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BAKU – TBILISI – CEYHAN CRUDE OIL PIPELINE PROJECT
REINSTATEMENT

Kaynak: Blacud vd, 2004. Eski Haline Getirme. BTC Ham Petrol Boru Hattı Çevre İzleme ve Yönetimi Eğitim Materyali. Çınar Müh. ve BOTAŞ, Adana.

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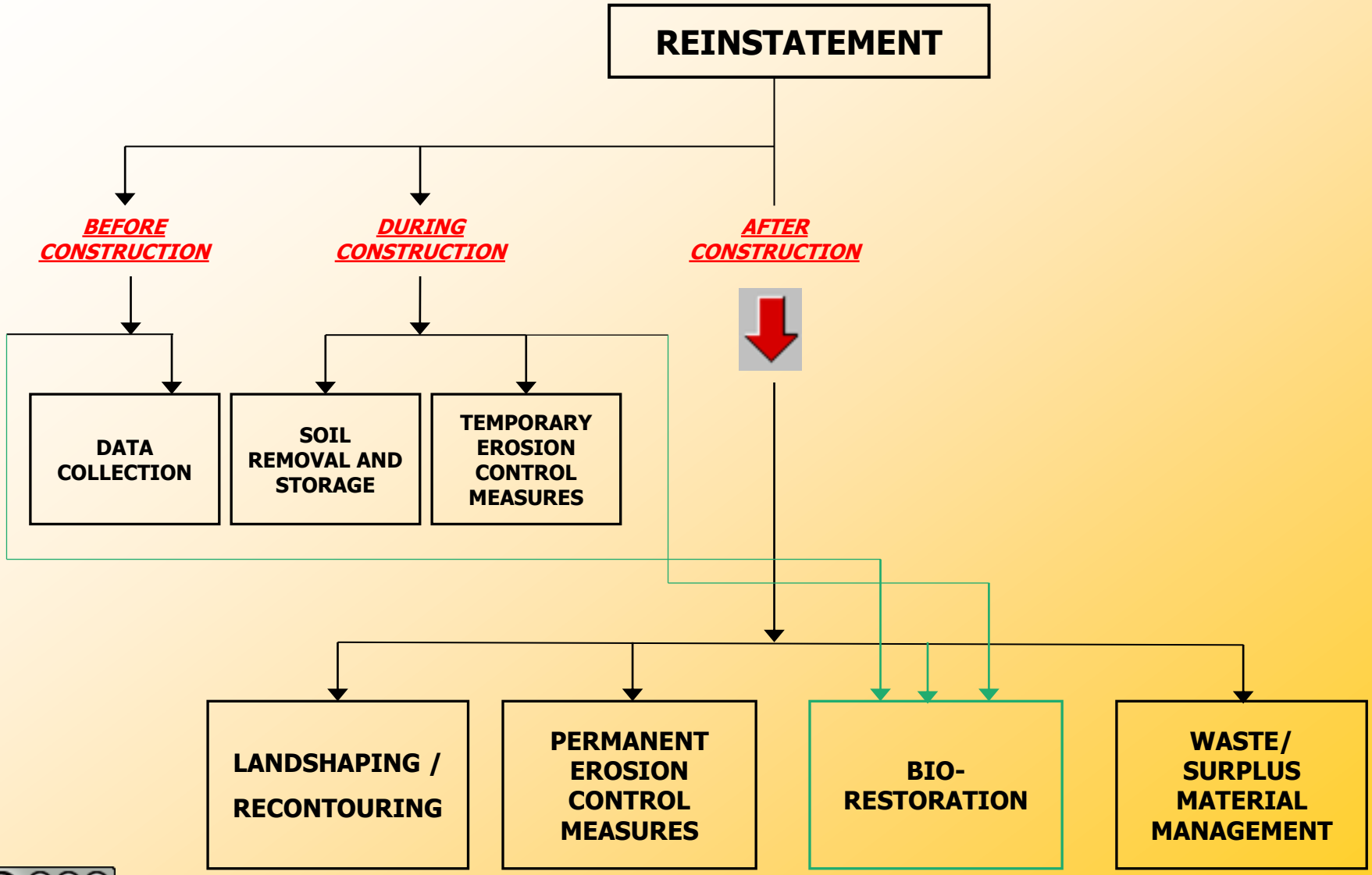

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REINSTATEMENT

BEFORE CONSTRUCTION

DATA COLLECTION

ENVIRONMENTAL PRE-CONSTRUCTION SURVEY

- GENERAL INFORMATION about flora, fauna, soil, topography. etc.
- ADDITIONAL INFORMATION in order to develop SARMS for Special Areas

PRE-CLEARANCE SURVEY

- Topsoil assessment form
- Plant enumaration form

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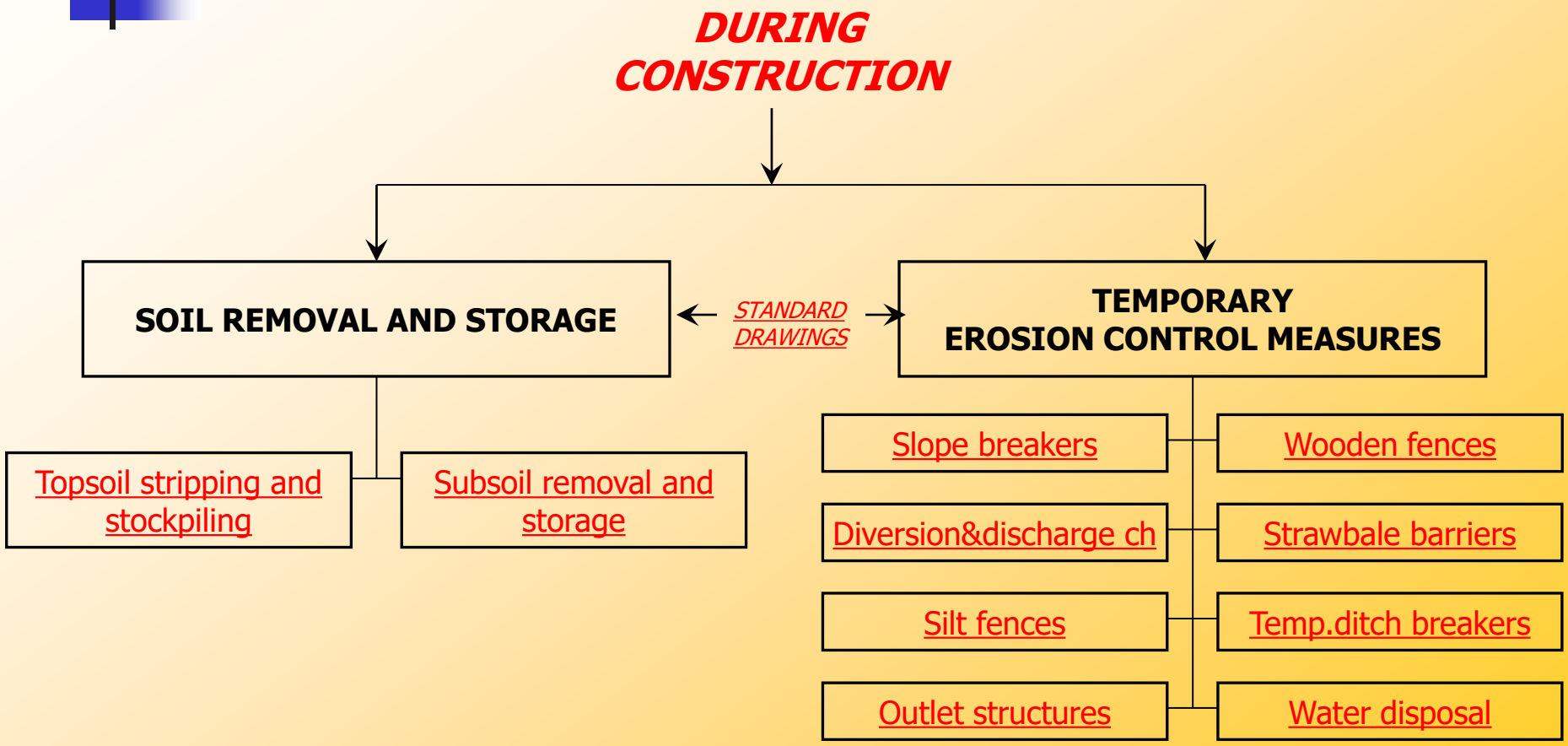
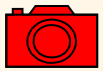
REINSTATEMENT



TOPSOIL STRIPPING AND STOCKPILING



- Strip to its full depth (typically 150-300 mm)
- Stockpile not more than 2 meters high with side slopes <45 %,
- Compact stockpile surface lightly to reduce rainfall penetration but not enough to promote anaerobic conditions,
- Impliment suitable drainage and erosion control measures

NEXT

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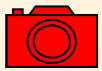
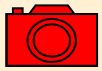
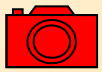
TOPSOIL STRIPPING AND STOCKPILING IN PARTICULAR AREAS



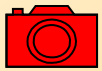
- Rocky areas



- Wetlands



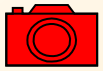
- Snow conditions



- ESAs

BACK

SUBSOIL REMOVAL AND STORAGE



- Subsoil is excavated from both trenches and also from cut areas of side and steep slopes
- Subsoil storage areas at extra lands requires approved environmental assessment report including topsoil management and land owner permit

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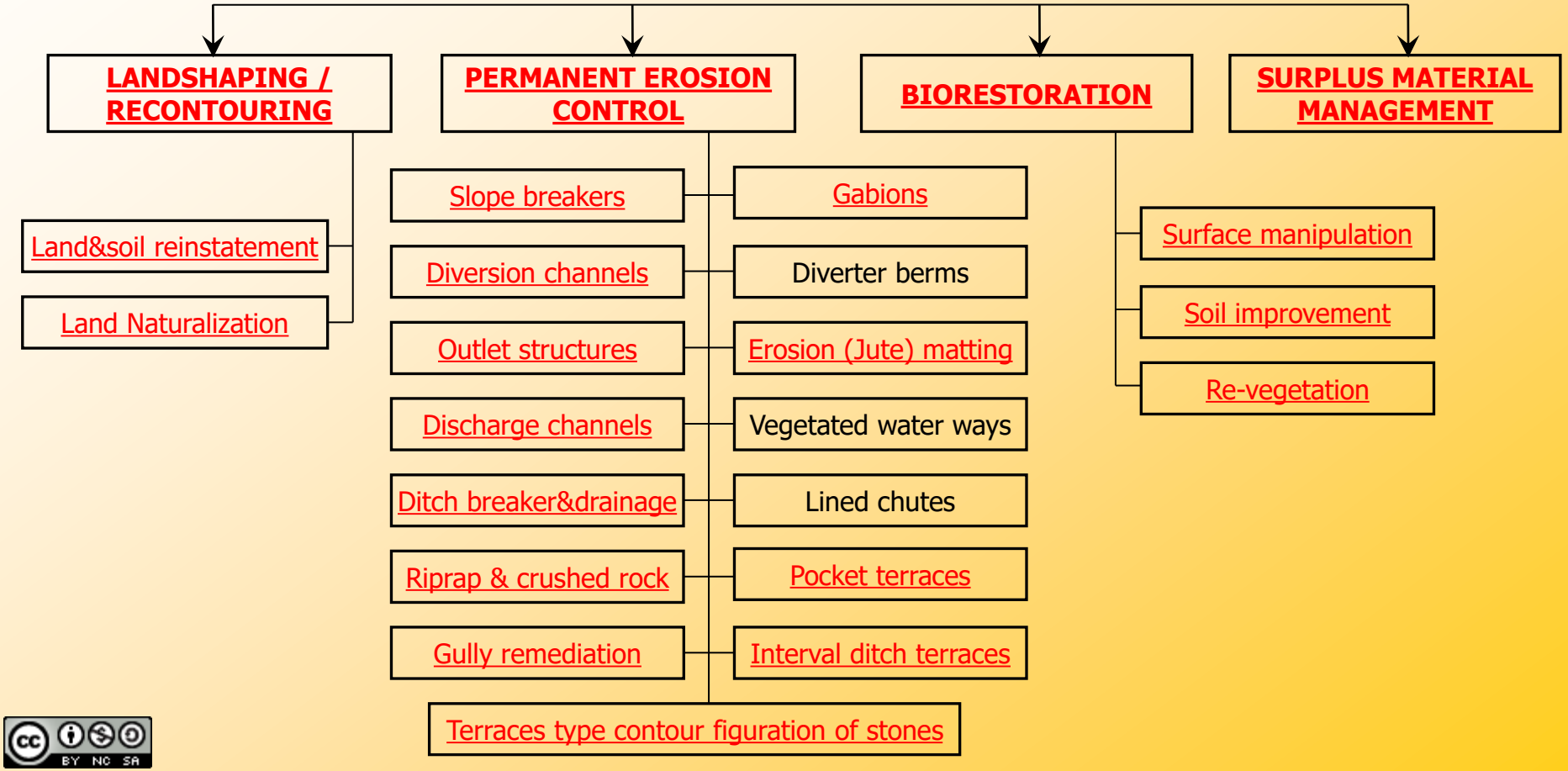
REINSTATEMENT

AFTER CONSTRUCTION



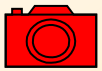
LANDSHAPING/RECONTOURING

- Shape the disturbed areas to conform as nearly as possible to the original land contour.
- Tie reconstructed area with the surrounding ladscape providing smooth, continuous sequence of hill slopes and valley floors.

BACK

LAND AND SOIL REINSTATEMENT

- Subsoil from the trench excavation and from clearing & grading activities should be returned to their original locations as much as possible, and compacted to the similar condition to the adjacent undisturbed area.

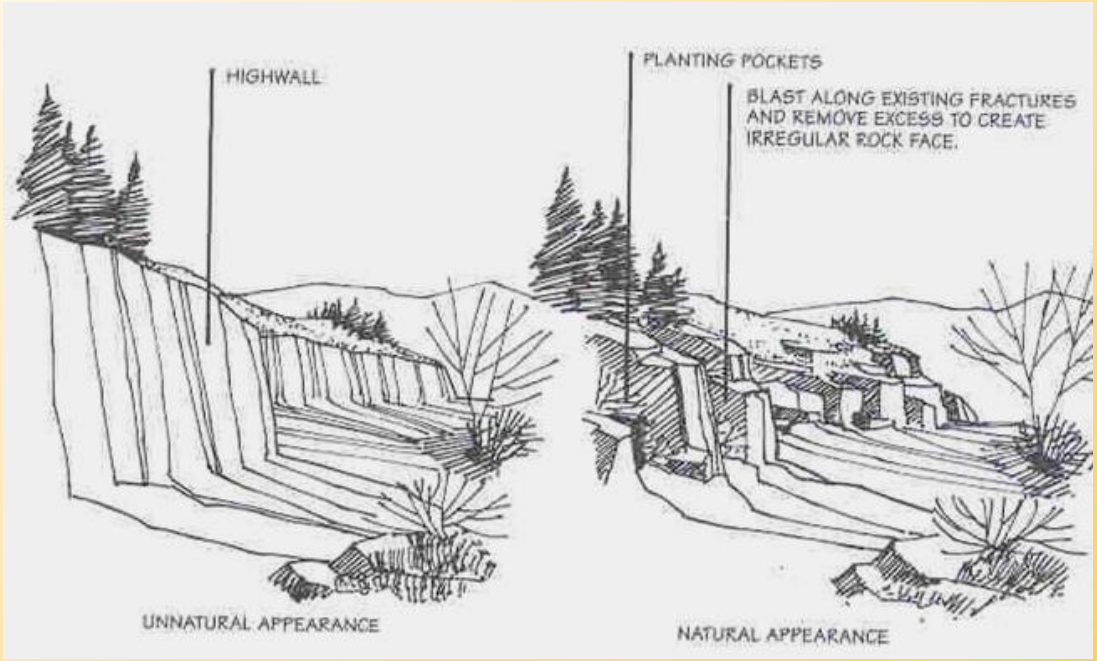


- Before spreading the topsoil over the compacted subsoil, the subsoil layer will be horrowed

- Topsoil would be redistributed over the entire disturbed area

LAND NATURALIZATION

Design and impliment a naturaliziation work where it is not possible turning back the topography to its original shape



Methods of naturalizing highwalls and rock cuts

BACK

PERMANENT EROSION CONTROL

Permanent erosion control measures stabilise and preserve soil against erosion before biorestoration works start.

