

MONUMENTATION AND REMONUMENTATION PLAN FOR  
MENOMINEE COUNTY, MICHIGAN

Prepared for the Implementation of Act 345 of 1990

Approved: July 27, 1992

MENOMINEE, BOARD OF COUNTY COMMISSIONERS

Prepared and Approved By:  
Menominee County Remonumentation Committee

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## I. INTRODUCTION--THE REASON FOR THIS PLAN

The adoption by the Board of County Commissioners of a "County Monumentation and Remonumentation Plan" is a requirement of Act 345 of the Public Acts of 1990. When the State Legislature was considering the adoption of Senate Bill 380 (which became Public Act 345), the following "Supporting Argument" was presented by nonpartisan Senate staff for use by the Senate in its deliberations:

Implementing the county monumentation program would mark the first time in 175 years that a concerted effort was made to do this critically needed job. Since the 1850s, there has been no statewide effort to validate corners, even though surveyors' tools have advanced from a 33-foot chain and a compass to a technological arsenal that includes a device that gives automatic measurements of angles between corners, and instruments that bounce a signal off a satellite to determine the exact longitude and latitude of a given point. Orderly, consistent remonumentation with standardized markers would assist in the documentation and planning of roads and utilities, the (location) of public and private property, the settlement of ownership claims and disputes, and the provision of a central data base containing information on counties and townships throughout the State. Completion of the remonumentation system in a county would enable the county to implement a computerized mapping system that would include the precise location of roads, utilities, and property lines; the corners would serve as the foundation for such a map. Further, the remonumenting on a county-wide basis would be more economical than contracting out a few corners at a time, and individual surveys would be less expensive if surveyors could rely on monumented corners.

The County must adopt a County Plan which must be approved by the State Survey and Remonumentation Commission in order to be eligible for state grants for monumentation and remonumentation. The Model County Plan prepared and adopted by the State Commission pursuant to Section 8(1) of Public Act 345 may be adopted as is by a county or, if necessary, with changes appropriate for that county. The grants are made available from funds that the County must send to the state regularly, beginning in January of 1991. The companion Act 346, of the Public Acts of 1990, (Senate Bill 381) provides for the collection of funds by each County's Register of Deeds.

## II. DEFINITIONS

The following words or phrases as used in this plan are those contained in Act 345, of the Public Acts of 1990, with additions:

A) Act -- means Act 345, of the Public Acts of 1990, the State Survey and Remonumentation Act, being Sections 54.261 to 54.279 of the Michigan Compiled Laws.

B) Commission -- means the state Survey and remonumentation Commission created under Act 345 of the Public Acts of 1990.

C) Corner -- means a public land survey corner or a property controlling corner.

D) County Representative -- means the Surveyor, whether elected or appointed, holding the office of County Surveyor or, if no County Surveyor, the Licensed Surveyor appointed to perform the duties described in Section 9 of the Act.

E) County Surveyor -- means the Surveyor elected or appointed within a county according to the requirements set forth in Section 95 of Chapter 14 of the Revised Statutes of 1846, being Section 54.95 of the Michigan Compiled Laws.

F) Global Positioning System (GPS) -- means a satellite-based surveying system meeting the standards of the Federal Geodetic Control Commission (FGCC).

G) Locate -- means to recover an existing corner which conforms to the minimum standards specified herein.

H) Lost Corner -- means a previously established corner whose position cannot be recovered beyond reasonable doubt, either from traces of the original general land office marker or its accessories or from acceptable evidence or testimony that bears upon the original position, and whose location can be restored only by reference to one or more interdependent corners.

I) Marker -- means the physical object which occupies the location of a public land survey corner, a property-controlling corner, or a horizontal or vertical control station.

J) Monument -- means to install a marker which meets or exceeds minimum standards as specified herein.

K) Monumentation Surveyor -- means the Surveyor who is awarded a contract to (a) perform research for and monument or remonument markers or (b) establish horizontal and/or vertical control markers.

