



ROADPAC'14

PROGRAMs RP53A and RP71A

Unfinished construction and earthworks

User guide

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1. Programs RP53a and RP71a

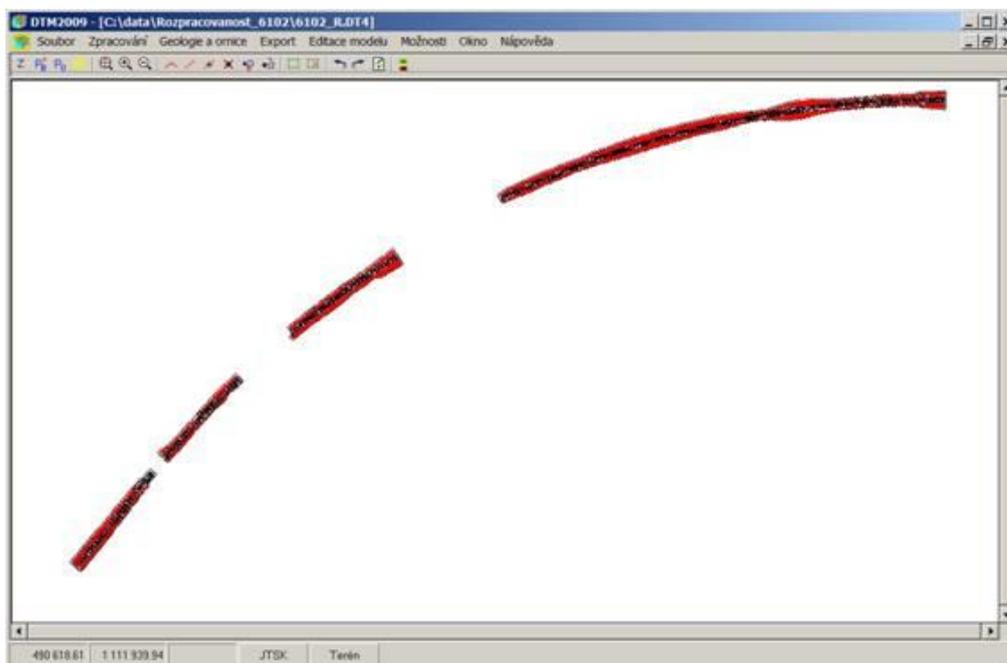
1.1 Program features and principles used in their solution

PROGRAMS RP53A and RP71A - earthworks volume calculations and the percentage of completion

The purpose of this program block is to evaluate the percentage of unfinished construction works. The calculation is performed for selected road project under construction. Calculation can be arbitrarily divided into sections according to user requirements. During the phased continued road construction the common calculations can be repeated with new data.

The basis of process is both a planned road, namely a set of cross sections “align” .SPR (it includes a full description of the existing terrain, topsoil and description of the final state of the corridor) and surveyed current terrain. This surveyed surface is performed usually by air scanning or ground surveys and evaluation in a **digital terrain model**. It is first necessary step to convert such survey to the file format STR (Current Terrain cross sections), built along the same alignment file (.SHB) and the chainage file SSS on the same system as used during creation of the original file “align” .SPR. In the course of further processing is the file (Current Terrain cross sections) named “**alignname.DTMmodelname .STR**”

The scanned area does not have to continuously cover the whole road range. Area(s) can be scanned in a road section(s) only. Between them must arise in the DTM an empty space. This can be achieved by suitable choice of parameters during triangulation of surface network.



The picture shows four non-contiguous sections of unfinished scanned areas in format DTM RoadPAC. The route was named 6102.SHB, unfinished terrain model was named 6102_R and everything is also stored in the file 6102.6102_R.STR. In place of the spaces in the file STR are empty cross sections (terrain points number = 0)

Tasks proceeds further as follows:

- a) Using digital terrain model of unfinished surface (6102_R.dt4) a file of type STR (terrain cross-sections) is created uses basic road alignment name 6102.SHB and a basic system of chainage 6102.SSS. The resulting set file XTR and STR are saved by "save as" with extended name align.dtmmodelname.STR (In our case, 6102.6102_R.STR)
- b) Enters the usual drawing of corridor cross sections in the file 6102.O53 and usual calculation of the final earthworks volumes stored in files 6102.L71, 6102.L71a, 6102.L71b, 6102.SHM (volumes of soil, topsoil, data of Excel type and mass-haul).
- c) For the calculation of unfinished road is used the same input data 6102.V53 and 6102.V71 as in the case of previous run (which is why it is essential that the previous calculations were carried out properly).
- d) Then the input form of program (input data) starts. In appropriate textbox must be filled model name (6102_R) in green-labeled box. This name in next process should not be changed. So is provided a file model.STR involvement in processing. Other data in the text boxes may be adjusted but it is not expected in principle.
- e) Main drawing form is an exact copy of the form of program RP53. However, no data from recent tab "cross section drawing selection" is applied, because in processing of volumes entering (like in program SI71) all cross sections contained in the file SPR - however there is defined unfinished-current terrain.
- f) Input form for earthworks volume calculation is an exact copy of form of program RP71. By the earthworks volume calculations, however, does not change the specified values. Calculated volumes are written into a mass-haul and the final listings and they have no influence to unfinished volumes processing. During unfinished volumes processing are respected omitted sections - the objects, and the desired position of subtotals, the subtotals are also possible to add or remove.
- g) Both forms are alternately switched using button the "Inspection range of unfinished volumes" in the first form and the "Return to earthworks mode" or "Cancel" in the second form. All changes in both input forms are entered into the original input data sets V53 and V71, and if you do not quit calculations over button "CANCEL" are applied in other calculations by programs (RP53 and RP71).
- h) After clicking on the button "CALCULATION" in the first form the appropriate both calculations are performed in the working directory and you can view and evaluate all the results. Any repairs and modifications of input data and repeating of the calculation are possible.