BACK

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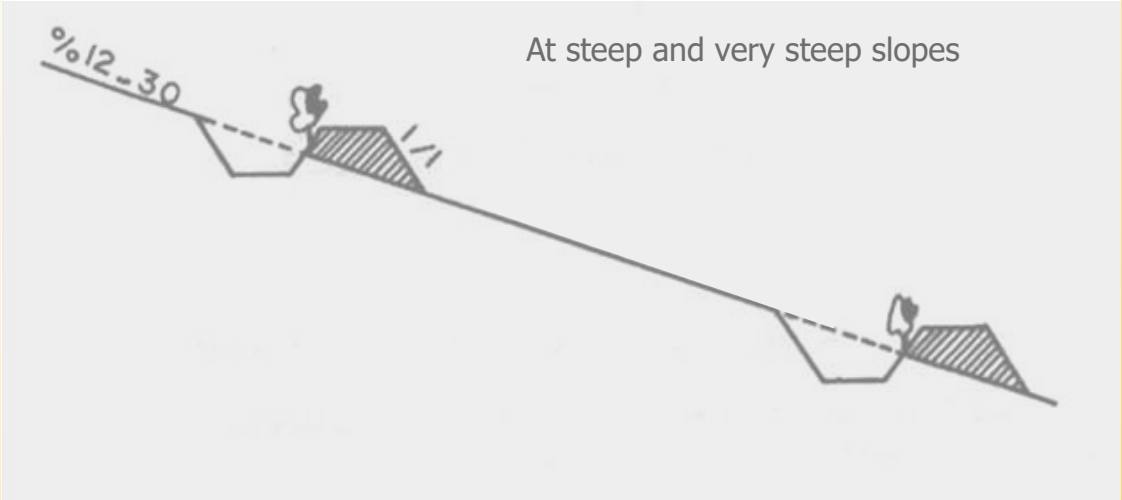
INTERVAL DITCH TERRACES

- This technique is very suitable for the plantation works in steep slopes (>12%)
- As this technique requires a small amount of soil excavation, it is a proper technique for the places where the soil depth is low.
- It is a cost effective technique providing large water retention capacity within the channel with a small amount of soil excavation.
- The surplus rocky material taken from RoW can be used as a retaining material for the terraces, supporting long term efficiency of the technique
- The ditches retain the water and give opportunity for water percolation and followingly lateral water flow within the soil supporting plant roots development at the intervals between the terraces as well as surface stabilization.
- In slopes where the soil depth is high, this technique can be implemented easily to avoid erosion.

NEXT

INTERVAL DITCH TERRACES



BACK

POCKET TERRACES

- This is a proper technique in steep slopes (>20%)
- The pocket terraces implementations are one of the proper techniques for the slopes where the soil depth is low, and the outcrop formations are present.
- The pocket terraces in crescent form retain water and soil, and support tree and shrub growth.
- The surplus rocky material taken from RoW can be used as a retaining material for the terraces supporting long term efficiency of the technique.
- The diameter of the pocket terraces is min 2m for the shrubs. For the trees the radius can be defined in accordance with the crown size of the trees. In proper areas the size of the pocket terraces can be increased to provide planting basin for more trees, and also for the more effective erosion control. This technique is called **intermittent stone bench**.

NEXT

POCKET TERRACES and INTERMITTENT STONE BENCHES

Pocket terraces

Intermittent stone benches

BACK

TERRACES TYPE CONTOUR FIGURATIONS OF STONES IN STEEP SLOPES

- This technique can be implemented at the slopes where the soil depth is low and slope gradient is more than 12%.
- The surplus rocky material taken from RoW can be used to implement this technique.
- The ditch line in contour at the terraces is connected to outlets giving 0.5-1% slope angle for the runoff water discharge

NEXT

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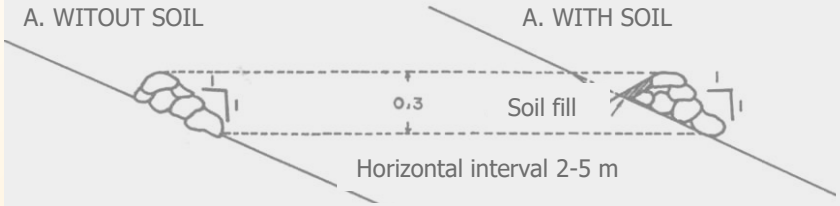
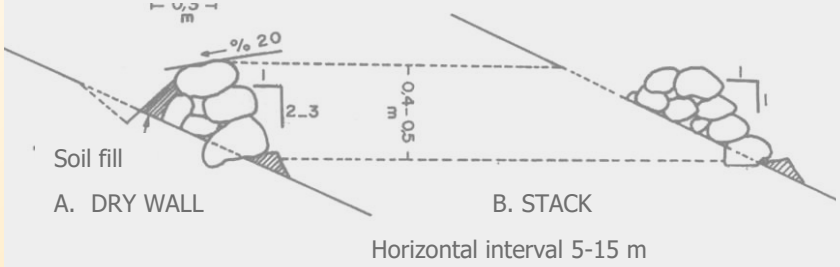
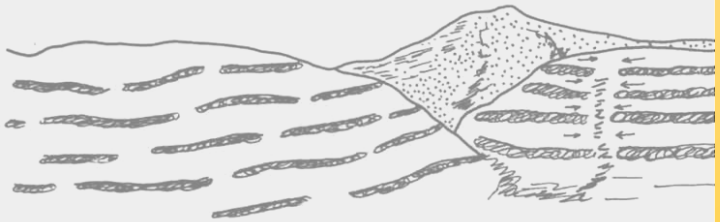
TERRACES TYPE CONTOUR FIGURATIONS OF STONES IN STEEP SLOPES

1. SMALL SCALE ROCK STACK



2. MODERATE SCALE DRY ROCK WALL AND STACK





BACK

BIORESTORATION

MAIN FOCUSES

- Conserving the landscape and biodiversity
- Supporting erosion control measures

WITHIN THE CONTEXT OF

- ESAs Biorestoration
- Generel Biorestoration Strategy

BACK

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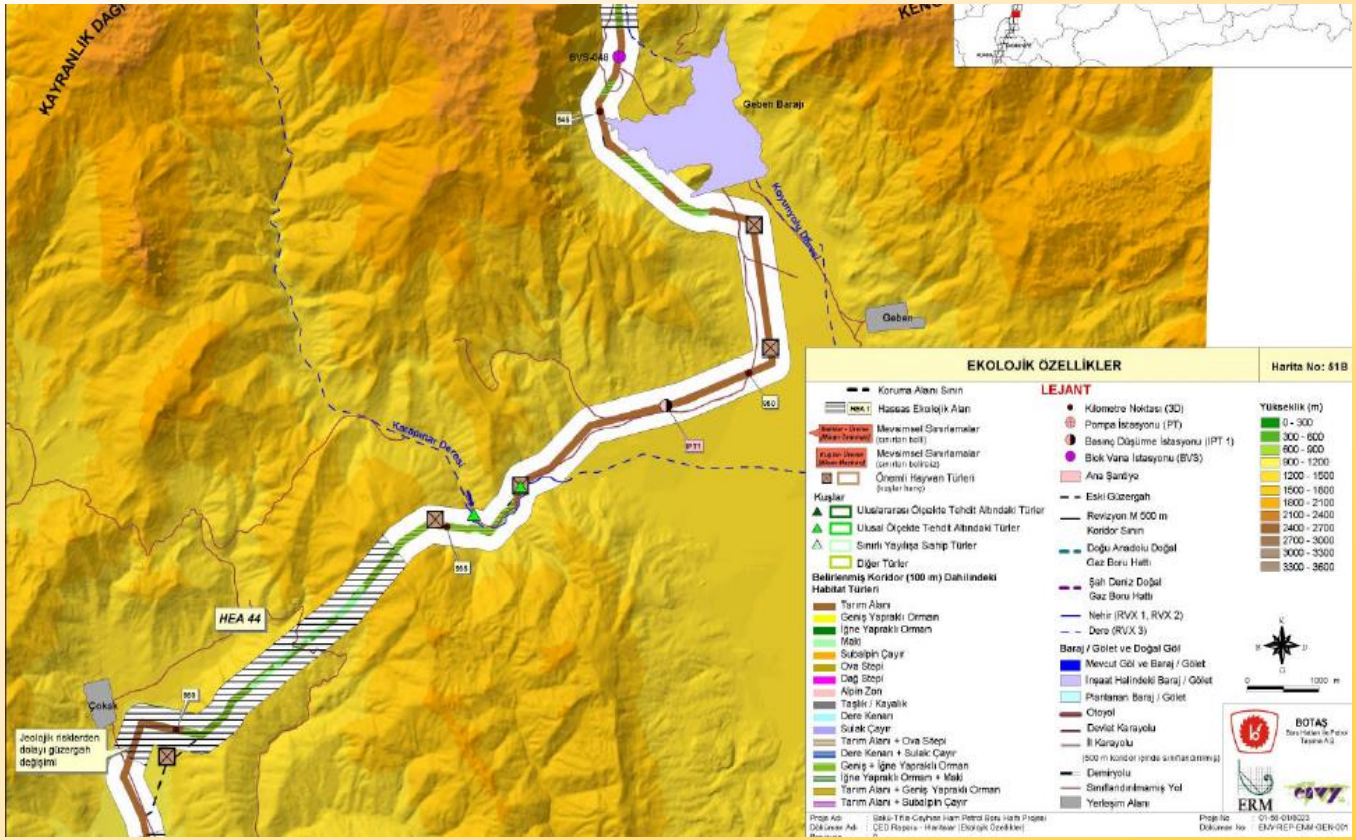
ECOLOGICALLY SENSITIVE AREAS- ESA 44



NEXT

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TARGET SPECIES AT EAS 44, ESA 47 AND ESA 46

Bilimsel adı	Türkçe adı
Verbascum luridiflorum	: Sığırkuyruğu
Thlaspi cilicicum	: Akça çiçeği
Cephalantera kotschyana	: Sefelantera
Centaurea lycopifolia	: Peygamber çiçeği
Fritillaria alfredae Post. ssp. Glaucoviridis	: Terslale, ağlayan gelin
Lamium garamicum L. ssp. nepetifolium	: Ballıbaba
Cyclamen pseudo-ibericum	: Siklamen

NEXT

TARGET SPECIES AT EAS 44, ESA 47 AND ESA 46

Centaurea lycopifolia Boiss. & Kotschy – ESA 47, 46

Cyclamen pseudo-ibericum Hildebr. – ESA 46

Fritillaria alfredae Post. ssp. *Glaucoviridis – ESA 46*

NEXT

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TARGET SPECIES AT EAS 44, ESA 47 AND ESA 46

Lamium garganicum L. ssp. *nepetifolium* (Boiss.) R. Mill – ESA 46

Verbascum luridiflorum Hub. - Mor. – ESA 44

Cephalantera kotschyana Renz&Taub. Hayek – ESA 44

Thlaspi cilicicum (Boiss.) Hayek – ESA 44, ESA 46

NEXT

SARMS CHART FOR ESAs (ESA 44, ESA 46 and ESA 47)

KP LOCATION	SARMS TYPE	KP LOCATION OF AIP	DISTANCE (m)	BIORESTORATION STRATEGY			BIORESTORATION SCHEDULE
				Plant Scientific Name	Restoration	Monitoring	
955+910-961+010	ESA 44	AIP-44-A: 958+795-958+800	5	*Verbascum luridiflorum*	SC&S	Sprout check	2nd half of Nov.
				Thlaspi cilicicum	SC&S	Sprout check	2nd half of Nov.
		AIP-44-B: 959+752-959+790	38	*Cephalantera kotschyana*	TSM	Sprout check	Reinstatement Chart
				Thlaspi cilicicum	SC&S		2nd half of Nov.
974+540-981+650	ESA 46	AIP-46-A: 977+210-977+550	340	*Centaurea lycopifolia*	TSM	Sprout check	Reinstatement Chart
				Thlaspi cilicicum	SC&S		Late Oct. or early Nov.
		AIP-46-B: 978+800-979+300	500	*Fritillaria alfredae Post. ssp. Glaucoviridis*	BC&R SC&S		2nd half of Oct. Late Oct. or early Nov.
				Lamium garamicum L. ssp. nepetifolium	TSM		Reinstatement Chart
				Cyclamen pseudo-ibericum	PR	Flowering check	2nd half of August
		AIP-46-C: 980+530-980+590	60	*Cyclamen pseudo-ibericum*	PR	Flowering check	2nd half of August
994+290-994+740	ESA 47	AIP-47-A: 994+200-994+800	600	*Centaurea lycopifolia*	TSM	Sprout-check	Reinstatement Chart
1026+500-1028+500	ESA 48	AIP-48-A:1028+100-1028+000	100	*Anthemis pungens Yaviv*	TSM	Sprout-check Re-seeding	Reinstatement Chart
		AIP-48-B:1028+400-1028+390	10	*Tordylium pustulosum Eiciss*	SC&S		2nd half of Nov.

TSM :Topsoil Management
SC&S : Seed Collection and seeding
SC&Sl : Seed Collection and seedling
BC&R : Bulb collection and replanting
BC&Sl : Bulb collection and seedling
PR : Permanent relocation
T : Translocation to the vicinity and re-plant-back

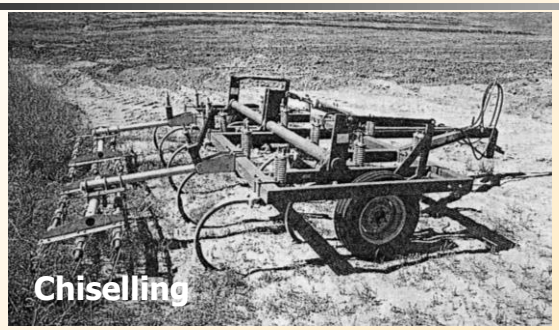
BACK

SURFACE MANIPULATION

- Prepare the surface of disturbed lands to receive seed and provide proper soil environment for tree planting .
- Leave the graded surface in a roughened condition to improve permeability and provide micro-sites for seed germination
- Most type of surface manipulation are standard agricultural techniques such as chiselling, disking, harrowing.

NEXT

SURFACE MANIPULATION



- A chisel and disk can break up a soil crust and incorporate fertilizer
- Both disking and chiselling are usually followed by horrowing to break up small clods and prepare a fine seedbed for drill seeding
- For the broadcast seeding, chiselling and disking may be the final seedbed activity, since a rougher seedbed is more desirable for broadcast seeding than drill seeding

SOIL AMENDMENTS

In according to soil structure and texture

improve soil physical and chemical conditions for vegetation growth.

