



RFP
Charter Township of Union
Fire Hydrant Replacement
Request for Proposal (RFP)

Sealed Bids for the installation of four (4) fire hydrant assemblies including appurtenances will be received by the **Charter Township of Union**, at the Water Treatment facility located at **5228 South Isabella Road, Mt. Pleasant, MI 48858**, until **10:00 AM** local time on September 11, 2019, at which time the Bids received will be publicly opened and read.

Mail or Deliver Sealed Proposals to:

Fire Hydrant Installation and Gate Valve Replacement
Department of Public Services
Attention: Kimberly Smith, Public Service Director
Charter Township of Union
5228 South Isabella Road
Mt. Pleasant, MI 48858

General Scope:

The Charter Township of Union is soliciting requests from qualified contractors to complete the following work:

The project would consist of the installation and testing of four (4) hydrant assemblies including appurtenances at locations within public right of way along Pickard and Meridian Road. All testing shall conform with the Charter Township of Union Specifications, State of Michigan Requirements, and Ten State Standards. The information contained below are the specific qualifications each contractor must meet in order to provide an accurate proposal. Attachments include record drawings, technical specifications and details are included.

Requirements - General:

- Work must comply with all applicable federal, state and local laws and regulations
- All equipment shall be installed compliant with manufacturers recommendations and the Township Standard Specifications and Details
- Contractor shall be responsible for obtaining all local regulatory permits (including fees) which may include plumbing, and mechanical
- Date of completion to be within 30 days of equipment delivery as coordinated with the Township Staff.
- Provide in addition to all other equipment factory warranties, a (1) year full labor and material warranty on all workmanship, material and equipment furnished for this project.
- Prospective bidders are recommended to conduct a site visit prior to bidding although not required.

Terms of Agreement:

General:

- To hold bid open for 60 consecutive calendar days from the bid due date
- To enter into and execute a contract with Charter Township of Union
- References:
 - Provide minimum of three (3) references of similar municipality projects located within the Michigan and have been completed within the last five (5) years.

Insurance:

- Contractor will have Worker's Compensation Insurance in limits required by state law and Comprehensive General Liability Insurance coverage in force for all of its operations under this contract. Township and DPW shall be listed as additional insureds on policy

Bonds:

- The Contractor shall include in the proposal price the cost to provide the following:
 - Letter of Surety and licensed to do business in the State of Michigan.

Shop Drawing Submittals:

- Provide one hard and one pdf copy of material specification sheets, and warranty information to Township. Do not proceed until written approval is received

Services / materials to be provided:

Contractor shall provide all equipment, backfill, and restoration material necessary to complete the work described herein. The scope of work shall include but shall not be limited to the following. Refer to the attached Drawings and Technical Specifications for additional information.

- Hydrant Installation
 - Installation of new hydrant and associated components. Any concrete work, excavation, removal and disposal of existing materials, dewatering, backfill/ compaction, removal of blind flange, NSF approved C900 watermain (up to 5' per detail), fittings and valves, disinfection, testing, to facilitate installation shall be included.
 - Contractor shall be responsible to confirm shutoff valve is in good working order and condition prior to replacement of hydrant. If valve is found to be in poor condition, contractor shall be responsible to remove and replace.
 - If valve is determined to be in good operating condition, replacement will not be necessary. Service Disruption will not be permitted and/or necessary. All new components shall be properly testing and disinfected prior to making connections to existing system. 12.5% chlorine swab and visual leak inspection shall be considered acceptable.
- Valve Removal / Replacement
 - Installation of new 6" valve and associated components. Any concrete work, excavation, investigation to locate, removal and disposal of existing materials, dewater, backfill / compaction, fittings, disinfection, testing to facilitate installation.
 - All new components shall be properly tested and disinfected prior to making connections to existing system. Service disruption and boil water notice is anticipated to isolate main to facilitate valve removal and replacement.

- General
 - Mobilization, site restoration and cleanup
 - Coordination of delivery and unloading of new equipment
 - Contractor shall conduct all work so as to not interfere with the existing system operations.
 - Field investigation to confirm material type and depth prior to performing work and making connections.
 - Coordination with Township Staff and DPW

Services / Materials Not To Be Included:

- Site accessibility and potable water supply (provided by owner).
- Contractor shall be responsible to coordinate and provide construction schedule and minimum 24-hour notice before completing work.
- All operations including valve turning to be completed by DPW staff.
- Coordination with property owners on boil water notice
- Field staking of existing gate valve and proposed hydrant location.

Contractors Proposal Form

Bidders are instructed to submit bids for this project on a lump sum basis as stated in the Proposal.

All bid items are tax inclusive. All work shall be in compliance with DPW Specifications, Details and terms identified in the RFP and applicable laws. **The following bid tabulation is per site as the Township reserves the right to accept and/or reject any or all portions of the proposal.**

No.	Item	Unit	Est. Qty.	Unit Price	Total Cost
Location #1					
1	Hydrant Installation including Appurtenances	LS	1		
2	6" Valve Removal and Replacement	LS	1		
3	Site Restoration and Cleanup	LS	1		
Subtotal Location #1					
Location #2					
1	Hydrant Installation including Appurtenances	LS	1		
2	6" Valve Removal and Replacement	LS	1		
3	Site Restoration and Cleanup	LS	1		
Subtotal Location #2					
Location #3					
1	Hydrant Installation including Appurtenances	LS	1		
2	6" Valve Removal and Replacement	LS	1		
3	Site Restoration and Cleanup	LS	1		
Subtotal Location #3					
Location #4					
1	Hydrant Installation including Appurtenances	LS	1		
2	6" Valve Removal and Replacement	LS	1		
3	Site Restoration and Cleanup	LS	1		
Subtotal Location #4					
Total					

Total Lump Sum Fee

\$

Bidders Signature

Printed Name:

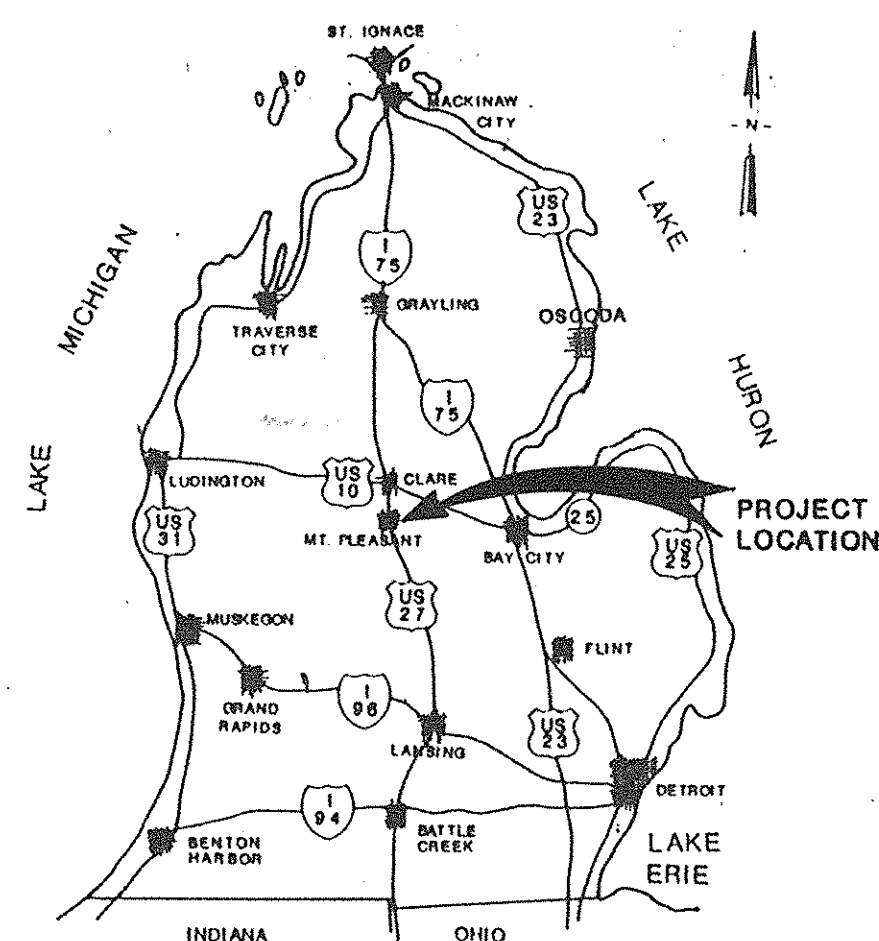
Business Name:

Address:

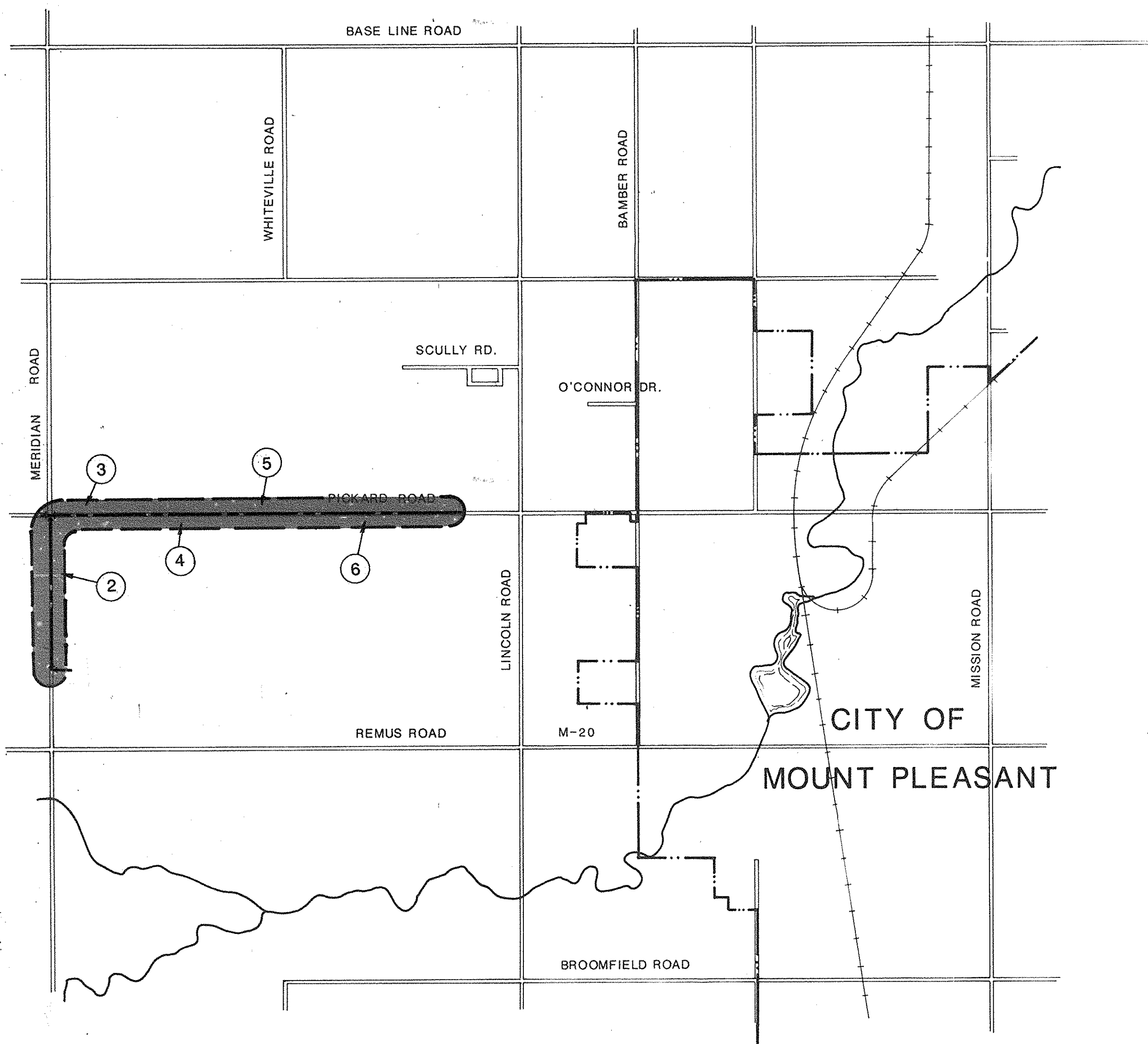
MI Contractor License No.:

Telephone:

Email:



VICINITY MAP
NO SCALE



LOCATION MAP

UTILITIES

UNION TOWNSHIP
 Township Hall
 Address: 2010 South Lincoln Road
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 772-4600
 Township Supervisor: Kenneth J. Schaeffer

CITY OF MT. PLEASANT
 City Engineer
 Address: 120 South University Avenue
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 773-7971

Police Department
 Address: 120 South University Avenue
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 773-7971
 (Business)
 (517) 773-5935
 (Emergency)

Fire Department
 Address: 120 South University Avenue
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 773-7971
 (Business)
 (517) 778-7994
 (Emergency)

ISABELLA COUNTY
 Drain Commissioner
 Address: 200 North Main Street
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 779-0911

Road Commission
 Address: 2261 East Remus Road
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 773-7131

Sheriff
 Address: 207 Court Street
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 772-5911

Department of Public Works
 Address: 200 North Main Street
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 772-0911

MICHIGAN DEPARTMENT OF TRANSPORTATION (M.D.O.T.)
 Maintenance Garage
 Address: 1120 South Mission Road
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 772-2455

District Office
 Address: 1420 Front Street
 Grand Rapids, Michigan 49504
 Telephone: (616) 451-3091

CONSUMERS POWER COMPANY
 Regional Office
 Address: 2400 Weiss Street
 Saginaw, Michigan 48605
 Telephone: (517) 799-7110

MICHIGAN CONSOLIDATED GAS COMPANY (MI. CON.)
 District Office
 Address: 1205 South Mission Road
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 773-3971

GENERAL TELEPHONE COMPANY OF MICHIGAN (GTE)
 Division Office
 Address: 327 East Center Street
 Alma, Michigan 48801
 Telephone: (517) 463-0211

ANN ARBOR RAILROAD COMPANY
 Address: West Broadway Road
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 772-3560

CABLE VISION, INC.
 Address: 915 East Broomfield
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 772-0956

MICHIGAN STATE POLICE
 Address: 1011 North Mission Road
 Mt. Pleasant, Michigan 48858
 Telephone: (517) 773-5951

MISS DIG: (800) 482-7171

PLAN INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2-6	TRANSMISSION MAIN PLAN & PROFILE
7	TRANSMISSION MAIN DETAILS

DRAWING SYMBOLS

PROPOSED	EXISTING	DESCRIPTION
---	---	WATERMAIN
---	---	SANITARY SEWER
---	---	STORM SEWER
---	---	SANITARY FORCE MAIN
---	---	GAS MAIN
---	---	OVERHEAD ELECTRIC
---	---	PROPERTY LINE
○ MA	○ MA	MANHOLE (MH)
□ CB	□ CB	CATCH BASIN (CB)
⊕	⊕	GATE VALVE
⊙	⊙	FIRE HYDRANT ASSEMBLY
○	○	SIGN
⊙	⊙	POLE, POWER OR ELECTRIC
△ RP	△ RP	REFERENCE POINT
△ BM	△ BM	BENCH MARK (BM)
---	---	CULVERT W/ HEADWALL

GENERAL NOTES

NOTE: LOCATION OF EXISTING UTILITIES

Existing public utilities and underground structures such as pipe lines, electric conduits, sewers and water lines are shown on the Plans. The information shown is believed to be reasonably correct and complete. However, neither the correctness nor the completeness of such information is guaranteed. Prior to the start of any operations in the vicinity of any utilities, the CONTRACTOR shall notify the utility companies and request that they stake out the locations of the utilities in question.

NOTE: Special care shall be taken in excavating in the proximity of all underground utilities. The CONTRACTOR shall secure assistance from the appropriate utility company in locating its lines. The CONTRACTOR shall also provide support for any utility within the excavation, provide proper compaction under any undermined utility structure and, if necessary, install temporary sheeting or use a trench box to minimize the excavation. The CONTRACTOR shall protect and save harmless from damage all utilities, whether privately or publicly owned, above or below the ground surface, which may be encountered during construction.

DIVISION B
UNION TOWNSHIP
WEST SIDE WATER SYSTEM
TRANSMISSION MAIN

UNION TOWNSHIP, ISABELLA COUNTY,
MICHIGAN

NOTES: AS-BUILTS OBTAINED BY
UNION TWP. D.P.W.
ALL DIMENSIONS ARE
DESIGN ONLY.

The as-built watermain locations shown are as-constructed. In many cases, the watermain valves and hydrants were constructed differently from the design plans without the knowledge or approval of the Engineer.

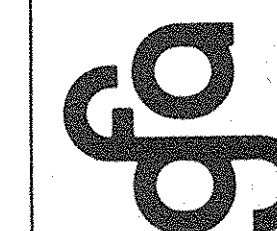
RECORD DRAWINGS FOR REFERENCE ONLY
CONTRACTOR TO FIELD VERIFY

Marquette
105 E. Washington Street
Marquette, Michigan
49855
(906) 228-5171

Traverse City
124 West State Street
P.O. Box 927
Traverse City, Michigan
49684
(616) 946-8874

Consulting
Engineers
Surveyors
Planners

Gourdie/Fraser
& Associates, Inc.



JTR AS-BUILT
12-6-89

REV 2-2-88

APR DAC 2-2-88

CKD DAC 2-2-88

DRN J.L.H. 7-30-87

870322

MATCH LINE SEE BELOW

NOTE:
EXTG. 3'-4" DITCH, 20'-25' OFF CENTERLINE
IN THIS AREA. DITCH TO BE REPLACED TO
EXTG. GRADE. WATER MAIN DEPTH TO BE
ADJUSTED TO MAINTAIN 5' MIN. COVER.

