REQUEST FOR PROPOSALS

PUMP STATION NO. 5 SERVICE AREA
SANITARY SEWER INSPECTION
CHARTER TOWNSHIP OF UNION
ISABELLA COUNTY

Proposals Due:
10:30 A.M., Thursday, March 27th, 2025

Bid Opening (Signed and Sealed: Mailed and/or Delivered):
Sealed Bids will be received, by the Charter Township of Union at the DPW Offices located at 5228 South Isabella Road, Mt. Pleasant, until 10:30 AM local time on March 27, 2025, at which time the Bids received will be publicly opened and read.

Attention: Ms. Kim Smith
Charter Township of Union
5228 South Isabella Road
Mt. Pleasant, MI 48858
Phone 989-772-4600, Ext 224

Questions shall be directed to:

Attention: Ms. Jennifer Graham, P.E.
Gourdie-Fraser, Inc.
123 West Front Street
Traverse City, MI 49684
Phone 231-946-5874
jennifer@gfa.tc

Project Scope:
The Charter Township of Union owns and operates a municipal sewer system that provides collection and treatment to approximately 5,500 customers. The sanitary sewer system is comprised of pressure force main and gravity sewer mains that collect and transport their wastewater system located off River Road. The existing residential area along Concourse Drive, Meadowlark Lane, and Billlbrael Lane are serviced by 8-inch gravity sewer that discharges into an existing sanitary Pump Station (#5) located at 3248 Concourse Drive. This station and associated infrastructure was installed in the 1980's and experiences high water volumes typically during heavy rainfall events. In an effort to be proactive the Township conducted extensive televising and corrective repairs in 2017 but overall pipe conditions were found to be in good condition.

Based upon past inspection, repairs and research conducted, the Township suspects that stormwater inflow is occurring through illegal cross connections such as footing drain connections, sump connections, roof drain connections, storm sewer connections, etc from the existing dwellings. Therefore, the Township has retained their Engineer, Gourdie Fraser to assist with the solicitation of bids from qualified contractors to provide services related to performing additional investigation in this area.

This Project shall consist of smoke testing the gravity sanitary sewer pipe of the Charter Township of Union's sanitary sewer collection system in the Pump Station No. 5 service area (refer to attached location map and associated inspection report table).

Scanned copies of the As-Built Drawings for Concourse Drive are included in this RFP along with an overall existing sewer system map illustrating the area of investigation and the 2017 Televising reports. Record drawings for the remainder sewer do not exist and the contractor shall be responsible to field verify, conduct site visits and familiarize themselves with the project. The Township does have on file videos of the areas televised from 2017 and are available upon request. Contractor shall be responsible to review site conditions for accuracy to ensure adequate access is available and provide equipment capable to conduct smoke testing as identified in the RFP, specifications, and details.

Scope of Services:

General:

- Work must comply with all applicable laws, regulations
- Schedule of work shall be coordinated with the Township Engineer and DPW Staff.
- Provide a (1) year full warranty on all workmanship, material and equipment furnished for this project.

Work Items:

1. Smoke testing all 8" sanitary sewer pipe identified on site plan in accordance with specifications and local / state regulatory requirements.
2. Restore each manhole site back to existing conditions after inspections and smoke testing. Any damage to existing manholes shall be repaired and /or restored to existing or better conditions at no additional cost to the project.

Bid Submittal Requirements:

The contractor shall agree to the above terms and conditions stipulated and will certify that their equipment will be able to operate under the requirements that have been stated above. The contractor shall include the following in addition to price with their submitted proposal:

- Provide a tentative timeline for completion of the work.
- Provide minimum of three (3) references for similar municipality/commercial projects located within Michigan and completed within the last two (2) years.

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 the Charter Township of Union

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.

Bonds:

- The Contractor shall include in the Bid price the cost to provide the following:
  - Letter of Surety, licensed to business in the State of Michigan, stating ability to obtain a Performance Bond, and Labor and Material Bond for 100% of the proposal amount.

- Maintenance and Guarantee Bond in the amount of 50% of the proposal amount, guarantying for a period of one (1) year from final acceptance of the project work.

Schedule:

- To be completed by November 1, 2025
- All work must be completed within thirty (30) calendar days from the beginning of removal to final clean up. Delays by inclement weather shall be approved by the Department of Public Services Director.
- Contractor shall provide a plan and schedule to Owner and Engineer for approval prior to beginning the work.