BACK

REVEGETATION

Major issues for the successful tree seedling establishment

- selection of proper native species
- purchase of the best quality planting stock
- correct handling of planting stock
- correct planting techniques
- effective control of competing vegetation
- proper soil conditions and preparation
- weather

NEXT

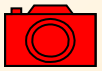
REVEGETATION

REVEGETATION

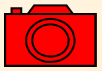
- **PLANT PROVISION**
  - Plant selection
  - Nurseries
  - Seed collection and plant translocation
- **PLANTING**
  - Seeding
  - Tree & shrubs planting
- **AFTERCARE MONITORING**

NURSERIES

Main focuses



- Nursery conditions



- Plant characteristics

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WASTE SURPLUS MATERIAL MANAGEMENT

Dispose surplus material in accordance with the requirements of the Waste Management Plan

BACK

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REINSTATEMENT MARCH CHART

BACK

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POST-REINSTATEMENT ACTIVITIES

BACK

PRE-CLEARANCE SURVEY & DATA COLLECTION

PUNJ LLOYD LIMAK JV
BAKU – TBILISI – CEYHAN
CRUDE OIL PIPELINE PROJECT LOT - C

TOPSOIL ASSESSMENT FORM

Name of the Evaluator :

Date :

Equipment used/ Assessment Methodology :

Sampling/ Assessment location	Representing chainage		Top Soil Depth	Nature of Topsoil/ Color/ Remarks
	From	To		

BACK

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PRE-CLEARANCE SURVEY & DATA COLLECTION

PUNJ LLOYD LIMAK JV
BAKU – TBILISI – CEYHAN
CRUDE OIL PIPELINE PROJECT LOT - C

TREE ENUMERATION FORM

Name of the Enumerator :

Date :

Chainage		Trees	Total	Shrubs	Density
From	To				

BACK

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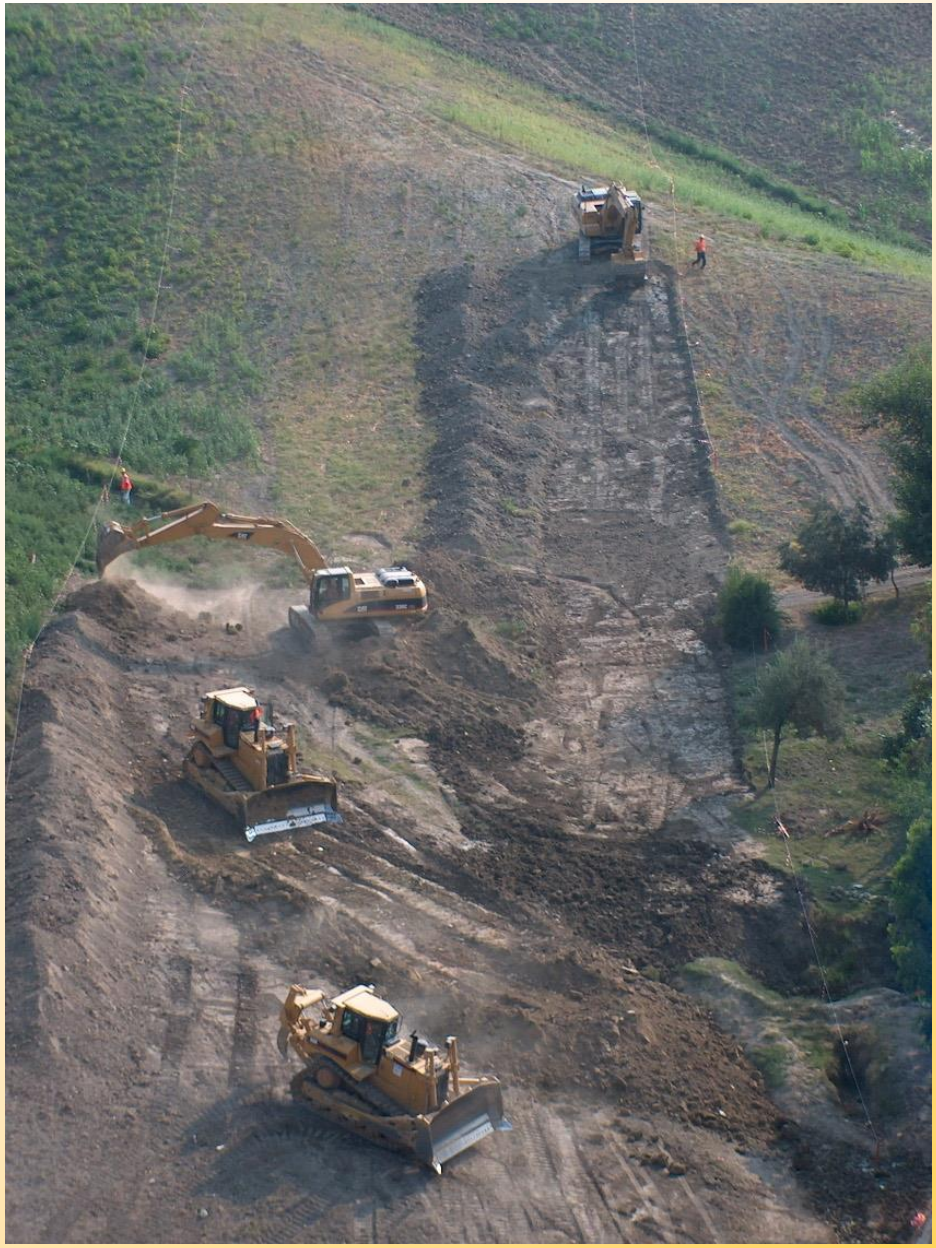

TOPSOIL REMOVAL & STORAGE

NEXT

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TOPSOIL REMOVAL & STORAGE

BACK

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TOPSOIL REMOVAL & STORAGE
Rocky areas

NEXT

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TOPSOIL REMOVAL & STORAGE
Rocky areas

BACK

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TOPSOIL REMOVAL & STORAGE
Wetlands

Working over trackmat without topsoil/turf stripping

NEXT

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TOPSOIL REMOVAL & STORAGE
Wetlands

NEXT

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TOPSOIL REMOVAL & STORAGE
Wetlands

BACK

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TOPSOIL REMOVAL & STORAGE
Snow conditions

BACK

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TOPSOIL REMOVAL & STORAGE
ESAs

NEXT

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TOPSOIL REMOVAL & STORAGE
ESAs

NEXT

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TOPSOIL REMOVAL & STORAGE
ESAs

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TOPSOIL REMOVAL & STORAGE
ESAs

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TOPSOIL REMOVAL & STORAGE
ESAs

BACK

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SUBSOIL REMOVAL & STORAGE

BACK

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TEMPORARY EROSION CONTROL MEASURES
Silt fences

Structures installed at low sheet flow areas to intercept runoff

NEXT

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TEMPORARY EROSION CONTROL MEASURES
Silt fences

BACK

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TEMPORARY EROSION CONTROL MEASURES
Diversion and discharge channel

***Diversion Channels**: Strutures installed transverse to RoW to diverte water flow coming from upper watershed*

***Discharge Channels** Structures installed longitudinal to RoW to connect slope breakers safely with the outlets*

BACK

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TEMPORARY EROSION CONTROL MEASURES
Wooden fences

Structures installed at side slopes and ridge constructions to avoid landslides and soil losses

BACK

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TEMPORARY EROSION CONTROL MEASURES
Outlets

BACK

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TEMPORARY EROSION CONTROL MEASURES
Slope breaker

Graded channels across RoW width at the steep slope to remove surface runoff and mitigate erosion

BACK

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TEMPORARY EROSION CONTROL MEASURES
Ditch/trench breakers

Structures installed in the open trench and removed before lowering the pipe to arrest flows inside the trench

BACK

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TEMPORARY EROSION CONTROL MEASURES
Water disposal

Activities to discharge turbid and sediment laden water acumulated in trench, and to discharge hydrotest water using proper filtering structures

BACK

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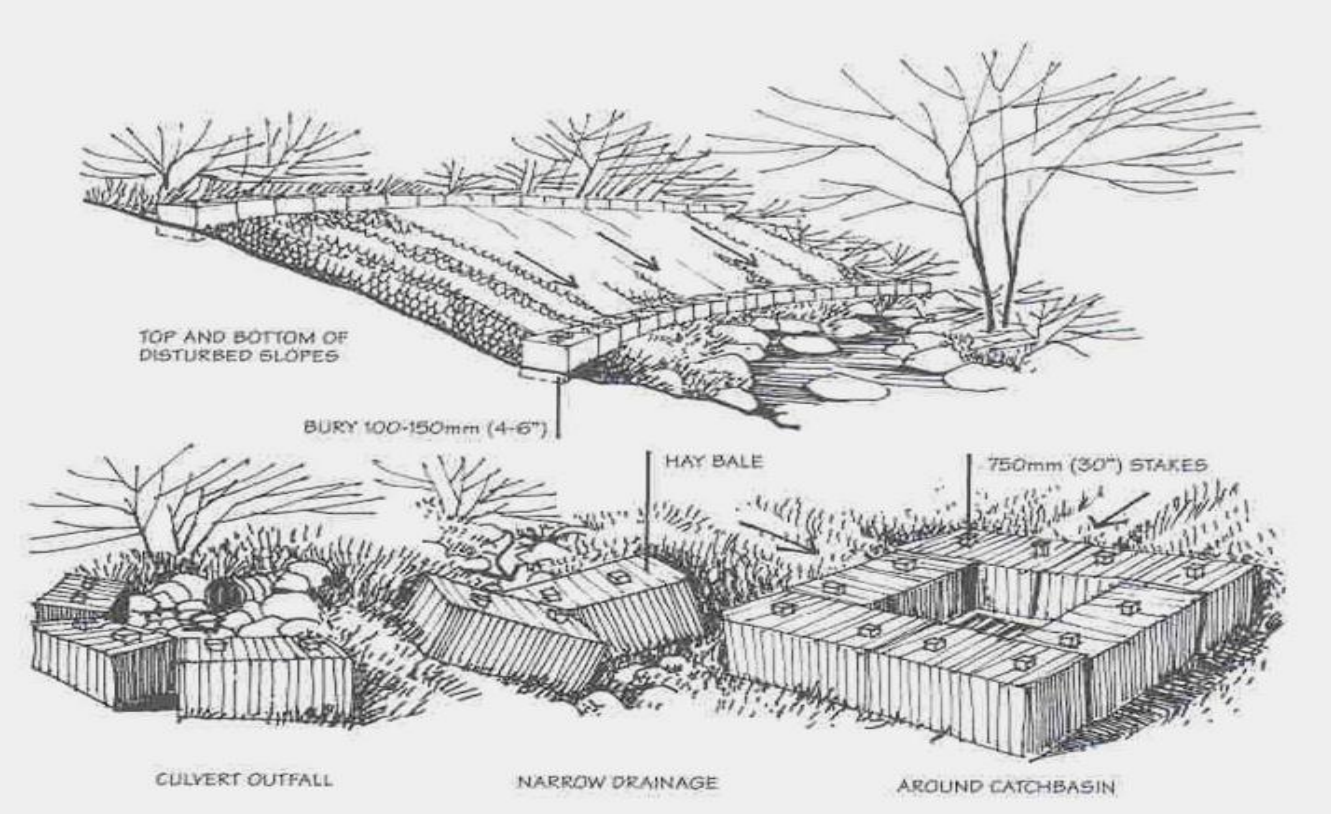
TEMPORARY EROSION CONTROL MEASURES
Straw bales



Structures installed in areas where small amounts of temporary sediment interception are required

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TEMPORARY EROSION CONTROL MEASURES
Straw bale barriers

BACK

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LANDSHAPING / RECONTOURING
Land and Soil Reinstatement

NEXT

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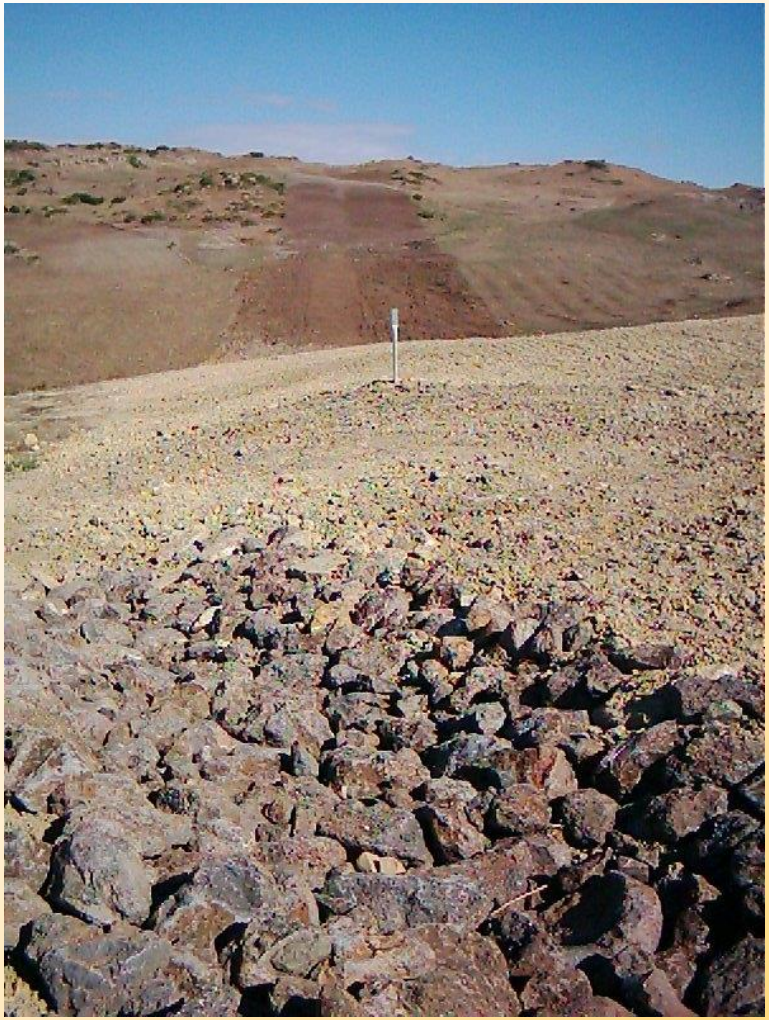
LANDSHAPING / RECONTOURING
Land and Soil Reinstatement



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LANDSHAPING / RECONTOURING
Land and Soil Reinstatement

BACK

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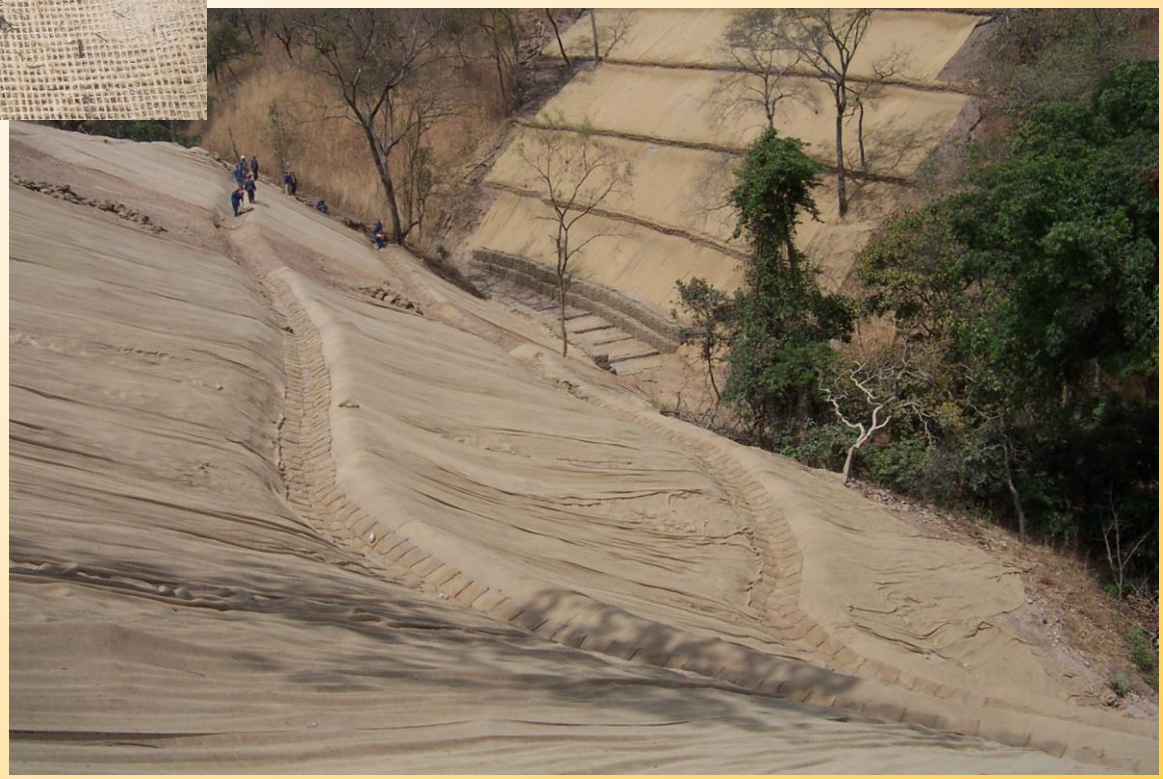
PERMANENT EROSION CONTROL MEASURES
Jute Matting



