

CHAPTER 6

ASSESSEMENTS/ APPORTIONMENTS

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6:1 DEFINITIONS

Apportionment: A percentage of a project accruing to individual parcels within a Drainage District, including the county at large, for road benefit and to municipalities for public health, convenience and welfare. If there is a state highway, MDOT would also have an at large apportionment.

Assessments: A percentage of the cost of a project accruing to individual parcels, including the county at large for road benefits and municipalities for public health, convenience and welfare times the total cost (computation of cost) for the project. If there is a state highway, MDOT would also have an at large assessment.

Computation of Cost: The entire cost of a drain including; (1) the entire cost of surveying; (2) the cost of locating, establishing and constructing; (3) the fees and expenses of special commissioners; (4) the compensation to be paid the board of review; (5) the cost of construction of bridges and culverts; (6) the contracts for construction or other work to be done on the drain; (7) the estimated cost of an appeal in case the apportionment made by the commissioner shall not be sustained; (8) the estimated cost of inspection; (9) the cost of publishing all notices required; (10) all fees of the probate judge; (11) attorney fees for legal services in connection with the drain; and (12) interest on bonds for the first year, adding the whole into a gross sum and adding not less than 10% nor more than 15% to cover contingent expenses.

Drainage District: The land area contributing storm water to a given outlet.

Benefits Derived:

1. **Benefit:** Anything that is for the good of a person or thing; Advantage or profit.
2. **Derived:** To draw or obtain from a source.
3. **Benefits Derived:** A good received or obtained from a source (Drain) that is for the good of the general public.

Deficiency Assessment: If there are not sufficient funds at the time of the maturity of bonds or notes, it shall be the duty of the Drain Commissioner to levy an additional assessment. This assessment can be spread over a number of years, not to exceed seven, if it would cause undue or unnecessary hardship if spread over one year. This may occur when original construction went over its allotted amount or when property taxes were delinquent and the land has not been sold.

Maintenance Assessment: An assessment may be made to recover the costs of maintenance or repair to the drain in order to continue the normal flow of water. Drain Commissioners are allowed to spend \$2,500 per mile of the drain or a fraction of a mile in any one year. If the expenditure will be more than \$2,500 a year for maintenance, a township resolution from all municipalities that have 20% or more of the total assessment must be obtained to allow more than the \$2,500 expenditure.

If the drain fund does not contain sufficient funds to cover maintenance costs, a reassessment shall be made within two years after completion of the maintenance. Assessment notices shall be mailed by 1st class letter to property owners of record that appear on the latest

assessment roll and to all municipalities, county and MDOT, if applicable, and by publication in a newspaper of general circulation within the drainage district.

If the drain fund falls below the \$2,500 figure, an assessment of \$1,250 per mile or fraction of a mile may be assessed. These funds shall be deposited in the individual drain funds for future inspections, repair, and maintenance of the drain.

Appeals: Those property owners aggrieved by the decision of the Board of Determination can make an appeal after the Board of Determination. A property owner may appeal of the Board of Determination's decision to circuit court within 10 days of the decision by the Board of Determination.

Appeals of an assessment/apportionment may be made to the Probate Court to request a Board of Review be convened, within 10 days after the Drain Commissioner's Day of Review. This Board consists of three property owners appointed by the Probate Judge to hear the appeal by the property owner and the Drain Commissioner's reasoning for the assessment and the method that was used to reach the assessment/apportionment. The Board of Review's decision is final, but if the Board reduces the assessment/apportionment for the appellant, it must redistribute the assessment/apportionment within the district.

6:2 INTRODUCTION

An apportionment should be fair, uniform, equitable, reasonable, consistent, logical, objective, and defensible.

An apportionment should not be unreasonable, inconsistent, arbitrary, or personal.

The "Apportionment of Benefit" should be based on the "Principal of Benefits Derived." All apportionments are the sole discretion of the Drain Commissioner.

Michigan follows the "Roman Civil Law" drainage concept. This obligates owners of land in the lower watershed to accept water and its problems from above. It also obligates the upper watershed owners to help correct any problem to which the drainage of their water contributes to the lower watershed. (These lands contribute water and must be considered in the design of the drainage system)

Drainage in Michigan is older, in fact, than the state of Michigan itself. If you read the history of Michigan Drain Law, beginning with chapter 80 of the Acts of 1839, Michigan Legislature regular session; and progress forward to act 40 - Public Acts of 1956, as amended, you will find consistent language throughout concerning the matter of apportionment of costs.

From the beginnings of drain laws in the 1830's until the present day, this language has prevailed, and is as sound (and as true) today as the day it was written.