- i) The results of the calculation after clicking on the button “CALCULATION” are: Drawings of the corridor cross-sections with drawn of the unfinished surface profile (model.O53), the appropriate protocol (model.L53) protocol on unfinished volumes (model.L71d) and other standard outputs of the program RP71: align.L71, align.L71 align.L71b and align.SHM. Basic volume tables (file trasa.L71) are complemented by the evaluation of the areas of development in the various cross sections.

Drawing style of corridor cross sections including unfinished earthworks

is same as for program „RP53 – drawing for corridor cross section.“ Surface of unfinished earthworks is added and drawn by violet color in standard drawing of cross section.

Program SI53 draws corridor cross sections in harmony with Articles 29 to 33 of the Czech National Standard (CSN) 73 01 40 - Drawings of roads:

- 1) Terrain surface in cross section and marking of old pavement thickness by thin, continuous line, green colour.
- 2) Stripping of topsoil by thin dashed line, green colour,
- 3) Centreline of proposed road by thin dash-and-dot line.
- 4) Outlines of all adaptations (earthworks), which relate to formation, red colour. For plotting it corresponds to a thick line.
- 5) Outlines of proposed roadway by continuous thin line.
- 6) Cross section centreline is accompanied by terrain level (horizontally) and vertical alignment level (vertically).
- 7) Edge of pavement and carriageway marking is marked by short vertical lines accompanied by shortened level, i.e. units of meter and centimetres (e.g. 1.65). Levels of formation are marked in a similar manner. Detail points of formation can be identified by level and location in a form: 355.20/15.80 - elevation/position. Choice of all such options is based on settings of plotting code no. 8.
- 8) Datum plane is marked by thin continuous horizontal line with description of datum plane level.
- 9) Each cross section is marked by chainage of proposed road that is located at centreline above the cross section.
- 10) Earthworks and accompanying works data will not be specified in cross sections (according to Clause 33 of CSN 73 0140 it is not necessary to specify them in cross sections).
- 11) The Drawing can be complemented by horizontal dimensions of total cross section width (supporting documentation for land acquisitions).

For plotting of cross sections SOME functions may be omitted. Cross sections are displayed in five colours (white/black, red, green, brown and cyan); you can select different pen for each colour. Font of description is standard.

Function of volumes calculation creates files of results L71, L71a, L71b and mass-haul file SHM consistently with the program RP71. These files, except the first one, are not supported with viewing of results.

Moreover, it creates the file L71d. (Unfinished works.) This file is in the form of tables ready to load into Excel.

1.2 Processed data files

Input files:

- .V53 - input data of program RP53A
- .SPR - input cross sections file
- .V71 - input data of program RP71A
- .SHB - main points of horizontal alignment
- model.STR - cross section of unfinished terrain

Output files:

- .model.L53 - listing of calculation and drawing
- .model.O53 - cross section drawing with unfinished surface
- .L71 - protocol of calculation – earthworks volumes assembly added by sub-areas
- .L71a - protocol of calculation – topsoil and additional assemblies
- .L71b - full protocol of results (format for EXCEL)
- .SHM - mass-haul file (connection on RP76 – drawing of mass-haul diagram)
- model.L71d - protocol of unfinished volumes (format for EXCEL)

Local connection file:

- .model.SPR - extended corridor cross section file, added by unfinished surface. This file is created by RP53A and for further processing is not stored.

