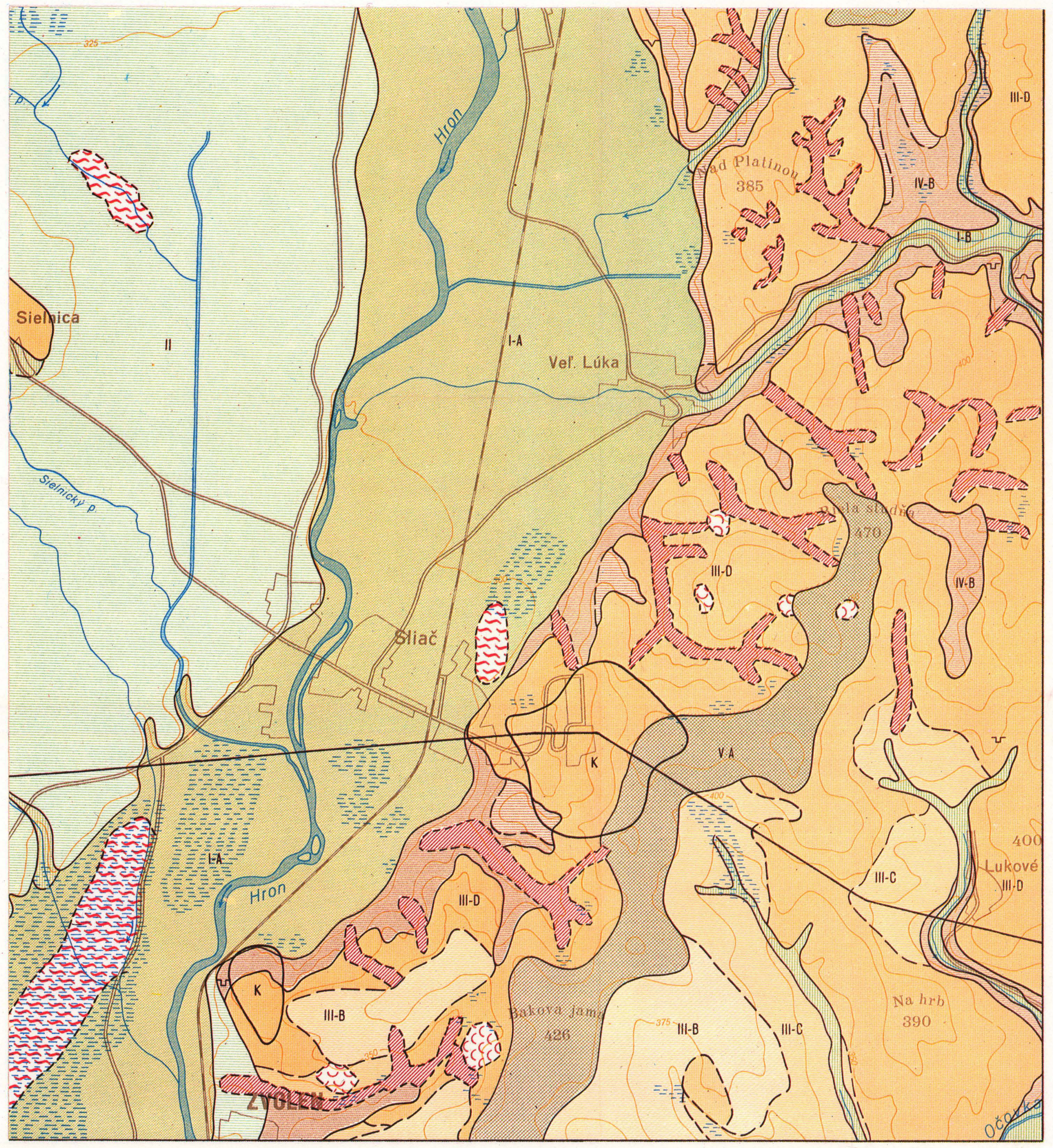


II. Terrace steps of the Hron river and its affluents	II	2-4, 4-7	Terrace fluvial deposits in several levels of various stages. They are composed of silty and clayey stiff to firm, to hard loams (1,5 to 4 m thick), of sands (1 to 2 m) and of sandy gravels, considerably loamed and weathered (3 to 5 m). In the vicinity of slopes they are covered by deluvia.	Gravel and sand terraces are considerably saturated, especially in the season of precipitation when the level of the ground water is 2 to 5 m (in some places even more). In the depressions the groundwater rises up to the surface.
III. Moderate deluvial slopes (up to 15°)	III-A	>5	Thick deluvia (>5 m) on the foot of the slopes, mostly of solifluctuous origin.	Very weakly saturated to practically dry.
	III-B	2-5	Deluvia 2,5 to 5 m thick. In the bedrock they are compressible, very little permeable clayey rocks (sandy clays, weathered tuffites, elluvia of claystone schist, etc.).	Weakly to very weakly saturated deluvia, ground water flows over impervious bedrocks, saturated with precipitation and wells of fissure and hillside waters; in convenient places it soakes the deluvium.
	III-C	<5, 2	Deluvia of a thickness of 2,5 to 5 m. In bedrock hard and little compressible rocks (limestones, dolomites, crystallinicum, agglomerate, tuffs, pliocene gravels, etc.).	Very weakly saturated deluvia, on permeable solid rock practically dry (limestones, dolomites, gravels).