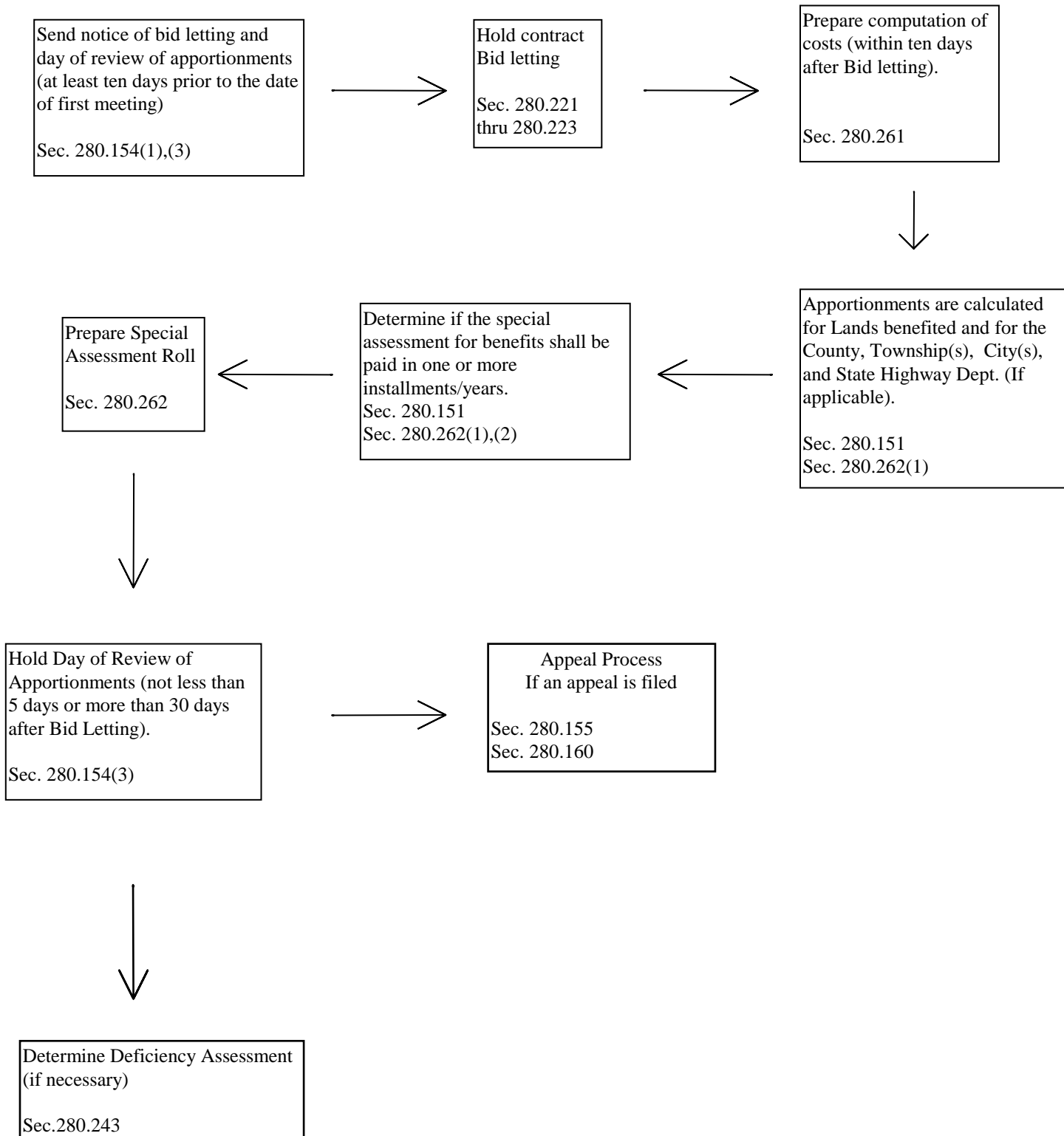
6:3 DRAIN CODE REQUIREMENTS

Section 280.152 (Chapter 7)
Section 280.193 (Chapter 8)
Section 280.199 (Chapter 8)

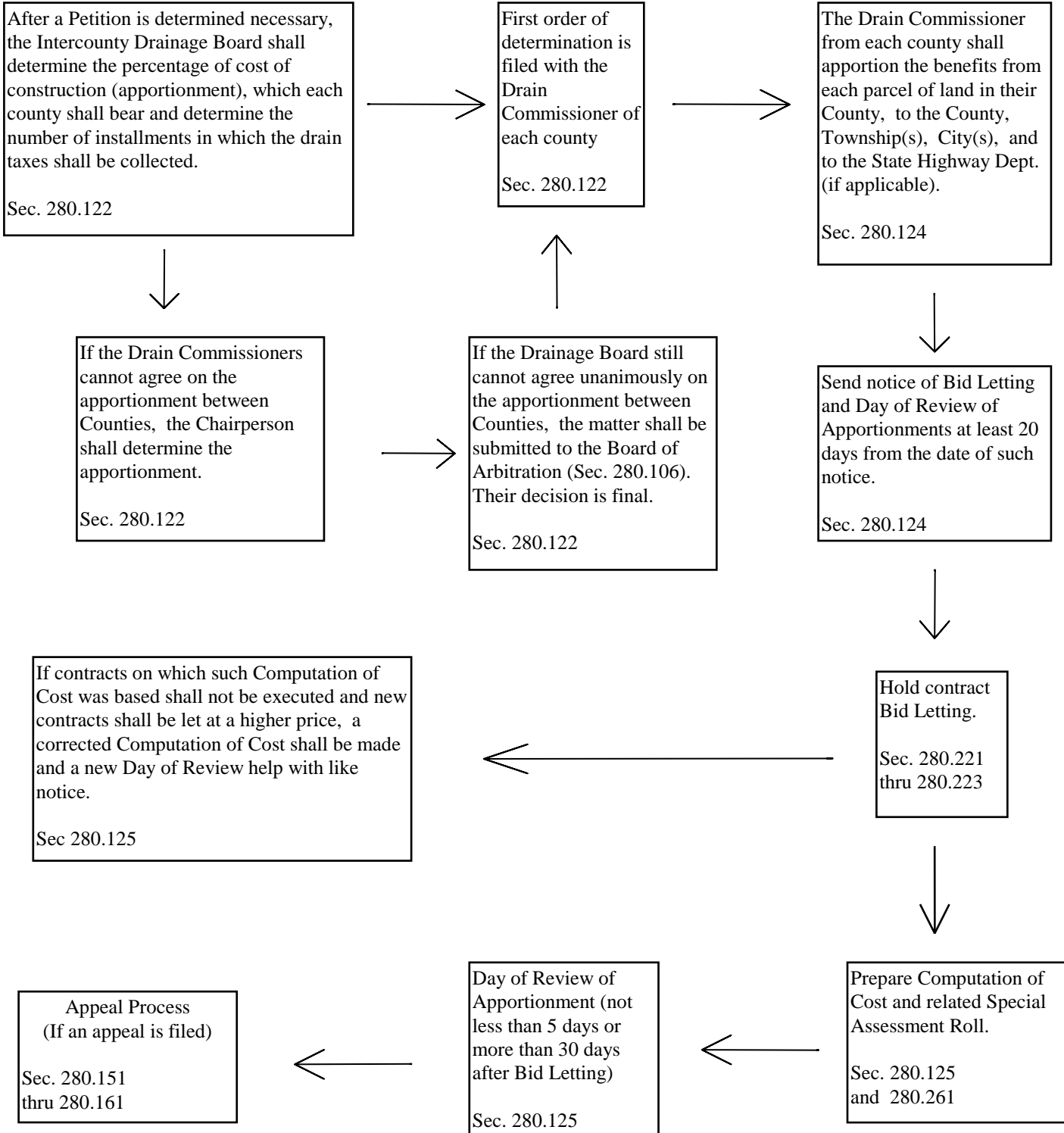
Section 280.468 (Chapter 20)
Section 280.520 (Chapter 21)