DEFINITIONS (continued)

L) Obliterated Corner -- means a previously established corner which has no remaining traces of the marker or its accessories, but its position has been perpetuated or its position may be recovered beyond reasonable doubt by the acts and testimony of the interested landowners, competent surveyors, or other qualified local authorities or witnesses, or by some acceptable record evidence.

M) Open Meetings Act -- means Act 267 of the Public Acts of 1976, as amended, being Sections 15.261 to 15.275 of Michigan Compiled Laws.

N) Peer Group -- means not less than three non-associated Surveyors, appointed by the County Representative. One member of the Peer Group shall be the County Representative, who shall act as chair.

O) Plan Administrator -- means a person appointed by the County Board of Commissioners as the individual responsible for administration of all survey contracts and grants approved by the Board of Commissioners. This person shall not be a participating monumenting surveyor.

P) Property-controlling Corner -- means a Public Land survey corner or any property corner which does not lie on a property line of the property in question, but which controls the location of 1 or more of the property corners of the property in question.

Q) Public Land Survey Corner -- means any corner actually established and monumented in an original survey or resurvey used as a basis of legal description for issuing a patent for the land to a private person from the United States government.

R) Remonument -- means to install a marker where: 1) the existing marker does not meet minimum standards as specified; 2) the existing marker is in danger of becoming "lost" or "obliterated"; or 3) the corner has been "lost" or "obliterated".

S) Surveyor -- means a Land Surveyor licensed under Article 20 of the occupational Code, Act 299 of the Public Acts of 1980, being Sections 339.2001 to 339.2014 of the Michigan Compiled Laws.

### III. PLAN OBJECTIVES

- A) Provide for the location, monumentation and/or remonumentation of corners on a maximum 20-year planned timetable.
- B) Establish the position of County Representative for the purpose of implementation of this Act, if the office of County Surveyor does not exist.
- C) Establish the position of Plan Administrator for the purpose of implementation of this Act.
- D) Create a system for the research of the history of all corners and horizontal and vertical control markers.
- E) Create and maintain a repository for all records pertaining to Public Land surveys.
- F) Provide for a "perpetual maintenance program" for all corners and horizontal and vertical control markers.
- G) Provide for the location of, and a data base for, horizontal and vertical control markers.
- H) Coordinate with adjoining counties for the monumentation of all county line corners.
- I) Annually determine monumentation requirements for which a grant application will be submitted for state approval.

IV. ADMINISTRATIVE DUTIES: COUNTY REPRESENTATIVE AND PLAN ADMINISTRATOR

In compliance with Act 345 of the Public Acts of 1990, the County Representative shall be the representative of the Board of County Commissioners for all surveying projects approved by or initiated by the Commission.

The County Representative's duties include:

- A) Establishing, scheduling meetings of, and chairing a Peer Group which will meet and act as advisors for ratification of corner locations. These meetings shall be in compliance with the Open Meetings Act.
- B) Provide supporting documents to Plan Administrator for submitting grant application, which will include as a minimum:
  - 1. For the current-year projects, a description of the work area completed, The work area projected to be completed by December 31st, and the work area remaining to be completed.
  - 2. A general work-progress report for all previously-awarded contracts.
  - 3. The Work Program and a grant request for the following year. The Work Program will indicate (a) the area where the Public Land survey corners and Property-controlling corners are proposed to be monumented and/or remonumented within the next contract year; (b) the area where the Public Land Survey corners and Property-controlling corners are to be researched in the next contract year; (c) the area where horizontal and vertical control stations are to be researched and located; and (d) the area where horizontal and vertical coordinates are to be established.
- C) Submitting documentation as required by the Commission.
- D) Creating and maintaining a filing system for horizontal and vertical geodetic monumentation information obtained from National Geodetic survey, United States Geological Survey and other sources.
- E) Coordinating the densification of horizontal and vertical geodetic monumentation with the Commission's Geodetic Advisor.
- F) Creating and maintaining a filing system for each corner, which contains all survey information compiled.
- G) Performing other duties indicated under "Plan Execution."