Equipment/Materials:

Contractor shall provide all equipment and materials necessary to complete the work described herein. The Contractor shall provide a detailed summary of the equipment and services to be provided. The scope of work shall include but shall not be limited to the following:

- Mobilization and Miss Dig
- Smoke testing of gravity sewer pipe and documentation of findings in accordance with plans and specifications. The contractor shall be responsible to provide all labor, equipment, temporary water and power supply, and accessories to complete the work.
- All work including staging, storage and equipment shall remain within the confines of public ROW and existing easements.
- Contractor shall be responsible to conduct field exploration to verify all conditions prior to beginning work.
- Work zone signing and traffic maintenance as coordinated and approved by the Isabella County Road Commission and Charter Township of Union
- All coordination and communication with EGLE as required for testing (as applicable).
- Coordination and communication with property owners notifying of testing to occur in service area.
  - Provide notice by mail a minimum of 2 week prior to testing in the area.
  - Provide door hanger a minimum of 5 days prior to testing in the area.
  - Copies of all notifications and door hangers to be provide to Township a minimum of 30 days prior to testing for approval.
- Applicable investigation and excavation to access manholes as some maybe buried.
- Site restoration and clean-up.

Owner shall provide all equipment, labor and materials necessary to complete the work outlined above including:

- Site accessibility. Contractor shall be responsible to coordinate and provide construction schedule and minimum 48 hour notice before completing work.

Contractors Proposal Form

Bidders are instructed to submit bids for this project on a unit cost per manhole t basis as stated in the Proposal. Bypass pumping, traffic control, and all other labor, materials and equipment are considered incidental and to be included in total bid price. All work shall be performed incompliance with the terms identified in the RFP and applicable laws.

NO.	ITEM DESCRIPTION	EST QTY	ITEM UNIT	UNIT PRICE	ITEM COST
1	Mobilization	1	LS	$	$
2	Traffic Control	1	LS	$	$
3	Smoke Testing	6,620	LF	$	$
4	Site Restoration	1	LS	$	$
				TOTAL BID	**$**

Bidders Signature

Printed Name:

Business Name:

Address:

MI Contractor License No.:

Telephone:

Cell Phone:

Email:

The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the Work and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any / all bids if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the work as requested.

The Charter Township of Union reserves the right to accept or reject any or all proposals.

Engineering
Surveying
Testing &
Operations

123 West Front Street
Traverse City, Michigan 49684
231.946.5874
231.946.3703

TECHNICAL SPECIFICATIONS FOR

PUMP STATION NO. 5 SERVICE AREA SANITARY SEWER INSPECTION

Charter Township Of Union

GFA PROJECT NO.: 23069
DATE: FEBRUARY 2025

PROJECT SPECIFICATIONS
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SECTION 01536 – SAFETY PRECAUTIONS AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements on providing and maintaining facilities for the protection and safety of all persons and property.

1.2 REFERENCES

A. Unless otherwise specified, the work for this Section shall conform to all State and National laws, ordinances, rules and regulations pertaining to the kind, including but not limited to the following Standard Specifications:
   1. State of Michigan "Occupational Safety and Health Act", Act 154 of the Public Acts of 1974 (MIOSHA) as administered by the Michigan Department of Labor and Public Health.
   2. MDOT Michigan Manual of Uniform Traffic Control Devices (MMUTCD)

PART 2 - PRODUCTS

2.1 SIGNS AND BARRICADES

A. Provide in accordance with MDOT Michigan Manual of Uniform Traffic Control Devices - Part 6.

2.2 TEMPORARY FENCING

A. All fencing shall be strong and durable enough to discourage unauthorized entrance, constructed with the following materials:
   1. Posts: Wood or steel
   2. Fabric: Snow fence type, wood or plastic, 4 feet high.

PART 3 - EXECUTION

3.1 GENERAL

A. Provide adequate warning signs, barricades, lights, and flagmen as necessary for the protection of the work and safety of the workmen and general public. Control devices shall:
   1. Protect workmen and the public from all open trenches and excavations.
   2. Provide temporary fencing to discourage unauthorized entrance.

B. All barricades, signs, lights, and other protective devices shall be installed and maintained in conformance with the transportation authority having jurisdiction.

C. Designate all streets or roads that are closed with barricades and warning signs. Closing of roads shall be approved by the authority having jurisdiction (Isabella County Road Commission). Properly notify the local emergency services prior to closing of any road.