Flow Chart

Chapter 4 - Assessment Flow Chart

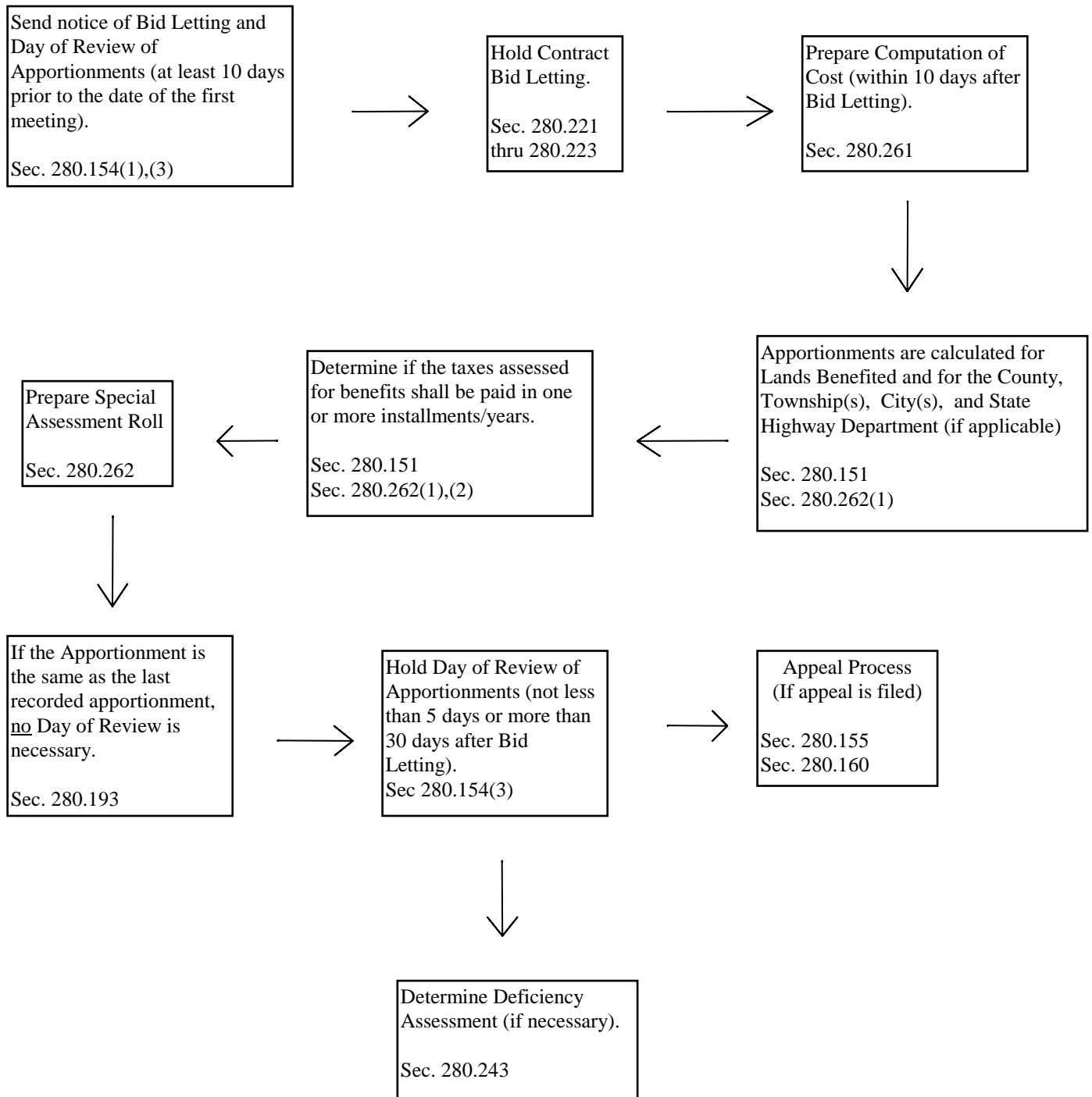


Flow Chart Intercounty Drain Chapter 6 - Assessment Flow Chart



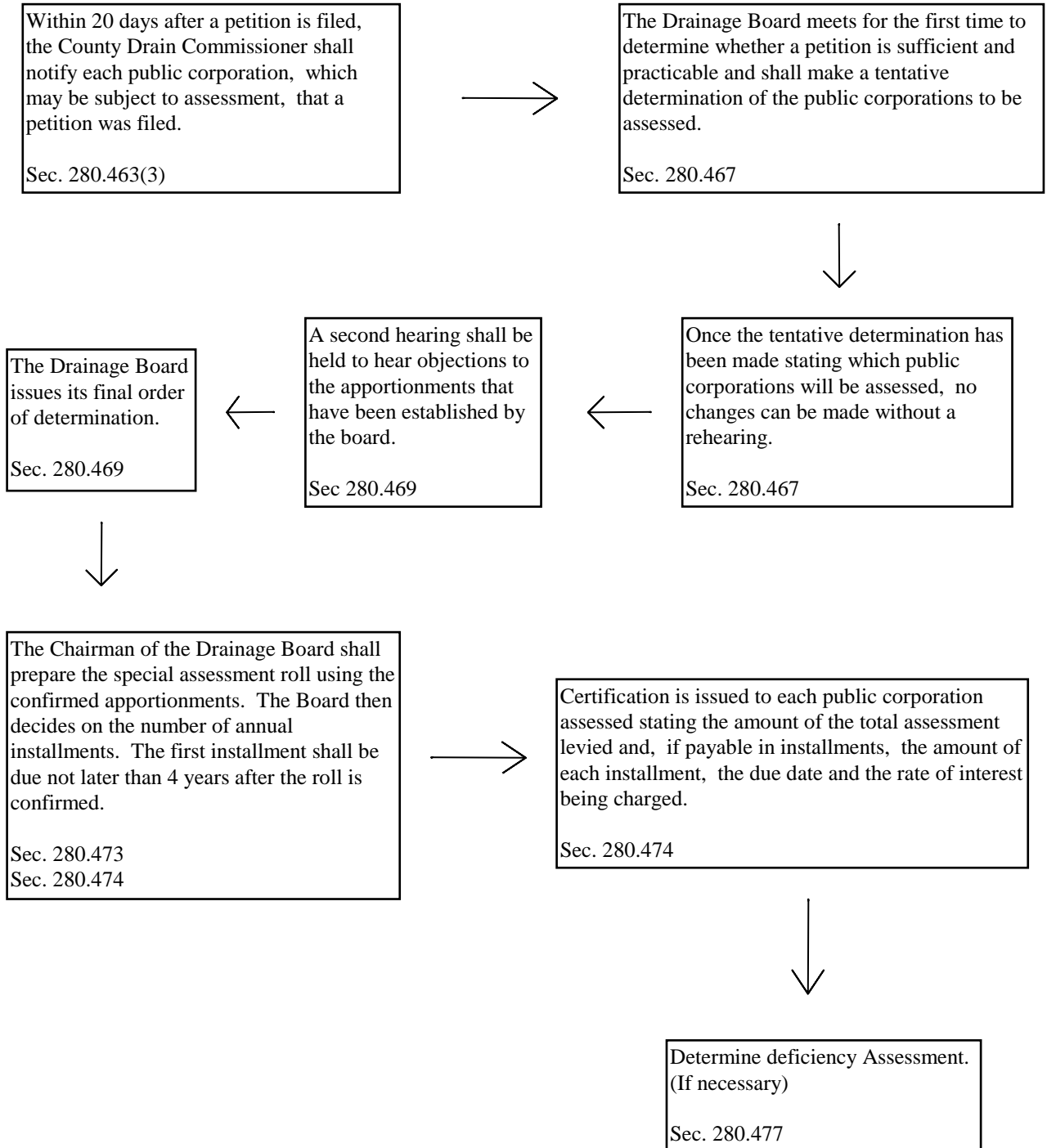
Flow Chart

Chapter 8 - Assessment Flow Chart



Flow Chart

Chapter 20 - Assessment Flow Chart



6:5 MDOT APPORTIONMENT

6:5.1 Introduction

Section 323 of the Drain Code, Michigan Compiled Laws (MCL) 280.323, states:

“Whenever an apportionment is made against a state trunk line highway, the amount of the assessment based on such apportionment shall be paid out of any state trunk line highway funds on hand in the state treasury.”