The Plan Administrator duties include:

- A) Submitting proposed County/Monumentation-Surveyor Contracts to the Board of County Commissioners for its approval and its authorization for execution.
- B) Selecting Monumentation Surveyors in compliance with Qualification-Based Selection (QBS) as set forth in House Concurrent Resolution 206 (June, 1987).
- C) Recommending payment to the Monumentation Surveyor as provided by the contract.
- D) Submitting annually a grant application and supporting documents to the Commission by December 31st.
- E) Submitting documentation as required by the Commission.

## V. PLAN EXECUTION

To comply with the requirements of the Act and the County Monumentation plan, the County Representative shall establish requirements and procedures to implement the following:

- A) Research the history of corners and horizontal and vertical control stations.
- B) Field verify whether corners are "Existent", "Lost" or "Obliterated."
- C) Following the Peer Group's ratification, set a marker at all corners. The location of said corners shall be established in accordance with the procedures set forth in the "Manual of Instructions for the survey of Pubic Lands of the United States," 1973, prepared by the Bureau of Land Management of the United States Department of Interior (Technical Bulletins, or subsequent editions).
- D) Recover all existing horizontal and vertical control stations.

## VI. WORK PROGRAM

To meet the objectives of the Act, all work shall be performed in the following manner:

- A. Research: Minimum number of corner locations shall be researched each year so as to complete the monumentation program within 20 years. Copies of all research information shall be available to the public. The County may charge a reasonable fee for such copies.

No marker shall be considered a part of the plan until the research for its location has been performed and the location has been ratified by the Peer Group.

- B. Monumentation: Annually locate and monument or remonument a minimum number of corners so as to complete the program within 20 years.

The corners proposed to be monumented shall be specified as part of the annual grant application. An annual grant may include some unspecified corners in danger of becoming "lost" or "obliterated."

For corners monumented under the Act, the Monumentation Surveyor shall furnish the County Representative two copies of a completed and recorded Land Corner Recordation Certificate, as required by Act 74 of the Public Act of 1970, as amended, being Sections 54.201 to 54.214 of the Michigan Compiled Laws. The County Representative shall forward one copy to the County Plan Administrator to be forwarded to the Commission with the work progress reports, as required by the Commission.

Any surveyor may submit a corner location to the County Representative for Peer Group review.

When filed with the County Representative, all information is considered filed with and available to the Commission. The County agrees to maintain these records and to provide copies of any records requested by the Commission at no charge.

## VII. PERPETUAL MONUMENT MAINTENANCE PROGRAM

When all corners have been monumented as specified under this Act, A "Perpetual Monument Maintenance Program" shall begin. Each year thereafter, a minimum of 1/20th of the corners shall be checked and, if necessary, remonumented. The specific corners or specific region to be checked shall be a part of the annual grant application.

## VIII. GEODETIC DENSIFICATION AND MAINTENANCE PROGRAM

The County representative shall research the entire county for existence of NGS/CGS (National Geodetic Survey/Coast and Geodetic Survey) horizontal and vertical control stations. Thereafter, a thorough field search shall be made for each control station identified by the research. A report of the status of each station shall be prepared using the NOAA/NGS "DDPROC" (National Oceanic and Atmospheric Administration/National Geodetic Survey Descriptive Data Processing System) method. The report shall be filed with the County Representative, the Commission, and the NGS Geodetic Advisor for submission to NGS (National Geodetic survey). The County Representative shall provide for the preservation and maintenance of all geodetic markers in the County. The cost of this work shall be included as part of a grant application.