D. Maintain temporary fencing throughout the duration of construction.

E. Remove temporary fencing at project completion or after permanent fencing is installed.

END OF SECTION 01536

SECTION 01570 – TRAFFIC REGULATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Provide and maintain traffic control equipment and personnel to protect the work and workmen, and to ensure the least possible obstruction to traffic and inconvenience to the general public.
   2. Meet all the requirements of the construction permit issued by the right-of-way owner, as applicable.

1.2 REFERENCES

A. MDOT Michigan Manual of Uniform Traffic Control Devices (MMUTCD)

PART 2 - PRODUCTS

2.1 GENERAL

A. All products shall be in accordance with the Michigan Manual of Uniform Traffic Control Device.

PART 3 - EXECUTION

3.1 DETOURS

A. Contractor shall be solely responsible for acts or omissions resulting in any legal proceedings due to improper or inadequate detour or safety controls.

B. Submit proposed detour route to the Engineer, the municipality, the Isabella County Road Commission (Right-of-Way Owner) and all emergency services for approval prior to construction in the detour area.

C. Keep fire hydrants adjacent to the work accessible to firefighting equipment at all times.

D. Keep police, fire, and other emergency services informed of the status of road closings.

3.2 PUBLIC ACCESS

A. Maintain traffic access in accordance with local laws and regulations having jurisdiction.

B. Minimize the time that vehicular and pedestrian access to any occupied home, or other building is interrupted. Maintain continuous access to businesses.

END OF SECTION 01570

SECTION 02763 – SMOKE TESTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes smoke testing materials and procedures to be used in the investigation of the sanitary sewer facilities in the Pump Station #5 service area. Available record drawings, televising inspection reports and project study area map are provided for reference. All materials and procedures shall be consistent with these specifications, current industry standards, and as approved by the Owner and Engineer.

1.2 REFERENCES

A. NASSCO – National Association of Sanitary Sewer Companies

1.3 REQUIREMENTS

A. The nature of smoke testing inspections is to confirm system connectivity, identify gravity sewer system defects that allow inflow and infiltration (I&I), assist in locating cross-connections between storm and sanitary sewer, and provide a permanent record of the defects including type, location, and severity. Inspections will be performed by introducing non- toxic smoke into the sanitary sewer pipes using a high capacity blower, observing and documenting smoke exiting vent stacks and at defect locations, and documenting the defects.

B. The field crew will be of sufficient size to properly operate the smoke generation machine and provide full coverage of the area to visually locate smoke discharged from defects, provide traffic control, monitor sewer surcharge, and document work.

C. The employees performing the smoke testing under the provisions of these specifications shall be properly trained and thoroughly experienced in the use of the equipment and procedures.

D. Each employee shall wear or have on them a photo ID identifying him/her by name, company name and contact information. Clothing and vehicles identifying the company is also preferred. All job supervisors will have business cards with contact information to provide to residents if requested.

E. The Contractor shall take appropriate action to ensure their employees are polite to the public in all aspects of the work and that immediate assistance is provided to property owners if needed.

F. Contractor shall notify the Owner and Engineer a minimum of 48 hours prior to the startup of smoke testing work or re-startup following delays due to weather. Contractor will provide the Engineer the location for the next days work at the end of each day, if requested. No payment will be made for work performed without proper notification.

PART 2 - PRODUCTS

2.1 SMOKE PRODUCTION

A. Smoke fluid or approved equal, shall produce continuous smoke that can be controlled by the testing crew for the duration of the test. The smoke generated shall be white to gray in color, leave no residue, and shall be non-toxic and non-explosive.

B. The Contractor shall supply the Safety Data Sheet (SDS) for the material utilized to generate the smoke to the Client(s), Owner(s) and emergency services prior to testing. A copy of the SDS should also be carried by field personnel for any residents that request a copy, or if a First Aid situation should occur.

2.2 BLOWERS

A. The Contractor shall provide a portable blower designed and built specifically for the use of smoke testing. The blower shall be self-contained and capable of producing adequate cubic feet of air per minute to generate sufficient pressure for testing. If inadequate pressure is generated, then additional blowers (dual blowers) or larger blowers may be required. Adequate pressure is being provided when smoke is exiting the vent stacks as a plume or, where no vent stacks are present, smoke is exiting the upstream/downstream manhole casting/vent hole/pick hole, etc. In general, the larger the pipeline diameter being tested, the higher the smoke blower capacity (cfm) required.