State highway funds are allocated through MCL 247.651-675 (Act 51). Specifically, Section 14a of Act 51, or MCL 247.664a, states that the Michigan Department of Transportation (MDOT) can only pay its apportioned benefit percentage based on joint promulgated administrative rules between the MDOT and the Michigan Department of Agriculture (MDA). The rules are based on:

“...engineering determination of benefits based on the pro rata share of storm water runoff from the county roads or state highways within the drainage district in direct proportion to the total storm water runoff in the entire drainage district.”

A copy of Section 14a and its promulgated administrative rules, R280.1-R280.9, is provided below. A copy of the laws can be obtained from the website: <http://www.michiganlegislature.org/law>. A copy of the administrative rules can be obtained from the website: <http://www.state.mi.us/orr/>

This section will summarize how MDOT’s assessments can be derived from:

- Apportionment percentage calculations per Administrative Rules 2, 7, and 8
- Supplemental benefit and agreements per Administrative Rules 3 and 4
- The use of recurrence interval as discussed in Administrative Rule R280.2 (4) (this applies to enclosed systems).

6:5.2 Calculation by Administrative Rule (Rules 2, 7, and 8)

In summary, the concept of “equivalent runoff acres” is used to determine MDOT’s apportionment percentage. Per Rule 2, the engineering formula $Q = ciA$ is used. In the formula, “c” is the “runoff coefficient” (reference Table I in Rule 9), “i” is the rainfall intensity, and “A” is the area of the drainage district. Rule 8 eliminates “i”, rainfall intensity, due to the assumption of constant rainfall in the drainage district. Therefore, the concept of “equivalent runoff acres” is shown in the computation examples provided in Rule 8, and the engineering formula becomes $Q=CA$, where “C” is the “average runoff coefficient” as determined by Rule.

Administrative Rule 8 provides two computation examples in subsections (a) and (b). Please see the administrative rules provided below.

6:5.3 Supplemental Benefit and Agreements (Rules 3 & 4)

Administrative Rule 3 allows for additional apportionment based on “supplemental benefits . . . jointly determined to be necessary . . . to accommodate or relieve . . . state highway drainage.” This can occur for example when additional waterway carrying capacity is needed. Rule 3 goes on to discuss “special specifications.” These types of special specifications would be outside the published MDOT Standard Specifications for Construction. MDOT permit requirements (Drain construction and maintenance projects must obtain a permit when working with MDOT right of way) to meet traffic control or construction sequencing, etc. are also excluded. This may be a specific material, e.g., pipe material, which is preferred under certain pavement conditions.

Rule 4(2) allows for the drafting of agreements that **are not** to be part of the assessment or apportionment process. Such agreements, jointly determined to be necessary, would be for work not subject to the rules. These may include portions of the cost for early preliminary engineering studies to determine project scope and preliminary cost estimates.

6:5.4 Recurrence Interval Factor (Rule 2(4))

Administrative Rule R 280.2 (4), involves the use of “Recurrence Interval Factors” from Table II in R 280.9. The “Factors” can be used to adjust the calculated apportionment percentage when a drain project is designed for accommodating the Michigan Department of Transportation’s runoff from its right of way to an **“enclosed”** county or intercounty system. Application of R 280.2 (4) is rarely, if ever, used. When MDOT requests that an enclosed system be increased in size to accommodate its design flow, Rule 3, R 280.3, for computation of a “supplemental benefit” is usually applied to cover construction costs.

For background information, Rule 280.9, Table II, refers to both a “Rainfall Intensity Conversion Factor” and the “Recurrence Interval Factor.” These factors come from the FHWA publication titled, “Design of Roadside Channels, Hydraulic Design Series No. 4.” They are used primarily for estimating drainage design flows and provide a relationship between design recurrence intervals.

As noted in MDOT's Road Design Manual, which can be found on MDOT's website (<http://www.mdot.state.mi.us/design/englishroadmanual/>), MDOT designs its enclosed drainage systems for the 10-year storm frequency. A depressed roadway section with a pump station would be designed for a 50-year storm frequency. Open channel systems are also designed for a 50-year storm. An example of the Section 14a calculations using the Recurrence Interval Factor is provided below. This example is based upon an open channel ditch system from an interstate or state trunk line to an "enclosed" county drain.

If you have any questions, please contact:

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6:5.5 EXAMPLE OF RECURRENCE INTERVAL FACTOR

SECTION 14A CALCULATIONS WITH RECURRENCE INTERVAL				
Example 300 foot ROW				
MDOT Right-of-Way Consists of				
	Width	Factor "C"	Equiv Width	
Pavement 2-24'	48	0.9	43.20	
Paved Shoulders 2-13'	26	0.9	23.40	
Gravel Shoulders 2-4'	8	0.5	4.00	
Berm	218	0.2	43.60	
	300		114.2	
	Equiv "C"	0.381		
Total Area in Drainage District Equals 1000 Acres				
	Acres	Factor "C"	Equiv Acres	% Equiv Acres
Agricultural Land Area=	550.000	0.200	110.00	
Residential Land Area=	100.000	0.300	30.00	
Commercial Land Area=	100.000	0.800	80.00	
Industrial Land Area	100.000	0.900	90.00	
County Road Area=	50.000	0.500	25.00	
MDOT	100.000	0.381	38.10	10.21%
Total Area=	1000.000		373.100	
MDOT Apportionment Without the Recurrence Interval Factor Equals				10.21%
Intensity Difference Between 10 year and 50 Year Storm Frequencies				
Recurrence Interval Factor				
(Design of Drainage Channels, FHWA, Hydraulic Design series No. 4)				
10 year recurrence interval factor	1.6			
50 year recurrence interval factor	2.2			
Ratio of the design runoff from MDOT ROW to the design runoff of the drain			2.2 / 1.6	= 1.375
MDOT Apportionment With the Recurrence Interval Factor (1.375x10.21%) Equals				14.04%