	III-D	0-2	In the depth of <2,5 m there is a hard solid rock or Pliocene gravels.	
IV. Steep elluvio-deluvial slopes (over 15°) and narrow dividing ridges	IV-A	0-2	In the depth of <2,5 m there are thicker unconsolidated rocks or plastic soils (e.g. Pliocene gravels, Pliocene clays, etc.)	In the Pliocene complex little abundant hillside springs may occur in the slope.
	IV-B	0-2	In the depth of <2,5 m a solid bedrock occurs.	Fissure springs in the vicinity of the slope foot and hillside springs. In the limestones and dolomites very abundant springs occur on the foot of the slopes.
V. Wide and flat dividing ridges	V-A	0-2	In the depth of <2,5 m thicker unconsolidated rocks or plastic loams occur (e.g. Pliocene gravels and clays).	Ground water level in the depth of >5 m.
	V-B	0-2	In the depth of <2,5 m a solid bedrock occurs which (besides limestones and dolomites) usually is weathered up to a considerable depth, forming thick elluvia.	

Boundaries of a) zones, b) subzones

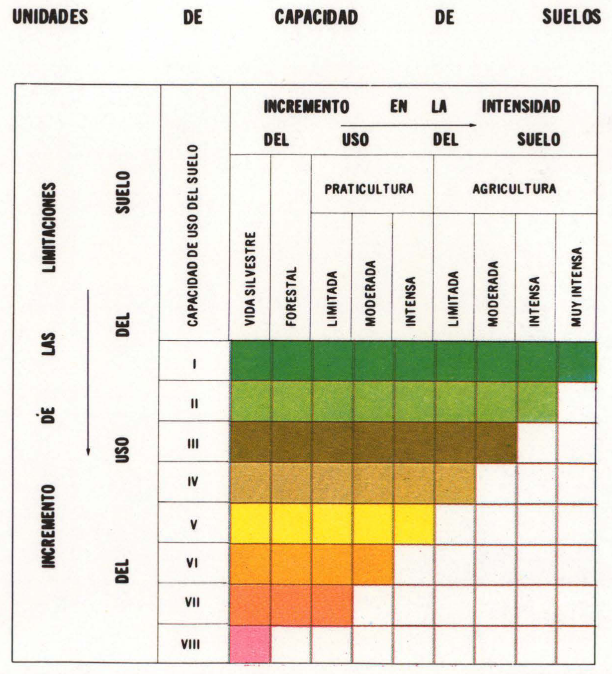
Lower protection districts of spas

Districts depreciated by strong scouring erosion

Districts depreciated by slides

Districts depreciated by putrified muddy deposits

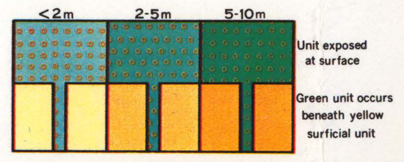
A. PART OF THE MAP OF ENGINEERING-GEOLOGICAL ZONATION, AND ITS EXPLANATION, ZVOLEN BASIN, CZECHOSLOVAKIA
SCALE 1:25,000
Reprinted from Matula (1969)