B. The base of the blower shall have appropriate adapters and seals to make a good connection to the manhole without excessive loss of smoke.

2.3 OTHER EQUIPMENT

A. Cameras are required to document each defect or observations found by the crew. It is recommended that a minimum of a 5 mega-pixel camera be used for taking photos, and that a flag or other means of identification be placed on/in the ground to help identify the defect or observation in the photograph.

B. GPS equipment shall be utilized to document smoke testing defects, it should be capable of pinpointing the identified defect with an accuracy of one meter or less.

C. In addition to the blower, the smoke testing crew shall provide all other equipment, tools, and materials required to perform smoke testing as outlined by these specifications including, but not limited to, sewer line stoppers, sand bags, cameras, confined space entry equipment, and traffic control equipment.

PART 3 - EXECUTION

3.1 WORK PROGRESS

A. The work shall generally progress as follows:

1. The Contractor shall apply for and obtain local agency permits for all work to be as applicable. All required insurances, traffic control measures, and other terms of the permit shall be provided to the satisfaction of the Engineer.
2. The Township will provide the Contractor with the procedure that should be followed regarding notification of fire department, police department, emergency personnel, etc.
3. The Contractor shall have the Engineer review required submittals including, but not limited to, property owner notification letter and door hangers, the field inspection forms and database deliverable. Work shall not proceed until Engineer and Owner accepts all submittal formats.
4. A WORK SCHEDULE shall be submitted to the Engineer and Owner for review and approval. No field testing or notification may proceed until the schedule has been approved by the Engineer. After approval of the WORK SCHEDULE, the Contractor shall not make any revisions or modifications to it without the Engineer's written approval.
5. Daily Notifications:
    a. The Contractor shall notify, by hand delivery of approved door hangers to each address, all residences and businesses in the study area. All notification door hangers shall be approved by the Engineer and Owner before printing and distribution. The Contractor shall place door hangers on all residences and business 2-7 days prior to smoke testing at those specific addresses. Notification shall be an ongoing process throughout the project and shall be limited to the area provided in the look ahead schedule. Door hangers shall not be placed for areas which will not be tested within 7 days. If smoke testing is delayed for more than 7 days due to rain, etc., the area shall be re-notified. All smoke notifications should include information about the project, ways to avoid smoke entering the building and at least one (1) phone number that residents can call with any questions or concerns.
    b. The Contractor shall check with all residents who expressed special concerns or special needs/notification prior to testing.
    c. Notification of Emergency Services and dispatch centers will be completed each morning prior to testing that day. Engineer will provide the required contact information for notifications by the contractor.
    d. The Owner will provide the Contractor a list of the existing residences including addresses for their use for notification.
6. It shall be the Contractor's responsibility to keep adequate records of all notifications and to produce them upon Engineer's request. Failure to comply with this requirement may be cause to suspend the Contractor's operations until compliance is achieved.
7. Notification of Emergency Services and dispatch centers will be completed each morning prior to that day's testing. Owner/Client will identify and provide contact information for all individuals designated for daily notifications.
8. Perform the smoke testing.
9. Prepare and provide the smoke testing data documents.

3.2 WORK SCHEDULE

A. Upon award of the Contract, and prior to commencing any work, the Contractor shall provide a complete WORK SCHEDULE to the Engineer for review and approval. The Work Schedule shall be typed and indicate the planned progress for the proposed work.

B. Acceptable Periods of Work
    1. Work hours must be approved by the Engineer. However, the Contractor shall not typically commence testing before 8:00 a.m. local time and shall terminate testing no later than

4:00p.m. each day. If the Contractor wishes to test before 8:00 a.m. or after 4:00 p.m. local time, such testing shall be shown on the submitted WORK SCHEDULE and is subject to the Engineer's approval.

2. Smoke testing shall not be performed on weekends or on holidays without the prior approval of the Engineer.

C. Contractor shall not perform smoke testing on days that, in the opinion of the Engineer, will hinder the results of the test. (For example, heavy rains or excessively saturated soil conditions). Contractor may provide soil moisture or segment re-testing data as evidence that soil conditions are favorable for smoke testing.