6:6 SECTION 14a ACT NO. 327, PUBLIC ACTS OF 1972 (MCL 247.664a)

Expenditure of funds allocated by this act to the department of state highways or to a county road commission to pay the cost of drain assessments under Act No. 40 of the Public Acts of 1956, as amended, being sections 280.1 to 280.623 of the compiled laws of 1948, imposed after the effective date of rules, promulgated under this section, shall be made only if all apportionments of benefits of any nature or kind determined or made for the drainage of county roads or state highways are made in accordance with rules jointly promulgated by the department of state highways and the department of agriculture. The department of state highways and the department of agriculture jointly shall promulgate rules in accordance with and subject to Act No. 306 of the Public Acts of 1969, as amended, being sections 24.201 to 24.316 of the Compiled Laws of 1948, to provide for an engineering determination of benefits based on the pro rata share of storm water runoff from the county roads or state highways within the drainage district in direct proportion to the total storm water runoff in the entire drainage district. Fifty percent of the cost of a drain assessment against the county for the drainage of county roads shall be paid by the county road commission from county road funds. Expenditures for such purposes shall be reported separately by each county road commission to the state highway commission. Section 16 applies to expenditures made pursuant to this section.

6:7 DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION AND DEPARTMENT OF AGRICULTURE DRAINAGE ASSESSMENTS

Filed with the Secretary of State on August 15, 1977.

These rules take effect 15 days after filing with the Secretary of State.

(By authority conferred on the department of state highways and transportation and the department of agriculture by section 14a of Act No. 51 of the Public Acts of 1951, as added, being §247.664a of the Michigan Compiled Laws).

6:7.1 R 280.1 Definitions (Rule 1)

Apportionment: means that portion or share of the total cost of a drainage improvement, expressed as a percentage, to be borne by the assessed party by reason of benefits to a state highway or county road.

Assessment: means the apportionment expressed as a monetary amount.

County Road: means a roadway, including the right of way, under the jurisdiction of a County Road Commission. It includes property contiguous to a roadway owned in fee or easement by the county, which is used for highway purposes. It does not include facilities such as garage sites and office buildings that are not contiguous to the highway right of way.

Department: means the Michigan Department of Highways and Transportation.

Drainage district: means the total area of land contributing storm water runoff to the drain or portion of the drain under consideration.

Rainfall intensity: means the rate of rainfall in inches per hour.

Runoff: means that part of the rainfall, which drains off the land rather than being absorbed.

Runoff coefficient: means the ratio of the rate of runoff to the rate of rainfall at an average storm intensity if all the drainage area is contributing.

State highway: means a roadway, including the right of way, under the jurisdiction of the department, which is part of a designated system of highways. It includes property contiguous to the highway owned in fee or in easement by the department, which is used for highway purposes. It does not include facilities such as garage sites and office buildings that are not contiguous to the highway right of way.

6:7.2 R 280.2 Computation of basic benefits (Rule 2)

(1) Basic benefits for county roads and state highways shall be computed in direct proportion to the pro rata share of storm water from county roads and state highways within the drainage district to the total design storm water runoff from the drainage district.

(2) Storm water runoff quantities (Q) shall be determined for the drainage district by use of the accepted engineering formula, $Q = ciA$, this being the product of the runoff coefficient (c), referred to in table I set forth in rule 9, the rainfall intensity (i), and the area of the drainage district (A). Rainfall intensity is assumed to be of uniform rate throughout the drainage district.

(3) Storm water runoff quantities (Q) for a county road or a state highway shall be determined by using the same method as that used for the entire drainage district. Computation examples are set forth in rules 7 and 8.

(4) If the rainfall intensity used in the design of a county road or a state highway drainage facility is not the same as the rainfall intensity used in the design of the enclosed receiving county drain or intercounty drain, the basic benefit computed for the county road or the state highway

shall be multiplied by the number, which expresses the ratio of the design runoff from the county road or state highway to the design runoff for the receiving county or intercounty drain according to the recurrence interval factors. (See table II set forth in Rule 9)

6:7.3 R 280.3 Computation of supplemental benefits (Rule 3)

(1) Supplemental benefits for county roads and state highways, which shall result from maintenance, improvement, or the installation of facilities, structures, or mechanical devices jointly determined to be necessary by the highway jurisdiction and drain commissioner or drainage board to accommodate or relieve county road drainage or state highway drainage, shall be computed in the direct proportion of the estimated cost or the actual cost, if known, of such maintenance, improvement, facilities, structures, or mechanical devices to the estimated construction cost or the actual construction cost, if known, of the total project.

(2) Supplemental benefits for county roads and state highways, which shall result by reason of special specifications or construction conditions required by county highway authorities and state highway authorities, shall be computed in the direct proportion of the estimated cost of the actual cost, if known, of such special specifications or construction conditions to the estimated construction cost or the actual construction cost, if known, of the total project.

6:7.4 R 280.4 Apportionments (Rule 4)

(1) Apportionments to a county for county road benefits and to the Department for State Highway benefits shall be based on benefits computed and determined under Rule 2 and Rule 3 except that such apportionments shall not include the cost of work performed under Rule 4(2).

(2) The Department or a County Road Commission may enter into agreements with a Drain Commissioner or drainage board to perform additional work, which is not subject to these rules. Cost of work performed under such agreements shall not be included with the assessments to the Department or the County Road Commission.

(3) A County Road Commission or the Department shall be notified of its apportionments pursuant to Act No. 40 of the Public Acts of 1956, as amended, being §280.1 et seq. of the Michigan Compiled Laws.

6:7.5 R 280.5 Assessments (Rule 5)

(1) Assessments shall be according to the apportioned ratio of the total cost of a project.

(2) If a project is financed by the sale of bonds, evidence that the bonds shall be sold shall be presented with the apportionment notice.

(3) Fifty percent of the cost of drain assessments against a county for drainage of county roads shall be paid by the County Road Commission from county road funds.

6:7.6 R 280.6 Reports (Rule 6)

Expenditures for county drain assessments shall be reported by each County Road Commission to the State Highway Commission. The reports shall be made as of December 31 of each year and shall be submitted by March 1 of the following year.

6:7.7 R 280.7. Average runoff coefficient; computation examples (Rule 7)

The following examples demonstrate the desired method of computing the “average runoff coefficient” (A.R.C.) for cross-sections commonly employed in the construction of county roads and state highways.