When deemed timely by the County Representative, a Monumentation Surveyor shall be engaged to determine "NAD 83" (North American Datum of 1983), three-dimensional coordinates in accordance with Act 9 of the Public Acts of 1964, as amended, being Sections 54.231 to 54.239 of the Michigan Compiled Laws, on corners or other monumented points approved by the Commission. All work for NGS control densification and inclusion into the National Geodetic Reference System (NGRS) shall meet or exceed the positional accuracy and marker requirements of Group C; Order 2; 20 PPM according to the FGCC standards entitled "Geometric Geodetic Accuracy Standards and Specifications for using GPS Relative positioning Techniques" for GPS (Global Positioning systems) or Second-Order Class I-1:50,000 minimum distance accuracy for all other measurement systems according to FGCC manual entitled "Standards and Specifications for Geodetic Control Networks." The NGVD 1929 (National Geodetic Vertical Datum of 1929) datum will be used until such time as the new NAVD 1988 (North American Vertical Datum of 1988) vertical adjustment is completed.

Essentially, once a corner or another approved point is monumented, it could become part of the "NGRS" (National Geodetic Reference System) providing a network in which geodetic control eventually will be available on virtually all remonumented corners. The specific stations or specific region to be included in the work program shall be part of the annual grant application.

## PEER-GROUP CREATION AND FUNCTIONS

The Peer-Group shall consist of 4 members, 3 of whom shall be appointed by the County Surveyor.

- (a) one member shall be the County Surveyor.
- (b) three members shall be non-associated land surveyors, licensed to practice in the State of Michigan.

Functions: The Peer-Group shall act as an advisory Board for determining the location of corner positions.

- (a) The Peer-Group shall review all work submitted by the Monumenting Surveyor.
- (b) Acceptance or rejection of corner positions and/or other work submitted by the Monumenting Surveyor must be made by 3/4 of the Peer-Group.  
The Monumenting Surveyor shall be invited by the Peer-Group to attend meetings of the Peer-Group whenever Monumenting Surveyor's work is being reviewed.
- (c) The Peer-Group recognizes the fact that they do not have the right to make the judicial decision as to the location or a disputed corner. Therefore nothing in these rules shall prohibit a dissenting surveyor from establishing his own corner position and filing the appropriate documentation.
- (d) In the event that the Monumenting Surveyor and the remaining members of the Peer-Group are unable to reach an agreement as to the location of the disputed corner(s), the Monumenting surveyor's contract shall be considered terminated and complete with regards to the disputing corner(s), and he/she shall be compensated for all work completed up to that point in time. This termination will not affect other work being completed under the terms of his contract. The County Surveyor shall then contract with a different surveyor to complete the remonumentation of the disputed corner(s). The Peer-Group review process will then begin again.

X. AMENDING THE PLAN

This plan may be amended subject to all the following approvals:

- A) Approval by the County Representative.
- B) Approval by the Board of County Commissioners.
- C) Approval by the Commission.

XI. SEVERABILITY

If any section or provision of this plan for any reason conflicts with present or future Legislative Acts or Administrative Rules, that section shall be invalid, but such invalidation shall not affect the remaining provisions of this plan.

XII. ANNUAL FUNDING AVAILABILITY

Work programs specified in Sections VI, VII and VIII shall be adjusted depending upon the actual annual grant and other funds available.

APPENDIX A -- ITEMS ELIGIBLE FOR GRANT FUNDS

Items eligible for grant Funds include the following:

1. Corner research expenses.
2. Time spent in developing corner-location documentation, including time spent to research existing records, summarize the evidence found, prepare drawings when necessary, and prepare a final report. Information to be shown on the above-noted drawing may include traverse information and useful physical features (e.g., lines of occupation, roadways, fences, etc.).
3. Time spent in presenting corner locations to the Peer-Group for ratification.
4. Field time spent to set and witness markers, including field-traversing time, if necessary.
5. Such other items as may be specified in the grant application and approved by the Commission.

APPENDIX B -- PROCEDURE FOR RATIFICATION OF A CORNER POSITION

When a Monumentation Surveyor desires the ratification of a corner position, he/she shall make a written request for same to the County Representative, accompanied by the corner-position documentation. Not later than 28 calendar days after said request, the County Representative shall call and chair a meeting, noticed in compliance with the Open Meetings Act, of a Peer-Group to review the corner-position documentation furnished.

