



United States
Department of
Agriculture

Soil
Conservation
Service

210 Walnut Street
693 Federal Building
Des Moines, Iowa 50309

July 31, 1990

NATIONAL ENGINEERING MANUAL
210-V-AMENDMENT IA29 - PART 545

SUBJECT: APPROVED COMPUTER PROGRAMS

Purpose. This notice transmits pages IA545-25(1) through 25(9)

Effective Date. This amendment is effective upon receipt.

Explanation of Changes. This amendment provides an updated listing and description of approved calculator and computer programs for use in Iowa.

Filing Instructions.

Remove Page 5

IA545-25(1) through 25(5)
(Amend. IA24, March 1987)

Insert Page 5

IA545-25(1) through 25(9)

This amendment should be noted on the Iowa Supplement Tabulation Sheet.


J. Michael Nethery
State Conservationist

Attachment

A
F
EN2
RC&D
MNTC - 5
SCE - Midwest States



The Soil Conservation Service
is an agency of the
Department of Agriculture

SUBPART B - EXHIBITS

IA545.15

§IA545.15 Reference Listing of Calculator and Computer Programs Approved for Use in Iowa

<u>Computer/ Calculator</u>	<u>Program Name</u>	<u>Description</u>	<u>Version</u>	<u>Date</u>	<u>Programmer</u>
HP41CV/CX	1. AREA	Computes area & perimeter length		060685	Nelson (IA)
	2. AREA	Computes area & perimeter length		032587	Nelson (IA)
	3. DITCH	Mannings formula		072486	Nelson (IA)
	4. DN22	Rock Chute Design		033186	Struthers (IA)
	5. DRY DAM	Full Flow Pipe Structure Design		082184	Jensen (IL)
	6. FILL YD	Average end area earthfill		060182	Deckerd (MO)
	7. P/E RTG	Principal & emergency floodrouting for Iowa		103086	Droessler (IA)
	8. STABIL	Determines depth of flow in trapezoidal channel		100384	Andreas (IL)
	9. TSTOR	Terrace storage		081682	Nelson (IA)
	10. TSTOR	Terrace storage		022084	Nelson (IA)
	11. TSTO	Terrace design		032288	Nelson, Godwin (IA)
	12. USLE	Computes soil loss		082782	Nelson (IA)
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WANG	1. OMNI	Omni utilities	2.1	0486	(IA)
	2. POND <u>1</u> /	Missouri pond program		0785	(MO)
	3. YARDCOMP	Double end area earthfill			Rohlf (IA)

1/ Approved only for ponds which do not require IDNR permits. May also be used for preparing preliminary estimates for I & E's.

IA545-25(1)

(210-V-(NEM), Amend. IA29, June 1990)

SUBPART B - EXHIBITS

IA545.16(a)(10)

§IA545.15 Reference Listing of Calculator and Computer Programs Approved for Use in Iowa

<u>Computer/ Calculator</u>	<u>Program Name</u>	<u>Description</u>	<u>Version</u>	<u>Date</u>	<u>Programmer</u>
AT&T	1. OHIO Programs			040990	(OH)
		RCN	3.0		
		638's	2.0		
		Waterway	4.0		
		Yardage	1.44		
		Hydraulics	2.0		
		Animal Waste	1.1		
		Water Surface Profile	1.0		
		Note Reduction & Plotting	2.2		
	2. TERRACE	Terrace design	3.0	040990	(IA)
	3. EFM 2	Hydrology	.10	0390	(NHQ)
	4. Grassed Waterway	Waterway Design	1.12		(NHQ)
	5. HYDRO- YARDAGE	Pond design	3.0	062689	(IA)
	6. Pond 1/	Missouri Pond Program	0785		
	7. TR-55	Urban Hydrology	2.0		(NHQ)
	8. TOTAL STATION UTILITIES	Survey Utilities	6.0	062790	(IA)
	9. SCS MENU	User Menu	3.0	040990	(IA)
	10. Design Plus	Quantities	3.1.09		(Comm.)

1/ Approved only for ponds which do not require IDNR permits. May also be used for preparing preliminary estimates for I & E's.

