



Guidelines for the geological content of "Kapalo mobile"

Version 2.1

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1 BACKGROUND

This document contains instructions for usage of Android based application for capturing bedrock data i.e. Kapalo mobile. Application was coded at the Geological Survey of Finland (GTK), Kuopio office, in 2015. This document contains only geological guidelines for the usage, technical instructions can be found from the internal help of the application. Structure of the used database is a simplified version from the full version of the ArcMap based Kapalo application used since 2007 in GTK. The available language versions of the application are English and Finnish, based on the language selection of the gadget. The up to date version can be found and installed from Google play under the name "Kapalo".

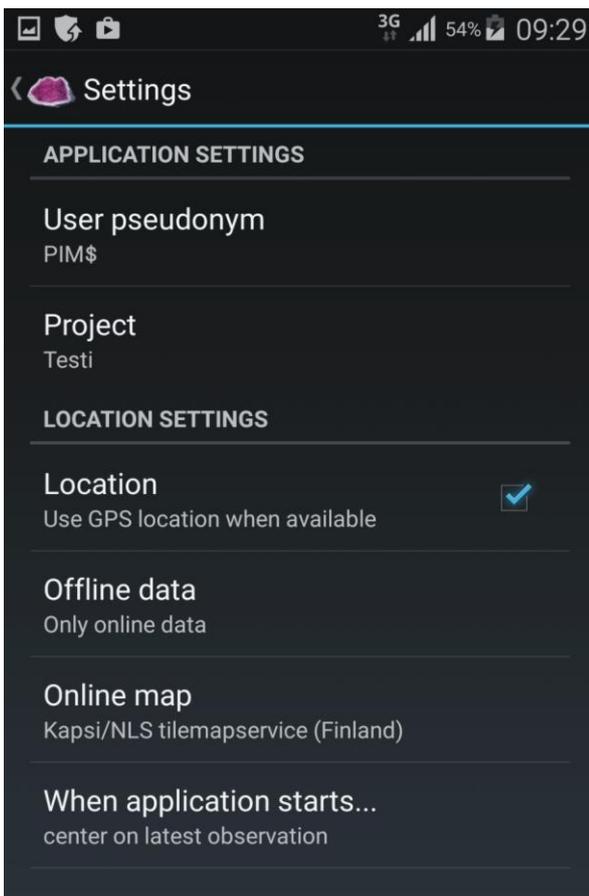
Highest hierarchical level in the data base structure is the observation point and the other points: rock observations, pictures, samples and tectonic measurements are linked to it. Under the Rock observation three subtables are used for minerals, structures and mineralization and alteration. Tectonic measurements are divided into five types: layering, foliation, fault, fold axis and lineation. Domain lists used by the program and the database can be found from here: <http://gtkdata.gtk.fi/mobiili/kapalodomains.html>.

If you have any suggestions for improving this document don't hesitate to send an e-mail to per-tu.mikkola@gtk.fi.

2 TARGET- AND TABLE-SPECIFIC INSTRUCTIONS

2.1 Settings

In addition to settings the setting window is used for changing certain default values used by the application (Figure 1)



GTK's four letter pseudonym, for those that have one, otherwise chosen by user. String field.

Name of the project. String field.

Is the GPS-location used if position available.

Online-offline data: choosing between using background data stored locally or loaded from internet.

Selection of the used online map.

Centering of the view when started: last observation or GPS-location.

Figure 1. Settings window of Kapalo mobile.

2.2 Observation form

Observation form (Figure 2) contains information about the observation ID, observation type, size etc. and a list on linked subtables as well as buttons for creating them.

Exit without saving the changes.

Save the changes and exit.

Object ID in the database, uneditable for the user.

Time and date, taken from the clock of the device.

Pseudonym of the observer, taken from the settings. String field.

Build from user pseudonym, time and observations stored earlier. Can be edited if for example earlier observations exist in an other database.

Taken from the settings.

Outcrop, quarry etc. Domain list.

Name of a target, hill, village etc. Unobligatory. String field.