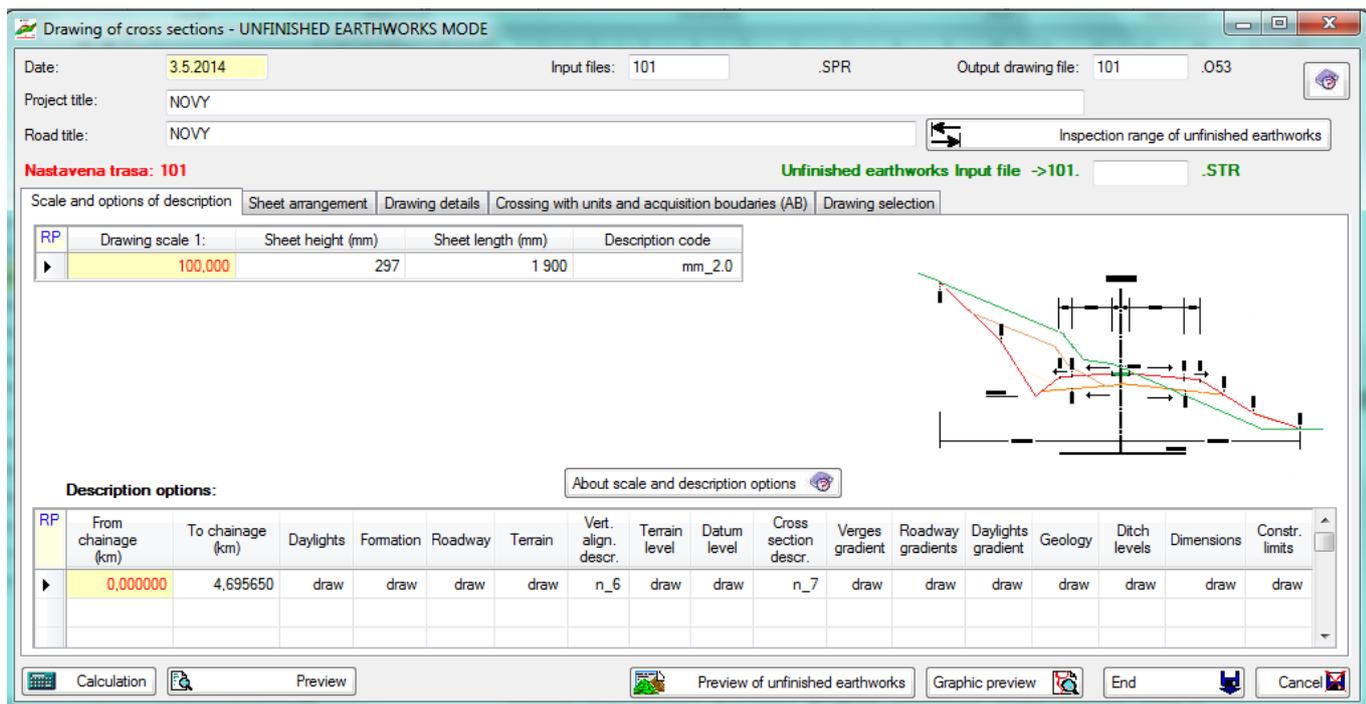
2. Input data of program RP53a

Input data are collected by direct filling in tables and forms displayed on computer screen. Operation of the program is described in detail in ROADPAC manual chapter "Introduction".

2.1 Block of control data

Control data starts by selection of Input data from the main program menu.

This form is very similar to form of program RP53. The textbox for entry of unfinished model name (green color) is added only, and some bottoms are different.



Meaning of individual items:

Date date of input data entry
Project title text that is displayed in headings of reports
Road title ditto

Name of Cross sections input file SPR

If the name is not specified, the program will use default name of the active road from the main menu. This file will be also used as an input of cross sections data.

Name of output drawing O53

Ditto. This file will be used as an output of required drawing.

Unfinished earthworks input file

Max. 8 characters complement the name of the model of unfinished works surface. The following are the names of all files that contain the details of unfinished works: STR, SPR, L53, Q53, L71d.

Button: Inspection of unfinished earthworks range

This button switches the first and second pair of input forms of programs RP53A and RP71A. In both windows can alternately make changes to the input data. Calculation or return, however, can be started from the first form (PR53a) only.

Standard buttons: **Calculation, Preview, Preview of unfinished earthworks, Graphic preview, End, Cancel.**

Calculation click to perform a preliminary calculation of both parts of the job using the current data V53 and V71.

Preview clicking displays the protocol of the preliminary calculation of RP71A - file L71: details of the calculation of the areas and volumes of unfinished works in the various cross sections and standard tables of earthwork volumes.

Preview of unfinished earthworks clicking displays the protocol of the preliminary calculation of RP71A-table volume calculations of unfinished works (align.model.L71d file)

Graphic preview displays the resulting drawing of corridor cross sections in the PRAGOPLOT type file, complete with unfinished surface drawing (align.model.O53 file)

Note: During the calculations arise also a set of results that are not very different from the standard results of the calculations, standard drawing and standard volume tables. See a list of all outputs at the beginning of the manual. These files can be viewed after the final calculation in the user directory, or even during the preliminary calculation in the working directory "Temporary Files".

End Click to repeat the final calculation with current data in the user directory, the current data is stored in the user directory. Specifications form closes, the resulting protocols are already created. They can be viewed only from the main window.

Cancel Click to restore the original status of the input data V53 and V71 in the user directory, the eventual result of the preliminary calculation of unfinished works will be deleted

2.3.1 Parameters scale and descriptions.

The tab is identical to the program SI53, all functions work well and entered data is written to the file V53.

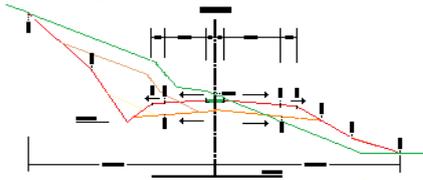
In this tab there are two tables placed. In the first table you specify one row of constants. In the second one user specify codes for plotting, which define extent of a drawing in individual segments. It is necessary to specify at least one row, 10 lines as a maximum. Plotting codes in their aggregate must cover all the file part, from which we require drawings of cross sections to be plotted. If there are no plotting codes specified in some segment, cross sections in this section are not plotted (this can be used for selection from the file; nevertheless, recommended way is to specify selection by chainage block data).