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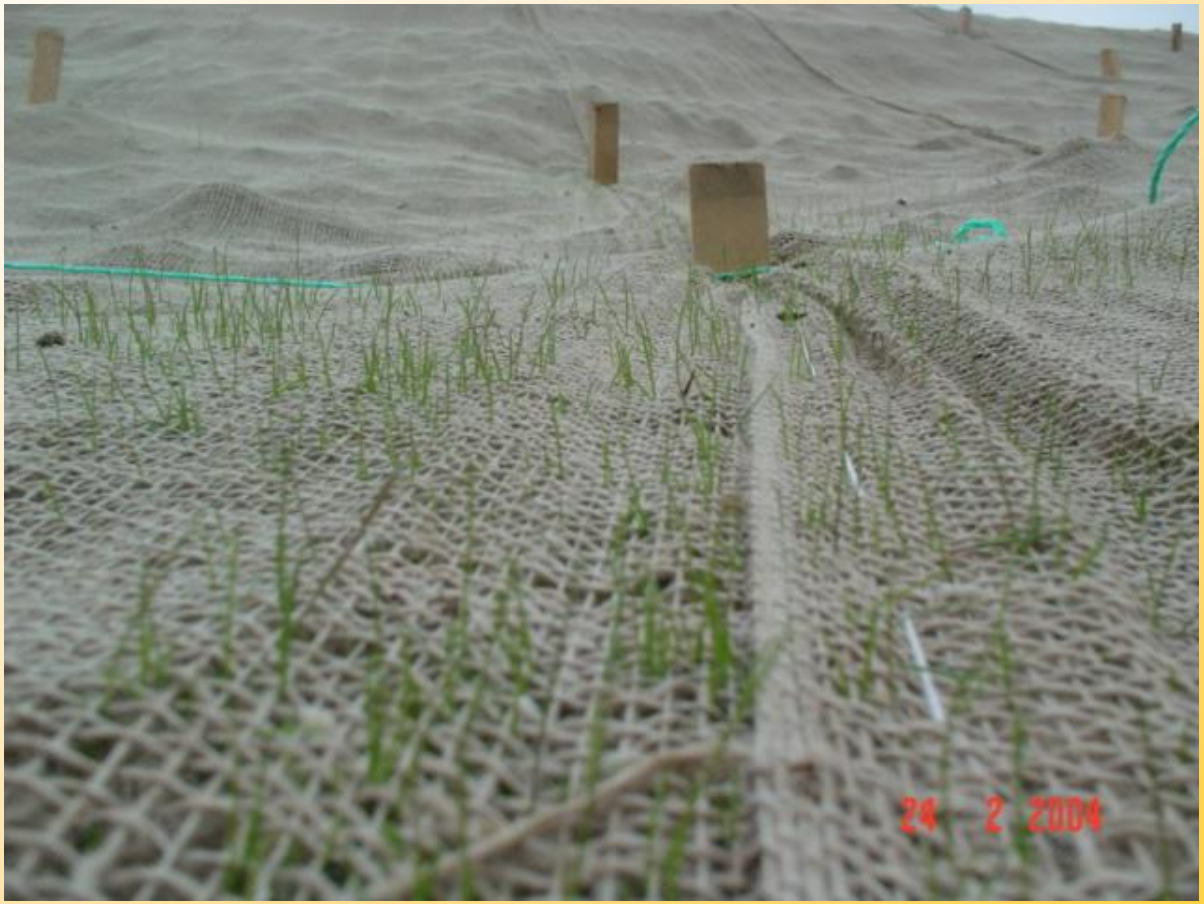
PERMANENT EROSION CONTROL MEASURES
Jute Matting



BACK

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PERMANENT EROSION CONTROL MEASURES
Jute Matting

BACK

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PERMANENT EROSION CONTROL MEASURES
Gabions

BACK

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PERMANENT EROSION CONTROL MEASURES
Slope breakers

NEXT

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PERMANENT EROSION CONTROL MEASURES
Slope breakers

NEXT

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PERMANENT EROSION CONTROL MEASURES
Slope breakers

BACK

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PERMANENT EROSION CONTROL MEASURES
RipRap&Crashed Rock

BACK

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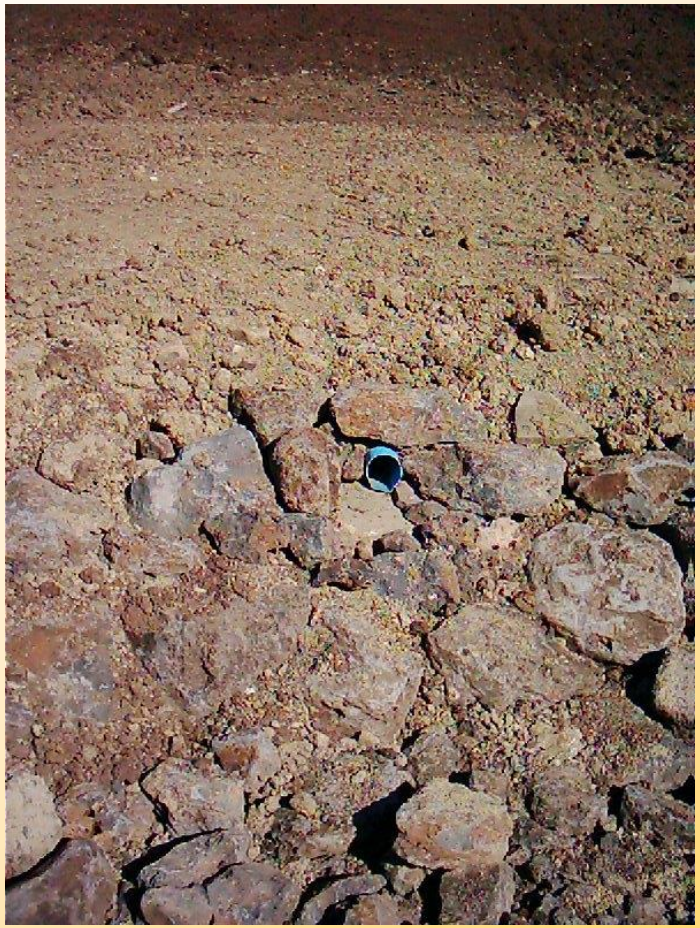
PERMANENT EROSION CONTROL MEASURES
Outlet structures



NEXT

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PERMANENT EROSION CONTROL MEASURES
Outlet structures

BACK

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PERMANENT EROSION CONTROL MEASURES
Diversion channel

BACK

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PERMANENT EROSION CONTROL MEASURES
Discharge channel

BACK

ÇINAR

PERMANENT EROSION CONTROL MEASURES
Gully remediation

BACK

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PERMANENT EROSION CONTROL MEASURES
Ditch breaker and drainage

BACK

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PERMANENT EROSION CONTROL MEASURES
Terraces Type Contour Figurations of Stones in Steep Slopes

BACK

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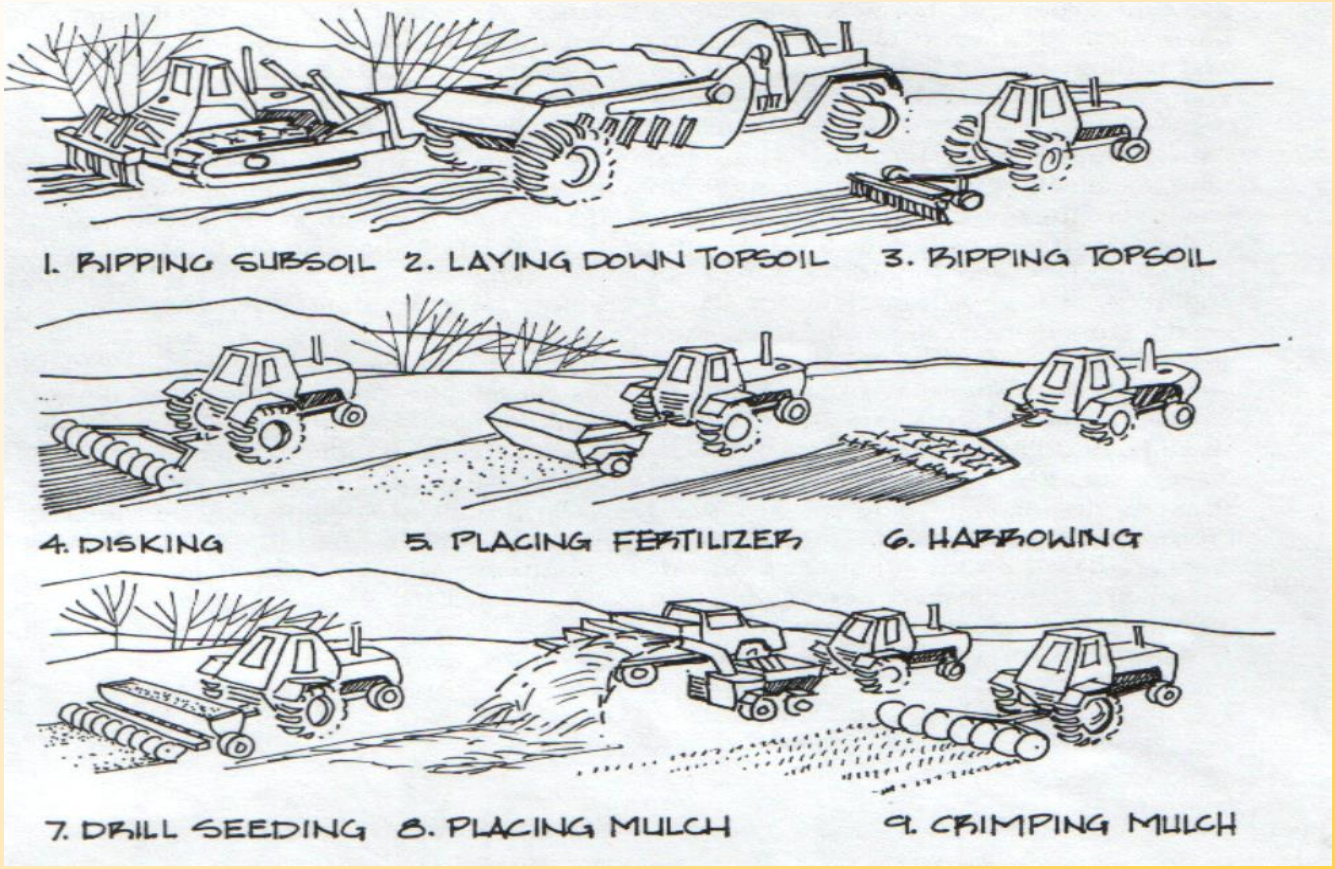
BIO-RESTORATION
Surface Manipulation



NEXT

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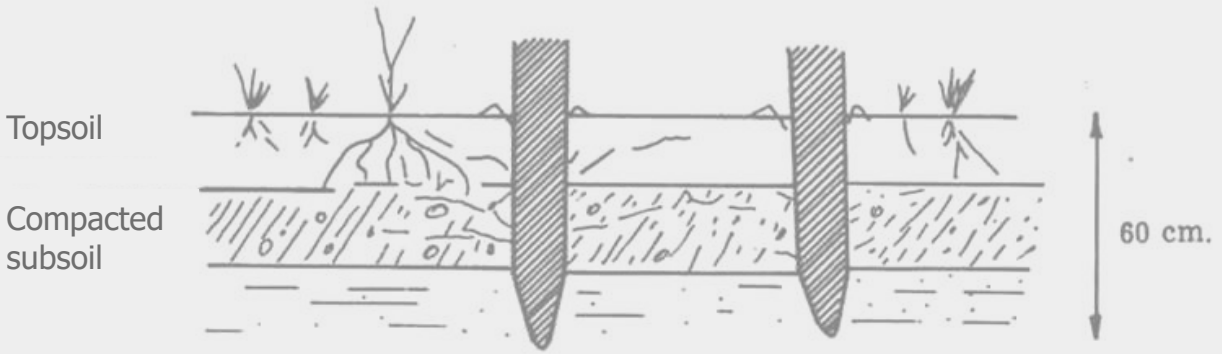
BIO-RESTORATION
Ripping



compacted and low permeable soil or highly compacted subsoil is ripped for the better plant root development. Also, by ripping, surface runoff and accordingly soil loss is decreased due to increased water penetration.

NEXT

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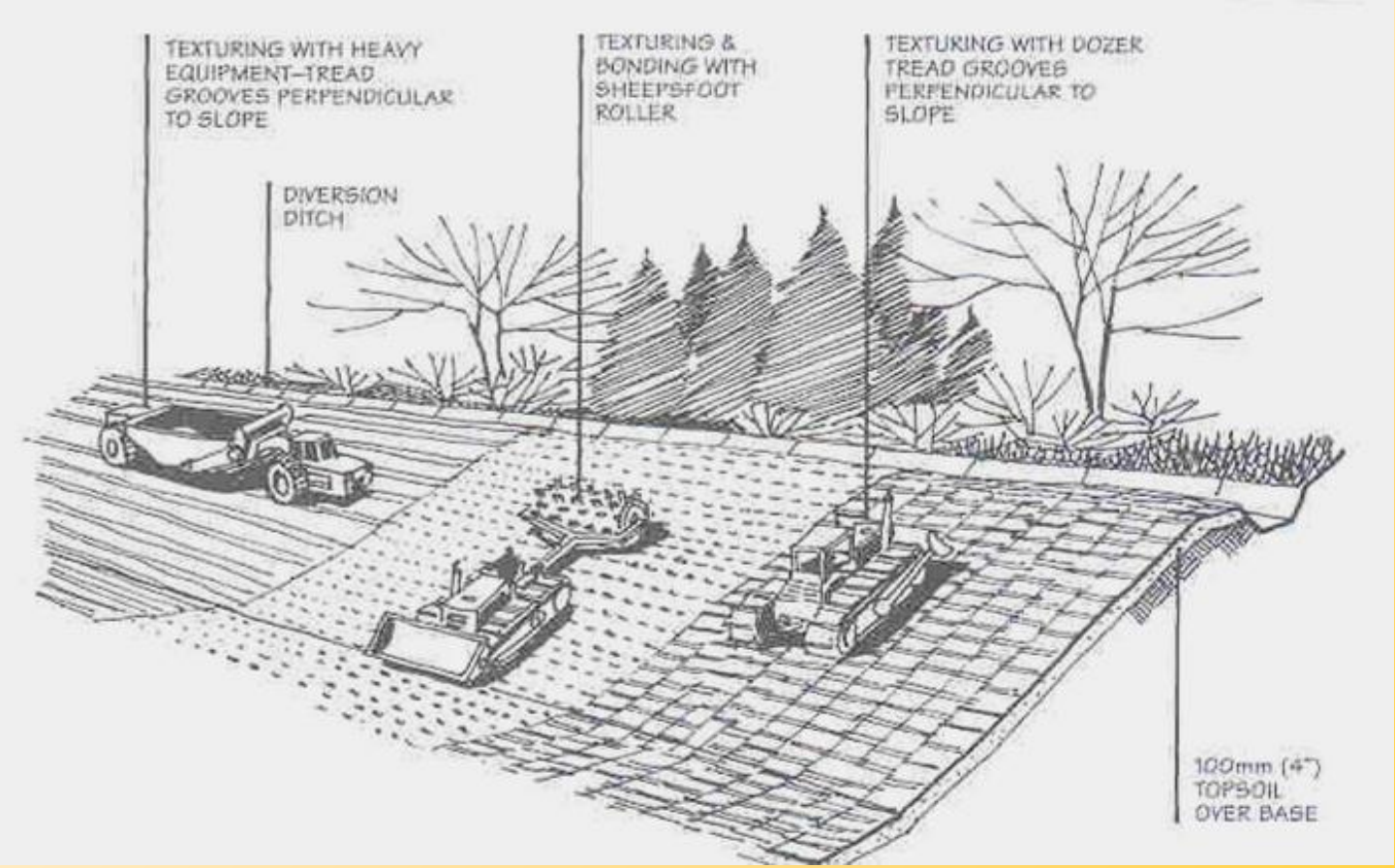
BIO-RESTORATION
Surface Manipulation

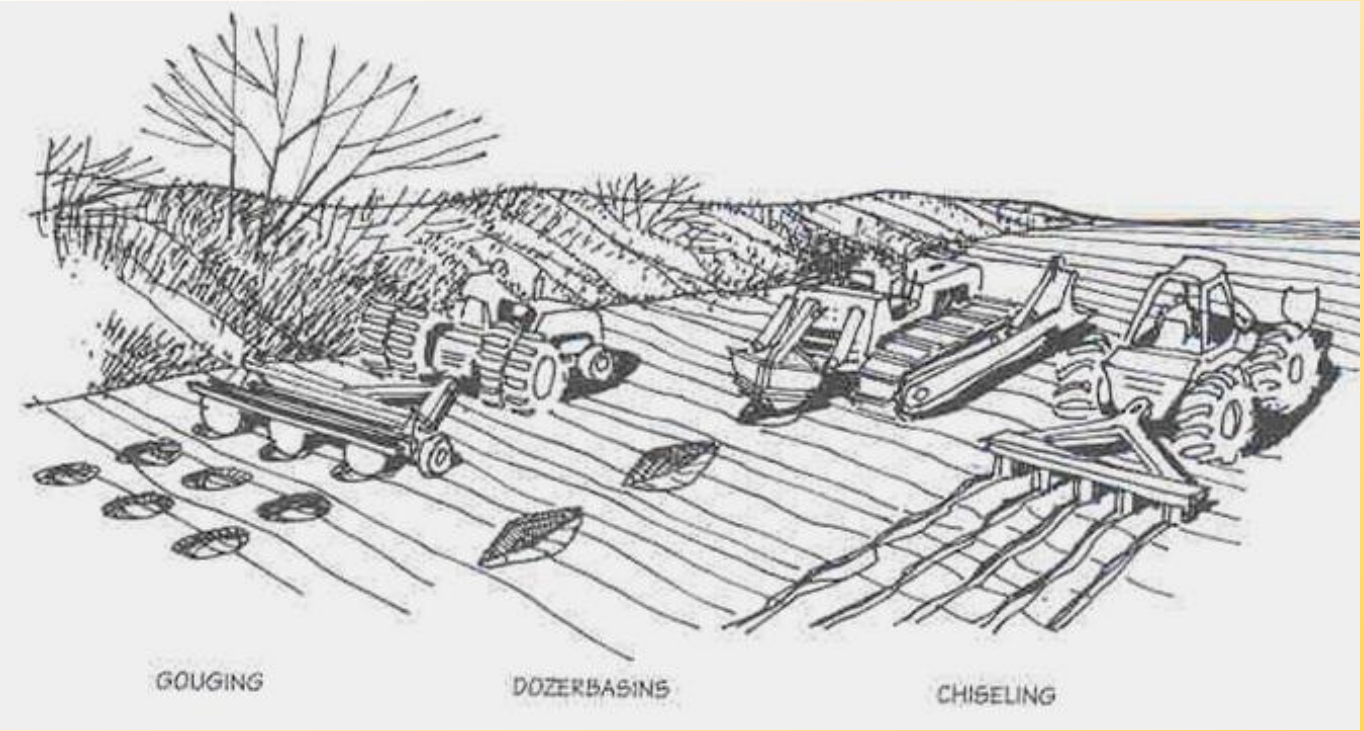


Methods of roughening slopes to slow runoff

NEXT

ÇINAR

BIO-RESTORATION
Surface Manipulation



Surface-roughening methods of concentrating precipitation

BACK

ÇINAR

BIO-RESTORATION
Plant selection

The plants for restoration should be selected from native vegetation cover.