Length of the observation area in metres.

Width of the observation area in metres.

Height of the observation in metres. Not needed for normal "flat" outcrops.

Remarks about the observation. String field.

List of rock observations, tectonic measurements, samples and pictures linked to the observation, visible in this order. Also shown are certain parameters of the subtables. Height of the list does not increase after four subtables, but this part of the screen can be scrolled separately. Short press opens the subtable whereas a longer press deletes the row in a subtable after asking for a confirmation.

Buttons for creating new rock observations, sample, tectonic measurement and picture.

Save the changes and exit.

Field	Value
OBJECTID	7
DATE OBSERVED	2015-09-14 01:23:59
OBSERVED BY	PIM\$
OBSID	PIM\$-2015-257
PROJECT	Testi
TYPE	OUTCROP
LOCATION	
LENGTH	-1.0
WIDTH	-1.0
HEIGHT	-1.0
REMARKS	
Subtables	
ROP	PIM\$-2015-257 17
Rockname: Conglomerate	
Foliation	2
Direction: 25 Dip: 25	
Sample	PIM\$-2015-257.1 1
Rock name: Conglomerate	
Picture	PIM\$-2015-257.k1 2
Remarks:	

Kuva 2. The observation form of Kapalo mobile.

2.3 Rock observation

Rock observation(s) (Figure 3) are used for storing data about the rock type(s) of the observation. Stored attributes include rock name, percentage, colour, grain size etc.. Subtables are used for storing structures, minerals and mineralization signs and alteration.

The screenshot shows a mobile application interface for editing a rock observation. The form is titled 'Rock observation point' and includes the following fields and subtables:

- OBJECTID:** 18
- OBSID:** PIM\$-2015-210
- ROCK CLASS:** PLUTONIC ROCK
- ROCK NAME:** GRANODIORITE
- FIELD NAME:** Granodiorite
- GROUPING NAME:** Porfyryrinen
- OCCURENCE TYPE:** MAIN ROCK TYPE
- COLOR ATTRIBUTE:** REDDISH
- COLOR:** GREY
- WEATHERING COLOR:** (empty)
- PERCENTAGE:** 90
- MIN SUS:** -1.0
- MAX SUS:** -1.0
- GRAIN SIZE:** SMALL-GRAINED 1 - 2 MM
- REMARKS:** (empty)

Subtables:

Structure	Remarks:	ID
Porphyritic		28
Foliated		29

Action Buttons: STRUCTURE, MINERAL, MAA, SAVE

Into which rock class the rock type belongs to. Is automatically filled if the rock name below is chosen first. Domain list.

Name of the observed rock type. If rock class above is chosen first only rock names belonging to that class are shown. Domain list.

Geologist or project specific rock name. String field.

Intrusion or other grouping name. String field.

How the rock in question occurs in the observation area: main rock type, dyke, enclave etc. Domain list.

Prefix of the color. Light, dark, greenish etc. Domain list.

Color of fresh rock surface. Domain list.

Color of the outcrop weathering surface. String field.

Proportion of the rock type in the observation area. 100 % as default value for the first rock. For the next one reduced with the used-%.

Minimum of the measured susceptibility values. Device (and scale) are stored when moving the data into geodatabase.

Maximum of the measured susceptibility values. If values are homogeneous this field is used.

Grain size of the ground mass. Domain list.

Free description of the rock type in question. String field.