General principles:

- 1) Neither row nor group of rows need to be sorted.
- 2) Parameters specified by chainage pair, i.e. by beginning and end of segment, are valid including chainage limits. Segments specified in one table may overlap. There are following rules for determination of validity of specified parameters:
 - a) Rows with greater chainage of the beginning of valid segment are preferred.
 - b) In case of equal segment beginnings, the rows with smaller chainage of section end are preferred.

Scale and options of description

RP	Drawing scale 1:	Sheet height (mm)	Sheet length (mm)	Description code
▶	100.000	297	1 900	mm_2.0



Description options:

RP	From chainage (km)	To chainage (km)	Daylights	Formation	Roadway	Terrain	Vert. align. descr.	Terrain level	Datum level	Cross section descr.	Verges gradient	Roadway gradients	Daylights gradient	Geology	Ditch levels	Dimensions	Constr. limits
▶	0.000000	4.695650	draw	draw	draw	draw	n_6	draw	draw	n_7	draw	draw	draw	draw	draw	draw	draw

Table scale of drawing:

Meaning of individual items:

Scale is number of drawing scale. If zero is specified, the program will replace it by a default value 100. (Scale 1:100).

Sheet height specified in mm. It is limited by size of a plotter. Default = 297.5 mm.

Sheet length specified in mm. It is limited by size of a plotter. Standard = 1900 mm.

Description Code of font size Code of used font size. Values:

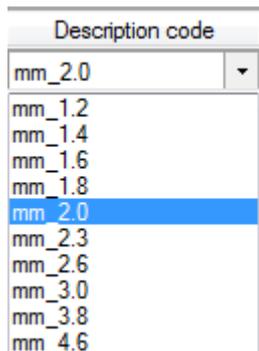


Table option of drawing by codes from 1 -15:

Chainage segment from (km) means chainage of beginning of a segment of drawing codes validity for a drawing specified in a row in km.

Chainage to (km) means chainage of end of segment in km. If zero is specified, the codes will be valid in a single cross section only.

Description options are requests describing, what should be plotted in cross sections covered by given segment:

- In general: 0 = plotting not required
- 1 = plotting of below specified cross section parts is required

- K1: Daylights.
- K2: Formation.
- K3: Roadway.
- K4: Terrain.

K5: Levels of vertical alignment and number of decimal places of levels description (mm or cm):

X number of decimal places of vertical alignment level

Y number of decimal places of edges level

Value of code (5)	Vert. alignment dec. pl.	Carriageway dec. places	With profile grade mark
n_0	Without description	2	no
n_1	3	2	no
n_2	2	2	no
n_3	3	3	no
n_4	3	2	yes
n_5	2	2	yes
n_6	3	3	yes

K6: Terrain elevations.

K7: Datum plane.

K8: Description of elevations: Edge of a pavement and edge of a carriageway marking, edge of formation, detail points.

Permitted values of K8 code are 0 to 7 with following meaning:

Value of code (8)	n_0	n_1	n_2	n_3	n_4	n_5	n_6	n_7
Carriageway edges levels	no	yes	no	yes	no	yes	no	yes
Formation edges levels	no	no	yes	yes	no	no	yes	yes
Daylights edges levels	no	no	no	no	yes	yes	yes	yes

K9: Verge gradient

K10: Roadway gradients

K11: Daylights gradients.

K12: Geology.

K13: Ditch levels

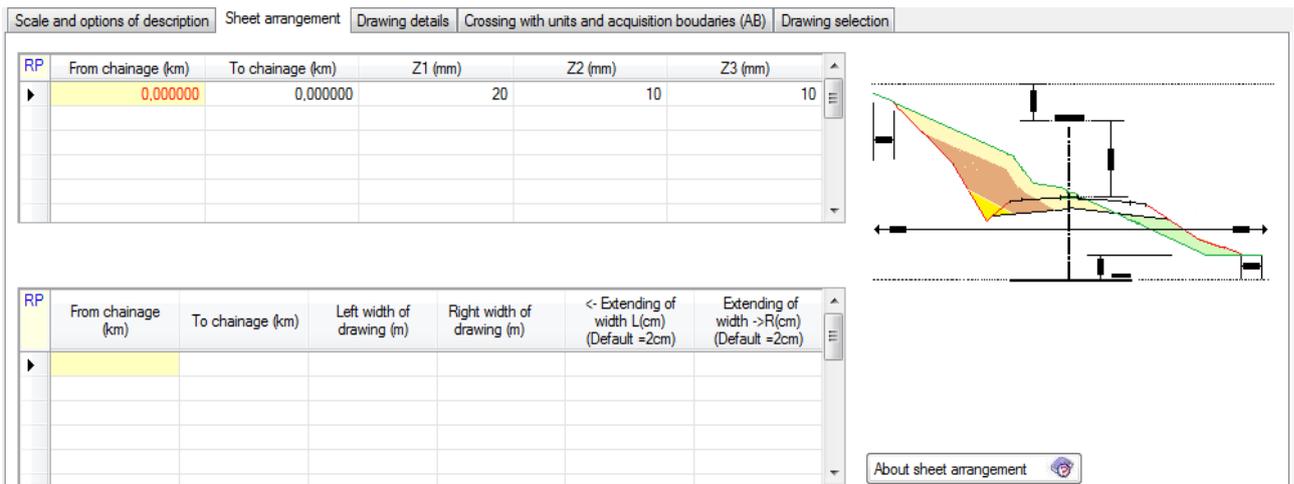
K14: Roadway dimensions.