MERIDIAN ROAD
SCALE: 1"=50'

FIRE HYDRANT STUB ASSEMBLY
12" X 12" X 6" TEE
6" GATE VALVE & BOX W/ 3' STUB
FOR FUTURE HYDRANT
MARK W/ 4" X 4" POST

(2) 12" GATE VALVE & BOX
(VALUE LOC. UNKNOWN)

MATCH LINE SEE RIGHT

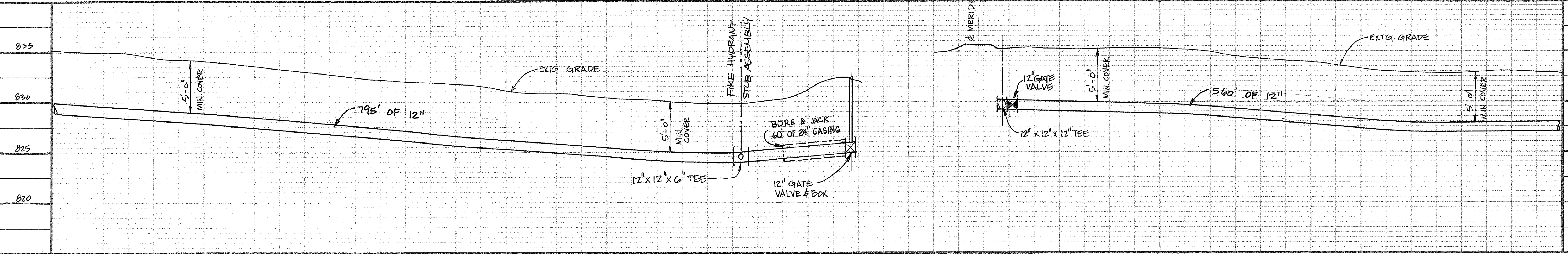
12" GATE VALVE
W/ PLUG & STUB

MATCH LINE SEE LEFT

NOTE:
EXTG. 1'-2" DITCH, 20'-25' OFF
CENTERLINE IN THIS AREA. DITCH
TO BE REPLACED TO EXTG. GRADE.
WATER MAIN DEPTH TO BE ADJUSTED
TO MAINTAIN 5'-0" MIN. DEPTH, WITH
6 FOOT UNDER ROADS AND DRIVEWAYS.

PICKARD ROAD
SCALE: 1"=50'

MATCH LINE SEE SHEET 4



MATCH LINE SEE SHEET 2

LOCATION #1

NOTES: RESULTS OBTAINED BY
UNION TWP. D.P.W.
ALL DIMENSIONS ARE
DESIGN ONLY.

MERIDIAN ROAD
SCALE: 1"=50'

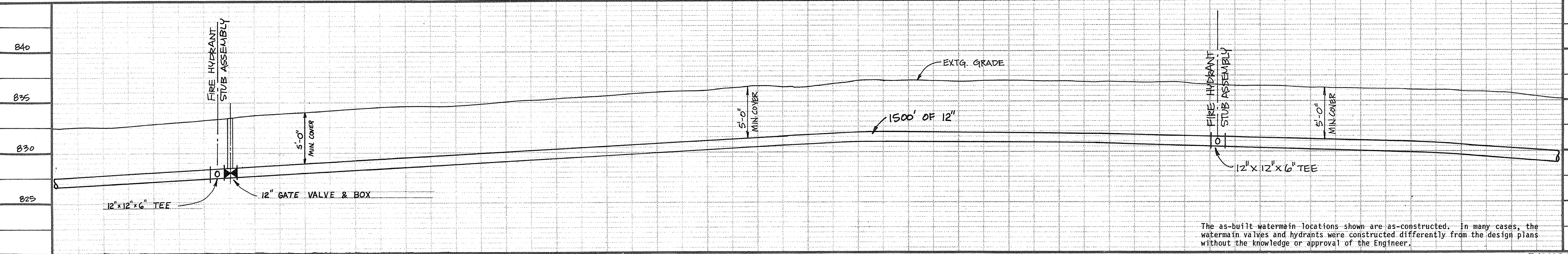
FIRE HYDRANT STUB ASSEMBLY
12" X 12" X 6" TEE
6" GATE VALVE & BOX W/ 3' STUB
FOR FUTURE HYDRANT
MARK W/ 4" X 4" POST

12" GATE VALVE & BOX

1500' OF 12" TRANSMISSION MAIN

NOTE:
EXISTING 3'-4" DITCH, 20'-25' OFF CENTERLINE
IN THIS AREA. DITCH TO BE REPLACED TO EXTG. GRADE.
WATER MAIN DEPTH TO BE ADJUSTED TO MAINTAIN
5' MINIMUM COVER, WITH 6 FOOT UNDER ROADS AND
DRIVEWAYS.

FIRE HYDRANT STUB ASSEMBLY
12" X 12" X 6" TEE
6" GATE VALVE & BOX
W/ 3' STUB FOR FUTURE HYDRANT
MARK W/ 4" X 4" POST



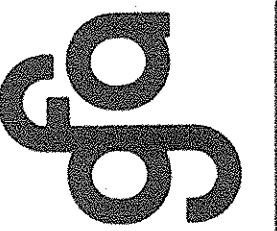
MATCH LINE SEE ABOVE

Marquette
105 E. Washington Street
Marquette, Michigan
49855 (906) 228-5171

Traverse City
124 West State Street
P.O. Box 927
Traverse City, Michigan
49684 (616) 946-8874

Consulting
Engineers
Surveyors
Planners

Gourdie/Fraser
& Associates, Inc.



MERIDIAN ROAD
FROM 1840' NORTH OF WELL SITE
TO PICKARD RD.
PICKARD ROAD
FROM MERIDIAN TO 560' EAST OF MERIDIAN
UNION TWP.

12-6-89 JTR
AS-BUILT
REV. 2-2-88
APR. DAC 2-2-88
CKD. DAC 2-2-88
DRN. JLL 11-13-87
870322

MATCH LINE SEE BELOW

MATCH LINE SEE SHEET 5



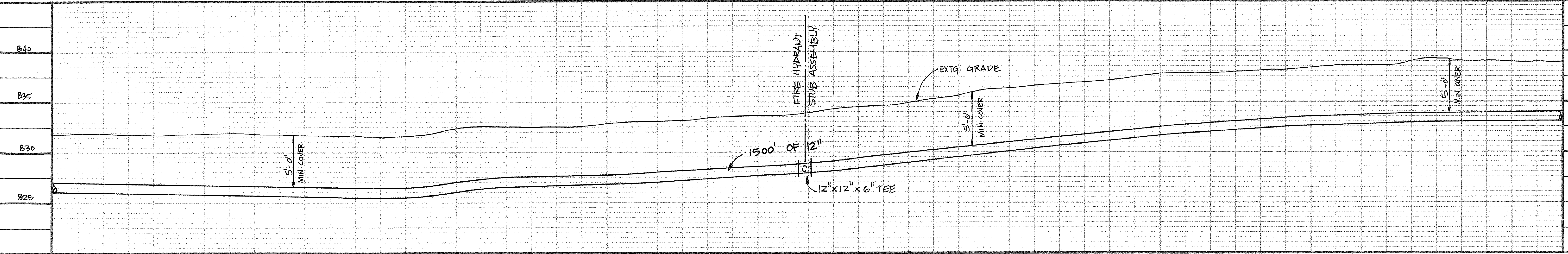
FIRE HYDRANT STUB ASSEMBLY
12"X12"X6" TEE
6" GATE VALVE & BOX W/ 3' STUB FOR
FUTURE HYDRANT
MARK W/ 4"X4" POST

1500' OF 12" TRANSMISSION MAIN

NOTE:
EXISTING 1'-2' DITCH, 20'-25' OFF CENTERLINE
IN THIS AREA. DITCH TO BE REPLACED TO EXTG. GRADE.
WATERMAIN DEPTH TO BE ADJUSTED AS REQUIRED
TO MAINTAIN 5'-0" DEPTH, WITH 6 FOOT UNDER ROADS AND
DRIVEWAYS.

PICKARD ROAD
SCALE: 1"=50'

#430



MATCH LINE SEE SHEET 3

MATCH LINE SEE ABOVE

NOTES: RESULTS OBTAINED BY
UNION TWP. D.P.W.
ALL DIMENSIONS ARE
DESIGN ONLY.