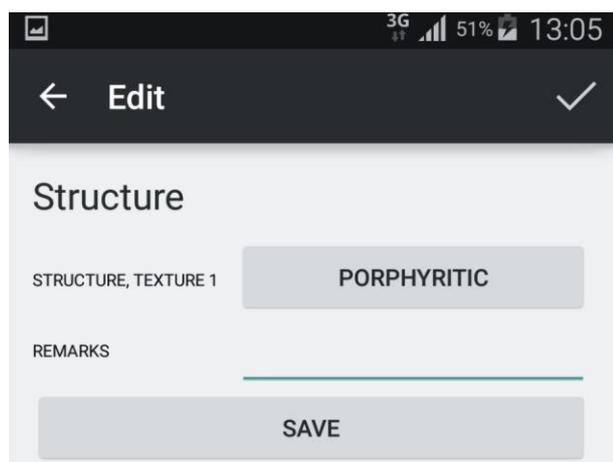
List of rock structures, mineralization signs and alterations and minerals linked to the rock observation. Also shown are certain parameters of the subtables. Height of the list does not increase after four subtables, but this part of the screen can be scrolled separately. Short press opens the subtable whereas a longer press deletes the row in a subtable after asking for a confirmation.

Buttons for creating new structure, mineral and mineralization signs and alteration (MAA).

Figure 3. The rock observation form of Kapalo mobile.

2.3.1 Structure and texture form

Structure and texture form (Figure 4) is used to store data concerning observed structures and textures of the rock type. Relationship to the rock observation is one to many.

The image shows a mobile application interface for editing a 'Structure' record. At the top, there is a dark header bar with a back arrow, the word 'Edit', and a checkmark icon. Below the header, the title 'Structure' is displayed. The form contains two main fields: 'STRUCTURE, TEXTURE 1' with a dropdown menu currently showing 'PORPHYRITIC', and 'REMARKS' with a text input field. A 'SAVE' button is located at the bottom of the form. The status bar at the top of the phone shows '3G', signal strength, 51% battery, and the time '13:05'.

Structure of the rock type. Domain list.

Remarks concerning the saved structure. String field.

Figure 4. The structure and texture form of Kapalo mobile.

2.3.2 Mineral form

Mineral form (Figure 5) is used for storing data concerning the observed minerals of the rock, relationship to the rock observation is one to many. Self-evident minerals are not saved; i.e. granite by definition contains K-feldspar, plagioclase and quartz. Exception to this rule is made in respect to porphyritic rocks, where the porphyry minerals is stored. Normally only the so called index minerals are stored, for example staurolite and garnet in case of staurolite-garnet paraschist. The index minerals are numbered so that the most abundant one is assigned as number 1, second most abundant as number 2. The maximum number of index minerals per rock type is 3. In case of plutonic rocks the index minerals are the mafic minerals, in biotite granite for example the biotite. Appearance of the mineral is stored in subtable and more than one appearance can be stored per mineral, for example pyrite as disseminated and fracture filling.

Name of the mineral. Domain list. Mineraali: mineraalin nimi, arvolista.
 Is the mineral an index mineral? In case of hornblende-biotite granite both mafic minerals are index minerals. The more abundant biotite being 1 and hornblende 2. Max 3 per rock type is stored.
 Grain size (mm) of the mineral in question. Is not stored if of the same size as the other minerals of the rock.
 How well the crystal-faces of the mineral have developed. Domain list.
 Remarks related to the mineral in question.

List of the appearances of the stored minerals.

Button to add an appearance.

Figure 5. The mineral form of Kapalo mobile.

Mineral appearance subtable contains only data for the appearance type of the mineral (Figure 6).

Appearance type of the mineral. Domain list.

Figure 6. The mineral appearance form of Kapalo mobile.

2.3.3 Mineralization signs and alteration form

This form is used for data concerning whole rock alteration and observed signs of mineralization (Figure 7.), relationship of this table to the rock observation is of type one to many. User should note that the form contains data which is not always related to each other, thus the other half of the form often remains blank.

Type of the whole rock alteration. Domain list.

Degree of the observed alteration. Domain list.

Different types of mineralization signs. Domain list.

Type of mineralization. Domain list.

Figure 7. The mineralization signs and alteration form of Kapalo mobile.

2.4 Outcrop picture point

Outcrop picture form is used to store information about the pictures taken from the observation area. Camera symbol on the form (Figure 8) activates the camera of the device. Application names the taken picture files according to the GTK's convention: for example PIM\$-2015-204.k1, .k2, .k3 etc. This standard name is followed by random number in order to enable taking of several shots for each picture point in the field and later saving the best one (Remember in this process to remove the random number). If you're taking several pictures that you intend to save, each of these must be accompanied by their own outcrop picture point.