At least ten days prior to the meeting, the County Representative shall give notice of the meeting to the Peer Group, each Monumentation Surveyor whose corner-position documentation will be reviewed, and any surveyor who has set a corner different from the position being considered. All corner-position documentation will be reviewed by the Peer Group. Minutes shall be taken which shall become the official record when approved by the Peer Group.

After the Peer Group's ratification, the Monumentation Surveyor shall install the appropriate corner marker and cap and shall file a Land Corner Recordation Certificate as required by Act 74 of the Public Acts of 1970, as amended, being Sections 54.201 to 54.214 of the Michigan Compiled Laws. County Representative shall verify the appropriate corner marker and caps installed by the Monumentation Surveyor. Two copies of said Certificate shall be furnished to the County Representative.

APPENDIX C -- MINIMUM STANDARDS FOR MONUMENTATION

The permanent marker set at the location of the corner shall be set in conformance with Act 74, of the Public Acts of 1970, as amended, being Sections 54.201 to 54.214 of the Michigan Compiled Laws.

The County shall adopt standardized markers and/or caps to be utilized when remonumentation is necessary.

APPENDIX D -- MINIMUM STANDARDS FOR CORNER WITNESSING

All corners shall be witnessed in accordance with Act 74, of the Public Acts of 1970, as amended, and the published rules promulgated by the State Board of Land Surveyors under Act 299 of the Public Acts of 1980, as amended, being Sections 339.2001 to 339.2014 of the Michigan Compiled Laws.

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## HISTORY OF SURVEYING IN MENOMINEE COUNTY

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The Government Land Office (GLO) Survey of Menominee County was made between 1847 and 1852. The survey work was performed under the direction of 6 different Deputy Surveyors as follows: John and James Mullett 1847-1848; George Adair, Francis Coleman, Harvey Mellen and E.C. Martin, 1850-1852. The Solar Compass was in common usage at the time of the GLO Survey in Menominee County, and is apparent from the references to magnetic variation made frequently in the original notes.

Several Railroad Surveys were made in the late 1800's and some of these maps are on record at the Menominee County Register of Deeds Office. These surveys took place 25 to 40 years after the GLO Survey, and many of them show ties to Section Corners. Several corners in the county have been re-established by reference to an 1877 Railroad Survey of the Chicago and Northwestern Railroad.

There was little survey work done in the early 1900's that is on record. Surveys by Albert Haas and Orson Burlingame can be found in the old "RECORD OF SURVEYS" books in the Register of Deeds Office.

In the period between 1950 and the present, several surveys were made, and are on record either at the Register of Deeds Office or at the Menominee County Road Commission Office in Stephenson. Some of the Surveyors who worked during this period are:

Robert Olson, who worked for the Menominee County Road Commission and also had a private practice between 1950 and 1973. Many of his records remain at the County Road Commission.

George B. Wilson, RLS, - was in private practice in Menominee County between 1968 and 1986.

William Lenca, RLS, - in private practice in Menominee County from 1980 to present.

Other sources of survey information to be found during this period are State Highway Department Surveys and Department of Natural Resources Surveys. In the early 1980's, a dependent re-survey of Indian Lands was made by the U.S. Department of Interior, Bureau of Land Management. This survey covered only a very limited area of Harris Township.

APPENDIX E -- RESEARCH & RECONNAISSANCE

I. RESEARCH SOURCES AND ANALYSIS

By thoroughly examining and using the following list of sources for survey information, the prudent surveyor can be confident that the corner has been properly located:

- A. General Land Office (GLO) Survey: including Original, Dependent, Independent, or Omitted lands (notes, plats, and special instructions).

If these records are not available in the county offices, they may be obtained from the Michigan Department of Natural Resources, the National or State Archives, or the Eastern Regional Office of the Bureau of Land Management.

