED CONSTRUCTION JOINTS IN THE REINFORCED CONCRETE STRUCTURES SUBJECT TO THE ENGINEER'S APPROVAL.
- SELECTED BACKFILL SHOULD BE COHESIONLESS MATERIAL FREE OF ORGANIC MATTER AND FREE OF GRAVEL GREATER THAN 10 CM .
- APPLY TWO COATS OF BITUMINOUS COATINGS FOR ALL SURFACES IN CONTACT WITH SOIL UNLESS OTHERWISE NOTED.

CONCRETE & REINFORCED CONCRETE

- BASIS OF DESIGN : AASHTO 1996 , & BS 8007 CODE OF PRACTICE FOR DESIGN OF CONCRETE STRUCTURES FOR AQUEOUS LIQUIDS
- PARTICULAR CARE SHOULD BE GIVEN TO THE PLACING OF REINFORCEMENT , THE MAKING OF CONCRETE , & TO FOLLOW THE SPECIFICATIONS CAREFULLY.
- CONCRETE :
 - CLASS A CONCRETE SHALL BE USED FOR STRUCTURAL ELEMENTS AND CLASS B CONCRETE FOR BLINDING CONCRETE
- REINFORCEMENT :
 - ALL REINFORCEMENT SHALL BE OF HIGH TENSILE STEEL GRADE 60
 - LAP SPLICE LENGTH=50 STEEL BAR DIAMETER
- WHEN REINFORCEMENT IS SHOWN IN PLAN:
 - FULL LINES DENOTE BOTTOM REINFORCEMENT.
 - DASHED LINES DENOTE TOP REINFORCEMENT.
- THE CONCRETE PROTECTIVE COVER FOR ANY REINFORCEMENT SHALL BE 50 mm.



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PROGRAMME: Lebanese Host Communities Support Programme
Support to Integrated Service Provision at the Local Level