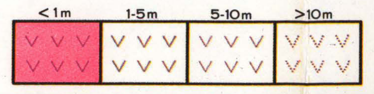
C. PART OF THE EXPLANATION FOR A POTENTIAL-USE-OF-SOILS MAP PUBLISHED BY THE COMISIÓN DE ESTUDIOS DEL TERRITORIO NACIONAL OF MEXICO

Reprinted from CETENAL (1971)

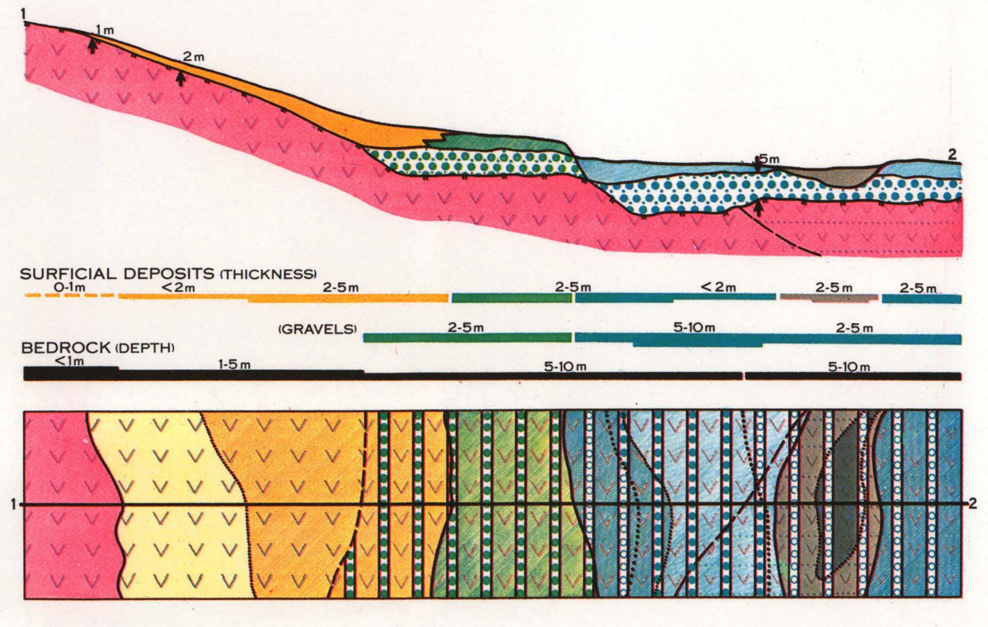
The classification system appears to be nested in that lands classed by a Roman numeral in a row appear suitable for all uses up to and including the last colored column.



D. SYSTEM OF MAP REPRESENTATION OF QUATERNARY SOIL UNITS OF DIFFERENT CHARACTER AND THICKNESS
Reprinted from Matula (1971, fig. 5)