K15: Dimensions of construction limits.



2.3.2 Parameters –Height and width of section zones

Table located in SHEET ARRANGEMENT tab is designed for detailed specification of space arrangement of one cross section in drawing. If the table is empty, the program will use default values of zones Z1 to Z3. If smaller than standard values are specified, the program will replace them by default values. See next page.



2.3.3 Table layout of sheet height

Meaning of individual items:

Segment from is chainage of beginning of section of parameters validity from km

Segment to means chainage of end of validity section to km

Heights of zones specified in mm; it concerns following types:

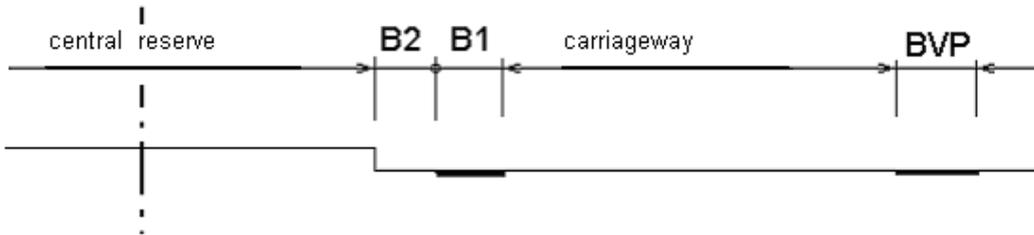
Z1 Zone above a chainage description. Default = 20 mm.

Z2 Zone between a chainage description and a cross section drawing.

Default = 10 mm.

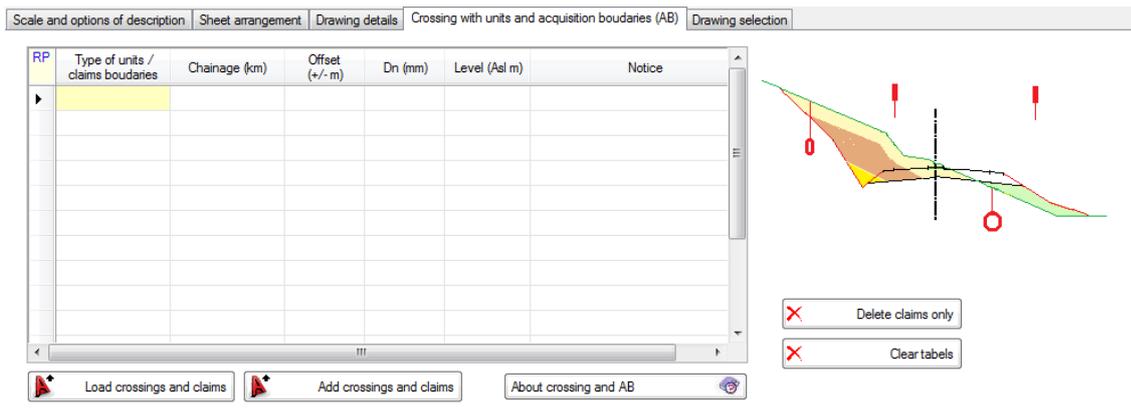
Offset of inner edge of a carriageway marking strip in cm, i.e. distance of an inner edge of a carriageway marking strip from an edge of a central reserve.

Figure 1:



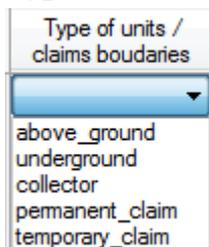
2.3.5 Crossing with units and acquisition boundaries

On next tab is placed table intended for drawing specification of crossing units or land acquisition marks respectively.



Meaning of individual items:

Type of unit/ claim boundaries, user select required option



Chainage means chainage of relevant cross section in km

Offset (+/-m) means transverse position of item in relevant cross section

Dn (mm) Diameter of unit if it is an underground unit

Level (m) Level of unit if it is an underground unit

Notice Arbitrary text

In RoadCad is a built-in function to generate crossing with units in longitudinal profile and with cross sections of the alignment (based on the plotted units networks, plotted alignment and plotted cross sections according to the .SSS file - the system of chainage. Function creates a file Align.css (data for cross sections) and align.crs file (data for longitudinal profile). On forms of RP53 and RP34 programs is placed buttons " Load crossing and claims" that reads (.css .crs) files, if any, and they are included in the input data, V53 and V34, and also in the dialog table. This makes it possible not only to draw markup of crossing, but also their eventually manual modification by the dialogue.

A similar method as crossing of units are also enters the drawing of boundaries temporary and permanent land claim in the cross section drawings. To file .Css from the layout are intersections of cross section with boundary of permanent and temporary claim generated, as it is defined by the coordinates, and these boundaries are again transferred to the input data, the RP53 . The dialog is again possible to make their modification. In cross sections drawing are then drawn by special mark - single or double flag.

Load crossing and claims.

This will erase the existing data of the crossing and claims, and replace them with new ones from the "align." .CSS, file if the file exists.

Add crossing and claims

A similar function, but the original data file V53 retained (may be a previously written data directly into the tables).