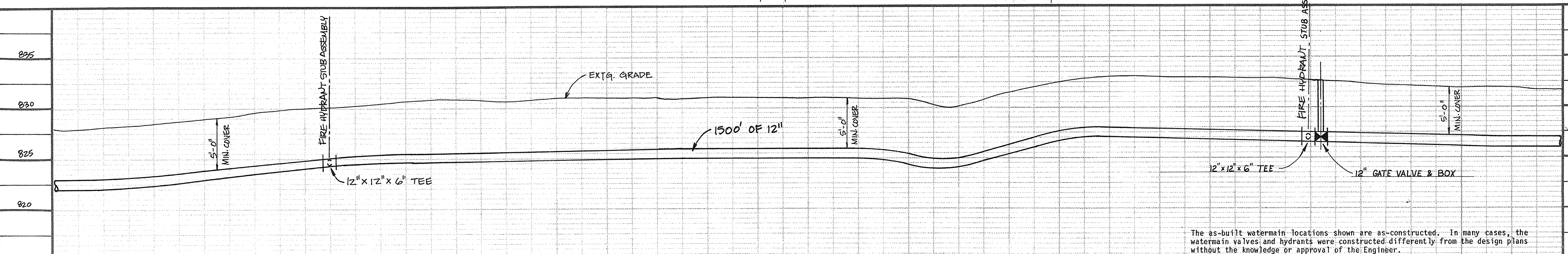
FIRE HYDRANT STUB ASSEMBLY
12"X12"X6" TEE
6" GATE VALVE & BOX W/ 3' STUB FOR
FUTURE HYDRANT
MARK W/ 4"X4" POST

FIRE HYDRANT STUB ASSEMBLY
12"X12"X6" TEE
6" GATE VALVE & BOX W/ 3' STUB FOR
FUTURE HYDRANT
MARK W/ 4"X4" POST

NOTE:
EXISTING 1'-2' DITCH, 20'-25' OFF CENTERLINE
IN THIS AREA. DITCH TO BE REPLACED TO EXTG. GRADE.
WATERMAIN DEPTH TO BE ADJUSTED TO MAINTAIN
5' MINIMUM COVER, WITH 6 FOOT UNDER ROADS AND
DRIVEWAYS.

PICKARD ROAD
SCALE: 1"=50'

LOCATION #2



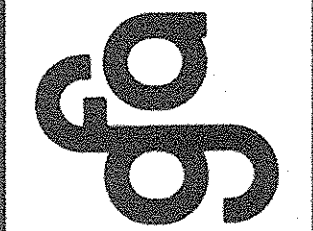
The as-built watermain locations shown are as-constructed. In many cases, the watermain valves and hydrants were constructed differently from the design plans without the knowledge or approval of the Engineer.

Marquette
105 E. Washington Street
Marquette, Michigan
49855 (906) 228-5171

Traverse City
124 West State Street
P.O. Box 927
Traverse City, Michigan
49884 (616) 946-8874

Consulting
Engineers
Surveyors
Planners

Gourdie/Fraser
& Associates, Inc.



PICKARD ROAD
FROM 560' EAST OF MERIDIAN
TO 3560' EAST OF MERIDIAN
UNION TWP.

JTR 12-6-81
AS-BUILT

REV. Z-2-88

APR. DAC 2-2-88

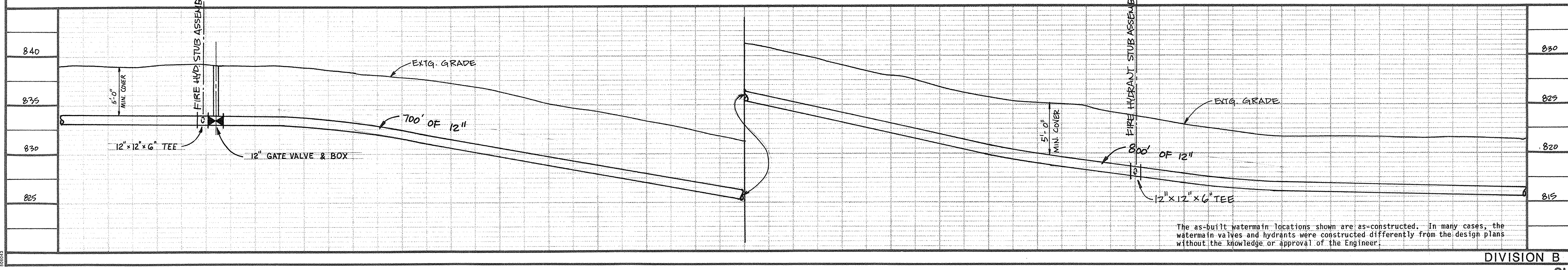
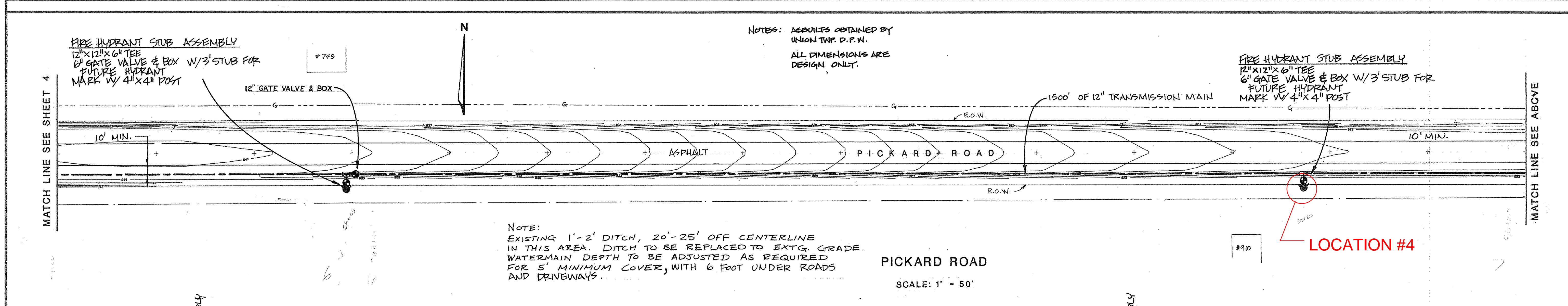
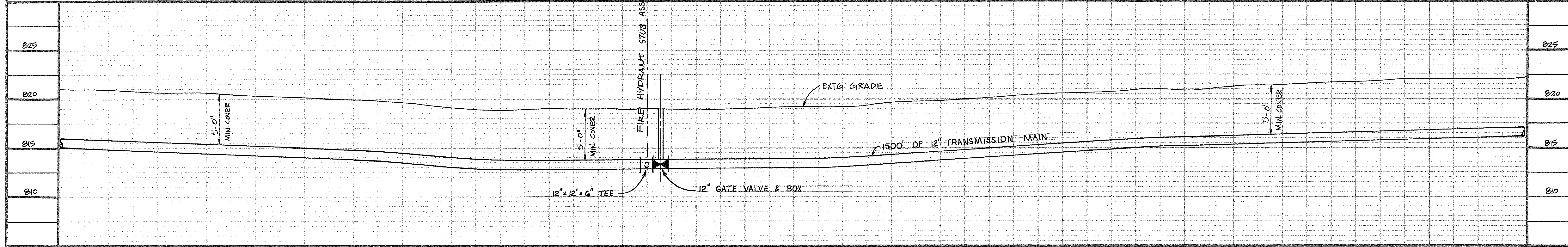
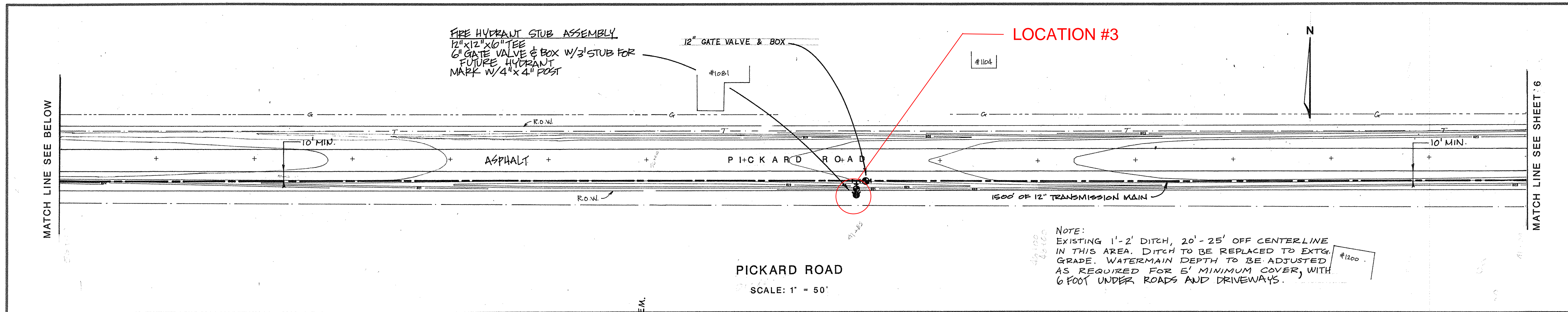
CKD. DAC 2-2-88

DRN. JLA 11-13-81

870322

DIVISION B

SHEET 4 OF 7



FIRE HYDRANT STUB ASSEMBLY
 12" x 12" x 6" TEE
 6" GATE VALVE & BOX W/3' STUB FOR
 FUTURE HYDRANT
 MARK W/4" x 4" POST

12" GATE VALVE & BOX
 #1081

LOCATION #3

NOTE:
 EXISTING 1'-2' DITCH, 20'-25' OFF CENTERLINE
 IN THIS AREA. DITCH TO BE REPLACED TO EXTG.
 GRADE. WATERMAIN DEPTH TO BE ADJUSTED
 AS REQUIRED FOR 5' MINIMUM COVER, WITH
 6 FOOT UNDER ROADS AND DRIVEWAYS.