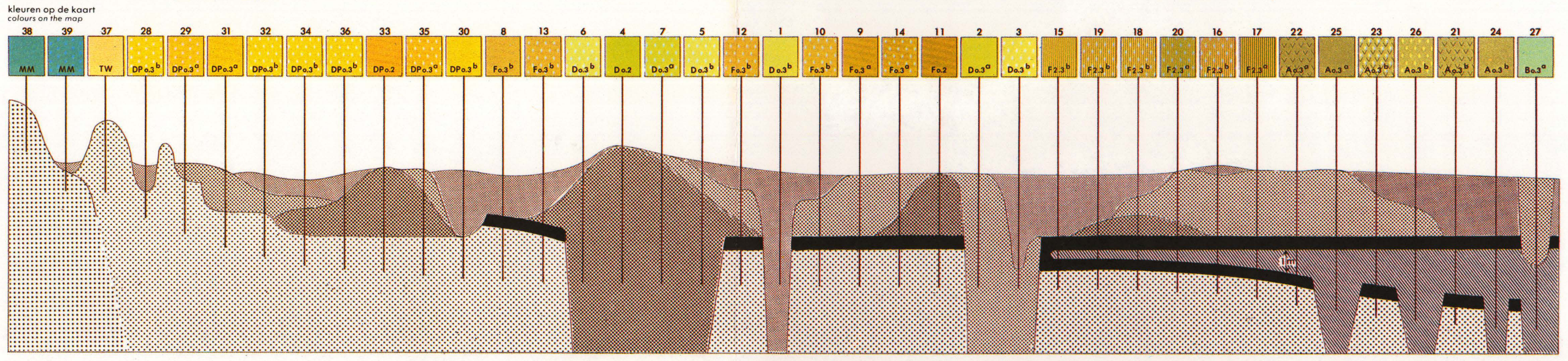


E. MAP REPRESENTATION OF THE CHARACTER AND DEPTH OF THE PRE-QUATERNARY ROCK SURFACES
Reprinted from Matula (1971, fig. 5)



F. EXAMPLE OF PORTRAYAL OF DIFFERENT SOIL AND ROCK UNITS IN AN ENGINEERING GEOLOGY MAP AND CROSS SECTION
Reprinted from Matula (1971, fig. 5)

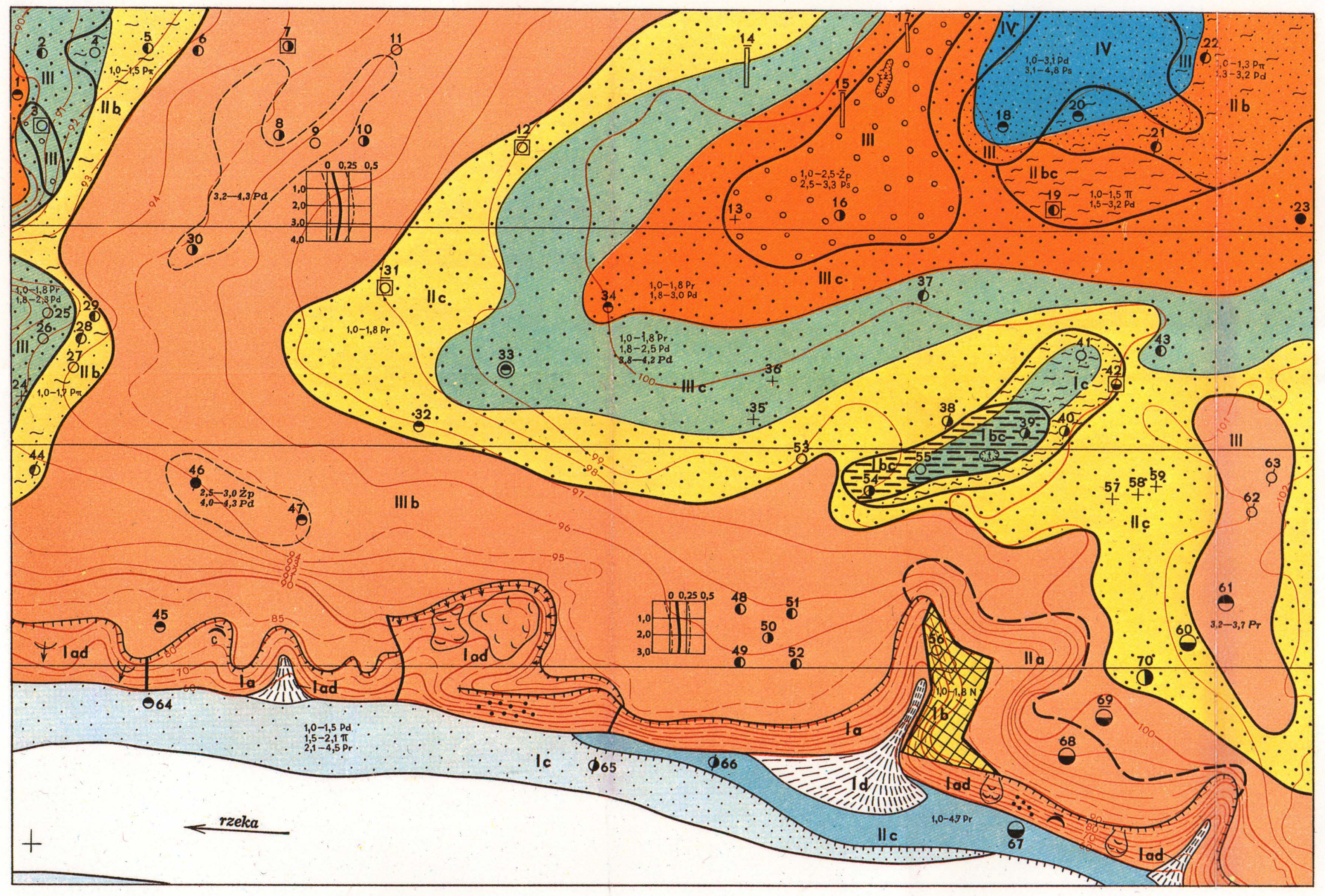
Schematisch profiel ter verduidelijking van de legenda
Schematic section to aid interpretation of Legend