Delete claims only

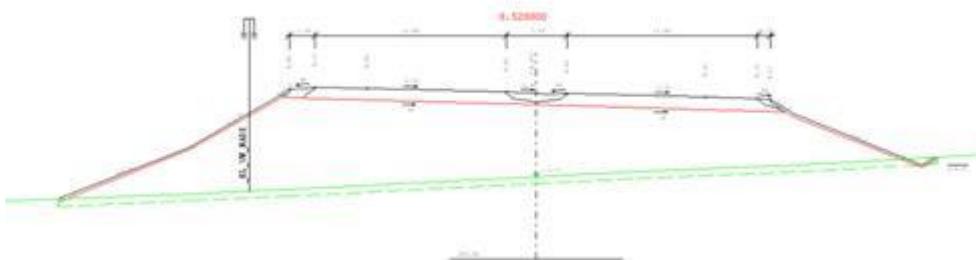
It prepares the table before loading claims. The claim data are deleted. The data crosses remain.

Clear tables

It prepares the table before loading: all data in the table is deleted

Intersections with the cross sections is bound to set of chainages .SSS (used while is generating the file .CSS). If there is a change in the chainage system (e.g. cuts to thicken), it would have to generate .CSS file again.

Sample drawings of units crossing



3. Input data of program RP71A

The form is identical to the program SI71, all functions work well and entered data is written to the file V71. Only a reduced number of buttons to return back to the first form “Return to EARTHWORKS MODE” and “CANCEL” is available

Meaning of individual items is as follows:

Date of input data entry

Project title and road title arbitrary text that is displayed in headings of protocols and listings.

Name of Input file (Corridor Cross section file .SPR)

Names are not required. If the name is not specified, the program will use standard name 'active road' from main menu. In case that the name is defined in proper textbox, then this name has preference to the standard name of "Active Road".

Name of Input file (geometry points of horizontal alignment .SHB)

It may not be specified. In this case no name of file is specified, program takes over active name of input file from main menu. File is used in case of computation mode with respect to curvature of alignment is under consideration only.

Notice: Below are files marked 'align' and 'extension', whereas as 'align' specified name on program form or 'align' specified in main menu is meaning.

Computation with influence of alignment curvature...

Check in checking box „**Make calculation more precise**“. If this option is checked, option is validate for all items and all output values. Distances of items are during calculation considered in its center of gravity.

3.1 Block of parameters

This block consists of two tables, which are situated on two tabs directly on a form sheet. (See next picture.) In table RANGE OF TASK there is a request for specification of calculation range. In table SELECTION OF OBJECTS can be specified location of engineering structures or other anomalies. In table “Totals with potential addition and subtraction” can be specified requests for subtotals and changes of cut-fill summary.

Active road is 101

RP	Range from (km)	to (km)
	0,000000	4,695650

Objects and sub-totals Initial values of totals

Bridges (objects) with code			Totals with potential additions and subtractions							
RP	From (km)	to (km)	Summation reset ?	RP	Chainage(km)	Cut (m3)	Fill (m3)	Topsoil stripping (m3)	Topsoil spreading (m3)	Unsuitable soil (m3)

Explanatory notes:

In the table “**Range of task**” must be specified range of task by road chainage of beginning and end in kilometers. Existence of the chainage in SPR file is required. (The program cannot create cross section in given chainage by interpolation of two adjacent cross sections). Such data will ensure calculation only in certain section of a road.

Table **Bridges (objects) with code** is used to specify position of engineering structures along a road. In such segment range, cut-fills calculation will be ignored. In case of larger engineering structures, which limiting the haul of soil (e.g. river), can be specified request for summary reset. One row can hold just one engineering (bridge) structure. Maximum of submitted engineering structures is 20.

Chainage of beginning and end in kilometers in this table; they define a segment, where an omission of cu-fill calculation is requested. In this case the program will perform interpolation of data based on two adjacent cross sections both for data concerning soil and data concerning topsoil.

Code for summary reset: [0/1]

- 0 resetting of summaries is not required
- 1 resetting of summaries is required. In this case, all summaries in chainage will be sets to zero in the end of engineering structure.

It is possible to request listing of summaries (subtotals) in table “**Totals with potential addition and subtraction**” in proper cross section, which is included in SPR file and possibly perform changes of totals in below stated items. This can be used for adjustment of earthworks and topsoil balance with effect of engineering structures constructed in relation with currently calculated road. One row can hold just one requirement. Maximum of submitted rows is 20.

Meaning of individual items is as follows:

Chainage Where listing of cut-fills with possible cut-fill changes of summaries is required. Changes of subtotals are specified by following figures:

Cut volume of cut in m3

Fill volume of fill in m3. It is necessary to specify always a negative value.

Topsoil stripping volume of topsoil stripping in m3.