For the plants which are not available might be compensated with the pioneering plants that can be defined from existing disturbed areas around.

BACK

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BIO-RESTORATION
Nursery Conditions

BACK

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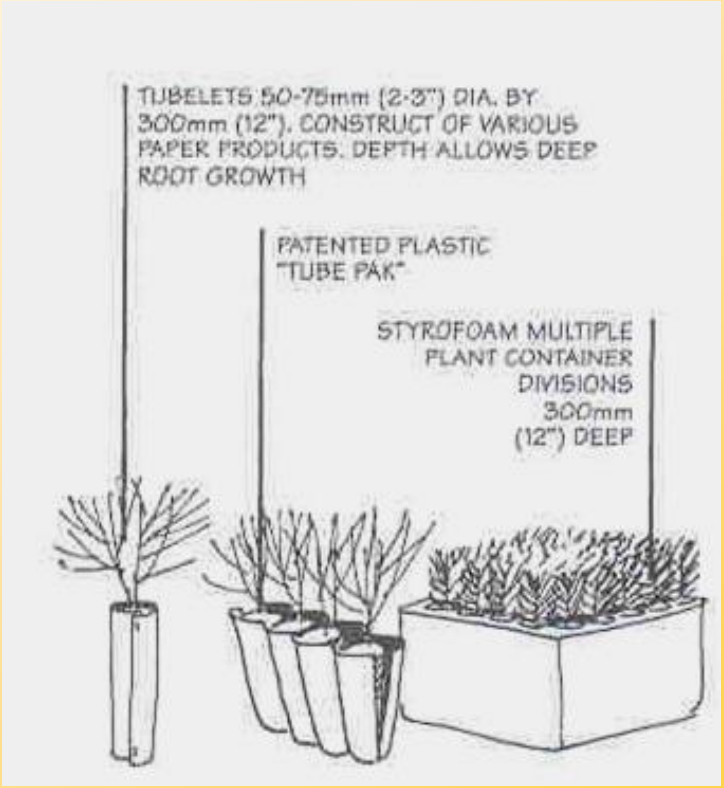
BIO-RESTORATION
Plant material characteristics

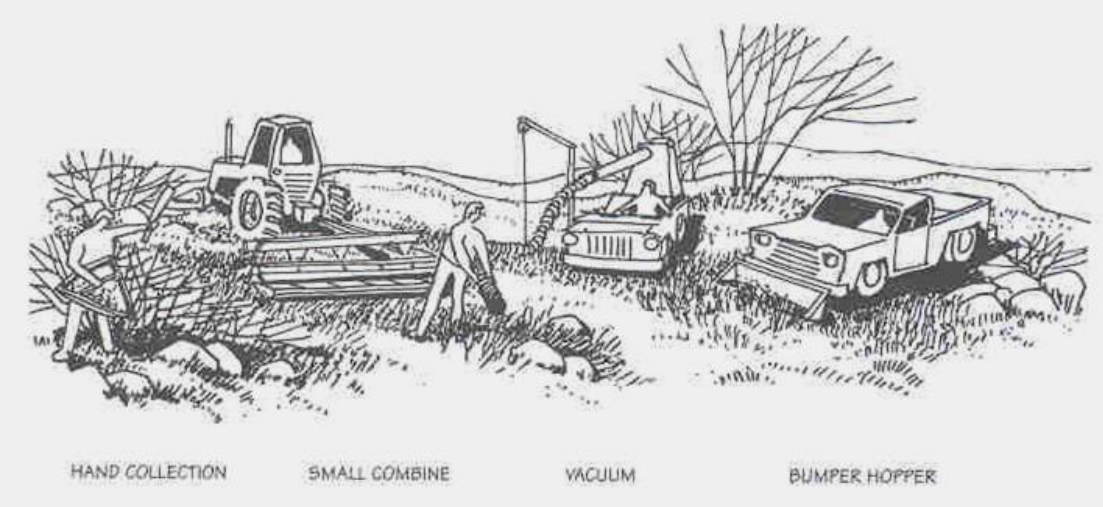


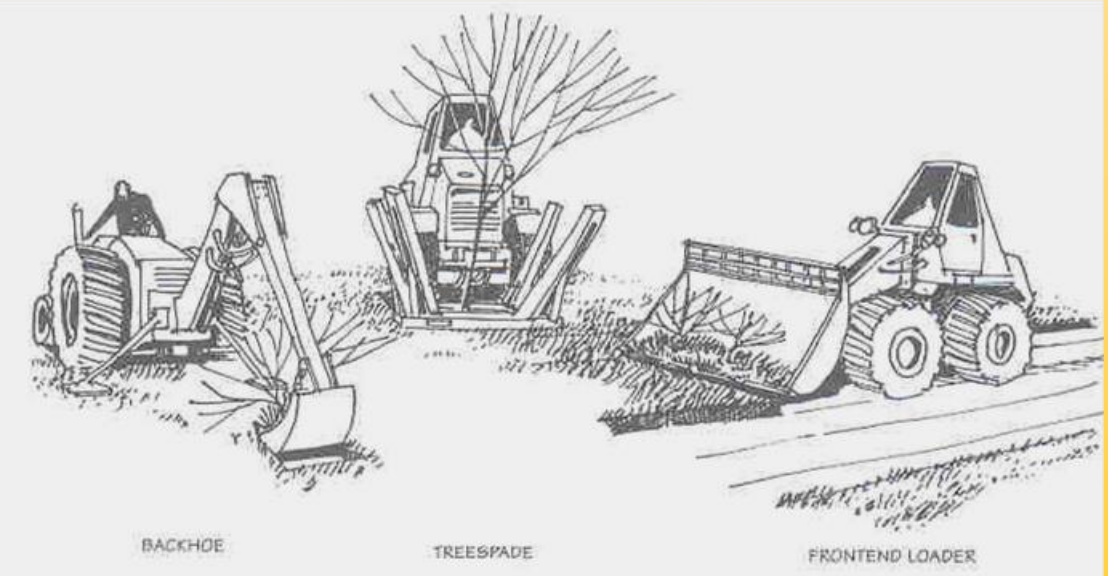
Methods of containering reclamation plants

BACK

ÇINAR

BIO-RESTORATION
Seed collection and plant translocation





NEXT

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BIO-RESTORATION
Seed collection and plant translocation

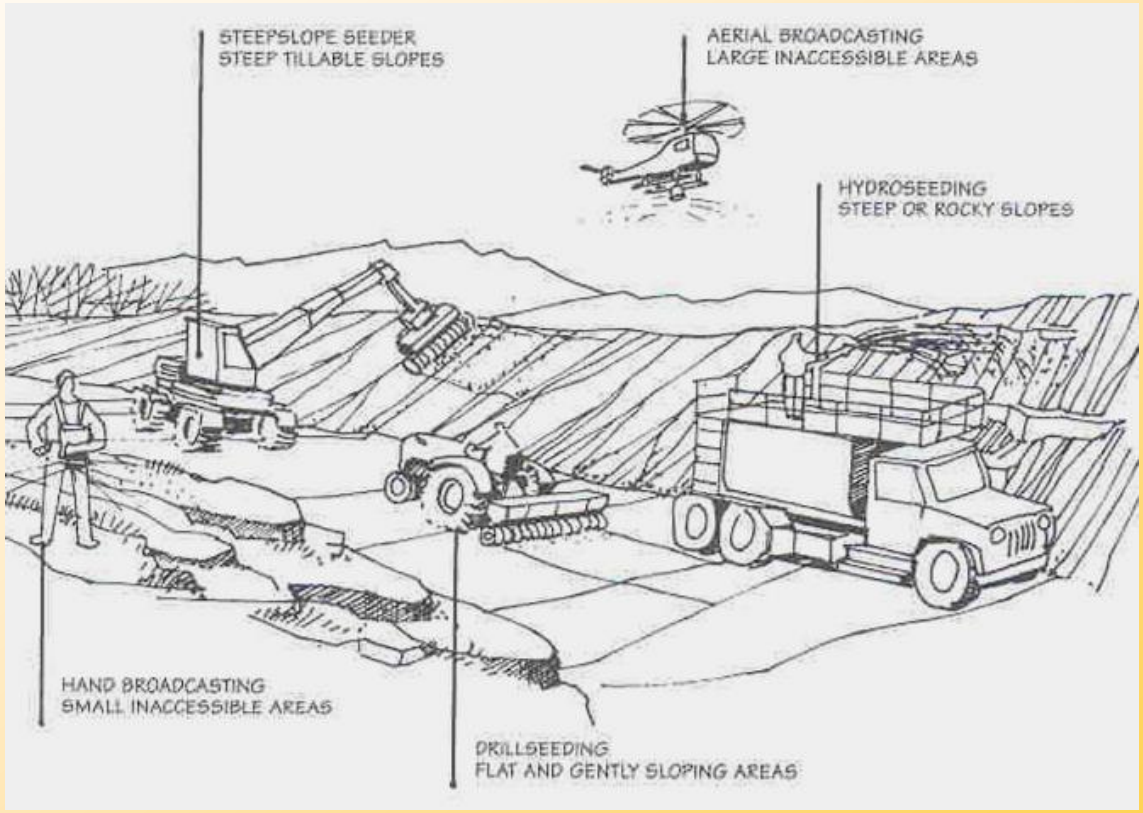
Bulb collection

Plant translocation

BACK

ÇINAR

BIO-RESTORATION
Seeding methods and applications



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BIO-RESTORATION
Broadcast seeding

NEXT

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BIO-RESTORATION
Hydroseeding, Broadcast seeding

NEXT

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BIO-RESTORATION
Tree and shrub planting

Seeding at Ecologically Sensitive Areas

BACK

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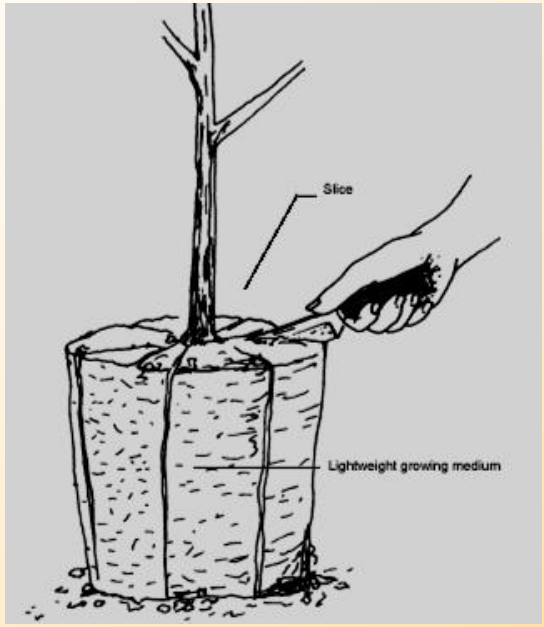
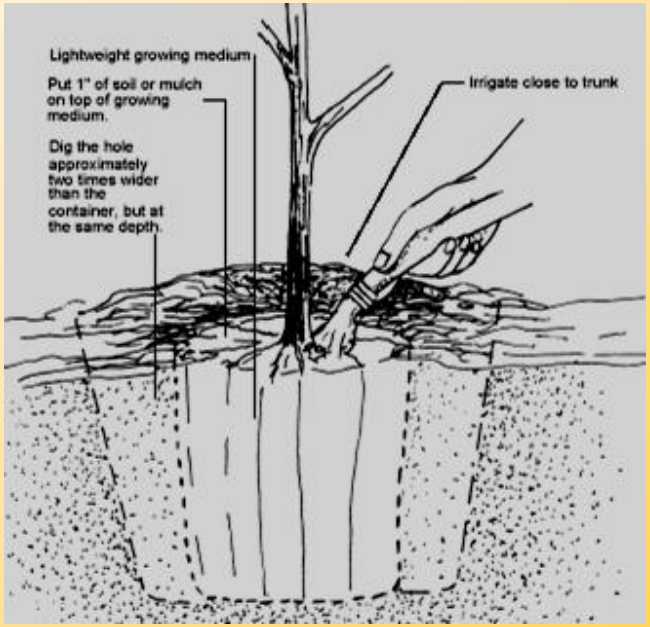
BIO-RESTORATION
Tree and shrub planting





NEXT

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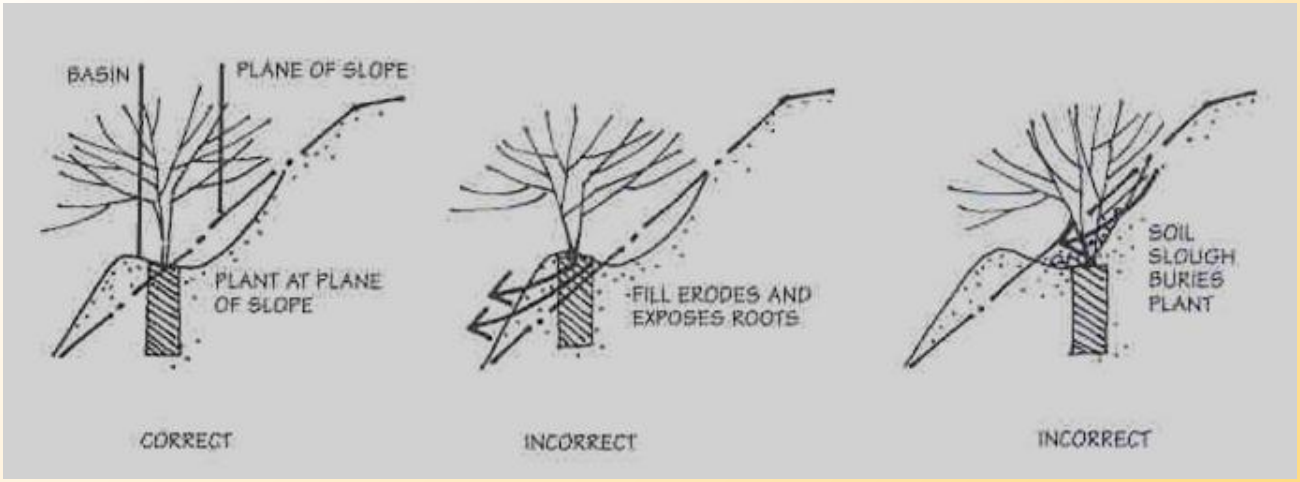
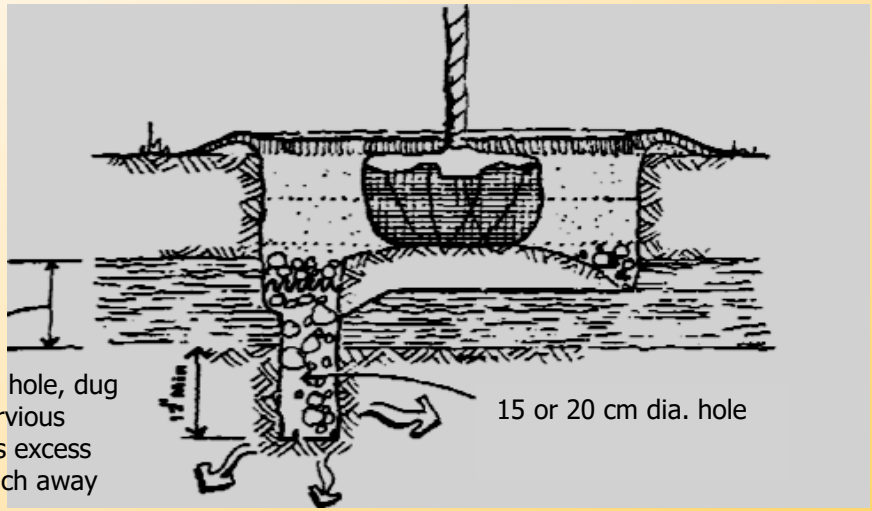
BIO-RESTORATION
Tree and shrub planting