Betekenis van de signaturen in het schematisch profiel
Symbols used in schematic section

- Afzettingen van Duinkerke III[b] — *Dunkirk III deposits*
- Afzettingen van Duinkerke III[a] — *Dunkirk III deposits*
- Afzettingen van Duinkerke II — *Dunkirk II deposits*
- Oudste holocene veenafzettingen en Hollandveen — *Oldest holocene peatdeposits and Holland peat*
- Afzettingen van Calais — *Calais deposits*
- Formatie van Twente, ontwikkeld als dekzand — *Twente formation, laid down as coversands*
- Formatie van Merksem — *Merksem Formation.*

Schaal 1:50 000
0 1 2 3 4 km



B. EXPLANATION AND PART OF MAP OF GEOLOGICAL-ENGINEERING CONDITIONS
SCALE 1:5,000
Reprinted from Lozinska-Stepien and Stochlak (1970, fig. 2)

Fig. 2. Map of geological-engineering conditions

1. Top of cohesive soils (loamy sands, loams, clays) below the ground surface
   - a – at depth of 1 m
   - b – at depth of more than 1 m
   - c – at depth of more than 2 m
   - d – at depth of more than 3 m
   - e – plateau
   - f – overflood terrace } at depth below 4 m
   - g – flood terrace
2. Kinds of soil encountered at depth of 1 m
   - a – gravels (Ż), sand-gravel mix (Żp)
   - b – coarse-grained sand (Pr), medium-grained sand (Ps)
   - c – fine-grained sand (Pd)
   - d – silty sand (Pπ)
   - e – sandy silt (πp)
   - f – silt (π)
   - g – loamy sands (Pg), sandy loams (Gp), loam (G), silty loams (Gπ), sandy clays (Ip), clays (I), silty clays (Iπ) in places where the top of cohesive soils occurs at a depth of more than 1 m
   - h – organic muds (Mo), peats (T)
   - i – antropogenic forms (N)
3. Geological profile
   - 3,4–4,5 Ps a – interbeddings encountered within cohesive soils (e.g. medium-grained sand, 3.4–4.5 m)
   - 1,0–2,5 Pr, 2,5–3,1 π b – geological profile of soils overlying the top of cohesive soil (e.g. coarse-grained sand 1.0–2.5 m, silts 2.5–3.1 m)
4. Characteristics of cohesive soils in vertical profile
   - a – degree of plasticity (*Sp*)
   - b – mean soil condition at corresponding depth
   - c – variability division
5. Accepted symbols
   - a – boundary of lithological differentiation of soils at depth of 1 m
   - b – boundaries of top surface of cohesive soils
   - c – boundaries of interbeddings in cohesive soils
   - d – boundaries of areas with gradients >5 per cent
   - e – morphological edges and scarps
   - f – boundaries of slides
   - g – landslide tongues
   - h – recent avalanches
   - i – active talus creep
   - j – alluvial fans
   - k – opencasts (general symbol) (c – brickyard, ż gravel pit, p – sand pit, t – peat pit)

