



ROADPAC'14

PROGRAM RP45

Setting up of pavement grading details

User Guide

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1. Introduction

Program “Setting-up of pavement grading details” is a part of program system ROADPAC. The program is an instrument to calculate absolute levels and position of detailed points of pavement in cross sections defined by cross section arrangement file (.SKR). Individual points are defined by horizontal offset from reference points and by vertical offset either from pavement surface or reference point. Calculation of point levels is performed from cross section arrangement file, converting to absolute elevations system. That is the reason why the vertical alignment file (.SNI) is necessary to be available before starting the calculation. For calculation of Y, X, Z coordinates of detailed points is necessary to dispose with horizontal alignment file (.SHB)

The calculated output is a listing that includes levels of detailed points in cross section with the distances from the centreline. In case of horizontal alignment file specification the listing includes coordinates Y, X, Z of detailed points. For one program run at most 8 pavement construction layers can be given. The output can be used for setting up of particular pavement courses and also for guiding of a finisher.

1.1 Processed data files

Input files:

- .V45 - input data
- .SNI - vertical alignment file
- .SHB - horizontal alignment file
- .SKR - cross section arrangement file

Output files:

- .L45 - Output listing

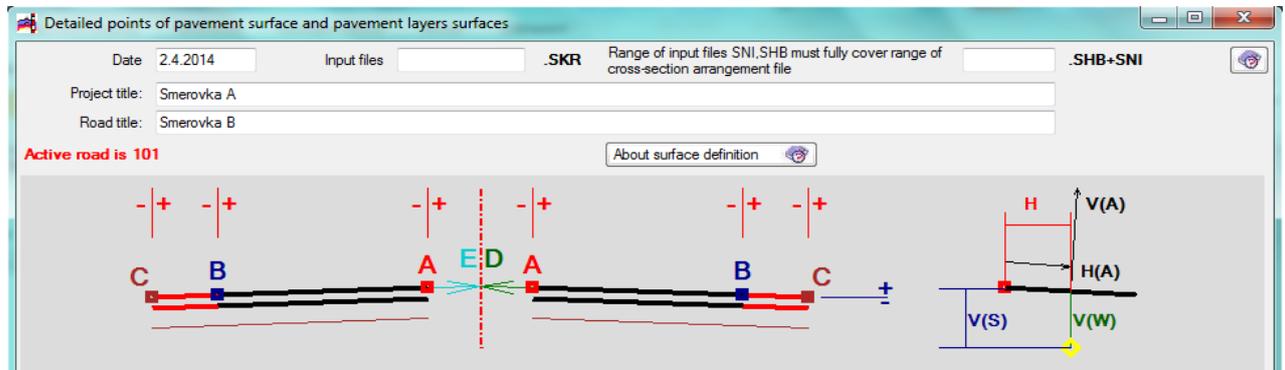
2. Input data

The input data are provided by filling and editing of tables or to click on controls placed on forms appearing on the computer display. Display operation is described in the user guide. See chapter Introduction. Forms usually incorporate common control part, graphical part if it is useful and input data part. A Picture box, if is placed on form, serve to display immediate results.

Input data of program “Setting-up of pavement grading details” is prepared using of 16 tables placed on 8 tabs gradually viewed on display. In case of specification less than 8 construct layers are any of tables and its rows omitted.

2.1 Block of control Data

Is shown by click on INPUT DATA button from main menu as following:



Meaning of individual items is following:

Date is date of input data specification

Project Title and Road Title arbitrary text will be written into headers of output listings.

Vertical Alignment/ horizontal alignment file and **cross section arrangement** file names need not to be specified. In case that file name is not given, the program takes over the standard name 'active road' from the main menu.

2.2 Block Layers Definitions

Block includes 8 tabs. Each of them allows define points for one pavement course layer in selected segment of the road - in two tables:

All tabs have the same form:

Top surface points 1.interface points 2.interface points 3.interface points 4.interface points 5.interface points 6.interface points 7.interface points 8.interface points

Range of task must be inside interval >= range of cross-sections arrangement file<=

RP	From (km)	To (km)	Name of surface /interface (Arbitrary TEXT)	Step (m)
	0,000000	4,624378	Surface	5,00

RP	Side	Point name	Origin point (A-E)	Code of vertical shift (S/W/A)	Horizontal shift H(A)[+/-m]	Vertical shift V(A)[+/-m]
	R	Poi C	C	W	0,00000	0,00000
	R	Poi A	A	W	0,00000	0,00000
	L	Poi A	A	W	0,00000	0,00000
	L	Poi c	C	W	0,00000	0,00000

Output style:
 Standard output
 Points array (n Y X Z).SOU

! Points D and E option is useful for carriageways with median only. Vertical shift type is always set W. Horizontal shift (+) is measured from inner edge of carriageway towards CL

In the upper table there are specified next values:

Chainage From, Chainage To

Chainage defines an interval where are processed cross sections elaborated in cross section arrangement file (.SPR). Both assigned values are in km. When

value of both items is 0 all cross section in range of cross section arrangement file will be processed.