PROJECT NAME: KFARNABRAKH STORMWATER DRAINAGE SYSTEM

NOTES

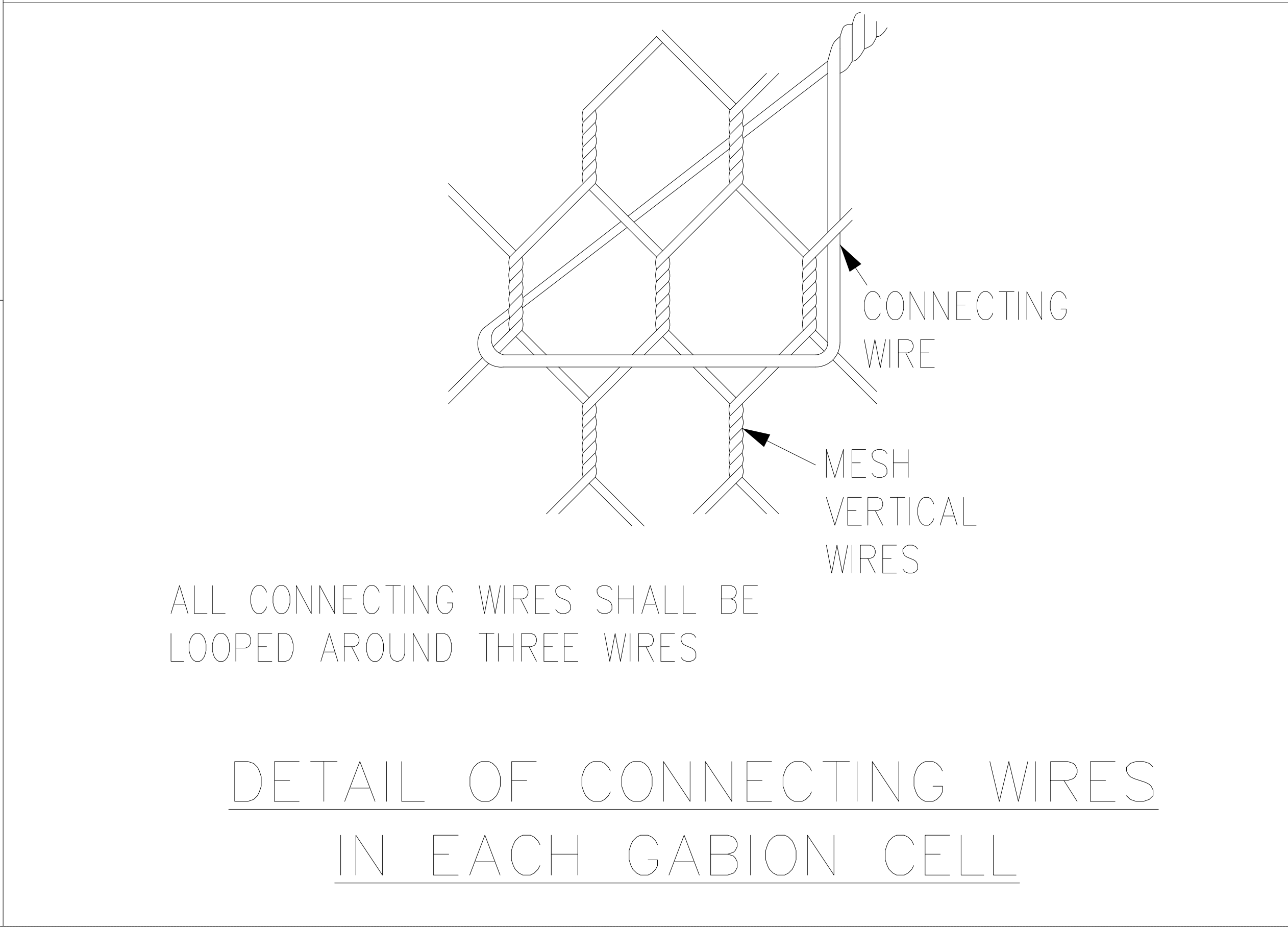
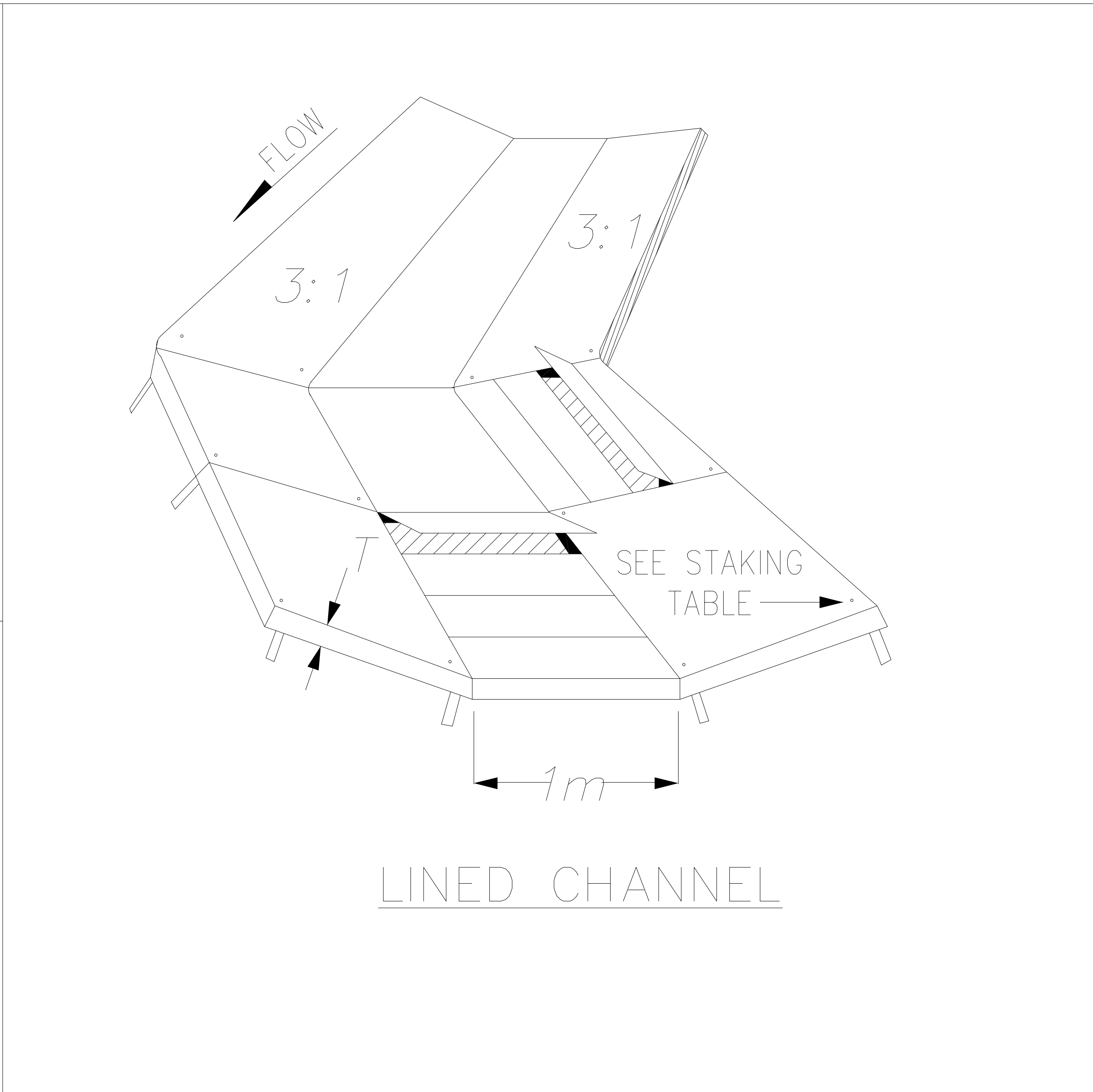