   Symbols of principal documentation points as for the documentation map (Table 1)
6. Geological-engineering conditions for direct foundation of structures

I. Very unfavourable geological-engineering conditions owing to:
- a. gradients >12 per cent
- b. presence in the geologic profile of organic soils, antropogenic forms, soils with plasticity from 0.5 to 1 and >1, with permissible soil pressure per unit at depth of 1 m from surface of ground <0.8 kG/cm²
- c. occurrence of underground water table down to a depth of 1 m below the ground surface
- d. occurrence of active geodynamic processes

Great difficulties in the execution and maintenance of the structures

II. Unfavourable geological-engineering conditions owing to:
- a. gradients 5–12 per cent
- b. occurrence in the geologic profile of soils with permissible soil pressure per unit at depth of 1 m below the ground surface >0.8–1.0 kG/cm²
- c. occurrence of water level at a depth of 1–2 m from ground surface
- d. occurrence of active geodynamic processes

Probable difficulties in the execution and maintenance of the structures

III. Mediocre geological-engineering conditions owing to:
- a. gradients <5 per cent
- b. presence in the geological profile of soils with permissible soil pressure per unit at a depth of 1 m below the ground surface >1.0–1.5 kG/cm²
- c. occurrence of water level at a depth of 2–3 m from ground surface
- d. probable occurrence of active geodynamic processes

Average conditions for the execution and maintenance of the structures

IV. Favourable geological-engineering conditions owing to:
- a. gradients <5 per cent
- b. presence in the geological profile of soils with permissible soil pressure per unit at a depth of 1 m from ground surface >1.5 kG/cm²
- c. occurrence of underground water table at a depth >3 m from ground surface
- d. absence of active geodynamic processes

Favourable conditions for the execution and maintenance of the structures

LEGENDA
LEGEND

Grens van de Duinkerke II transgressie.
Limit of Dunkirk II transgression.

Open water.

1 Do.3b — Kreekafzettingen van Duinkerke IIIb. *Dunkirk IIIb tidal channel deposits.*

2 Do.3a — Kreekafzettingen van Duinkerke IIIa. *Dunkirk IIIa tidal channel deposits.*

3 Do.3b — Kreekafzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa). *Dunkirk IIIb tidal channel deposits overlying older Dunkirk deposits (DIIIb on DIIIa).*

4 Do.2 — Kreekafzettingen van Duinkerke II. *Dunkirk II tidal channel deposits.*

5 Do.3b — Kreekafzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa op DII). *Dunkirk IIIb tidal channel deposits overlying older deposits (DIIIb on DIIIa on DII)*

6 Do.3b — Kreekafzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DII) *Dunkirk IIIb tidal channel deposits overlying older Dunkirk deposits (DIIIb on DII).*

7 Do.3a — Kreekafzettingen van Duinkerke IIIa op oudere Afzettingen van Duinkerke (DIIIa op DII) *Dunkirk IIIa tidal channel deposits overlying older Dunkirk deposits (DIIIa on DII).*

8 Fo.3b — Afzettingen van Duinkerke IIIb op Hollandveen op Pleistoceen. *Dunkirk IIIb deposits overlying Holland peat and Pleistocene deposits.*