Correct slope planting



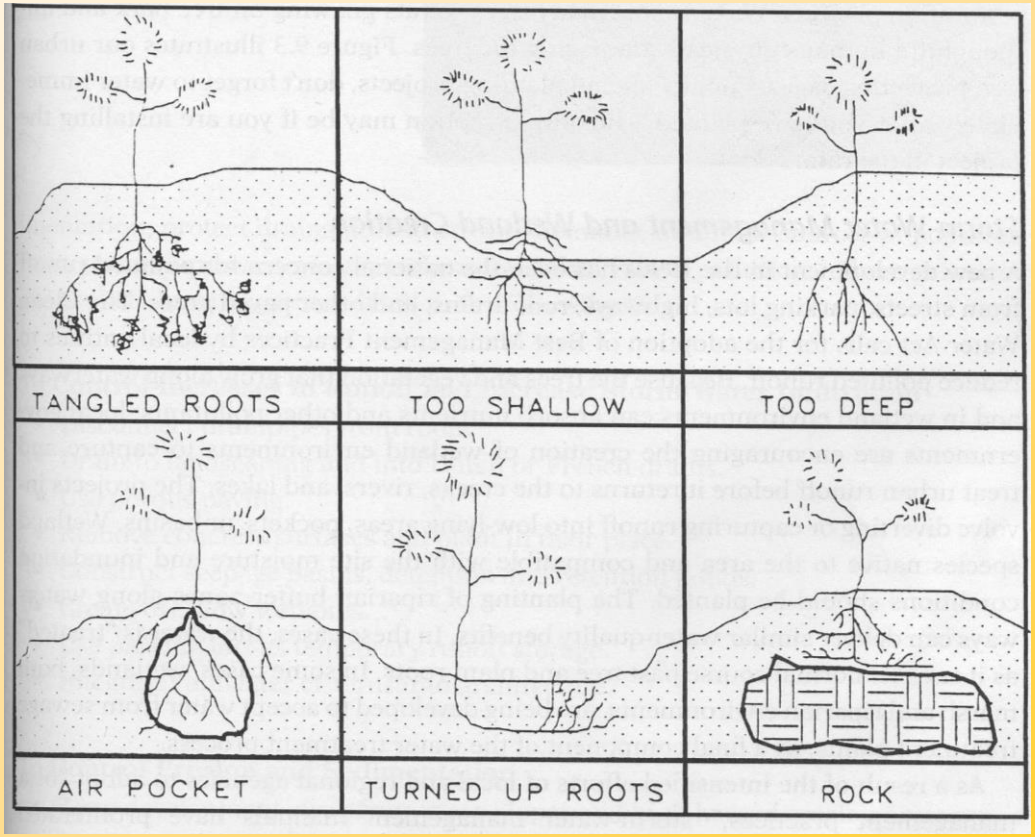
Planting at locations with impervious soil condition

NEXT

ÇINAR

BIO-RESTORATION
Tree and shrub planting

Wrong plantation



NEXT

ÇINAR

BIO-RESTORATION
Tree and shrub planting

NEXT

ÇINAR

BIO-RESTORATION
Re-vegetation for special areas, riparian vegetation

BACK

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BIO-RESTORATION
Aftercare Monitoring


Goat grazing pine, Horsell

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BIO-RESTORATION
Fencing

BACK

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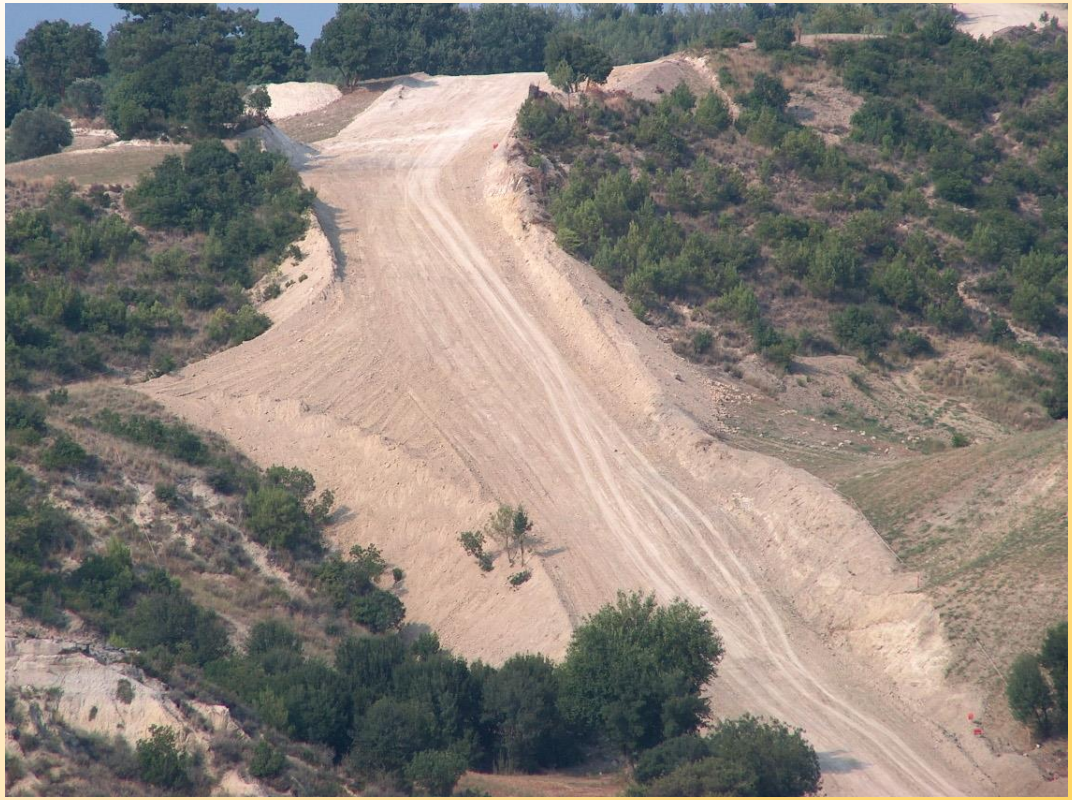

NEXT

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TOPSOIL REMOVAL & STORAGE

NEXT

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NEXT

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NEXT

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BACK

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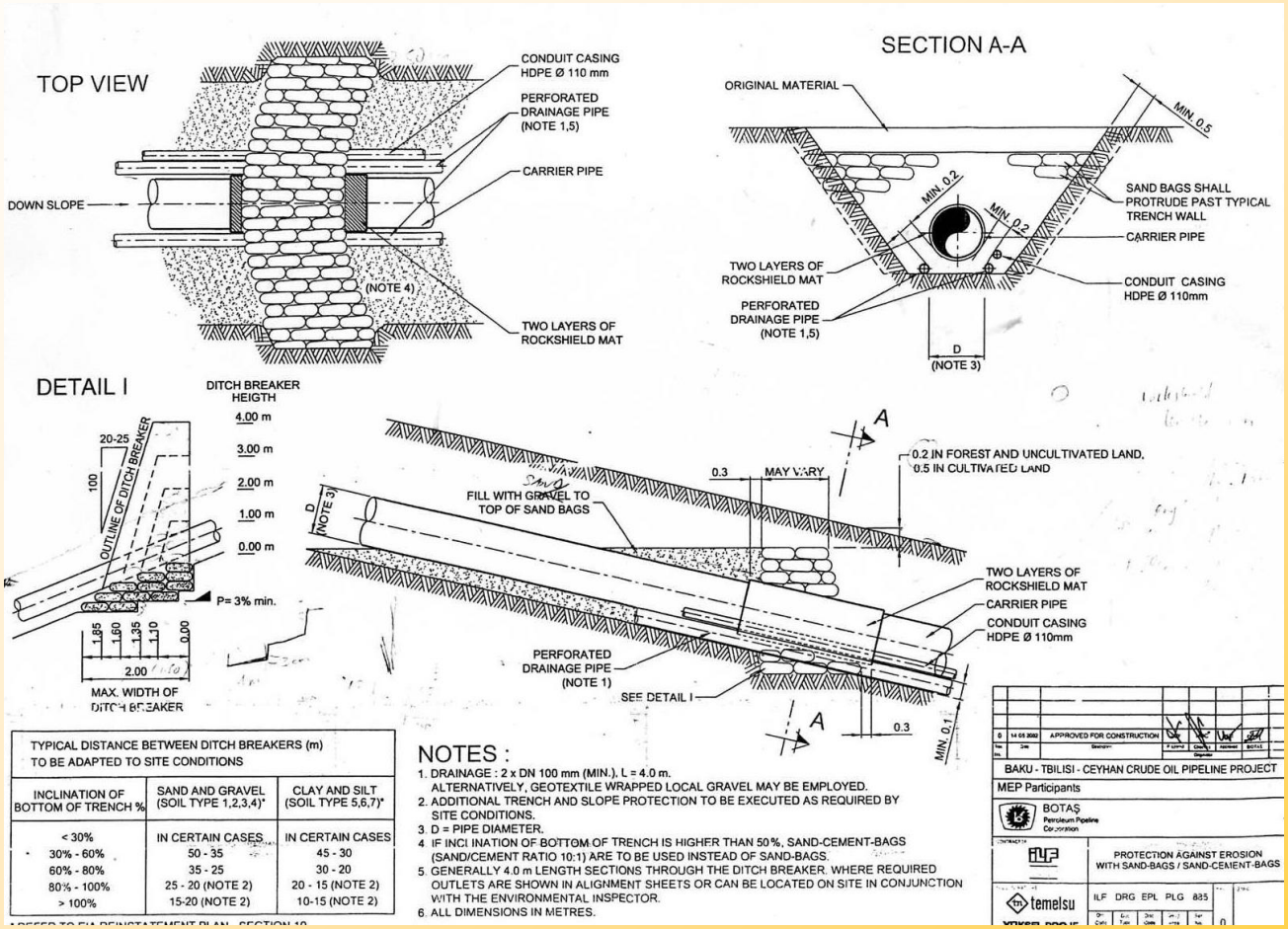
STANDART DRAWINGS

- Sand bags
- Slope breakers
- Vegetated waterway and lined chute
- Outlet of slope breakers
- Sediment filter/trench water disposal
- Subsoil retaining wooden fences
- Silt fences and straw bale barrier
- Erosion control mating installation
- Concrete wall

BACK

ÇINAR

SAND BAGS



TYPICAL DISTANCE BETWEEN DITCH BREAKERS (m) TO BE ADAPTED TO SITE CONDITIONS		
INCLINATION OF BOTTOM OF TRENCH %	SAND AND GRAVEL (SOIL TYPE 1,2,3,4)*	CLAY AND SILT (SOIL TYPE 5,6,7)*
< 30%	IN CERTAIN CASES	IN CERTAIN CASES
30% - 60%	50 - 35	45 - 30
60% - 80%	35 - 25	30 - 20
80% - 100%	25 - 20 (NOTE 2)	20 - 15 (NOTE 2)
> 100%	15-20 (NOTE 2)	10-15 (NOTE 2)

NOTES :

1. DRAINAGE : 2 x DN 100 mm (MIN.), L = 4.0 m. ALTERNATIVELY, GEOTEXTILE WRAPPED LOCAL GRAVEL MAY BE EMPLOYED.
2. ADDITIONAL TRENCH AND SLOPE PROTECTION TO BE EXECUTED AS REQUIRED BY SITE CONDITIONS.
3. D = PIPE DIAMETER.
4. IF INCLINATION OF BOTTOM OF TRENCH IS HIGHER THAN 50%, SAND-CEMENT-BAGS (SAND/CEMENT RATIO 10:1) ARE TO BE USED INSTEAD OF SAND-BAGS.
5. GENERALLY 4.0 m LENGTH SECTIONS THROUGH THE DITCH BREAKER. WHERE REQUIRED OUTLETS ARE SHOWN IN ALIGNMENT SHEETS OR CAN BE LOCATED ON SITE IN CONJUNCTION WITH THE ENVIRONMENTAL INSPECTOR.
6. ALL DIMENSIONS IN METRES.

0	14.05.2002	APPROVED FOR CONSTRUCTION				
No.	Date	Revision	Prepared	Checked	Approved	BOTAŞ

BAKU - TBILISI - CEYHAN CRUDE OIL PIPELINE PROJECT

MEP Participants

BOTAŞ Petroleum Pipeline Corporation

PROTECTION AGAINST EROSION WITH SAND-BAGS / SAND-CEMENT-BAGS

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ILF DRG EPL PLG 885

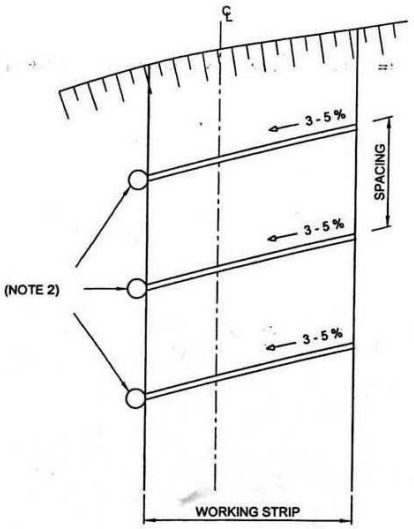
BACK

ÇINAR

SLOPE BREAKERS

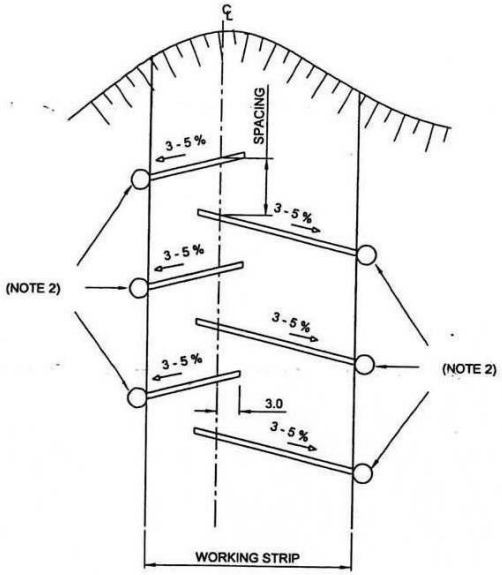
TYPE I

SLOPE BREAKERS ON SINGLE SIDE



TYPE II

SLOPE BREAKERS ON BOTH SIDES



SLOPE BREAKER SPACING CHART

R I (NOTE 4)	Kp 0 - 300 & Kp 900 - CEYHAN			
	SLOPE %	CLASS 1-2*	CLASS 3-5*	CLASS 6-7*
	0 - 14	100	80	60
	15 - 32	80	60	40
	33 - 40	60	40	20
	> 40	40	20	10

R II (NOTE 5)	Kp 300 - 900			
	SLOPE %	CLASS 1-2*	CLASS 3-5*	CLASS 6-7*
	0 - 14	120	100	80
	15 - 32	100	80	60
	33 - 40	80	60	40
	> 40	60	40	20

* REFER TO EIA REINSTATEMENT PLAN - SECTION 10

NOTES:

1. TYPE OF SLOPE BREAKERS ACCORDING TO TYPICAL DRAWING "CROSS SECTION OF SLOPE BREAKERS", SEE ILF-DRG-EPL-PLG-857.
2. FOR TYPE OF OUTLET SEE TYPICAL DRAWING "OUTLET OF SLOPE BREAKERS", ILF-DRG-EPL-PLG-856.
3. SPACING GIVEN IN ALIGNMENT SHEETS MAY BE CHANGED ACCORDING SITE SPECIFIC REQUIREMENT DEFINDED FROM ENVIRONMENTAL INSPECTOR.
4. AREAS OF HIGHEST HISTORICAL RAINFALL AND SPECIAL AREAS SEE EIA REINSTATEMENT PLAN /SECTION 21.
5. AREAS OF LOWEST ANTICIPATED ROUTE RAINFALL.
6. ALL DIMENSIONS IN METRES.