Opens the camera.

Name of the photo file, formed automatically from observation id.

Time and date of the photograph. Taken automatically.

Type of the picture, digital photo as default. Domain list.

Remarks concerning the picture. String field.

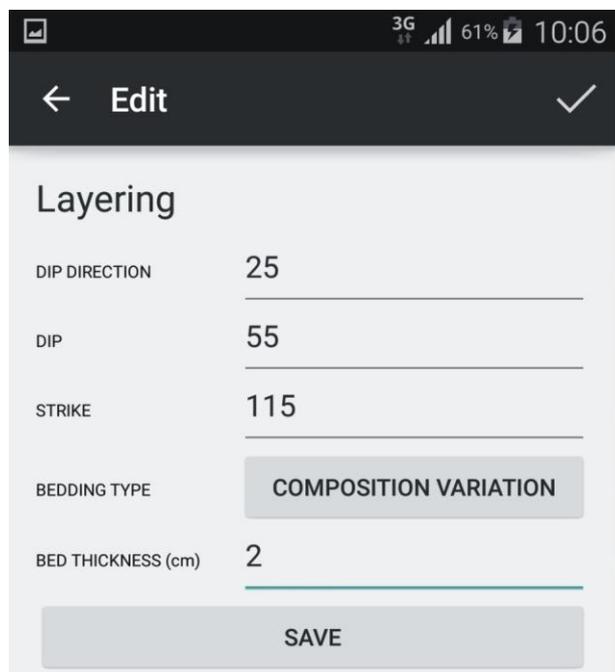
Figure 8. The outcrop picture form of Kapalo mobile.

2.5 Tectonic measurement

When the tectonic measurement button of the observation form is pressed the user is prompted to select one of the five possibilities: layering, foliation, fault, fold axel or lineation. Each tectonic measurement point contains one measurement and more than one can be stored for each observation.

2.5.1 Layering form

Layering form (Figure 9) is used for data concerning the measured layering: direction, dip, strike, type and thickness.

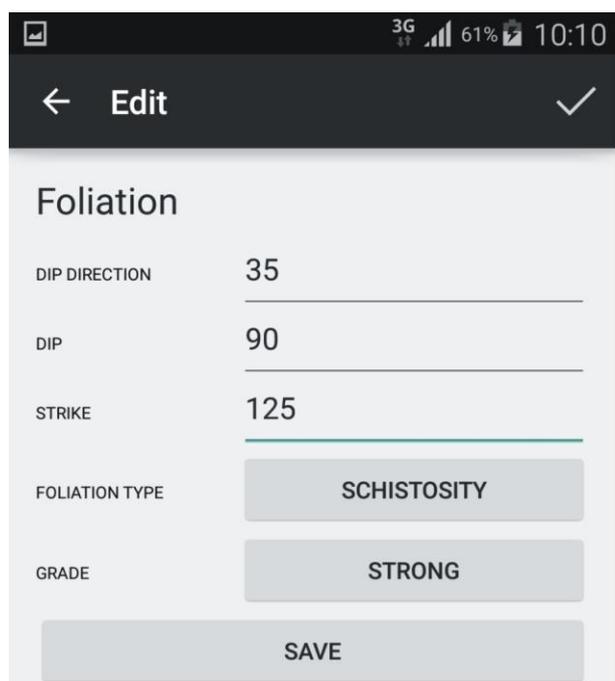


DIP DIRECTION	25	Direction of the dip, degrees 0-360.
DIP	55	Dip of the layering, degrees 0-90.
STRIKE	115	Stike of the layering, degrees 0-179.
BEDDING TYPE	COMPOSITION VARIATION	Type of the observed layering. Domain list.
BED THICKNESS (cm)	2	Observed average bed thickness (cm).

Figure 9. The layering form of Kapalo mobile.