9 Fo.3a — Afzettingen van Duinkerke IIIa op Hollandveen op Pleistoceen. *Dunkirk IIIa deposits overlying Holland peat and Pleistocene deposits.*

10 Fo.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa) op Hollandveen op Pleistoceen. *Dunkirk IIIb deposits overlying older Dunkirk deposits (DIIIb on DIIIa) on Holland peat and Pleistocene deposits.*

11 Fo.2 — Afzettingen van Duinkerke II op Hollandveen op Pleistoceen. *Dunkirk II deposits overlying Holland peat and Pleistocene deposits.*

12 Fo.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa op DII) op Hollandveen op Pleistoceen. *Dunkirk IIIb deposits overlying older Dunkirk deposits (DIIIb on DIIIa on DII) on Holland peat on Pleistocene deposits.*

13 Fo.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DII) op Hollandveen op Pleistoceen. *Dunkirk IIIb deposits overlying older Dunkirk deposits (DIIIb on DII) on Holland peat and Pleistocene deposits.*

14 Fo.3a — Afzettingen van Duinkerke IIIa op oudere Afzettingen van Duinkerke (DIIIa op DII) op Hollandveen op Pleistoceen. *Dunkirk IIIa deposits overlying older Dunkirk deposits (DIIIa on DII) on Holland peat and Pleistocene deposits.*

15 F2.3b — Afzettingen van Duinkerke IIIb op Hollandveen op Pleistoceen. In het Hollandveen komt een vertanding voor met de Afzettingen van Calais. *Dunkirk IIIb deposits overlying Holland peat and Pleistocene deposits. Holland peat interfingers with the Calais deposits.*

16 F2.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa) op Hollandveen op Pleistoceen. In het Hollandveen komt tevens een vertanding voor met de Afzettingen van Calais. *Dunkirk IIIb deposits, overlying older Dunkirk deposits (DIIIb on DIIIa) on Holland peat on Pleistocene deposits. Holland peat interfingers with the Calais deposits.*

17 F2.3a — Afzettingen van Duinkerke IIIa op Hollandveen op Pleistoceen. In het Hollandveen komt een vertanding voor met de Afzettingen van Calais. *Dunkirk IIIa deposits overlying Holland peat and Pleistocene deposits. Holland peat interfingers with the Calais deposits.*

18 F2.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa op DII) op Hollandveen op Pleistoceen. In het Hollandveen komt een vertanding voor met de Afzettingen van Calais. *Dunkirk IIIb overlying older Dunkirk deposits (DIIIb on DIIIa on DII) on Holland peat on Pleistocene deposits. Holland peat interfingers with the Calais deposits.*

19 F2.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DII) op Hollandveen op Pleistoceen. In het Hollandveen komt een vertanding voor met de Afzettingen van Calais. *Dunkirk IIIb deposits overlying older Dunkirk deposits (DIIIb on DII) on Holland peat on Pleistocene deposits. Holland peat interfingers with the Calais deposits.*

20 F2.3a — Afzettingen van Duinkerke IIIa op oudere Afzettingen van Duinkerke (DIIIa op DII) op Hollandveen op Pleistoceen. In het Hollandveen komt een vertanding voor met de Afzettingen van Calais. *Dunkirk IIIa deposits overlying older Dunkirk deposits (DIIIa on DII) on Holland peat and Pleistocene deposits. Holland peat interfingers with the Calais deposits.*

21 Ao.3a — Afzettingen van Duinkerke IIIb op Hollandveen op Afzettingen van Calais op Basisveen op Pleistoceen. *Dunkirk IIIb deposits overlying Holland peat on Calais deposits on lower peat and Pleistocene deposits.*

22 Ao.3a — Afzettingen van Duinkerke IIIa op Hollandveen op Afzettingen van Calais op Basisveen op Pleistoceen. *Dunkirk IIIa deposits overlying Holland peat on Calais deposits on lower peat and Pleistocene deposits.*