PICKARD ROAD
 SCALE: 1" = 50'

NOTES: ASBUILTS OBTAINED BY
 UNION TWP. D.P.W.
 ALL DIMENSIONS ARE
 DESIGN ONLY.

NOTE:
 EXISTING 1'-2' DITCH, 20'-25' OFF CENTERLINE
 IN THIS AREA. DITCH TO BE REPLACED TO EXTG.
 GRADE. WATERMAIN DEPTH TO BE ADJUSTED AS REQUIRED
 FOR 5' MINIMUM COVER, WITH 6 FOOT UNDER
 ROADS AND DRIVEWAYS.

PICKARD ROAD
 SCALE: 1" = 50'

FIRE HYDRANT STUB ASSEMBLY
 12" x 12" x 6" TEE
 6" GATE VALVE & BOX W/3' STUB FOR
 FUTURE HYDRANT
 MARK W/4" x 4" POST

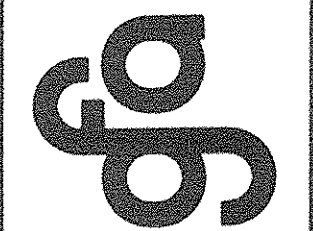
LOCATION #4

The as-built watermain locations shown are as-constructed. In many cases, the watermain valves and hydrants were constructed differently from the design plans without the knowledge or approval of the Engineer.

Traverse City
 124 West State Street
 P.O. Box 927
 Traverse City, Michigan
 49684
 (616) 946-5874

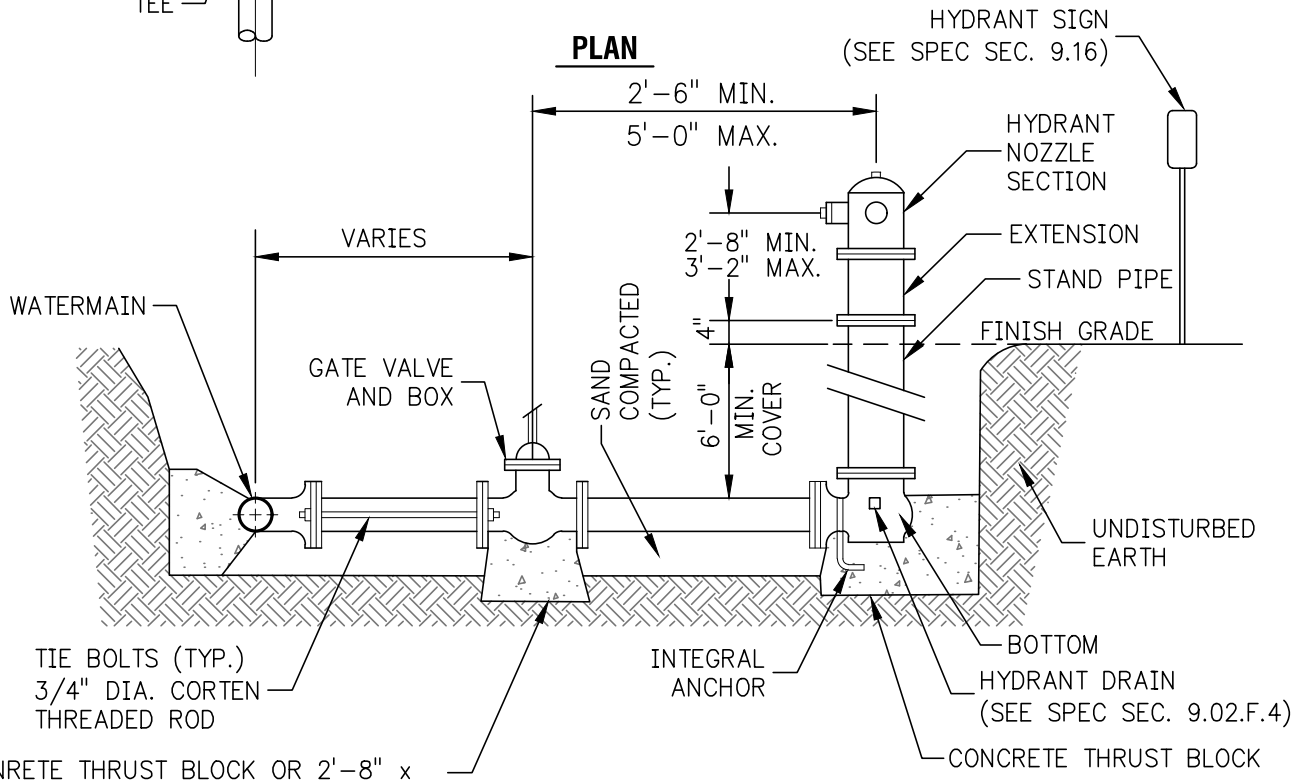
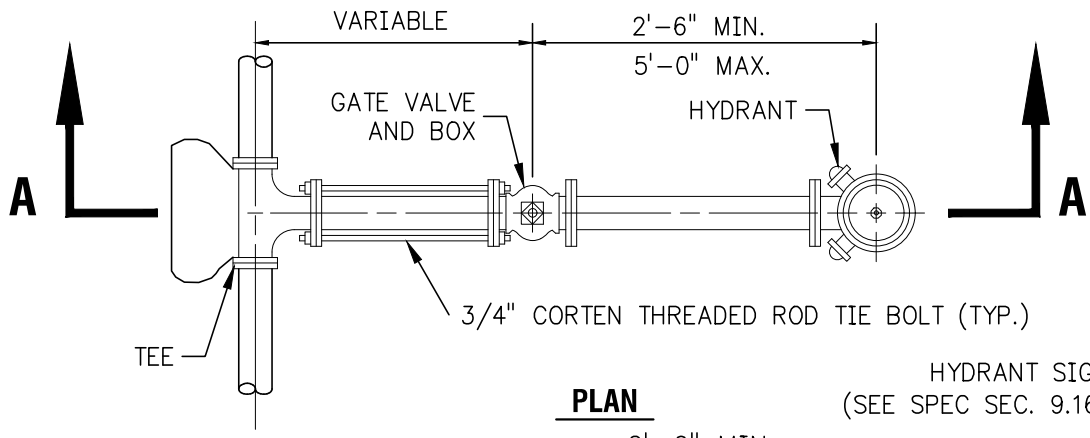
Consulting
 Engineers
 Surveyors
 Planners

Gourdie/Fraser
 & Associates, Inc.



PICKARD ROAD
 FROM 3560' EAST OF MERIDIAN
 TO 6560' EAST OF MERIDIAN
 UNION TWP.

JTR 12-6-09
 AS-BUILT
 REV. 2-2-88
 APR. DAC 2-2-88
 CKD. DAC 2-2-88
 DRN. JLA 11-13-07



NOTE: ALL MECHANICAL JOINTS REQUIRE RETAINER GLANDS

SECTION A-A

HYDRANT ASSEMBLY DETAIL

NO SCALE

SECTION 1

GENERAL REQUIREMENTS

1.01 PROJECT DESCRIPTION

Work includes the following major items:

(please insert project description here)

1.02 DEFINITIONS

The intent of this section is to identify certain persons involved in the project.

DPW/Utility Department	The agency performing the system operations and maintenance typically identified as a Department of Public Works.
Engineer	Engineer who provided the sanitary sewage system and or water main design, plans and specifications for the owner.
Owner	Party who is having the sanitary sewage system and or water main facilities installed.
Contractor	Contractor is prime Contractor who is so identified by the Owner and is responsible for the sanitary sewage system and or water main facilities installation.
Township	The governing Township (Charter Township of Union).

1.03 PRECONSTRUCTION CONFERENCE

Prior to commencement of any construction activities involving the sanitary sewer system and/or water system, a principal member representing the Owner, the Contractor, the Design Engineer, the Township Engineer and the Township DPW/Utility Department shall meet at a pre-determined location and time to discuss the project. It shall be the responsibility of the Owner or his/her Design Engineer to organize this meeting. At that time, the Contractor schedule, as well as the Township Engineer's requirements, will be discussed to obtain a mutual understanding of the project and the Township's inspection process.

1.04 LINES AND GRADES FOR CONSTRUCTION

The Owner (his Contractor and/or Engineer) shall provide adequate lines and grades for construction of the sanitary sewer and/or water main prior to installing the utilities.