Surface Name is the arbitrary text. At most 54 characters can be entered.

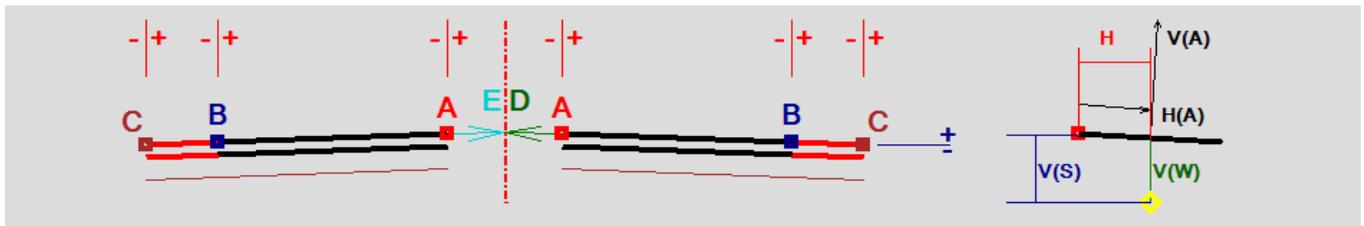
Step of chainages in segment (m) is the density of individual chainages in specified task range. Value is valid for all specified surfaces.

In second table there are defined detailed points each point on one row. The point can be defined for the left side of the road, for the right side of the road or for both sides (symmetrically). In one table can be specified at most 12 points (6 on the left and 6 on the right side). 6 values can be specified on one row:

Validity of the point position relative to centreline is specified by code:

- L** validity for left half of the cross section
- R** validity for right half of the cross section
- Blank validity for both half of cross section

Point Name up to 8 characters can be specified



Code of reference Point

By this code is specified the reference point. It is origin of horizontal offset distances. Specification by symbol A or B or C has following meaning:

- A** reference point is either the inner carriageway edge (dual carriageway roads) or centreline (single carriageway road)
- B** reference point is the outer carriageway edge
- C** reference point is the outer edge of roadway or hard shoulder
- D** reference point is point constructed by extension of current crossfall towards center line.

If the point C exists and a side limit is defined between points B and C, then point C is moved to the side limit position. Detailed points laid behind a side limit not exist and stars are printed in listing. Generally program replaces not existing points of roadway (e.g. pavement edge-point B or shoulder-point C) by point at side limit. This point of side limit has the same properties as the point B or C and can be referred to.

W/S/A Code of vertical offset type

Code specifies how the vertical offset is measured. It is specified by code W or S with following meaning:

- W** vertically from pavement surface level in defined point position
- S** vertically by absolute value from chosen relative point A or B or C

A by absolute value from chosen relative point A or B or C perpendicularly to current surface crossfall

Horizontal offset H (A)

Is the offset distance of defined point from relative point A or B or C. Specified in meters.

Value sign has following meaning:

- + Offset is measured outwards centreline
- Offset is measured towards centreline

In case of code A is offset measured along current surface

Vertical offset V (A)

Is an absolute vertical distance between the defined point and the related point (in case of code S) or a vertical distance between defined point and surface point level (code W). The sign of value has following meaning:

- + Point is derived by shifting upwards
- Point is derived by shifting downwards

In case of code A is vertical distance measured perpendicularly to current surface crossfall.

3. Description of Output Listings

The output listing is generated in the course of computation in the file "road".L45. Those listings can be affected by the common menu for RoadPAC programs which has no graphical output.

Chainage (km)	Point	Offset (+/-)	Y	X	Z
0.000000	Poi C	11.750	631261.392	1193301.495	228.184
0.005000	Poi C	11.750	631256.407	1193301.112	228.100
0.010000	Poi C	11.750	631251.421	1193300.729	228.017

Output listing includes following information:

- 1) Protocol about used files 'road'. SNI and 'road'. SHB
- 2) Protocol of computed points in computed cross sections. Output files contents absolute coordinates Y, X and Z of all specified points. Output file suppose further processing in any spreadsheet software. (EXCEL)

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 * 45	
*** Inaccessible type of leading line: aaa	
** First line ignored	
*** Between leading data read no marked line *	
*** Early data end	
** Inacceptable line type ignored: (copy of line)	
** Incorrectly specified chainage of segment (copy of line)	
** Incorrectly specified side of cross section (copy of line)	
** Incorrectly specified code of base point (copy of line)	
** Incorrectly specified code of elevation measuring (copy of line)	
** In section specified more than 6 points nnnn, line ignored	
** Line ignored (copy of line)	
** Line read with error (copy of line)	