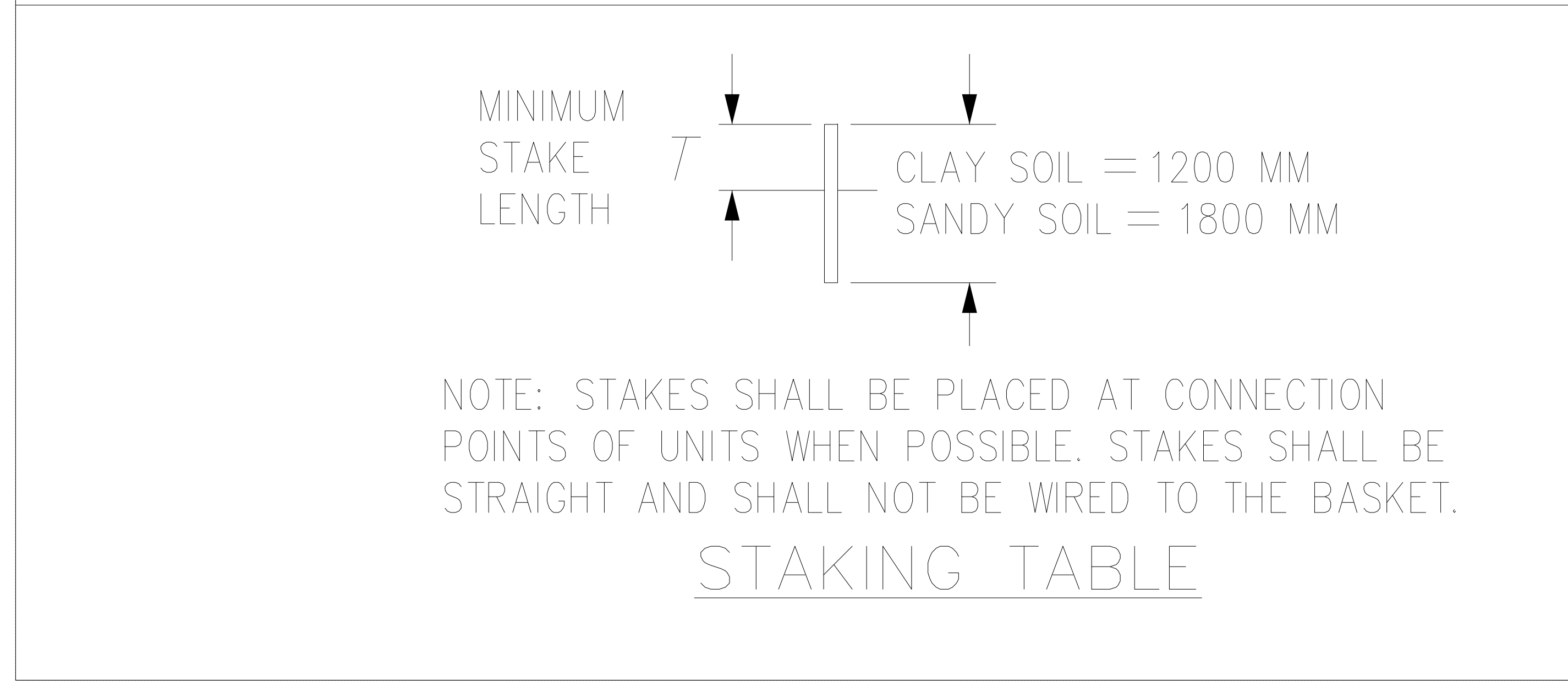
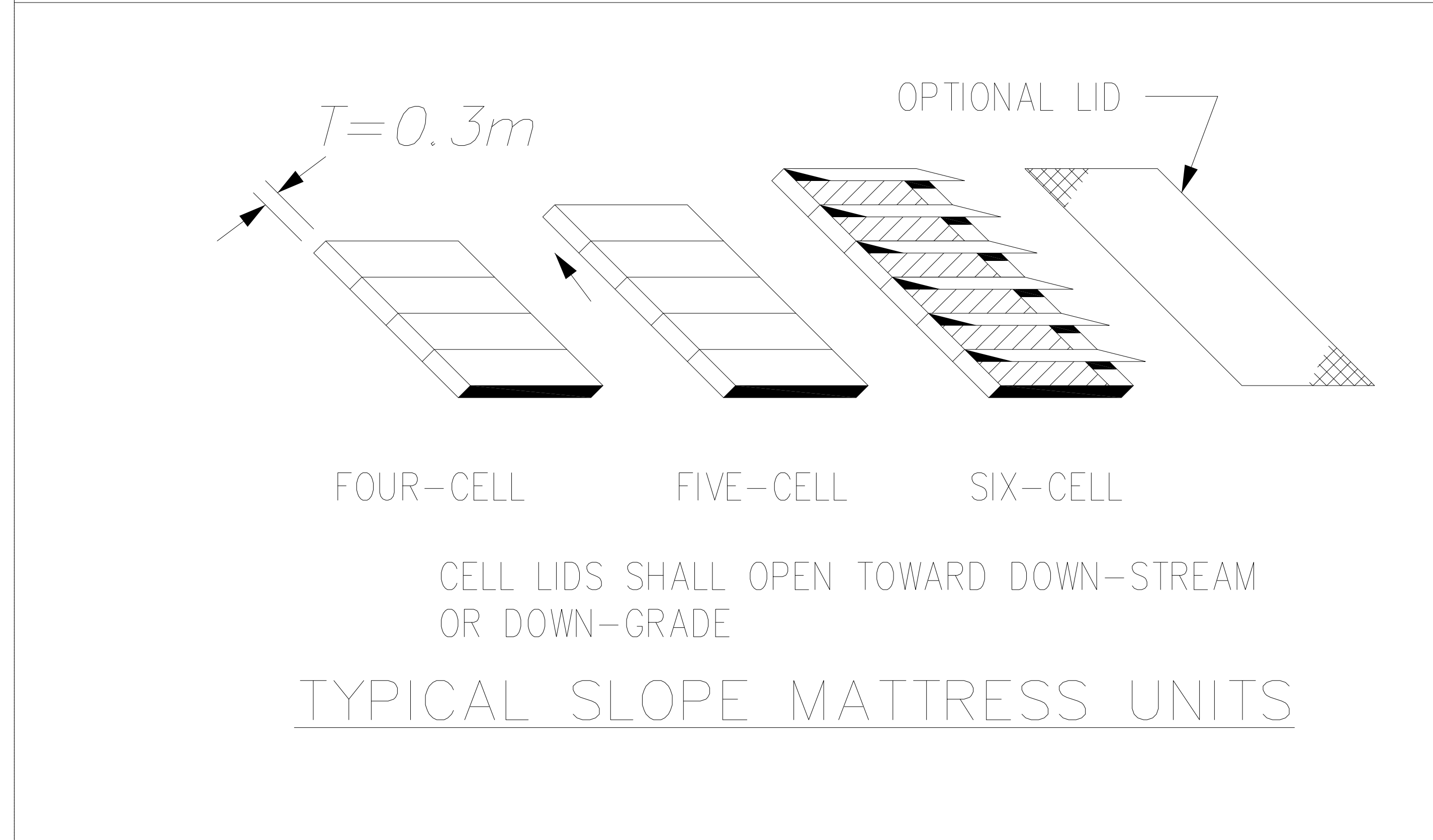
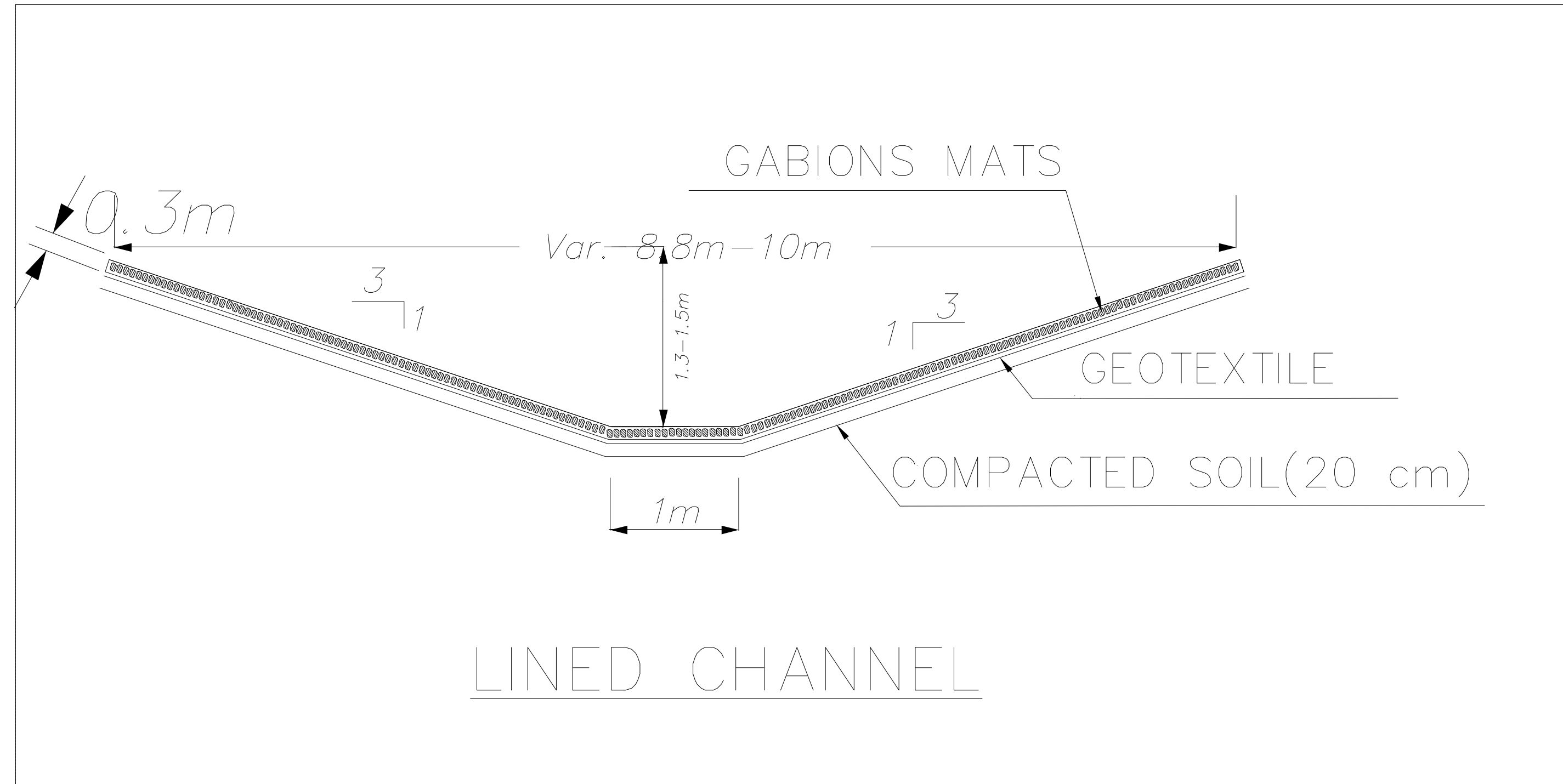
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- THE CONTRACTOR SHALL UNDERTAKE TOPOSURVEY FOR THE SITE AND SUBMIT SHOP DRAWINGS OF THE PROPOSED CULVERT (CULVERT, WING WALLS, ROAD WALLS) TO THE ENGINEER FOR APPROVAL PRIOR STARTING THE EXECUTION