1.05 PROGRESS SCHEDULE

The Owner shall, as soon as practical, prepare and submit to the Township three (3) copies of the Progress Schedule regarding sanitary sewer and/or water main construction. This schedule shall show in a clear, graphical manner the proposed date for commencement, progress and completion of the work.

1.06 INTERFERENCE WITH EXISTING SEWAGE TREATMENT WORKS

No bypassing of untreated sewage will be allowed during the construction of this project other than that which normally takes place due to stormwater overflows, etc. The Contractor shall provide a plan of work to the Township for approval before starting work on any phases of the project which might involve existing sewage facilities.

1.07 RELATIONS TO OTHER CONTRACTORS AND UTILITY FORCES

The Contractor shall so conduct his operations as not to interfere with or injure the work of other contractors or adjacent force account work, and he shall promptly make good any injury or damage which may be done to such work by him or his employees or agents.

The Contractor shall grant to other contractors and forces necessary means of access to their work.

1.08 PERMITTING AGENCIES

The Contractor shall perform all work in accordance with any and all applicable permit requirements. The Owner or his Design Engineer shall present the Township with a copy of all documentation and calculations for the permit process. The Owner will obtain the necessary permit for construction/installation prior to commencement of any work.

1.09 ACCESS TO WORK

The Township shall have access maintained to all sanitary sewer or water main work at all times. Proper notification (48 hours) shall be given to the Township prior to the start of any construction or testing.

1.10 SHOP DRAWINGS

Shop drawings of all equipment shall be issued to the Design Engineer during the shop drawing review stage for his approval. The Design Engineer shall forward these (2 copies) to the Township for his review regarding compliance with the Township requirements. The Township will not perform a technical review. That shall remain the responsibility of the Design Engineer. The Contractor should supply a minimum of six (6) copies of all equipment shop drawings to the Design Engineer. Final record shop drawings shall be issued to the Township as part of the close-out procedure in accordance with the close-out section of these specifications.

1.11 STREAM CROSSINGS

Stream crossings shall be performed in accordance with all permit requirements of the regulatory agencies and Charter Township of Union Technical Specifications.

1.12 DUST AND NOISE REDUCTION

The Contractor shall keep dust and noise from construction operations to a minimum. A dust palliative shall be used on disturbed road sections prior to surfacing if so determined by the Township.

1.13 MATERIAL CERTIFICATION

Manufacturer's certification slips shall be submitted to the Township for all pipe, manholes, fittings, etc. used in the installation of sanitary sewer or water mains. This is to verify that the product meets applicable standard specifications required.

1.14 MAINTENANCE BOND REQUIREMENTS

The Contractor shall supply the Owner and Township with a maintenance bond for 50% of the cost of the installation of the sanitary sewer and/or water system that is to be turned over to the Township. The maintenance bond shall be effective from the date of Township acceptance for a period of one (1) year.

1.15 INSURANCE REQUIREMENTS

Where the contract involves construction in a public right-of-way, the Contractor shall provide proof of insurance in the type and amounts required by the Township prior to start of the construction. In addition to the Township, the Township DPW and Township Engineer shall be named as additional insured.

1.16 ESCROW FOR TELEMETRY REQUIREMENTS

When telemetry equipment is required, the owner of the project will be required to provide an account above and beyond the construction contract price to be determined prior to approval and installation of project for standard telemetry equipment. This equipment will be integrated into the Township DPW network of monitoring systems. The types of units this may apply to include submersible lift stations, well houses, water booster stations, and pressure reducing valve vaults.

SECTION 2

STANDARDS AND REGULATIONS

2.01 REFERENCE STANDARDS

- A. Throughout these specifications, reference is made to various standard specifications. Such reference gives the serial designation. The latest revised specification shall apply in all cases. These standard specifications, where applicable, shall be binding on all construction activities.
- B. The following specifications and standards form part of this specification to the extent indicated by reference thereto or for quality of workmanship and materials required under the contract.

American Society of Testing Materials	(ASTM)
American Water Works Association	(AWWA)
American National Standards Institute, Inc.	(ANSI)
Michigan Department of Transportation	(MDOT)
American Society of Mechanical Engineers	(ASME)
American Concrete Institute	(ACI)
National Concrete Masonry Association	(NCMA)
Truss Plate Institute	(TPI)
National Electrical Code	(NEC)
Michigan Department of Environmental Quality	(MDEQ)
National Fire Code	(NFC)
Underwriters Laboratories	(UL)
National Sanitation Foundation	(NSF)
International Plumbing Code	(IPC)

2.02 REGULATORY REQUIREMENTS

- A. All construction work, alterations, repairs or mechanical installations and appliances connected herewith shall comply with all the State Rules and Regulations and local ordinances and such other statutory provisions pertaining to this class of work. Such Rules and Regulations and local ordinances are to be considered a part of these specifications by reference.
- B. All electrical work shall be in accordance with the latest edition of the National Electrical Code, the National Electrical Safety Code and applicable state and local codes. This shall not be construed to permit a lower grade of construction where the plans and specifications require workmanship or materials in excess of code requirements. All electrical equipment, wiring, cable, pre-assembled electrical panels, and materials shall be listed by Underwriters Laboratories, Inc.

SECTION 3

PROJECT CLOSE OUT

3.01 CLEANUP

Before final acceptance of the sanitary sewer system or water main system work, the Contractor shall remove all false work, excavated or useless materials, and rubbish, and restore to presentable condition per the restoration specifications and satisfactory to the Township, all property, both public and private, which may have been used or damaged during the installation of the sanitary sewer or water system work.

3.02 OPERATING AND MAINTENANCE DATA

The Contractor shall furnish written instructions for the operation and maintenance of the equipment furnished at the time of submittal of shop drawings. The instructions shall be short, easy to understand, with directions specifically written for this project, describing the various possible methods of operating the equipment. The instructions shall include procedures for tests required, adjustments to be made and safety precautions to be taken with the equipment. Maintenance instructions shall include test and calibration charts, exploded views of assembled components and spare parts lists. At least six (6) instruction booklets shall be furnished for each separate piece of equipment. These shall be transmitted to the Township as part of the close out of the project. Record drawings (1 set of reproducible mylars or vellums and one (1) digital copy in AutoCad format) shall be submitted to the Township along with hydrant and valve reports, water service lead reports, and sanitary sewer lead reports, as applicable to the project.

A. Pumps

Include the manufacturer's technical specification of the pump along with the application for the pump, the manufacturer's warranty certificate, installation instructions, serial numbers for all pumps, pump performance curve, pump trouble shooting guide and the pump efficiency rating.

B. Control Panel Operation and Maintenance Manual

Include the electrical panel legend, bill of material report, catalog cut sheets indicating make and model of all general accessories, installation instructions for the control panel, recommended spare parts, installation instructions for general accessories and a maintenance frequency chart.

C. Electrical Wiring

A color coded drawing of the as-installed electrical schematic shall be submitted for all electrical work performed as part of the project.

3.03 GUARANTEE

The Contractor shall guarantee all materials and equipment furnished and work performed for a period of one (1) year from the date of Township Acceptance. The Contractor shall warrant and guarantee for a period of one (1) year from the date of Township Acceptance of the system that the completed system is free from all defects due to faulty materials or workmanship. The Contractor shall promptly make such corrections, as may be necessary including the repairs of any damage to other parts of the system resulting from such defects. The Owner or Township, if they have taken over the system, will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the Owner or Township may do so and charge the Contractor the cost thereby incurred. Refer to the form Letter of Guarantee to be included with final close-out documents.

The Contractor shall supply a one (1) year maintenance bond per the "General" section of these specifications.

3.04 FINAL COMPLETION/ACCEPTANCE OF PROJECT BY TOWNSHIP

A. Township Projects

Final payment will not be made to the Contractor until all close out documents have been received and approved by the Township. These items are listed below:

1. Punch list items satisfactorily completed.
2. Maintenance bond.
3. Letter of guarantee (format provided by Township).
4. Affidavit of completion/consent of surety.

B. Private Projects

The Township will not accept the facility or allow connections to or use of the facilities until the following items have been received by the Township:

1. Punch list items satisfactorily completed.
2. Maintenance bond. (Valid for a period of one year from the date of Township acceptance of the system).
3. Letter of guarantee (format provided by Township).
4. Easement descriptions.

5. Descriptions of the facilities for a bill of sale.
6. Certification by the Engineer reviewing the installation.
7. Sanitary Sewer Lead Reports (as applicable).
8. Water Service Lead Reports (as applicable).
9. Water Valve Reports (as applicable).
10. Hydrant Reports (as applicable).
11. Operation and Maintenance Manuals
12. Record Drawings
- 12A. Record Drawings (as-constructed) must include three sets of 24" x 36" drawings and a digital copy (formats listed below) including a .pdf copy of each sheet.