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(210-V-(NEM), Amend. IA29, June 1990)

SUBPART B - EXHIBITS

IA545.15

§IA545.15 Reference Listing of Calculator and Computer Programs Approved for Use in Iowa

<u>Computer/ Calculator</u>	<u>Program Name</u>	<u>Description</u>	<u>Version</u>	<u>Date</u>	<u>Programmer</u>
	11. CadServe Retriever	Contours	5.0		(Comm.)
	12. L.I. Contour	Contours	2.0		(Comm.)
	13. VersaCad 386	Drafting	5.4		(Comm.)
	14. RIPRAP	Rock Chutes		0486	
	15. DAMS2	Structure Routing		020189	(NHQ)
	16. TR20	Flood Routing	2.0	0190	(NHQ)
	17. WSP2	Water Surface Profiles	111489	(NHQ)	
	18. TR66	Dam Breach Analysis		0887	(NHQ)

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PART 545 - ENGINEERING TECHNICAL MATERIALS

IA545.16

§IA545.16 Description and Limitations of the Approved Iowa Programs

(a) HP41 CV/CX Programs

1. AREA 060685 by Nelson (IA)
 - computes the area and perimeter length of an area described by survey shots
 - computes the distance between two points described by survey shots
 - requires 2 cards; 70 registers; SIZE = 007
2. AREA 032587 by Nelson (IA)

same as 060685 Version plus capability of entering x and y coordinates from an Omni survey
requires 3 cards; 88 registers; SIZE = 007
3. DITCH 072486 by Nelson (IA)
 - computes a variety of variables in Mannings Equation, given the remaining variables
 - computes for a trapezoidal channel:
 - depth and capacity
 - depth & bottom width
 - slope
 - velocity and capacity
 - requires a printer
 - requires 5 cards; 158 registers; SIZE = 011
4. DN22 033186 by Struthers (IA)
 - designs a rock chute base on the procedures in Design Note 22
 - requires 4 cards; 128 registers; SIZE - 015
5. DRY DAM 082184 by Jensen (IL)
 - computes the pipe capacity and the emergency spillway
 - elevation for a full flow pipe structure
 - temporary storage is not considered in the design
 - allows a hood/canopy inlet or pipe drop inlet
 - requires 7 cards; 214 registers; SIZE = 017

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6. FILL YD 060182 by Deckerd (MO)

- computes earthfill yardage using the average end area method from a cross-section on the centerline of the dam
- the earthfill template may be changed and the yardage recomputed
- handles one berm
- handles 40 stations on the cross-section
- documentation states that negative stations should not be used
- no settlement is included
- the user must be careful when selecting cross-section points, since the program will not interpolate between the points
- requires 3 cards; 83 registers; SIZE = 065

7. P/E RTG 103086 by Droessler (IA)

- routes both the principal and emergency spillway storms and computes the emergency spillway elevation, bottom width, exit slope, and top of fill elevation
- adjusts runoff for terraces
- accounts for aerated sediment storage
- follows Iowa procedures and specifications
- required 9 cards; 265 registers; SIZE = 044

8. STABIL 100384 by Andreas (IL)

- computes depth of flow for a given Q in a trapezoidal channel
- computes area, wetted perimeter, hydraulic radius, and velocity in a trapezoidal channel
- requires 4 cards; 108 registers; SIZE = 012

9. TSTOR 081682 by Nelson (IA)

- revised from the Missouri program (STOR (1) 021282) for Iowa
- designs broadbase, grassed backslope, and narrow base terraces
- stakeline is in the channel
- computes natural storage only
- no yardage computations
- requires 5 cards; 150 registers; SIZE = 034