REV	BY	Date	Description	Appr.
0	--	--	GENERAL REVISION	--
PROJECT NBR.				LB1701
PROJECT PHASE				TENDER
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DATE				7/1/2017
SCALE				N.T.S.
SHEET SIZE				A1

Title

CULVERT DETAILS

LB1701-KN-SD-012-REV 0



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PROJECT NAME: KFARNABRAKH STORMWATER DRAINAGE SYSTEM

- NOTES
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
 - ALL DETAILS TO BE READ IN CONJUNCTION WITH SPECIFICATION.
 - GABION AND SLOPE MATTRESS STRUCTURES ON THIS DETAIL ARE TYPICAL ONLY. THE STRUCTURES AS INSTALLED, SHALL ACHIEVE THE PLAN DIMENSIONS IN ALL 3 SPACIAL AXES, WITHOUT REGARD TO THE NUMERICAL COUNT OF UNITS OR ALPHABETICAL UNIT DESIGNATIONS ON THIS SHEET.
 - THE LIMITS OF STRUCTURE EXCAVATION SHALL BE THE NEAT LINES OF THE EXCAVATED PRISM REQUIRED TO INSTALL GABIONS OR SLOPE MATTRESSES.
 - LIDS FOR MULTIPLE OR SINGLE MATTRESSES ARE ACCEPTABLE
 - GEOTEXTILE (NON-WOVEN, NEEDLE PUNCHED): PERMITTIVITY SEC-1 / ASTM D 4491: MIN 0.7 ANY GEOTEXTILE SPLICES SHALL OVERLAP A MINIMUM OF 450 MM, WITH UPSTREAM OR UPSLOPE GEOTEXTILE OVERLAPPING THE ABUTTING DOWNSLOPE GEOTEXTILE

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Title

GABION CHANNEL DETAILS

LB1701-KN-SD-013-REV 0

LB1701 | TENDER | DWG | KN-SD-013 | 0