Topsoil spreading volume of topsoil spreading in m3. It is a sum of topsoil for arrangement of slopes and a central reserve

Unsuitable soil volume of unsuitable soil in m3

On the tab “**Initial volumes of totals**” of a form you can specify individual values that enable set values in summaries at the task segment beginning. Values are not specified if all summaries start with zero. Summaries consist of following items:

Cut (m3)	<input type="text" value="0.0"/>	Fill (m3)	<input type="text" value="0.0"/>	Mass haul diag. ordinate (m3)	<input type="text" value="0.0"/>	Subbase improvement layer 6 and 7 soil categ.	<input type="text" value="0.0"/>	(m3)
Categ.2 soil (m3)	<input type="text" value="0.0"/>	Categ.3 soil (m3)	<input type="text" value="0.0"/>	Categ.3 soil (m3)	<input type="text" value="0.0"/>	Categ.5 soil (m3)	<input type="text" value="0.0"/>	(m3)
Stripping of topsoil total (m3)	<input type="text" value="0.0"/>							
Fill slope finishing (m2)	<input type="text" value="0.0"/>	Topsoil spreading on slopes (m2)	<input type="text" value="0.0"/>					
Topsoil spreading on planes (m3)	<input type="text" value="0.0"/>	Unsuitable soil (m3)	<input type="text" value="0.0"/>					
Subsoil compaction (m2)	<input type="text" value="0.0"/>	Cut slope finishing (m2)	<input type="text" value="0.0"/>					
				Formation arrangement (m2)	<input type="text" value="0.0"/>			
				Topsoil stripping(m3)	<input type="text" value="0.0"/>			
				Claimed area (ha)	<input type="text" value="0.0"/>			

Earthworks volumes at beginning of road:

Cut is volume of cut in v m3

Fill is volume of embankment in m3 and is always specified as a negative value

Ordinate of Mass-haul diagram is a figure about mass-haul diagram in m3 (positive - overage, negative - deficiency)

Subbase improvement layer volume

Next items at beginning of road:

Categ2. cut volume in 2nd class of soil classification in m3

Categ3. cut volume in 3rd class of soil classification in m3

Categ4. cut volume in 4th class of soil classification in m3

Categ5. cut volume in 5th class of soil classification in m3

Categ67. cut volume in 6th and 7th class of soil classification in m3

Topsoil stripping volume of stripped topsoil in m3

Total volume of Topsoil total volume of topsoil in m3

Topsoil spreading on slopes	area of topsoil spreading in m2
Topsoil in central reserve	area of central reserve and unpaved shoulder topsoil spreading in m2
Embankment slope	area of finishing of embankment slope in m2
Sloping of a cut	area of a cut of slope finishing in m2
Modification of formation	area of modified formation in m2
Unsuitable soil	volume of unsuitable soil in m3
Subsoil compaction	of consolidated subgrade under embankment in m2
Area of land acquisition	area of a land occupied by road bed in ha
Thickness of active zone	in meters; is specified uniformly for entire road. If zero, active zone is not considered.

Computation with influence of alignment curvature

While proper option is checked program reads active horizontal alignment and volumes are then enumerated with respect to curvature of alignment: in range of all arcs are distances within items enumerated at average gravity centers of each item. If gravity center lay near center of current arc the distances will be shorter and vice-versa. Mostly is those distortion insignificant, but where are used small radiuses (junction branches) and where often left half of pavement is missing or is limited (side limits) are differences significant, indeed.

3.2. Output listings

The standard log of calculation (drawings) and a standard set of volumes are described in the basic program. (RP71) Here we describe the differences from these results only.

Earthworks volumes file align.L71

File is divided into three parts. The first and third part is virtually identical to the volume calculations listings of program RP71.

The first part contains the reports of the input file and an annotated copy of the input data. The third part contains standard earthworks volume tables - the areas and volumes of excavations, embankments, transversal movements, volumes itemized by categories of soil excavation and mass-haul values.

The second part consists of unfinished surfaces computing in cross sections - itemized:

Chainage: 129.250000

	Fill	CUT
Total area:	110.800	.356
Finished:	108.799	.310
Unfinished:	2.001	.046
Extra work- in cross section:	2.542	.210

Extra work- out of cross section:	.000	.398
Extra work total:	2.542	.607

Finished and unfinished figures are calculated by integrating its surfaces and corresponding drawings where the unfinished surface polyline is drawn in purple. Likewise cut extra works and fill extra works in cross section (In range of the width of the cross-section left to right) are calculated by integrating its surfaces. Cut Extra works and fill extra works outside profile are calculated by approximate formula in those cross sections only where the boundary profile height difference between the original terrain and focused unfinished terrain greater than 0.25 m, minor differences are ignored. For the purpose of this program is cut and fill extra work insignificant. It's volumes are in no way get to the final calculation of earthworks. They will be removed when road construction is over. They may also occur during the establishment of interim borrow pits of topsoil, or service roads.

In the final tables of unfinished works (file L71d) are delegating the sum of these values within cross section + beyond the cross section.

File of unfinished works model.L71d

The file contains the same values arranged in tables of areas and volumes, which have the same structure as final tables of volumes and are adjusted to retrieve Excel. The tables are arranged for continuous segments their boundaries are determined by none size-zero cross sections in DTM of unfinished surface, partly by entered subtotals and objects in the input data fileV71, which is also in these tables respected.

The tables contain the following information in columns:

Chainage

Finished (PLV1) Cut extra works (PLV2) Missing (PLV3)
Cuts

Finished (PLN1) Fill extra works (PLN2) Missing (PLN3)
Fill

Data are expressed in m³ and in %, relative to a projected 100% volumes.

Finished and Missing items give the sum of the value of excavations or embankments, equal to items in the final project state.