Digital Submittal Format Requirements: The developer shall submit to the Township a digital copy of the Record Drawings (as described in Section 3.04.B Item 12B of the Technical Specifications) in one of the following formats:

- a. Drawing Interchange File (.DXF) (DWG)

- 12B. Record Drawings: Record drawings shall consist of plan and profile. Sanitary sewer leads and water service leads shall be re-drawn in the new location along with the mainline structures and piping. Hydrant, valve and manhole numbering sequences shall be obtained from the Township. Each structure installed, such as manholes, water service leads, hydrants, valves, sewer leads, bends, tees, or other structures placed shall have three (3) physical measurements from structures which are shown on the plans and apparently not to be changed. Lead measurements are to be placed on the individual reports. Sanitary sewer profiles shall include manhole number, rim and invert elevations, distances between structures, size and type of pipe. Water main profiles shall include hydrant and valve numbers, all fittings, horizontal/vertical, and the accurate depth of placement. All profiles shall show conflict with existing utilities. Sanitary sewer lead and water service lead information shall be placed in a table format on the record drawings. Each plan sheet shall have a separate table for the type of lead shown on that sheet. See Table 3.1 and Table 3.2 for examples.

SECTION 3
PROJECT CLOSE OUT

Table 3.1

SEWER LEAD NUMBER	DISTANCE FROM DOWNSTREAM MANHOLE	DISTANCE FROM SEWER TO END OF LEAD AT PROPERTY LINE OR EASEMENT LINE	DEPTH BELOW GRADE

Table 3.2

WATER SERVICE LEAD NUMBER	DISTANCE FROM GATE VALVE OR FIRE HYDRANT. INCLUDE VALVE OR HYDRANT NUMBERS.	DISTANCE FROM WATER MAIN TO END OF LEAD AT PROPERTY LINE OR EASEMENT LINE

SECTION 4

EXCAVATION, TRENCHING AND BACKFILLING

4.01 SCOPE OF WORK

The work covered by this section shall consist of furnishing all materials, equipment and labor for the excavating, trenching, backfilling, and bore and jack required to install or repair sanitary sewers, water mains and other structures as shown on the plans and referred to in these specifications.

4.02 MATERIALS

A. Backfill Material

All backfill material shall be free from cinders, ashes, refuse, sod, frozen lumps, vegetable or organic material, boulders, rocks or stones or other material which, in the opinion of the Design Engineer, is unsuitable. However, from 1" above the top of the pipe to the subgrade of the pavement, material containing stones up to 3" in their greatest dimension may be used.

Where the type of backfill material is not specified, the Contractor may backfill with the excavated material provided that such material meets the requirements described above. Where excavated material is to be used for backfill and there is a deficiency due to a rejection of part thereof, the Contractor shall furnish the required amount of sand, gravel or other approved material at no additional cost.

B. Bore and Jack Materials

1. Steel Pipe

Jacked in place steel pipe shall meet the requirements of either ASTM A53, Type E or S, Grade B or ASTM A139, Grade B.

The ends of all steel pipe to be jacked shall be prepared for field welding at joints.

The nominal outside diameter and minimum wall thicknesses of steel pipe to be jacked in place shall be as shown below. Minimum wall thickness for railroad crossings may be reduced by 0.063 inch if cathodic protection is provided per railroad specifications.

SECTION 4
EXCAVATION, TRENCHING AND BACKFILLING

Nominal Size	Nominal Outside Diameter (inches)	Minimum Wall Thickness Required (inches)	
		M.D.O.T.	Railroads
2"	2.375	0.154	0.251
4"	4.500	0.188	0.251
6"	6.625	0.188	0.251
8"	8.625	0.188	0.251
10"	10.750	0.188	0.251
12"	12.750	0.188	0.251
14"	14.000	0.250	0.282
16"	16.000	0.250	0.282
18"	18.000	0.250	0.313
20"	20.000	0.250	0.344
22"	22.000	0.250	0.375
24"	24.000	0.250	0.407
26"	26.000	0.312	0.438
28"	28.000	0.312	0.469
30"	30.000	0.312	0.469
34"	34.000	0.312	0.532

2. Grout:

Grout shall consist of a mixture of Portland cement and sand in any proportion which does not have more than 50% sand by volume.

4.03 EXECUTION

A. Excavation

Excavation includes clearing the site of the proposed work and removal of all materials to a depth which is sufficient to permit the construction of the structure or utility in accordance with the plans. Excavated materials may be temporarily stored along the trench in a manner that will not cause damage to trees, shrubbery, or other properties and that will not endanger the banks of the trench by imposing too great a load thereon.

B. Length and Width of Trench

Not more than 200' of open trench will be permitted at a time without approval from the Design Engineer and Township Engineer/Township Utility Department, unless pedestrian bridges are maintained at 200' intervals and vehicular crossings of at least one lane are maintained at 300' intervals.

Streets shall not be completely blocked without written permission from the Design Engineer and roadway officials. All fire alarm boxes and fire hydrants must be kept clear and accessible at all times.

The width of the trench shall be ample to permit the pipe to be laid and joined properly and the backfill to be placed and compacted as specified.

In order to limit excessive loads on the pipe, the maximum width of trench shall not be more than 2' greater than the nominal inside diameter of the pipe. This limitation shall apply to the width of the trench at the top of the pipe. Trenches shall be of such extra width, when required, as will permit the convenient placing of timber supports, sheeting and bracing and handling of special conditions.

C. Bracing, Sheeting and Shoring

Open cut trenches shall be sheeted and braced as required by any governing federal or state laws and municipal ordinances and as may be necessary to protect life, property or the work. When close sheeting is required, it shall be so driven as to prevent adjacent soil from entering the trench either below or through such sheeting. Where sheeting and bracing are used, the trench width shall be increased accordingly. An approved pipe laying trench box may be used in lieu of sheeting where safety of the workmen and/or protection of the work is the sole consideration, if allowed by governing authorities.

Sheeting and bracing left in place must be removed for a depth of 3' below the established finish grade or the existing surface, whichever is lower.

Trench bracing, except that which must be left in place, may be removed when the backfilling has reached the respective levels of such bracing. Sheeting, except that which has been ordered left in place, shall be removed as the backfilling progresses.

D. Pumping, Bailing and Draining

The Contractor shall provide and maintain adequate pumping and draining facilities for removal and disposal of water from trenches or other excavations. He shall provide pumping and draining facilities for bulk headed sewer sections and shall operate same until bulkheads have been removed or construction is completed, if bulkheads are to be left in place. The drainage system must be maintained until the pipe has been covered with sufficient backfill material to prevent floating of the installed pipe sections.

Where work is in ground containing an excessive amount of water, the Contractor shall provide, install and maintain a suitable dewatering system and shall so operate it to insure proper construction of the work. The determination of whether an excessive groundwater condition exists, that is, or might be detrimental to the sewer or water main construction will be made by the Design Engineer. Proper disposal of the dewatering discharge (necessary easements, permits, erosion control, etc.) shall be the responsibility of the Contractor. Contractor shall not discharge or allow any groundwater to enter existing sanitary sewage system. Any water which does enter the existing sewage system shall be the Contractor's responsibility and he will pay any and all transporting and treatment costs involved with this water according to the local municipal authority. Cost of pumping, bailing and draining shall be incidental to and included in the price of the pipe or structure placed in the excavation.

E. Excavation to Grade

The trench shall be excavated to the depth required so as to provide a uniform and continuous bearing and support for the pipe barrel. The Contractor shall excavate the last 4" of depth to grade using hand tools.

Any part of the bottom of the trench excavated below the specified grade shall be refilled with approved materials and thoroughly compacted to a minimum of 95% of the maximum dry density as determined by ASTM D698 or the Michigan Cone Method. The finished subgrade shall be prepared accurately by means of hand tools. Blocking to bring the pipe to grade will not be permitted. Bell holes in the subgrade must be provided to allow for continuous support of the pipe barrel when bell type pipe is used.

If, in the opinion of the Design Engineer (with concurrence of the Township Engineer), subgrade pipe support conditions at some locations are found to be unsatisfactory, he shall have the authority to order subgrade preparation at these locations in accordance with the provisions for special foundations in clay, rock or poor soils.

F. Special Foundation in Clay or Rock

Subgrade consisting of clay or rock shall be excavated to at least 4" and not more than 6" below the specified grade. Before the pipe is laid, the subgrade shall be prepared by backfilling with an approved granular material in 3" compacted layers. The layers shall be thoroughly tamped as directed by the Design Engineer so as to provide a uniform and continuous bearing and support for the pipe barrel with a minimum compaction of 95% of the herein defined maximum dry density. The Contractor will not be allowed extra compensation for this work.

G. Special Foundations in Poor Soil

Where the bottom of the trench at subgrade is found to consist of unstable material which will, in the opinion of the Design Engineer, not provide adequate pipe support, the Design Engineer shall have authority to require either the removal of the unstable material and replacement with approved materials or require the Contractor to construct a foundation for the pipe consisting of piling timber or other materials in accordance with plans prepared by the Design Engineer. The use of stone bedding by the Contractor to reduce dewatering requirements will not be paid as an extra.