2.5.2 Foliation form

Foliation form (Figure 10) is used for storing concerning the measured foliation: directions, type and grade.



DIP DIRECTION	35	Direction of the dip, degrees 0-360.
DIP	90	Dip of the foliation, degrees 0-90.
STRIKE	125	Strike of the foliation, degrees 0-179.
FOLIATION TYPE	SCHISTOSITY	Type of the foliation. Domain list.
GRADE	STRONG	Grade of the foliation. Domain list.

Figure 10. The foliation form of Kapalo mobile.

2.5.3 Fault form

Fault form (Figure 11) is used to store fault measurement(s) from the observation. International users should note that the application concentrates on strike slip faults as these are far more readily observable in low topography crystalline bedrock, characterizing Finland, than normal faults or thrust faults.

The screenshot shows a mobile application interface for editing a fault record. At the top, there is a status bar with '3G', signal strength, 64% battery, and the time 10:20. Below that is a dark header with a back arrow, the word 'Edit', and a checkmark. The main content area is titled 'Fault' and contains several input fields: 'DIP DIRECTION' with the value '65', 'DIP' with '65', 'STRIKE' with '155', 'HORIZONTAL FAULT SENCE' with a dropdown menu showing 'SINISTRAL FAULT', and 'HORIZONTAL DISPLACEMENT (cm)' with '65'. A 'SAVE' button is located at the bottom of the form.

Direction of the dip, degrees 0-360.

Dip of the fault, degrees 0-90.

Strike of the fault, degrees 0-179.

Sense of the fault. Domain list.

Amount of horizontal displacement in cm.

Figure 11. The fault form of Kapalo mobile.

2.5.4 Fold axel form

Fold axel form (Figure 12) is used for storing data about the observed fold axis.

The screenshot shows a mobile application interface for editing a fold axis record. At the top, there is a status bar with '3G', signal strength, 64% battery, and the time 10:24. Below that is a dark header with a back arrow, the word 'Edit', and a checkmark. The main content area is titled 'Fold axel' and contains several input fields: 'DIRECTION' with the value '95', 'PLUNGE' with '85', 'AXIS SIZE' with a dropdown menu showing 'MINOR FOLD', and 'ASYMETRY' with a dropdown menu showing 'SINISTRAL'. A 'SAVE' button is located at the bottom of the form.

Direction of the plunge, degrees 0-360.

Pluge of the axis, degrees 0-90.

Size of the fold, 2 possibilities: fold or minor fold.

In case of asymmetric folds the asymmetry. Domain list.

Figure 12. The fold axel form of Kapalo mobile.

2.5.5 Lination form

Lination form (Figure 13) is used for linear features other than fold axels.

Lination

DIRECTION: 50

PLUNGE: 50

LINEATION TYPE: STRETCHING LINEATION

LINEATION ATTRIBUTE: BOULDER

LINEATION INTENSITY: STRONG

SAVE

Direction of the plunge, degrees 0-360.

Plunge of the lination, degrees 0-90.

Type of the lination. Domain list.

Attribute of the lination. Domain list.

Intensity estimation for the lination. Domain list.

Figure 13. The lination form of Kapalo mobile.

2.6 Sample point

Sample form (Figure 14) is used for storing data connected to taken samples. Sample numbering is done automatically according to GTK's convention: observation id followed by dot and running number. For example PIM\$-2015-204.1, PIM\$-2015-204.2, PIM\$-2015-204.3 etc., but the field can be edited manually.

Sample

OBJECTID: 2

SAMPELID: PIM\$-2015-204.1

ROCK NAME: MONTSODIORITE

FIELD NAME: Montsodiorite

THIN SECTION: NO

CHEMICAL ANALYSIS: NO

SAVE

Sample number, formed automatically. String field.

Rock type. Domain field.

Geologist or project specific rock name. Copied from rock name, can be edited. String field.

Do you intend to make a thins section of the sample. Yes/No.

Do you intend to make a chemical analysis from the sample. Yes/No.

Figure 14. The sample form of Kapalo mobile.