3.3 PERFORMANCE TESTING

A. Procedures:

1. Safety:
   a. The Contractor and his personnel shall be aware of and follow all Federal, State, and Local safety laws and regulations.
   b. No entry into any part of the collection system shall be permitted until the Contractor has demonstrated that on-site personnel has been trained in applicable confined space safety procedures and has the equipment on-site to allow those procedures to be followed.
   c. The Contractor shall minimize the physical entry of personnel into the sanitary sewer facilities. If required, manhole entry shall be in accordance with Federal, State, and local regulations for confined space entry and other regulations that may apply. The Contractor shall provide all safety equipment required for manhole entry operations, including harnesses, ventilation equipment, etc.
   d. Traffic Control. The area of work shall, at all times, be protected by means of an adequate number of cones, barricades, flags, or by other means necessary to properly and safely protect both vehicular and pedestrian traffic.
   e. Any condition deemed to be an unsafe by the Contractor shall be reported to the Engineer. It is further understood that the Contractor shall not be required to work where, in the opinion of the Contractor, conditions would not be safe for the public, company personnel, equipment and/or other.
2. Confirm that adequate conditions (soil moisture, existence of catchment hoods, proper notifications, residents requiring assistance or notification, any preliminary procedures that may be necessary prior to conducting test, etc.) exist which will allow for desired results
3. Unless otherwise approved by the Engineer, the sections of sewer subject to testing shall typically:
   a. Consist of a central manhole, where the blower will be positioned, and an upstream and downstream manhole and the sewer pipe between them. With three (3) manholes and two pipe sections, lengths should not exceed 1,000 feet. The blower capacity and/or number of blowers necessary will be determined by the adequacy of pressure as observed at the vent stack or downstream/upstream manholes.
   b. Upon approval of the Engineer, longer sections may be tested provided good pressure, as evidenced by smoke plume, is observed at the vent stacks.
4. The walk through for locating defects will not begin until smoke is highly visible with a smoke plume emanating from the plumbing vents of houses at the end of the setup location (maximum 500 ft radius) from the smoke testing machine. A locate flag will be placed at the location of the defect. Walkers shall traverse not only the sidewalk but between all

homes and in back yards looking for illegal connections including patio, pool drains, roof drain connections and buildings where vent stacks do not exhibit smoke.

5. Defects must be located and documented as approved by the Engineer. Contractor is responsible for using the following method(s) for locating a defect:
    a. Triangulate the defect with respect to the distance from two fixed objects (house corners, power poles, fire hydrant, etc.) and record on a location sketch and photograph.
    b. Survey with GPS to pinpoint the identified defect with an accuracy of one meter or less.
6. Flow Control - It is the intent of this specification that the smoke testing be accomplished without the need for bypass pumping. The Contractor shall provide temporary plugs, sandbags, or flow barriers as required to contain an adequate volume of smoke within the section of sewer being tested. The Contractor shall monitor the resulting surcharged sewer at the manhole upstream of the tested section of sewer and prevent overflow conditions from occurring by removing the flow barriers or removing sewage by vacuum trucks. The Contractor is responsible for providing any equipment necessary to prevent the overflow conditions.
7. All smoke testing information shall conform to the most recent version of the NASSCO smoke testing codes and database structure.
8. Data will be accurately and neatly recorded on field worksheets approved by the Engineer.
9. For each sewer main tested, the Contractor shall prepare a field log identifying each point of smoke exfiltration from:
    a. Roof gutters
    b. Sewer cleanouts
    c. Leakage in house laterals
    d. Patio or area drains
    e. Storm drain cross connections
    f. Manholes
    g. Sewer vents (lack of smoke)
    h. Any other source not stated above
10. Each smoke defect, as identified above, shall include an address, be referenced by sketch, and GPS, dimensioned to permanent landmarks along with intensity of smoke
11. A photograph of all leaks using a digital camera shall be included in the field log. Photographs of smoke evidence shall have a location indicated in the photograph using a defect flag where possible. All photographs shall be clearly cross-referenced to the typed and/or computer- generated log indicating the location of the leak. Once the defect has been flagged the Smoke Testing Contractor will snap a digital picture (delivered in minimum 640x480 resolution) showing the smoke exiting from the defect, flag, and physical features at or near the defect. Photographs should include sufficient field of view so that drainage patterns can be discerned.
12. The Engineer may authorize QA/QC testing of specific line segments previously tested to determine the quality of testing performed and/or establish if soil conditions are sufficiently dry to continue smoke testing into new areas. Any re-testing will follow the same procedures.
13. The Contractor shall deliver project data in format approved by the Engineer and Owner. Deliverables will include:
    a. Maps of study area with corresponding Inspection Report Summary table. Contractor to provide inspection reports in similar formatting and with the same naming convention as provided in summary table.
    b. Summary of work quantities completed.
    c. Summary of defect findings.

d. Completed field forms and sketches that document the testing and findings using the NASSCO smoke testing codes.
e. NASSCO database. All data codes and definitions shall conform to the NASSCO smoke testing requirements.
f. Submit one (1) complete copy of the field data and the electronic database to the Engineer for review. Upon receiving the Engineer's review and comments, the Contractor shall edit or revise the data delivery and/or electronic report as necessary and resubmit a copy of the final report (one hard copy and the electronic database) to the Engineer.