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BOTAŞ Petroleum Pipeline Corporation

ILF

SLOPE BREAKERS

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ILF DRG EPL PLG 855 | Rev. 0

NEXT

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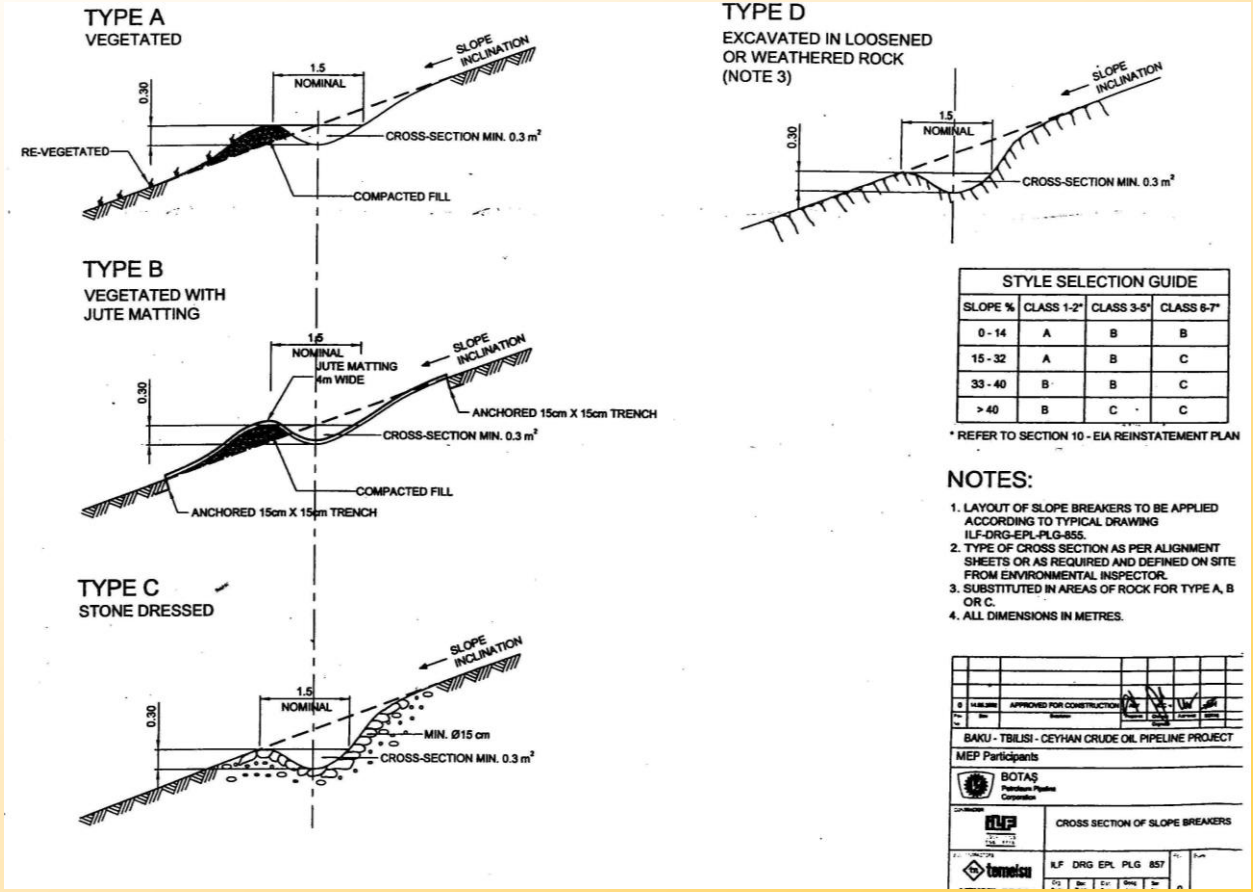
CROSS SECTION OF SLOPE BREAKERS



STYLE SELECTION GUIDE			
SLOPE %	CLASS 1-2*	CLASS 3-5*	CLASS 6-7*
0 - 14	A	B	B
15 - 32	A	B	C
33 - 40	B	B	C
> 40	B	C	C

* REFER TO SECTION 10 - EIA REINSTATEMENT PLAN

NOTES:

1. LAYOUT OF SLOPE BREAKERS TO BE APPLIED ACCORDING TO TYPICAL DRAWING ILF-DRG-EPL-PLG-855.
2. TYPE OF CROSS SECTION AS PER ALIGNMENT SHEETS OR AS REQUIRED AND DEFINED ON SITE FROM ENVIRONMENTAL INSPECTOR.
3. SUBSTITUTED IN AREAS OF ROCK FOR TYPE A, B OR C.
4. ALL DIMENSIONS IN METRES.

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MEP Participants

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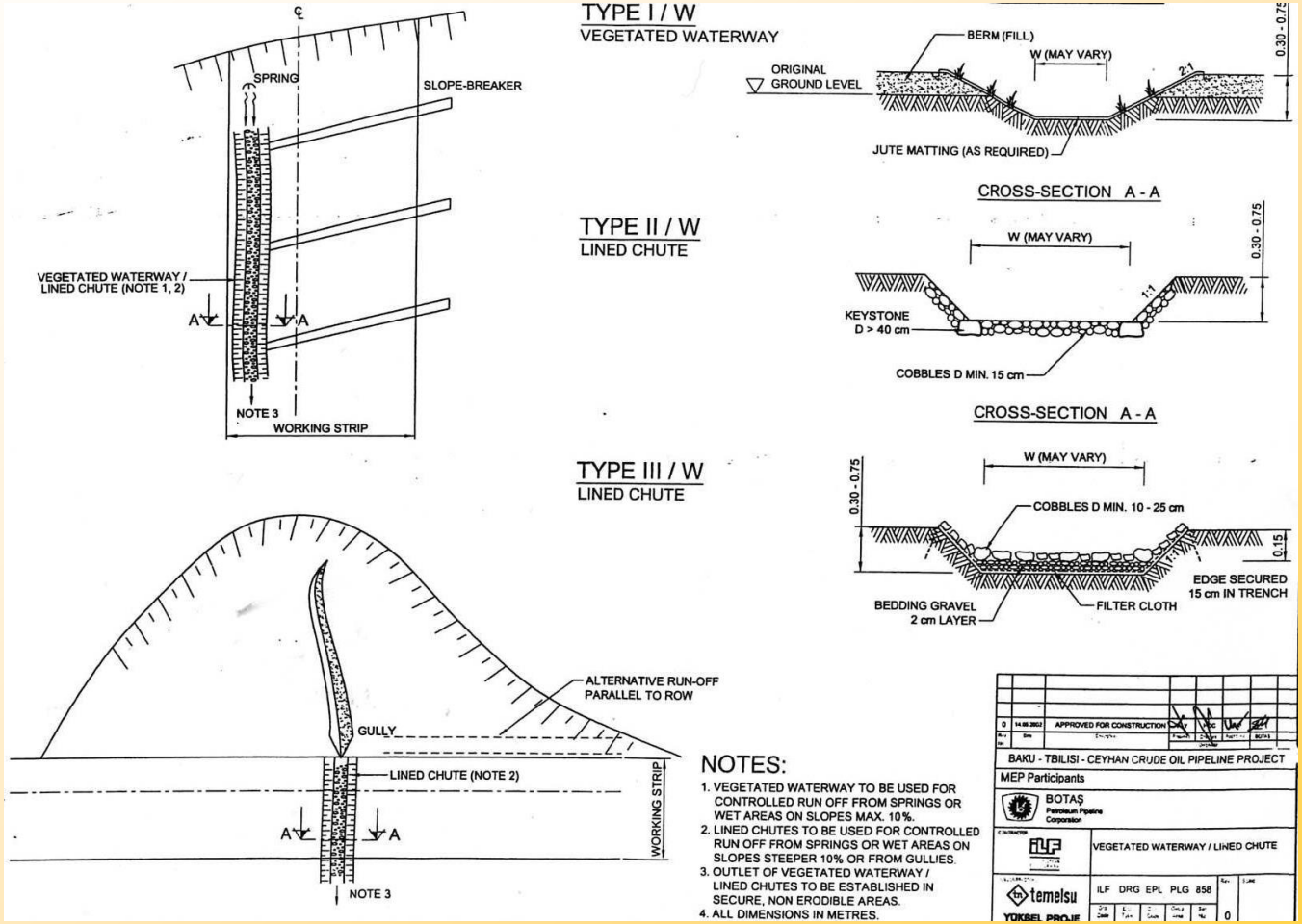
CROSS SECTION OF SLOPE BREAKERS