<u>SOURCES</u>	<u>TYPE OF INFORMATION USUALLY AVAILABLE</u>
B. County Records:	
County Surveyor	Land Corner Recordation Certificates, public and private land surveys and notes
County Register of Deeds	Land Corner Recordation Certificates, land surveys, subdivision plats, condominium subdivisions and other records
County Road Commission or Dept. of Public Works	Highway location surveys, GLO corner ties, highway easements, township road orders and other records
County Drain Commissioner or Dept. of Public Works	County and township drain records, unrecorded maps, and other records
Clerk of Court	Court records
Abstract Office/Title Company	Abstract records, survey maps, tract maps
Local Assessor	Conveyances, survey maps, tax maps and descriptions
Adjoining-County Offices or local Departments of Public Works	County line records, county line roads

<u>SOURCES</u>	<u>TYPE OF INFORMATION USUALLY AVAILABLE</u>
C. Municipal Records:	Board meeting minutes, cemetery records, township road and drain descriptions and maps, engineer, clerk, zoning administrator, utility and public works departments
D. Other Agencies:	
1. State	Department of Management and Budget-Bureau of Facilities, Department of Transportation, Department of Natural Resources, universities and historical collections, State Archives, State Library
2. Federal	Bureau of Land Management, Fish & Wildlife Service, Soil Conservation Service, U.S. Corps of Engineers, Civilian Conservation Corps, Coast Guard, National Parks Service, U.S. Forest Service, Federal Aviation Administration, Federal Communications Commission, National Geodetic Survey, U.S. Geological Survey, Bureau of Indian Affairs, International Great Lakes Survey, Defense Mapping Agency
3. Adjoining States	Bordering State survey records (Indiana/Ohio/Wisconsin)
E. Other Sources:	Private surveyors' and engineers' records, utility companies, forest product companies, mining companies, land agencies, railroad companies, abstractors, lending institutions, historical societies, oil and gas companies, American Land Title Association surveys
F. Other Maps and Plats	Plat books of ownership (Index to County Atlases & Plats)

<u>SOURCES</u>	<u>TYPE OF INFORMATION USUALLY AVAILABLE</u>
G. Aerial Photos	U.S. Soil Conservation Service, U.S. Agriculture Stabilization & Conservation Service, Department of Natural Resources, Michigan Department of Transportation, aerial mapping companies, and/or other agencies previously listed

II. For Property Owner & Resident Interviews:

1. Develop an interview form. The form should include space for the date, interviewer's name, and the name, statement, and signature of the person interviewed.
2. The interviewer should determine the credibility of the person interviewed and make a statement on the interview form.
3. The interviewer should attempt to obtain an affidavit when important parole evidence is used to determine the position of a corner.

ANALYSIS:

- A. Develop a checklist to ensure that all possible sources of information have been investigated (see example attached).
- B. Review, when necessary, all maps, plats, and aerial photos with the Public Land Survey (PLS) notes to correlate physical calls such as streams, lakes, swamps, etc., with distances on the maps, plats and photos.
- C. Review, when necessary, subsequent surveys to correlate with the PLS and other later surveys.

II. RECONNAISSANCE (FIELD)

- A. All record data related to established monuments, accessories, and calls to natural features should be reviewed to locate and define the area of search. Thereafter, a reconnaissance of the area, using the record-research data or PLS methods, is necessary to narrow the area of search and explore the area for evidence. Then, make a survey to locate existing monuments, occupation lines, possible corner locations, and natural feature calls from PLS field notes.

- B. A licensed surveyor experienced in land corner search, should make the field search or valuable evidence may be overlooked or destroyed.
- C. The field search should be made at a time of year when conditions are most suitable for uncovering evidence. This may depend on the terrain, vegetation, or seasonal ground cover.
- D. The record evidence of the monument to be located will suggest the type of search equipment to be used during the field search. The following list should be considered when preparing for the search:
  - 1. Metal locator -- for recovery of metallic monuments.
  - 2. Hand tools (picks, shovel, etc.) -- where monumentation is expected within a small area or near the surface.
  - 3. Mechanical equipment (backhoe or jackhammer) -- for excavation in large, deep, or difficult search areas.

The surveyor's judgement will control the depth and extent of the excavation. For reference purposes (for future surveys), provide an excavation report describing the extent and the location of the excavation. This may eliminate duplicate excavation efforts.