END OF SECTION 02763

SECTION 1

GENERAL REQUIREMENTS

1.01 PROJECT DESCRIPTION

Work includes the following major items:

The work under this contract consists of the following listed items and includes, but is not limited to, the furnishing of all labor, materials, tools and equipment, to properly install, construct or complete, as indicated on the drawings or specifications:

Pump Station No. 5 Service Area

1. Sanitary sewer smoke testing of 8” gravity sewer as specified on service area map and as outlined in the provided inspection report table.
2. Waterproofing sanitary sewer manhole lids as identified on the service area map and outlined in the inspection report summary table.
3. Sanitary sewer manhole lid adjustment, as applicable.

1.02 DEFINITIONS

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

DPW	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 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 Engineer 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 Engineer 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 Engineer with a copy of all documentation and calculations for the permit process. The Township, with the assistance of the Township Engineer, will obtain the necessary permit for construction/installation prior to commencement of any work.

1.09 ACCESS TO WORK

The Township Engineer or Township Resident Project Representative 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 Engineer 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 Engineer for his review regarding compliance with the Township requirements. The Township Engineer 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 Engineer 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 Engineer.

1.13 MATERIAL CERTIFICATION

Manufacturer's certification slips shall be submitted to the Township Engineer 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.

SECTION 13

REPLACEMENT AND CLEANUP

13.01 SCOPE OF WORK

Under this item, the Contractor will restore all lawns, trees, gardens, landscape plantings, sidewalks, ramps, trails, fences, commercial signs, water courses and sand, gravel, dirt, asphalt and concrete roads, catch basins, storm sewers, building sewers, water services, water valve boxes, meter vaults, property markers (such as concrete monuments, irons, stakes, pipes, etc.), mailboxes and other items which may be damaged during the course of construction. All replacement and cleanup work will be incidental to the project except those items of work that are delineated in the bid proposal.

All restoration work shall attempt to return the existing facilities to their original condition. Substitutions, such as gravel instead of grass, will not be allowable.

The Contractor shall pay special attention to the requirements of Act 347, "Soil Erosion and Sedimentation Control". In all construction work the Contractor shall take all precautions necessary to prevent erosion and to conform to the requirements of Act 347. Should erosion occur within the guarantee period, the Contractor shall regrade and reseed the disturbed area at no additional cost to the Owner.

Replacement and cleanup operations shall follow immediately behind the construction work. The Contractor shall make every effort to keep the job site clean and free of trash and miscellaneous building materials. The Contractor shall pay special attention in order to restore commercial signs, fences, etc. and to patch and repair pavement, driveways and sidewalks immediately after the construction work. In the event that replacement and cleanup work does not proceed in a satisfactory manner, the Owner may withhold periodic payments or close the construction area until such time as the replacement and cleanup is satisfactory. An exception may be made if there are physical limitations which do not allow for immediate replacement and cleanup.

13.02 PAVEMENT RESTORATION

A. General

All permanent pavement restoration shall be done over compacted backfill and a minimum 6" thick compacted M.D.O.T. 22A gravel base, unless otherwise noted on plans. The gravel base shall be placed and maintained in accordance with the M.D.O.T. Standard Specifications. All patches shall have square, neat, saw cut edges regardless of the final surfacing method planned for that section of the pavement restoration.

No patching work shall be started until the subgrade has been properly prepared. Prior to laying the bituminous patch, the adjacent road surfaces shall be swept clean of all foreign materials and the patch area and pavement primed with Michigan Department of Transportation's approved prime coat.

A bituminous bond coat shall be placed between successive lifts of the bituminous patch and bituminous surfacing. Each lift shall be thoroughly compacted before adding the next lift. This includes running the compaction roller longitudinally along the entire length of the joints between the patch and the existing pavement.