3.3 Plot file - drawings

Output file PLOTFILE contains drawings of individual cross sections situated vertically so that their centrelines are on a vertical. For arrangement of their layout in a drawing you can use program ARX1 CAD system (e.g. AutoCAD/BRICSCAD). Single PLOTFILE file can include up to 512 images – cross sections. As the limit of file SPR file (cross sections) is up to 8,000 cross sections, the program creates a new (additional) PLOTFILE file always after reaching 512 cross sections. Its name is automatically

derived from the name of the first PLOTFILE file "road.053" so, that the name "road" is extended by character 1, 2, ... A, B, etc.

Resulting or modified drawing can be processed (view or plot) by PRAGOPLOT system directly from ROADPAC menu or after that. Part of the system is an export to AUTOCAD/BRICSCAD format DXF. For plotting on a plotter you can use various pens that can be assigned colours on the display according to following table.

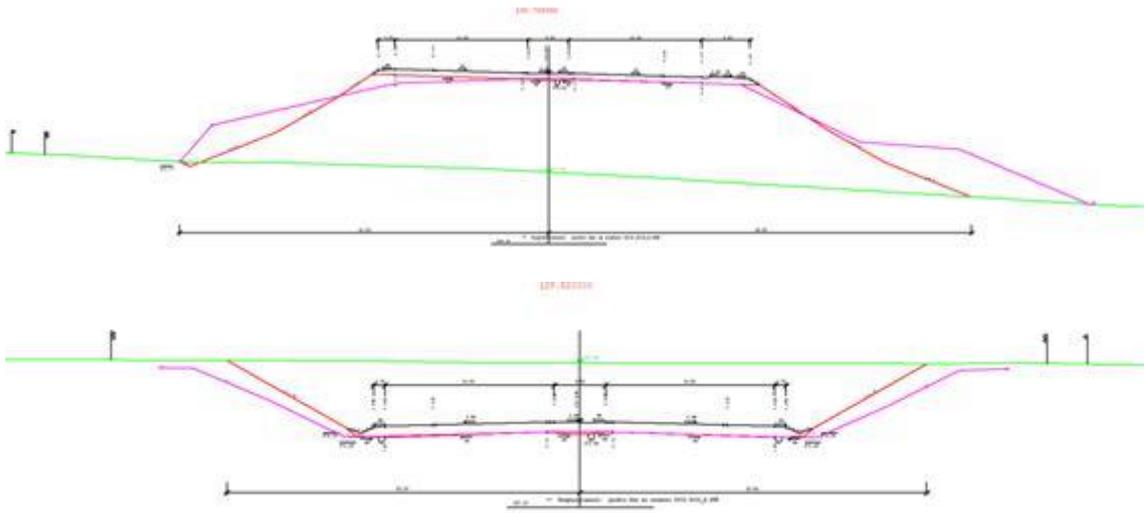
If the export to AUTOCAD is initiated directly from Roadpac menu, the program automatically assigns colours according to following table. If the export is initiated directly from PLOT5 program, when the drawing is displayed, you can set assignment of colours individually; this assignment can be saved. PLOT5 program uses different default values for colour assignment than Roadpac system.

Meaning thickness of a pen	Display	A-cad according to Roadpac	A-cad according to PLOT5
basic descriptions and roadway - thin line	white no. 15		7
roadbed, chainage, descriptions - thick line	light red no. 12		1
terrain and topsoil stripping	light green no.10		3

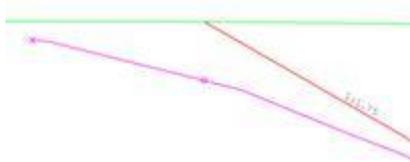
The following examples of drawings of the cross-sections of dual carriageway road under construction demonstrate ending of drawings on the side boundary of the cross-section: an addition to a common point at the top left, cutting the border to cut right at the top and bottom of both sides.

Následující ukázky kresby příčného řezu dvoupruhové komunikace s rozpracovaností demonstrují ukončení kresby na boční hranici příčného řezu: doplnění do společného bodu vlevo nahoře, uříznutí na hranici řezu vpravo nahoře a obě strany dole.

Unfinished works surface polyline is shown in violet.



Detail of unfinished surface polyline ending: the surface polyline last point is marked by cross, and by circle is marked counted boundary point of the cross section (vertically above or below the last point of the H-terrain and H-coridor)



4. *Warning messages*

The program differentiates between fatal errors, which usually cause program termination with unusable results and formal errors that are handled by alternate solution. Fatal errors are marked by *** in reports and formal errors are marked by **. The following table contains list of warning messages and comments to alternate solution:

Error message text	Alternate solution
*** Leading line is missing * 71	
*** Inaccessible type of leading line: aaa	
** First line ignored	
*** Between leading data read no marked line *	
*** Premature end of data	
** End line 999 is missing	
*** Line 711 is missing	
** Inaccessible type of line nnn ignored	
** Number of chainage, where subtotal is entered, is greater than 20, other ignored	
*** The line read with error (description of line)	

** Incorrect layers depths	
** Incomplete terrain on the left in chainage km: nn.nnnnnn	
** Incomplete terrain on the right in chainage km: nn.nnnnnn	
*** Program error - PI of filleting not found	