- (a) Cross-section A - dual roadway:

300' ROW

Consisting of:

Pavement	2-24'	Tabulation:	48' x 0.90 = 43.2
Paved shoulders	2-10'		20' x 0.90 = 18.0
Gravel shoulders	2-8'		16' x 0.50 = 18.0
Berms	216'		<u>216'</u> x 0.20 = <u>43.2</u>
	Totals		300' 112.4

Average runoff coefficient: $112.4 \div 300' = 0.375$

- (b) Cross-section B - urban roadway:

83' ROW

Consisting of

Pavement & C/G	57'	Tabulation:	57' x 0.90 = 51.3
Sidewalks	2-5'		10' x 0.90 = 9.0
Berms	16'		<u>16'</u> x 0.20 = <u>3.2</u>
	Totals		83' 63.5

Average runoff coefficient: $63.5 \div 83' = 0.765$

- (c) Cross-section C - dual roadway (depressed):

240' ROW

Consisting of:

Pavement & C/G	2-53'	Tabulation	106' x 0.90 = 95.4
Paved median	21'		21' x 0.90 = 18.9
Paved shoulders	2-9.5'		19' x 0.90 = 17.1
Berms	94'		<u>94'</u> x 0.20 = <u>18.8</u>
	Totals		240' 150.2

Average runoff coefficient: $150.2 \div 240' = 0.626$

(d) Cross-section D - rural roadway:

66' ROW

Consisting of		Tabulation
Gravel road	20'	20' x 0.7 = 14.0
Gravel shoulders	2.5'	10' x 0.5 = 5.0
Berms	36'	<u>36' x 0.2 = 7.2</u>
	Totals	66' 26.2

Average runoff coefficient: $26.2 \div 66' = 0.397$

6:7.8 R 280.8 Pro rata share of runoff for county roads and state highways (Rule 8)

Computation examples:

The computations hereinafter set forth are included to clarify the method by which the pro rate share of runoff for county roads and state highways may be determined.

Formula: $Q = ciA$

- Q = runoff
- c = runoff coefficient
- i = rainfall intensity
- A = area

Rainfall intensity is assumed to be constant throughout the drainage district, according to subrule (2) of rule 2, and since the apportionment is based on the pro rata share of the runoff, the rainfall intensity has been deleted from these computations.

(a) Computation No. 1:

Given:

Drainage district	670 acres
State highway ROW - dual roadway	17.65 acres
County road ROW - rural type	31.23 acres
Remaining lands - agriculture type	
(See subdivision (c)).	621.12 acres

Find: The pro rata shares of the runoff for state highways, county roads, and remaining lands.

Solution

State highway	$17.65 A \times 0.375 = 6.619$ equivalent runoff acres
County roads	$31.23 A \times 0.397 = 12.398$ equivalent runoff acres

Remaining lands 621.12 A x
 0.200 = 124.224 equivalent runoff acres
670.00

143.241 equivalent runoff acres

Pro rata share for state highways:

$$\frac{6.619}{143.241} = 4.621\%$$

Pro rata share for county roads:

$$\frac{12.398}{143.241} = 8.65\%$$

Pro rata share for remaining lands:

$$\frac{124.224}{143.241} = 86.724\%$$

(b) Computation No. 2:

Given:

Drainage district	32.00 acres
State highway ROW - urban type	6.33 acres
County road ROW - rural type	1.47 acres
Remaining lands - residential type	
(See subdivision (c))	21.42 acres

Find: The pro rata shares of the runoff for state highways,
 county roads and remaining lands.

Solution

State highway	6.33 A x 0.765 = 4.842
equivalent runoff areas	
County roads	1.47 A x 0.765 = 1.125
equivalent runoff areas	

County roads	2.78 A	x 0.397 =	1.104
equivalent runoff areas			
Remaining lands	<u>21.42</u> A	x 0.500 =	<u>10.710</u>
equivalent runoff areas			
Totals	32.00 A		17.781
equivalent runoff areas			

Pro rata share for state highway:

$$\frac{4.842}{17.781} = 27.231\%$$

Pro rata share for county roads:

$$\frac{1.125 + 1.104}{17.781} = 12.536\%$$

Pro rata share for remaining lands:

$$\frac{10.710}{17.781} = 60.233\%$$

(c) Utilities, railroads, or streets may also be subtracted from the total entitled “Remaining lands”, and computed on an equitable “c” factor at the discretion of the assessing authority.

6:7.9 R 280.9 Tables (Rule 9)

The tables referred to in these rules are set forth as follows:

Table I

<u>Type of Surface</u>	<u>Runoff Coefficient</u>
Concrete or asphalt pavement	0.8 - 0.9
Commercial and industrial	0.7 - 0.9
Gravel roadways and shoulders	0.5 - 0.7
Residential - urban	0.5 - 0.7
suburban	0.3 - 0.5
Undeveloped	0.1 - 0.3
Berms	0.1 - 0.3
Agricultural - cultivated fields	0.15 - 0.4
pastures	0.1 - 0.4
forested areas	0.1 - 0.4

Table II

Rainfall Intensity Conversion Factors (Design of Drainage Channels, FHWA, Hydraulic Design Series No. 4)			
Duration in Minutes	Factor	Duration in Minutes	Factor
5	2.22	40	0.8
10	1.71	50	0.7
15	1.44	60	0.6
20	1.25	90	0.5
30	1.00	120	0.4
Note: U.S. Weather Bureau says "Rainfall amounts for the 5-, 10-, and 15-minute durations may be obtained by multiplying the 30-minute values by 0.37, 0.57 and 0.72 respectively			
Recurrence Interval Factors (Design of Drainage Channels, FHWA, Hydraulic Design series No. 4)			
Recurrence Interval in Years	Factor		
2	1.0		
5	1.3		
10	1.6		
25	1.9		
50	2.2		
Storm Rating Based on 50-Year Maximum Rainfall (Handbook of Steel Drainage and Highway Construction Products, AISI, 2nd Edition)			
Storm Rating	One-Hour Maximum Rainfall		
1 year	0.428		
5 years	0.659		
10 years	0.762		
25 years	0.898		
50 years	1.000		
100 years	1.108		

6:8 SUMMARY

There are as many different methods of assessing, as there are Drain Commissioners, but all assessments/apportionments shall be based on the premise of benefit to the property. Some Drain Commissioners use a combination of acreage and size of property, while some use just acreage. Counties may use 14a for the County at large assessment/apportionment and others may not. Other counties may take a straight percentage of the assessment/apportionment. Whichever method the county uses to assess, MDOT must be done by using 14a or they cannot pay their assessments.

If you are a new Drain Commissioner, look at the method your predecessor used. To make radical changes in the method that has been used in your County previously may cause problems. Whichever method is used, it must be defensible to the property owners of the District on a Day of Review or at a Board of Review.