23 Ao.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa) op Hollandveen op Afzettingen van Calais op Basisveen op Pleistoceen. *Dunkirk IIIb deposits overlying older Dunkirk deposits (DIIIb on DIIIa) on Holland peat on Calais deposits on lower peat and Pleistocene deposits.*

24 Ao.3b — Afzettingen van Duinkerke IIIb op Hollandveen op Afzettingen van Calais op Pleistoceen. *Dunkirk IIIb deposits overlying Holland peat on Calais deposits and Pleistocene deposits.*

25 Ao.3a — Afzettingen van Duinkerke IIIa op Hollandveen op Afzettingen van Calais op Pleistoceen. *Dunkirk IIIa deposits overlying Holland peat on Calais deposits and Pleistocene deposits.*

26 Ao.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa) op Hollandveen op Afzettingen van Calais op Pleistoceen. *Dunkirk IIIb deposits overlying older Dunkirk deposits (DIIIb on DIIIa) on Holland peat on Calais deposits on Pleistocene deposits.*

27 Bo.3a — Afzettingen van Duinkerke IIIa op Afzettingen van Calais op Pleistoceen. *Dunkirk IIIa deposits overlying Calais deposits on Pleistocene deposits.*

28 DPo.3b — Afzettingen van Duinkerke IIIb op niet geërodeerd Pleistoceen. *Dunkirk IIIb deposits – immediately overlying non eroded Pleistocene deposits.*

29 DPo.3b — Afzettingen van Duinkerke IIIa op niet geërodeerd Pleistoceen. *Dunkirk IIIa deposits – immediately overlying non eroded Pleistocene deposits.*

30 DPo.3b — Afzettingen van Duinkerke IIIb op zwak geërodeerd Pleistoceen. *Dunkirk IIIb overlying weakly eroded Pleistocene deposits.*

31 DPo.3a — Afzettingen van Duinkerke IIIa op zwak geërodeerd Pleistoceen. *Dunkirk IIIa deposits overlying weakly eroded Pleistocene deposits.*

32 DPo.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa) op zwak geërodeerd Pleistoceen. *Dunkirk IIIb deposits overlying older Dunkirk deposits (DIIIb on DIIIa) on weakly eroded Pleistocene deposits.*

33 DPo.2 — Afzettingen van Duinkerke II op zwak geërodeerd Pleistoceen. *Dunkirk II deposits overlying weakly eroded Pleistocene deposits.*

34 DPo.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DIIIa op DII) op zwak geërodeerd Pleistoceen. *Dunkirk IIIb deposits overlying older Dunkirk deposits (DIIIb on DIIIa on DII) on weakly eroded Pleistocene deposits.*

35 DPo.3a — Afzettingen van Duinkerke IIIa op oudere Afzettingen van Duinkerke (IIIa op DII) op zwak geërodeerd Pleistoceen. *Dunkirk IIIa deposits overlying older Dunkirk deposits (DIIIa on DII) on weakly eroded Pleistocene deposits.*

36 DPo.3b — Afzettingen van Duinkerke IIIb op oudere Afzettingen van Duinkerke (DIIIb op DII) op zwak geërodeerd Pleistoceen. *Dunkirk IIIb deposits overlying older Dunkirk deposits (DIIIb on DII) on weakly eroded Pleistocene deposits.*

37 TW — Formatie van Twente, ontwikkeld als dekzand dikker dan 2 m. *Twente Formation, laid down as coversands.*

38 MM — Formatie van Merksem. *Merksem Formation.*

39 MM — Afzettingen van Duinkerke IIIb op Formatie van Merksem. *Dunkirk IIIb deposits overlying Merksem Formation.*

G. PROFILE LEGEND FOR GEOLOGIC MAP OF ZEEUWSCH-VLAANDEREN (OOSTBLAD), THE NETHERLANDS
SCALE 1:50,000
Reprinted from Rummelen (1965)

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA.—1974, REPRINTED, 1980, 1984—G84827

THE LOGIC OF GEOLOGICAL MAPPING