H. Backfilling around Pipes/Hydrants

The Contractor shall use care as to not placing backfill materials on top of fire hydrants. During backfilling all fire hydrants should be "bagged" prior to backfilling around their perimeter.

From the bottom of the trench to a depth of 1' above the top of the pipe, the trench shall be backfilled by hand with sand or approved excavated materials and tamped to a minimum of 95% of the herein defined maximum dry density.

The Contractor shall use care in placing this portion of the backfill so as to make sure sufficient material has been worked under the pipe and also avoid injuring or moving the pipe. Backfilling around PVC pipe shall be done in accordance with ASTM D2321 "Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe".

I. Backfilling to Natural Grade

From 1' above the pipe to the grade shown on the drawing or specified herein, the trench shall be backfilled by mechanical methods approved by the Design Engineer. A minimum compaction of 85% of maximum unit weight is required, unless otherwise noted.

Provide 30" of cover above the top of the pipe before application of wheel loading and 48" before use of heavy compactors.

J. Backfill under Structures

Where the excavation is made through or under existing or proposed pavement, curb, shoulders, driveways or sidewalks or where such structures are undercut by the excavation or where noted on the plans, the entire backfill to the subgrade of the structure shall be made with granular material. The granular material backfill shall be placed in layers and compacted to 95% of the herein defined maximum dry density throughout. This requirement shall apply to any trench that is within a

one-on-three slope beneath the road from the shoulder point or back of curb line. Extra compensation will not be allowed for this work.

Granular material is defined as a material meeting granular material Class II as defined in M.D.O.T. Standard Specifications.

K. Special Backfilling Requirements

The Contractor will be required to comply with the regulations of the State Highway, Municipal or County Road Engineering Departments with regard to backfilling in their respective right-of-ways and beneath the roads, and shall be responsible for determining these regulations prior to bidding.

L. Compaction Testing

Compaction testing may be periodically performed by a source and method approved by the Township to insure that compaction requirements are being met. Compaction percentage is based on the maximum dry density as determined by ASTM D1557 or the Michigan Cone Method.

M. Boring and Jacking

The following provisions apply to the construction of sewers, force mains, water mains and house leads which cross pavements under the control of the Michigan Department of Transportation, County Road Commission, or under railroads.

1. General

Steel pipes shall be jacked in place under highways as specified in the current standards published by the Michigan Department of Transportation. Pipe jacked in place under railroads shall meet the current standards established by the affected railroad. The Design Engineer shall incorporate bore and jack requirements into the contract documents. After the pipe has been installed in the steel casing pipe, the casing pipe shall be pressure grouted with an MDOT approved flowable fill or blown full of pea stone and the ends sealed with concrete.

2. Location of Jacking Pits:

a. State Highways

The minimum distance of the jacking pit to the edge of pavement will be specified by the M.D.O.T. and placed on the plans or contract documents by the Design Engineer.

b. County Roads

On all highways, a minimum distance of 15' shall be provided from edge of pavement to the face of boring pits. Any variances from these distances will require tight sheeting and if a traffic hazard, permanent guard rail will be required.

c. Railroads

The location of the jacking pit will be specified by the Railroad and/or the Design Engineer.

3. The boring machine shall be capable of assuring a crossing with no voids.

- a. In solid clay soils the cutting head or the auger, if no head is used, may be allowed to within 1" of the front of the casing.
- b. In sandy soils the cutting head or the auger, if no head is used, must be inside the casing at least 1/2 the diameter of the casing.
- c. If the soil is both clay and sand, the same procedure as for sand shall apply.
- d. In wet, sandy or gravelly type soils that have a tendency to move or run, the cutting head and/or auger shall be pulled back to at least 3' from the front of the casing.
- e. When boring is used to facilitate jacking pipe in place, the minimum diameter of the lead auger section shall be 1/2" smaller than the inside diameter of the pipe being jacked.
- f. Trenchless pipe placement - methods such as trenchless pneumatic piercing tools utilized to perform horizontal bores must be approved by the Township prior to its use.

SECTION 5

CONCRETE WORK

5.01 SCOPE OF WORK

The work under this section shall include all materials, labor and equipment necessary to achieve a finished product, including but not limited to the items in these specifications and those shown on the working drawings. Work includes, but is not limited to building footings, floor slabs, sidewalks, curb and gutter, driveways, etc.

All procedures and materials shall be in accordance with the American Concrete Institute "Building Code Requirements for Structural Concrete" (ACI 318) and "Specifications for Structural Concrete" (ACI 301).

5.02 MATERIALS

- A. Cement: Portland cement shall conform to "Specification for Portland Cement" (ASTM C150).
- B. Aggregates: Concrete aggregates shall conform to "Specification for Concrete Aggregates" (ASTM C33). Maximum coarse aggregate size for all members less than 8" in thickness shall be $\frac{3}{4}$ ". For members with thicknesses greater than or equal to eight (8) inches, the maximum coarse aggregate size shall be 1- $\frac{1}{2}$ ".
- C. Mixing Water: All water used in concrete shall be from a potable water supply.
- D. Concrete Mix Proportions

ACI 318 shall be used for selecting concrete proportions. The Contractor shall furnish, for the Township's approval, all information necessary to show compliance with ACI 318.

ACI-318 shall be used for developing mixture portions. The Contractor shall furnish, for the Engineer's approval, all records to show that his concrete supplier is in compliance with all provisions of Section 4.3.1. If the concrete supplier is unable to furnish all records to comply with Section 4.3.1, Sections 4.3.1.2 and 4.3.2.2 can be used. If no records are available for any of the above ACI Sections, Section 4.3.3.2 shall be used to develop a concrete mix design.

5.03 EXECUTION

A. Concrete Quality

All concrete shall meet the requirements of ACI 318 be from an approved batch plant and shall have a minimum compressive strength of 2500 psi and a maximum water-cement ratio of 0.64.

Air entrainment shall be 5%, more or less, 1% for concrete with maximum aggregate size of 1-½" and shall be 6%, more or less, 1% for concrete with a maximum aggregate size of ¾".

The concrete shall be of a consistency to work easily into corners, angles of forms and around reinforcement. The slump shall not exceed 4".

B. Mixing and Placing Concrete

1. Preparation of Equipment and Place of Deposit:

- a. Before placement, all equipment for mixing and transporting the concrete shall be cleaned and all debris and ice shall be removed from the places to be occupied by the concrete. Forms shall be thoroughly wetted (except in freezing weather) or oiled and masonry filler units that will be in contact with concrete shall be well drenched (except in freezing weather).
- b. Water shall be removed from place of deposit before concrete is placed. All latents and other unsound material shall be removed from hardened concrete before additional concrete is added.
- c. Expansion joint material shall be placed at all locations where concrete is placed against a structure.

2. Mixing:

- a. Ready Mixed Concrete shall be mixed and delivered in accordance with the "Specification for Ready Mixed Concrete" (ASTM C94). Mixing and transporting equipment shall be capable of providing concrete with meets the ASTM C94 requirements for uniformity.
- b. For job mixed concrete, the mixer shall be rotated at a speed recommended by the manufacturer. If mixer performance

tests are not made, each batch of 1 cubic yard or less shall be mixed for at least 1 minute after all materials are in the mixer. The mixing time shall be increased 15 seconds for each additional cubic yard or fraction thereof. The entire batch shall be discharged before the mixer is recharged.

3. Conveying:
 - a. Concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent separation or loss of materials.
 - b. Conveying equipment shall be of such size and design as to ensure a nearly continuous flow of concrete at the delivery point without separation of materials or loss of plasticity.

4. Depositing:
 - a. Concrete shall be deposited as nearly as possible in its final position to avoid segregation due to rehandling or flowing. Concrete shall be placed at such a rate that it is at all times plastic and flows readily. No concrete contaminated by foreign material shall be used nor shall retempered concrete be used unless approved by the Engineer.
 - b. When placing is started, it shall be carried on as a continuous operation until placement of a well defined section is completed.
 - c. All concrete shall be thoroughly consolidated during placement. It shall be thoroughly worked around embedded fixtures and into the corners of the forms.

5. Hot & Cold Weather Requirements:
 - a. Concrete placement during hot weather shall be in accordance with "Hot Weather Concreting" (ACI 305).
 - b. Concrete placement during cold weather shall be in accordance with "Cold Weather Concreting" (ACI 306). Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near freezing weather. No frozen materials or materials containing snow or ice shall be used.
 - 1) All reinforcement, forms, fillers and ground with which the concrete is to come in contact shall be free from snow and ice.

SECTION 5
CONCRETE WORK

- 2) Construction during cold weather shall be performed in accordance with ACI 306, "Recommended Practice for cold Weather Concreting", or as directed by the Engineer.