MICHIGAN ASSOCIATION OF COUNTY DRAIN COMMISSIONERS

NEW COMMISSIONER ORIENTATION

**Sheraton Hotel
Lansing, Michigan**

January 7 & 8, 1997

**“General Procedures and Methods for
Individual Property Owners Apportionment
For Agricultural Drains”**

From An Engineer’s Viewpoint

**Darwin D. McLeod, P.E., P.S.
BMJ ENGINEERS & SURVEYORS, INC.
519 Huron Avenue
Port Huron, MI 48060**

Phone (810) 984-5596 Fax (810) 984-8760

DRAIN CODE

(MCL 280.151)

“The Commissioner shall also apportion the percent of benefits to accrue to any piece or parcel of land by reason of the construction of such drain. Such percent so apportioned, when finally approved, shall be assessed against all parcels of land therein according to such apportionment of benefits as herein provided.”

(MCL 280.152)

“All apportionments of benefits under the provisions of this act shall be upon the principle of benefits derived.”

The “APPORTIONMENT OF BENEFIT” should be based upon the “PRINCIPLE OF BENEFITS DERIVED.”

All apportionments are the sole discretion of the Drain Commissioner. Keep in mind they must be justifiable, uniform, reasonable, consistent, logical, objective, DEFENSIBLE and have equality (the same rights, under the same conditions and among persons similarly situated). Be certain the apportionments are not unreasonable, inconsistent, arbitrary (with not thought), personal, capricious (freakish impulses), and without manifest error or inequality.

I. LEGALITY

Michigan follows the “Roman Civil Law” drainage concept. This obligates owners of land in the lower watershed to accept water and its problems from above. It also obligates the upper watershed owners to help correct any problem to which the drainage of their water contributes to the lower watershed. (These lands contribute water and must be considered in the design of the drainage system.)

II. ITEMS NOT CONSIDERED

Individual property owner’s special apportionments are not calculated by:

- A. Acre, Lineal Foot, Rod or Foot Frontage, because not every parcel is traversed by the drain.
- B. Formula, because every drain is different.
- C. Soils, because many different soils are on each parcel, and when the ground freezes, the characteristics of the soil change.
- D. The usage or non-usage of drain tile.
- E. The physical characteristics of the property, i.e. wooded or cleared, as these conditions are not of a permanent nature.

III. BENEFITS DERIVED

A. Definition of “Benefits Derived”

1. Benefit – “Anything that is for the good of a person or thing; advantage or profit.”
2. Derived – “To draw or obtain from a source.”
3. Benefit Derived – A good received or obtain from a source (drain) that is for the good of the general public or property.

B. Determination of “Benefits Derived”

1. Arrive at the percentage to be assessed to each of the at-larges (county, township, MDOT, railroad, etc.).
2. The Michigan Supreme Court has stated the following regarding the determination of “Benefits Derived”: “The effect that drainage will have on the adaptability of the land for use, the location of the land, the nature of the soil, and other factors pertinent in each instance.
3. Consider the Actual Benefits Received:
 - a. Adaptability of the land for use – A landowner’s flooding problem is solved.
 - b. Change in “Peaking Time” – Refers to the amount of time it takes for water to reach its peak in a given area. Shorter periods of flooding and fewer flooding times provide for the elimination of damage and removal of excess water from the watershed. This occurs either by surface or

subsurface means. Remember: The greater benefit will be realized where the problem exists today.

- c. Soil Conservation through the use of erosion control structures, seeding, rock chutes, rock riprap, etc.

SUMMARY: A BENEFIT DERIVED IS THE CORRECTION OF A PROBLEM THAT WOULD JEOPARDIZE HEALTH, SAFETY, CONVENIENCE OR WELFARE.

IV. SELECTION AND USAGE OF FACTORS

A. Contribution Benefit Factor (C.F.)

Everyone in the watershed (drainage district) contributes water run-off into the drain. Therefore, the drain is designed to handle the water run-off and is considered a benefit.

1. Do not use this type of factor if **all** properties within the watershed have the same use, i.e. agricultural.
2. Utilize the following table of factors for various land uses:

a. Agricultural	.20 thru .25
b. Residential	.30 thru .50
c. Commercial	.50 thru .70
d. Industrial	.60 thru .90
e. Unimproved	.10 thru .20

B. Longitudinal Benefit Factor (L.F.)

This factor pertains to the length of the drain and the location of the parcel along the drain. Remember: Benefit factor is highest where drainage benefit is greatest. This is a judgment

call on behalf of the Drain Commissioner and is based on knowledge of the drainage system.

1. Do not use this factor if flooding occurs along the entire length of the drain and the entire length is deepened and widened equally.
2. Certain reaches of the main drain may require different methods of work due to various problems along the drain. Hence, one section may require deepening and widening while others require no work. These various stages of work require consideration when determining the correct longitudinal factor to use for each parcel.
3. Use a range of longitudinal factors, such as 1.0 to 1.3. This particular range provides for a 30% variance overall and may be applied from “point of beginning” to “point of ending” of project.
4. To consider the following examples of the Longitudinal Benefit Factor, assume an agricultural drain is three (3) miles long.
 - a. First $\frac{1}{4}$ mile no work required – no benefit;
Benefit Factor = 1
 - b. Next $\frac{3}{4}$ mile, no flooding is occurring, clear and snag only; Benefit Factor = 1.1
 - c. Next mile, flooding occurring due to siltation, clean out only; Benefit Factor = 1.2
 - d. Next mile, flooding occurring, deepening and widening is necessary; Benefit Factor = 1.4

C. Accessibility Benefit Factor (A.F.)

This factor refers to “lateral” accessibility in lieu of the previously mentioned “longitudinal” accessibility. Lateral accessibility affects the parcels lying perpendicular to the drain.