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SUBPART B - EXHIBITS

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10. TSTOR 022084 by Nelson (IA)
 - provides for variable frontslope (doubles the inputted frontslope when Z exceeds 5:1)
 - computes natural storage only
 - computes yardage in the storage section only
 - staking table can be printed, if desired
 - requires 8 cards; 254 registers; SIZE = 065
11. TSTO 032288 by Nelson, Godwin (IA)
 - revision of 3 previous versions to reduce execution time and correct errors
 - includes cut and fill storage and yardage for level terraces
 - includes yardage outside of the storage section
 - provides for variable frontslope (add 5 ft. to the frontslope when Z is steeper than 5:1)
 - requires 8 cards; 246 registers; SIZE = 072
12. USLE 082782 by Nelson (IA)
 - computes the average annual soil loss in tons per acre per year
 - computes maximum "C" factor and maximum slope length to reach "T"
 - requires 6 cards; 183 registers; SIZE = 018

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(b) **WANG Computer Programs**

1. OMNI Utilities
 - dumps survey information from the Omni Total Station Surveying Instrument
 - prints survey on Okidata printer
 - allows user to modify survey data
 - plots survey data on Okidata printer and Houston Instruments Plotter
2. Missouri Pond Program
 - designs a low hazard pond according to procedures in Std. & Spec.378
 - uses simplified routing curve in TR-55
 - computes earthfill yards
 - allows user to enter cost figures and compare designs
 - no provision for aerated sediment storage
3. YARDCOMP
 - computes earthfill quantity using the double end area method



(c) AT&T Computer Programs

1. OHIO Programs
 - designs Animal Waste Storage Facilities
 - designs Grassed Waterways (trapezoidal and parabolic)
 - computes Curve Number and Peak Discharge
 - computes Hydraulic Formula Solutions
 - computes Cross-Section Area and Volume Quantities
 - designs Water and Sediment Control Basins
 - computes Water Surface Profiles
 - stadia survey note reduction and plotting
2. Terrace Design
 - computes storage for all types of terraces with constant or variable frontslopes
 - provides for cuts and fills if desired
 - computes yardage
 - prints a cut sheet and a contractor check sheet for each terrace



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3. EFM2
 - computes runoff curve number
 - computes time of concentration
 - computes peak discharge
 - computes runoff
4. Grassed Waterway
 - complete design of a grassed waterway
 - can generate construction drawings and specifications
5. Hydro-Yardage
 - designs non-TR60 dams according to procedures in standard 378 (Pond)
 - uses tabular unit hydrograph method of routing from TR-55
 - computes quantities
 - allows user to prepare cost estimate based on user supplied cost data
6. Missouri Pond Program
 - designs a low hazard pond according to procedures in Std. & Spec. 378
 - uses simplified routing curve in TR-55
 - computes earthfill yardage
 - allows user to enter cost figures and compare designs
 - no provision for aerated sediment storage
7. TR-55 Urban Hydrology
 - computes runoff curve number
 - computes time of concentration and travel time
 - computes peak discharge using graphical method
 - computes peak discharge using tabular method
 - computes storage volume for detention basins
8. TOTAL STATION UTILITIES
 - dumps survey information from the Total Station Surveying Instrument
 - allows user to modify survey data
 - plots survey data on Houston Instruments Plotter
 - converts files to a format which can be used by other programs
 - computes elevation - area table from L.I. Contour files
 - interfaces with Hydro-Yardage
 - loads data from computer to Letiz electronic field book

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9. SCS MENU
 - user menu to access engineering programs
 10. Design Plus
 - computes earthwork quantities
 - allows fast evaluation of layout alternatives
 - can generate cross sections from topog data
 - interfaces with VersaCad
 11. CadServe Retriever
 - develops planimetric and contour maps from survey data
 - interfaces with VersaCad
 12. L.I. Contour
 - develops planimetric and contour maps from survey data
 - interfaces with VersaCad
 13. VersaCad 386
 - computer aided drafting software
 14. RIPRAP
 - sizes riprap for rock chutes using design note 22 procedure
 - use slopes less than 10%
 - side slopes should be between 1.5 and 4.0:1
 - bottom width to depth ratio should be greater than 4
 - discharge should be less than 2,000 cfs
 15. DAMS2

routes 3 different storms through a single structure or series of structures
 16. TR20
 - routes one storm through a single structure or series of structures
 - routes breach hydrographs through structures and channels
 17. WSP2
 - develops water surface profiles in the upstream direction
 18. TR66
 - short cut method for routing a dam breach
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