- E. In areas where the only information available is the original General Land Office survey data or where it is difficult to narrow down a corner search area, it may be advantageous to perform a corner search after a random traverse line has been surveyed along the section lines between known corners. The original line calls and corner locations can be calculated and field located from the random traverse, thus narrowing down the search area and maximizing the effort spent on the actual field search for original survey evidence and/or subsequent survey corner evidence.

## CORNER MONUMENTATION

### FIELD MONUMENTATION

#### A. Type of Marker

A durable and easily identifiable marker locateable with a magnetic locator should be placed at the position of each remonumented corner, if possible. Each county will standardize the markers placed within its boundaries. Each marker will be stamped or engraved to identify it, have a centering mark to define the exact location of the corner, and be stamped with the license number of the surveyor responsible for its placement.

#### B. Inplace Markers

A existing in-place, non-ferrous marker shall be replaced with a standard county marker.

### SETTING OF MARKER

The marker should be placed carefully to minimize any future movement of the marker. Reference markers should be placed where corner positions are in unstable or inaccessible locations. It is always necessary to consider what future uses may be made of the marker location.

### NUMBER OF WITNESSES

Each marker should have a minimum of four (4) witnesses to substantial objects.

### LAND CORNER RECORDATION CERTIFICATE

A Land Corner Recordation Certificate shall be prepared and filed for each corner monumented or remonumented. This certificate shall be a complete document relating to the location, monumentation, perpetuation and history of a corner in accordance with Act 74, P.A. 1970, as amended.

## HORIZONTAL CONTROL

The ultimate goal of the remonumentation program is the remonumentation of every corner in the State of Michigan, which may include the determination of "NAD 83" (North American Datum of 1983) three-dimensional coordinates on these remonumented corners. The task of remonumentation will frequently involve horizontal traverse work between existing corners to enable the restoration of lost and/or obliterated corners. In order to maximize the remonumentation efforts this traverse work should be performed to the minimum accuracy standard allowable to meet the requirements of Act 9, Public Acts of 1964, as amended, by Act 154, Public Acts of 1988 being Sections 54.231 to 54.239 of the Michigan Compiled Laws, i.e., FGCC, Third Order Class I for Horizontal Control.

It should be stressed that the recommended survey control system does not propose to promote the State Plane Coordinate system at the expense of adequate monumentation, perpetuation and recordation of corners. Instead, the system seeks to remonument the corners and to erect new accessories to these corners in accordance with sound land surveying procedures while at the same time applying all of the advantages of the State Plane Coordinate system. In counties where extensive traverse work will be required it will be advantageous to be on the State Plane Coordinate System right from the beginning of the remonumentation project.

There are several publications that can be obtained from the National Geodetic Survey that can assist in understanding State Plane Coordinates and implementing these types of survey traverses:

1. Understanding State Plane Coordinate Systems by Joseph F. Dracup
2. Fundamentals of the State Plane Coordinate Systems by Joseph F. Dracup
3. FGCC, Standards and Specifications for Geodetic Control Networks
4. FGCC, Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques

These publications, along with the horizontal and vertical geodetic control data for the county, can be obtained from:

NGS Information Center  
N/CG 174, Room 26  
Rockwall Building  
Rockville, Maryland 20852  
(301) 443-8631

ADDRESSES FOR RESEARCH SOURCES

ACSM  
American Congress on Surveying  
and Mapping  
5410 Grosvenor Lane  
Bethesda, Maryland 20814

Cadastral Survey  
Eastern States Office  
350 S. Pickett Street  
Alexandria, Virginia 22304

Civilian Conservation Corps  
[This agency became the Works  
Progress Administration in 1935,  
then the Works Projects Adminis-  
tration in 1939, then Consolidated  
Federal Works Administration in  
1942. It was abolished in 1949  
and its services were transferred  
to the General Services Adminis-  
tration.]