1. The reasoning behind this method of factoring relates to the drainage benefits received and which parcels have the rain waters removed most promptly. Do not use this method if all properties are traversed or abutted by the drain for the entire watershed.
2. Range of factors depends on the size of the drainage district and may range from 2.0 to 0.1 depending on how many miles from the main drain to the outer limits of the watershed.
3. Two (2) considerations:
 - a. Each parcel traversing or abutting the drain receives a direct benefit. (Perhaps a factor of 1.0) After the main drain is constructed, the rainwater falling on the directly benefited land goes immediately into the newly constructed main drain and is removed downstream to its outlet.
 - b. All other parcels would receive an indirect benefit, which would decrease as you move further away from the main drain. (Perhaps a factor of .9 to .1) This is because in the tributaries the velocity of the water slows down and the slower the velocity, the longer it takes the water to move out of the

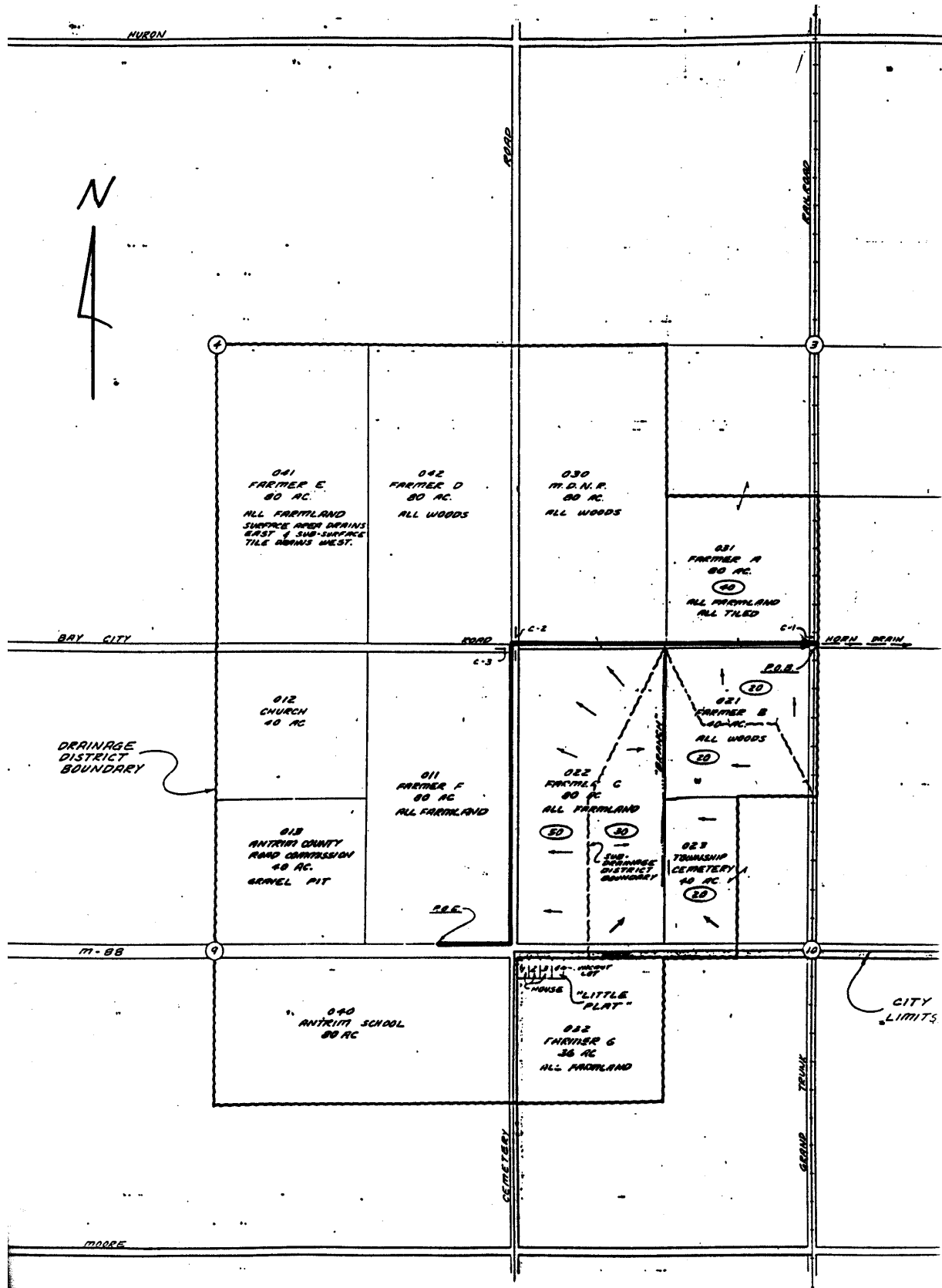
tributaries, which are not being improved. The unimproved tributary side drain are still full of trees, brush, etc. and may cause flooding as the rain waters cannot escape to the newly constructed outlet as fast as the rain occurs. Therefore, there is less access benefit and a lower benefit factor.

V. SUMMARY

- A. Drainage apportionments against parcels of land should be based on “Benefits Derived” and determined objectively with the use of benefit factors. The selection of factors must be readily explainable and justifiable.
- B. Drain assessing is not an exact science and is determined by the use of sound judgment based on knowledge and understanding of the project. The idea of a “just and impartial assessment” will vary from one drain commissioner to another depending on their opinion of the benefits derived.

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**SAMPLE COMPUTATION OF
COMPREHENSIVE BENEFIT FACTORS
ON PARCELS (SPECIAL APPORTIONMENT)**

I. PERCENT APPORTIONED	
COUNTY AT LARGE	18%
TOWNSHIP AT LARGE	10%
MDOT	8%
RAILROAD	1%
SPECIAL	63%
	<hr/>
	100%

**SAMPLE COMPUTATION OF
COMPREHENSIVE BENEFIT FACTORS
ON PARCELS (SPECIAL APPORTIONMENT)**

II. FACTOR COMPUTATION											
<u>PARCEL #</u> (see map)	<u>ACRES</u>	x	<u>C.F.</u>	x	<u>L.F.</u>	x	<u>A.E.</u>	=	<u>CONVERSION</u> <u>ACRES (C.A.)</u>		
031	40	x	0.2	x	1.0	x	1.0	=	8		
041	80	x	0.2	x	1.1	x	0.75	=	13.2		
011	80	x	0.2	x	1.3	x	1.0	=	20.8		
022	80	↙	50	x	0.2	x	1.1	x	0.9	=	9.9
		↘	30	x	0.2	x	1.1	x	0.8	=	5.28
TOTAL	<u>280 ACRES</u>								<u>57.18 T.C.A.</u>		

**SAMPLE COMPUTATION OF
COMPREHENSIVE BENEFIT FACTORS
ON PARCELS (SPECIAL APPORTIONMENT)**

III. PARCEL APPORTIONMENT							
<u>PARCEL #</u> (see map)	<u>C.A. per Parcel</u> <u>div. by T.C.A.</u>	=	<u>% OF C.A.</u>	x	<u>SPECIAL %</u>	=	<u>PARCEL</u> <u>APPORTIONMENT</u>
031	8 / 57.18	=	.139909059	x	63%	=	8.81427%
041	13.2 / 57.18	=	.230849947	x	63%	=	14.54355%
011	20.8 / 57.18	=	.363763554	x	63%	=	22.91710%
022	15.18 / 57.1	=	.265477440	x	63%	=	16.72508%
TOTAL			<u>1.00000000</u>				<u>63.00000%</u>