The bituminous mixture to be furnished under these specifications shall be delivered to the paver at a temperature no lower than 285 F. Any mixture that has a temperature below 285 F at the time of "laying" shall be rejected and hauled from the project.

Temporary road patches shall be gravel or bituminous cold patch. The patches shall be maintained in a smooth condition until final repairs are made.

The Design Engineer, Township Engineer and the County Road Commission shall be notified at least two (2) working days prior to the placement of any and all final pavement overlays.

Aggregate for mixes shall conform to the Isabella County Road Commission and the Union Township current standards.

B. Bituminous Patching

Existing asphalt roads and driveways shall be patched using the current Road Commission and/or MDOT standards. All patches shall be placed in two lifts of 165 pounds per square yard for the first course and 165 pounds per square yard for the second course or match existing thickness. A bituminous prime coat of 0.25 gallons per square yard and a tack coat of 0.10 gallons per square yard shall be used for all bituminous patches. Shoulders shall be restored to their original width and depth in accordance with M.D.O.T. Standard Specifications using M.D.O.T. 23A gravel.

C. Gravel Roads, Driveways and Shoulders

All gravel roads shall be restored in accordance with M.D.O.T. Standard Specifications using 6" of M.D.O.T. 22A gravel. Shoulders shall be restored to their original width and depth in accordance with 1984 M.D.O.T. Standard Specification 3.09 using M.D.O.T. 23A gravel. Shoulders shall be raised on the side opposite of main construction to match new pavement surfaces.

D. Concrete Pavement, Sidewalk and Driveways

Concrete for restoring pavement, sidewalks, and driveways shall attain a 28-day strength of 3,500 pounds per square inch. Neat edges of patch areas shall be obtained by the use of a concrete saw. Concrete mixing aggregates and curing methods shall conform to Concrete section. Concrete patches shall match the original width and depth and in no case, a depth less than 4". Sidewalks shall have contraction joints a distance apart equal to the width of the slab.

13.03 GRASS AREA

Grass areas shall be considered as two types: A) Type 1, areas which had lawns before construction, and B) Type 2, open fields or ditches not adjacent to established lawns. The plans may specifically call for Type 1 mixtures in which case the plans will govern. If there is a question as to which mixture to use, the Design Engineer shall make the final decision.

Terraces, lawns, ditches, open fields and other grassy areas shall be topsoiled, fertilized, seeded and mulched in such a manner that a grass approximately equal in type and density of the original is obtained. Slopes between 1:3 and 1:2 shall be sodded and staked or receive seed with mulch blankets.

A. Topsoil

Topsoil furnished shall consist of dark brown or black loam, clay loam, silt loam, or sandy loam surface of fertile, friable humus soil of mineral organics, not including peat or muck. Soil shall be screened topsoil, free of stones, roots, sticks and any other extraneous materials. All topsoil furnished shall be approved by the Design Engineer. Type 1 areas shall be topsoiled to a depth of 4" and Type 2 areas to a depth of 2".

B. Seeding and Fertilizing

Areas to be seeded and fertilized shall be carefully raked to even surfaces and all stones, sticks and other debris removed.

The area to be seeded shall be fertilized with agricultural fertilizer 12-12-12 analysis, Davco or Agrico or equal, applied on the prepared surface at the rate of 20 pounds per 1,000 square feet. Fertilizer shall be harrowed or raked into the soil to a depth of not less than 1".

Seeds shall be furnished in durable bags. On each bag of seed, the vendor shall attach a tag giving name, lot number, net weight of contents, purity and germination. All seed shall be thoroughly mixed and sown in a method which will ensure uniform distribution. Seeding during high winds or inclement weather will not be permitted. All seed is to be raked in and compacted. The seed shall be sown at the rate of five (5) pounds per 1,000

feet. The seeding mixtures shall be composed of certified seed of the purity, germination and proportions by weight as specified in the following table:

	SEEDS		MIXTURES	
Kind	Minimum Purity	Minimum Germination	Type I	Type 2
Perennial Rye Grass	98%	90%	20%	50%
Kentucky Blue Grass	90%	75%	60%	15%
Creeping Red Fescue	98%	80%	20%	35%

C. Mulching

Immediately after seeding all seeded areas, Type 1 and Type 2 shall be mulched with unweathered small grain straw or hay spread uniformly at a rate of 100 pounds per 100 square feet (two tons per acre). Hydroseeding method with similar application rate will be allowed.

D. Mulching Anchoring

All mulch shall be anchored using one of the following methods. The Contractor may use either method unless otherwise shown on the plans.