Defense Mapping Agency  
8613 Lee Highway  
Airfax, Virginia 22031-2137

Federal Communications Commission  
1919 "M" Street, N.W.  
Washington, D.C. 20554

International Great Lakes Survey  
[This organization no longer  
exists. Its work was split in half  
between NOAA and the Corps of  
Engineers. The data on buoys and  
level gauges went to NOS, the  
benchmarks for vertical control on  
the Great Lakes went to the  
Geodetic Survey, the analytical  
work went to the Corps.]

Interstate Commerce Commission  
12th St. & Constitution Ave., N.W.  
Washington, D.C. 20423

Michigan Department of Management  
and Budget  
Bureau of Facilities  
Stevens T. Mason Building  
530 W. Allegan  
P.O. Box 30026  
Lansing, Michigan 48909

Michigan Department of Natural  
Resources  
Geological Survey Division/  
Lands Division  
735 E. Hazel  
P.O. Box 30028  
Lansing, Michigan 48909

Michigan Department of State  
Bureau of History  
Archives Section  
717 W. Allegan  
Lansing, Michigan 48918-1800

Michigan Department of State  
Michigan State Library  
717 W. Allegan  
Lansing, Michigan 48918-1800

Michigan Department of  
Transportation  
Transportation Building  
425 W. Ottawa  
P.O. Box 30050  
Lansing, Michigan 48909

U.S. Department of Interior  
National Parks Service  
1849 C Street, N.W., Room 3104  
Washington, D.C. 20240

National Archives & Records  
Service  
General Services Administration  
Washington, D.C. 20408

National Ocean Service  
Universal Building South  
1825 Connecticut Ave., N.W.  
Washington, D.C. 20235

Office of Coast & Geodetic Survey  
Washington Science Center  
Building 1  
6001 Executive Boulevard  
Rockville, Maryland 20852

U.S. Agriculture Stabilization  
& Conservation Service  
1405 S. Harrison Road  
East Lansing, Michigan 48823

U.S. Army Corps of Engineers  
North Central Division  
P.O. Box 1027  
Detroit, Michigan 48231-1027

U.S. Army Corps of Engineers  
20 Massachusetts Avenue, N.W.  
Casimir Pulaski Building  
Washington, D.C. 20314

U.S. Department of Agriculture  
U.S. Forest Service  
1407 S. Harrison Road  
East Lansing, Michigan 48823

U.S. Department of Agriculture  
U.S. Soil Conservation Service  
1405 S. Harrison Road  
East Lansing, Michigan 48823

U.S. Department of Commerce  
14th St. & Constitution Ave., N.W.  
Washington, D.C. 20230

U.S. Department of Commerce  
NOS/National Geodetic Survey  
National Oceanic & Atmospheric  
Administration  
1400 Rockville Pike  
Rockville, Maryland 20852

U.S. Department of Interior  
Main Building  
1849 C Street, N.W.  
Washington, D.C. 20240

U.S. Department of Interior  
Bureau of Indian Affairs  
1849 C Street, N.W., Room 4160  
Washington, D.C. 20240

U.S. Department of Interior  
Bureau of Land Management  
1849 C Street, N.W.  
Washington, D.C. 20240

U.S. Department of Interior  
U.S. Fish & Wildlife Service  
1405 S. Harrison Road  
East Lansing, Michigan 48823

U.S. Department of Interior  
U.S. Geological Survey  
6520 Mercantile Way  
Lansing, Michigan

U.S. Department of Transportation  
Federal Aviation Administration  
Federal Highway Administration  
211 Federal Building  
Lansing, Michigan 48933

U.S. Government Printing Office  
Superintendent of Documents  
Division of Public Documents  
Washington, D.C. 20402

## GENERAL INFORMATION ON THE COUNTY

### Land Survey

501,734 acres	Forested
127,106 acres	Agricultural
40,139 acres	Urbanized

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668,979 acres Total

Of this 668,979 acres, 190,000 acres are considered Prime Farmland as defined by slope and soil type and 264,737 acres are wetlands as defined by soil type.

### Governmental Jurisdiction

14	Townships
2	Cities
3	Villages

1990 Census      24,920