ILF DRG EPL PLG 857

BACK

ÇINAR

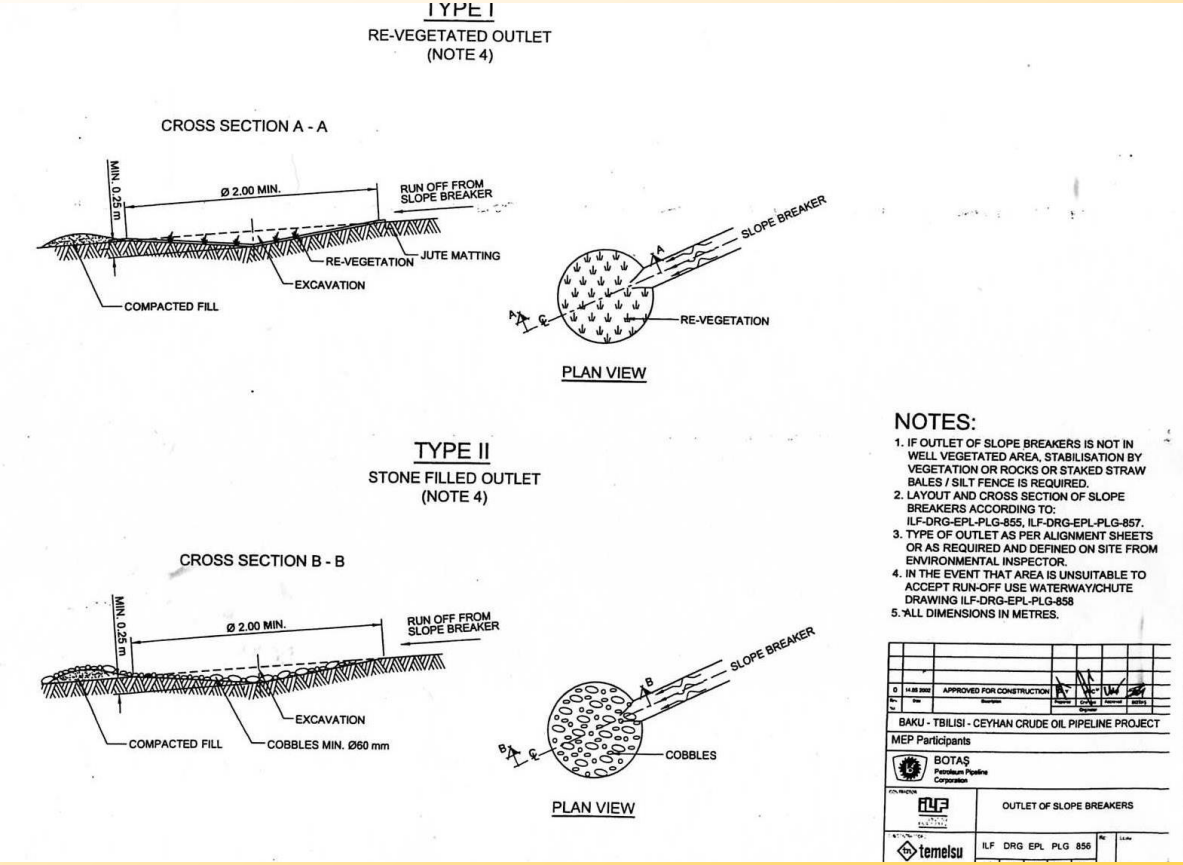
VEGETATED WATERWAY AND LINED CHUTE



BACK

ÇINAR

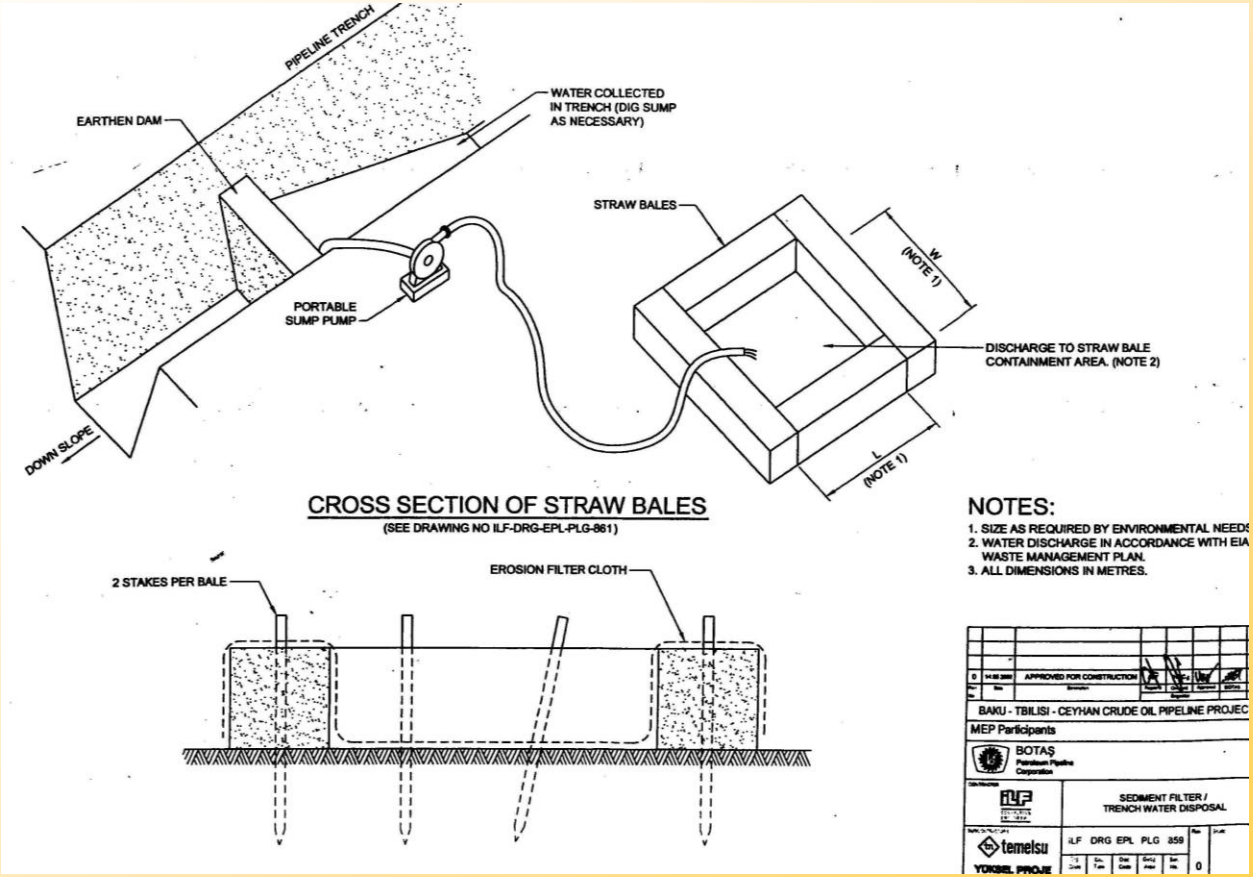
OUTLET OF SLOPE BREAKERS



BACK

ÇINAR

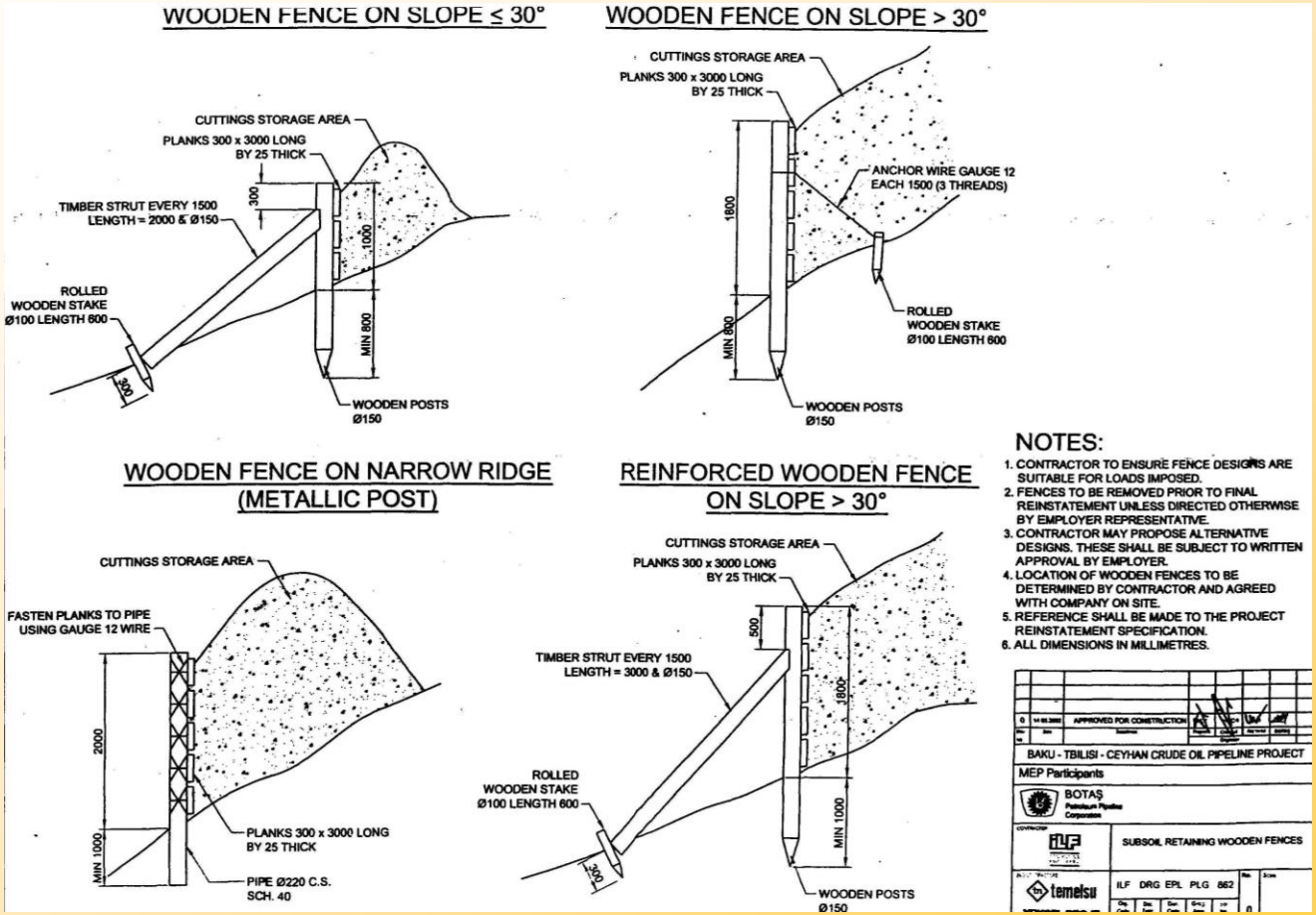
SEDIMENT FILTER/TRENCH WATER DISPOSAL



BACK

ÇINAR

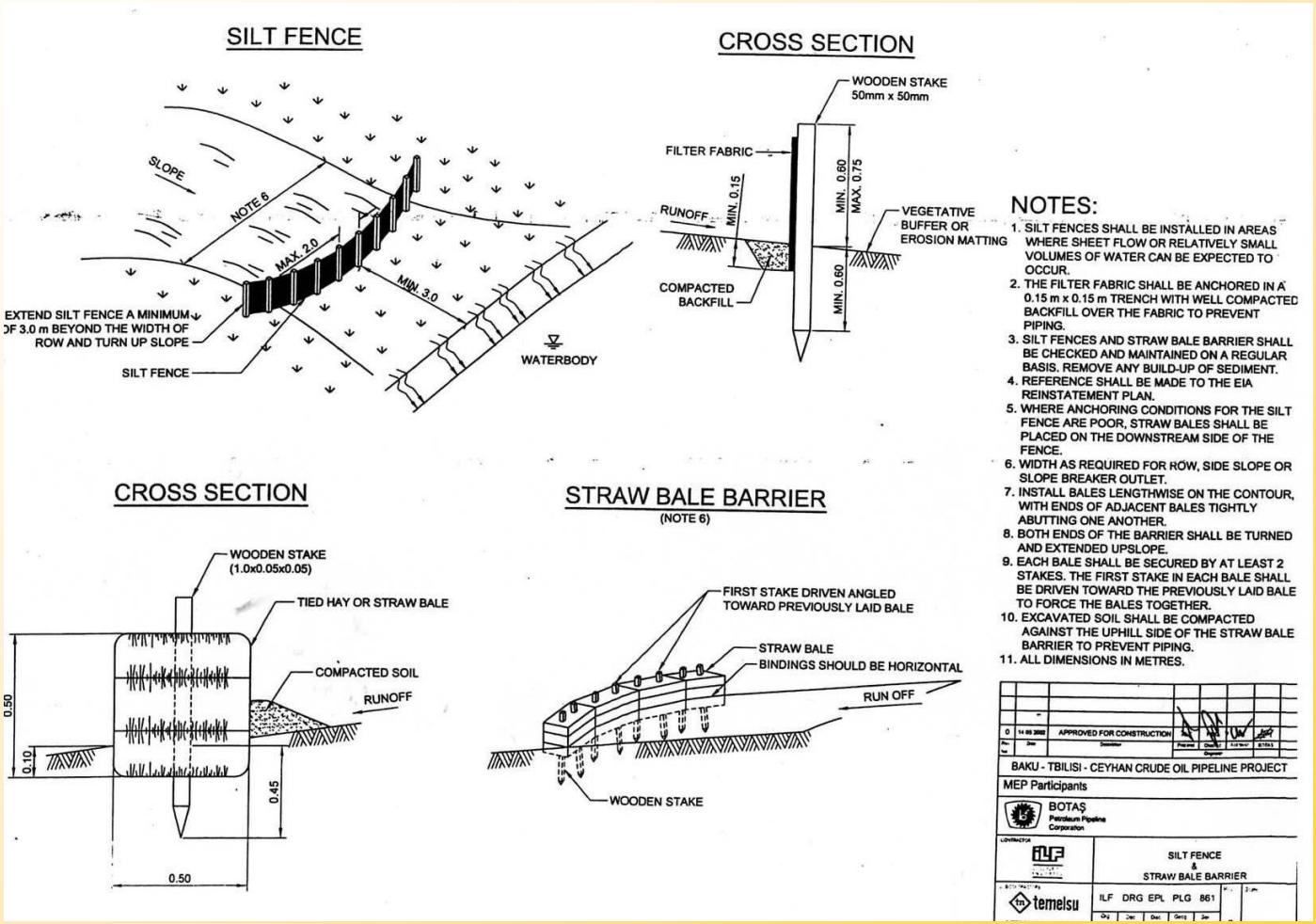
SUBSOIL RETAINING WOODEN FENCES



BACK

ÇINAR

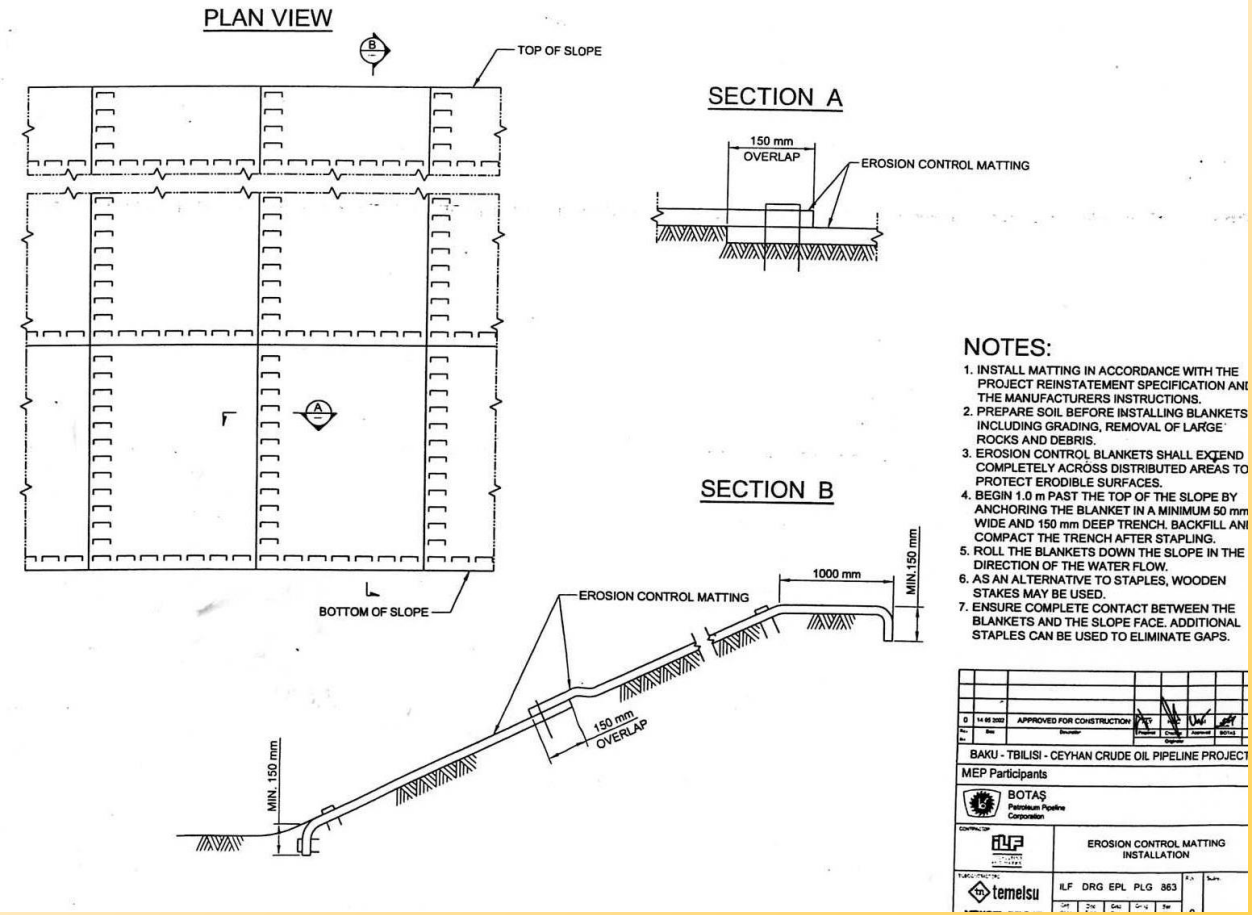
SILT FENCE AND STRAW BALE BARRIER



BACK

ÇINAR

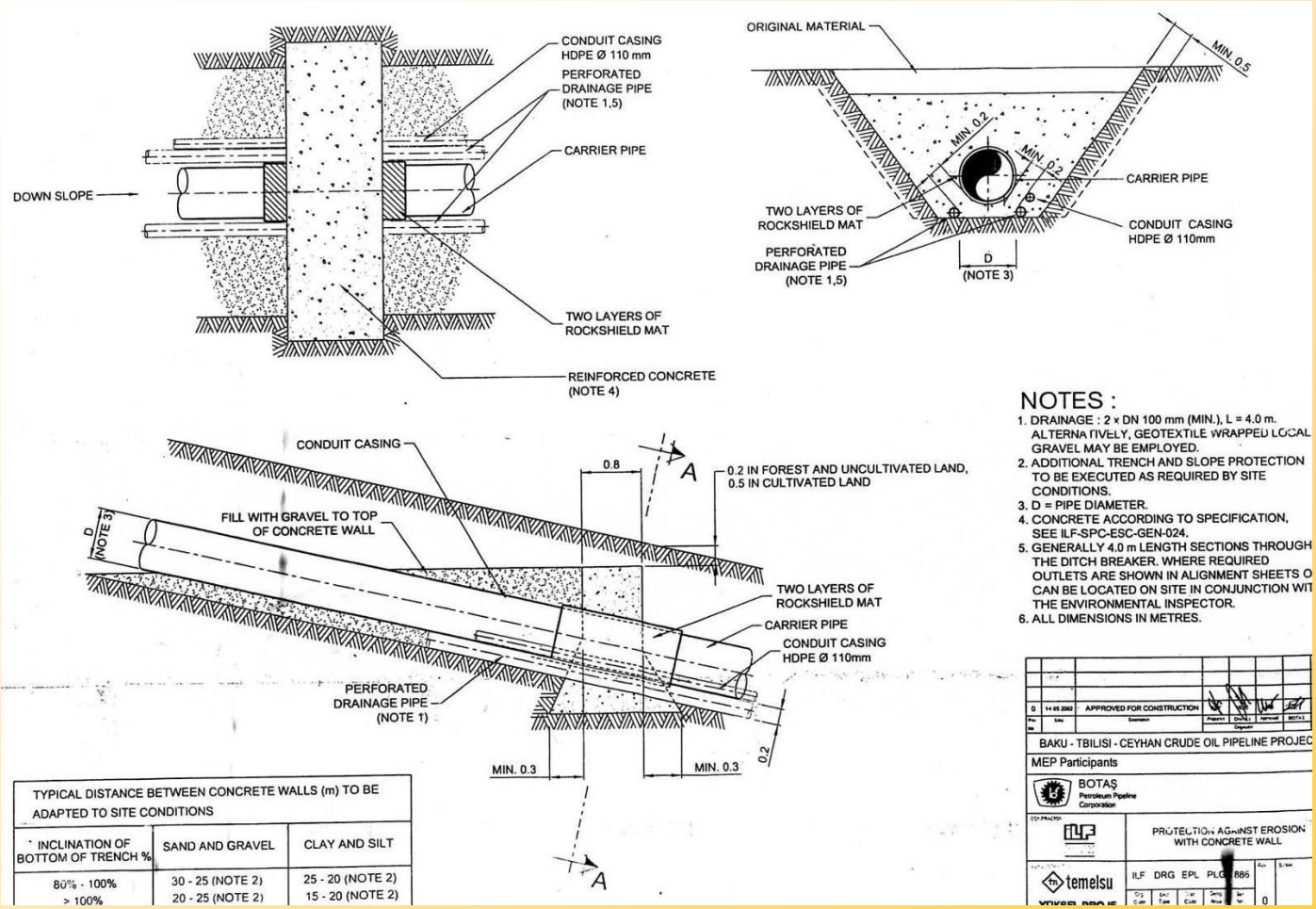
EROSION CONTROL MATING INSTALLATION



BACK

ÇINAR

CONCRETE WALL



NOTES :

1. DRAINAGE : 2 x DN 100 mm (MIN.), L = 4.0 m. ALTERNATIVELY, GEOTEXTILE WRAPPED LOCAL GRAVEL MAY BE EMPLOYED.
2. ADDITIONAL TRENCH AND SLOPE PROTECTION TO BE EXECUTED AS REQUIRED BY SITE CONDITIONS.
3. D = PIPE DIAMETER.
4. CONCRETE ACCORDING TO SPECIFICATION, SEE ILF-SPC-ESC-GEN-024.
5. GENERALLY 4.0 m LENGTH SECTIONS THROUGH THE DITCH BREAKER. WHERE REQUIRED OUTLETS ARE SHOWN IN ALIGNMENT SHEETS O CAN BE LOCATED ON SITE IN CONJUNCTION WIT THE ENVIRONMENTAL INSPECTOR.
6. ALL DIMENSIONS IN METRES.

TYPICAL DISTANCE BETWEEN CONCRETE WALLS (m) TO BE ADAPTED TO SITE CONDITIONS

INCLINATION OF BOTTOM OF TRENCH %	SAND AND GRAVEL	CLAY AND SILT
80% - 100%	30 - 25 (NOTE 2)	25 - 20 (NOTE 2)
> 100%	20 - 25 (NOTE 2)	15 - 20 (NOTE 2)

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MEP Participants

BOTAŞ
Petroleum Pipeline Corporation

CONTRACTOR

PROTECTION AGAINST EROSION WITH CONCRETE WALL

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