1. Method "A": The straw mulch shall be anchored by applying one of the following asphalt products at the rate shown. The asphalt may be blown on with the mulch or sprayed on immediately after the mulch is spread.

Asphalt Product	Application Rate
Liquid Asphalt R.C. 1, 2 or 3; M.C. 2 or 3	0.10 gal. per S.Y.
Emulsified Asphalt R.S. 1 or 2; M.S. 2; or S.S. 1	0.04 gal. per S.Y.

2. Method "B": A "Terra-Tak" mulch binder may be used in lieu of asphalt. Mixing and application shall be done in accordance with the manufacturer's recommendations.

3. Method "C": In areas with slopes greater than 10% or where shown on the plans, the Contractor shall place mulch netting or excelsior blanket mulch.

   a. Mulch Netting: Mulch shall be anchored by the use of mulch netting. The light weight fibrous netting shall be properly

placed over the mulch and secured to the ground using wire staples, spaced per manufacturer's recommendations.

b. Excelsior Blanket Mulch: An excelsior blanket shall be used in lieu of other mulch. The excelsior blanket shall be a consistent thickness of evenly distributed wood excelsior fibers, 80% of which are 6" or more in length. The top side of the blanket shall be covered with a coarse net of twisted Kraft paper or biodegradable extruded plastic mesh. Ends and sides shall be securely butted and stapled with U-shaped wire staples of a size and length suited to the soil conditions.

13.04 DITCHES

Ditches which have been grassed and maintained by the abutting property owner shall be restored to the pre-construction conditions.

Ditches in which culverts or drain tile have been installed shall have the same tile replaced, if in good condition, or a tile satisfactory to the Design Engineer installed in its place at the original line and grade.

Catch basins shall be reconstructed, if removed or damaged.

13.05 FENCE REPLACEMENT

A. Chain Link Fence shall be replaced according to current M.D.O.T. specifications.

B. Other Fences shall be replaced equal to and of the same type as existing.

C. Salvaged material, if approved by the Engineer, may be used for replacement.

D. Right-of-way fences shall be repaired/replaced as indicated on the construction drawings.

13.06 COMMERCIAL SIGNS

Commercial signs, which must be removed by the Contractor in order for work to proceed, shall be replaced and reconstructed to original condition. It is very important that replacement follow immediately behind the construction work.

13.07 BUILDING SEWERS

Building sewers shall include any and all parts of private residential, commercial or industrial sewage disposal system such as sewer pipe, septic tanks, drainfield, etc. Whenever the service of any such facility
is interrupted because of the Contractor's operations, he shall provide such interim methods of sewage disposal as are required to maintain a safe, nuisance free, non-polluting construction operation.

13.08 OTHER DEBRIS

The Contractor shall remove, at his own expense from the site, any and all broken pipe, bricks, blocks, lumps of concrete, broken machinery, cans, containers, and other trash and debris.

13.09 TREES

The Contractor shall endeavor to save as many trees as possible. Cut trees, including stumps, shall be disposed of by the Contractor. Any elm tree which is removed must be burned. Tree branches which become broken shall be removed by cutting off flush with trunk and the cut on the trunk shall be painted with an approved tree paint. Where removal of a stump would result in damage to existing utilities, the stump may be removed by chipping to a depth of at least one foot below the finished ground surface.

Trees removed by the Contractor and where approved by the Engineer shall be replaced with a reasonably sized tree of the same variety. Trees along the State Highways and County Roads that fall on the property line or in the road right-of-way shall be replaced at a new location off the right-of-way.

Replacement trees of the deciduous or hardwood type shall be furnished from nursery stock, at least 2" to 2½" in diameter, and shall have the roots contained in a ball of soil and wrapped in burlap.

Replacement trees of the evergreen type may be furnished from either nursery or native stock, at least 8' – 10' in height, and shall have roots contained in a ball of soil and wrapped in burlap.

Engineering
Surveying
Testing &
Operations

123 West Front Street
Traverse City, Michigan 49684
231.946.5874
231.946.3703

SANITARY SEWER INSPECTION REPORTS AND SERVICE AREA MAP FOR

PUMP STATION NO. 5 SERVICE AREA SANITARY SEWER INSPECTION

Charter Township of Union

GFA PROJECT NO.: 23069
DATE: FEBRUARY 2025

Union Township Sanitary Sewer

Pump Station No. 5 Service Area

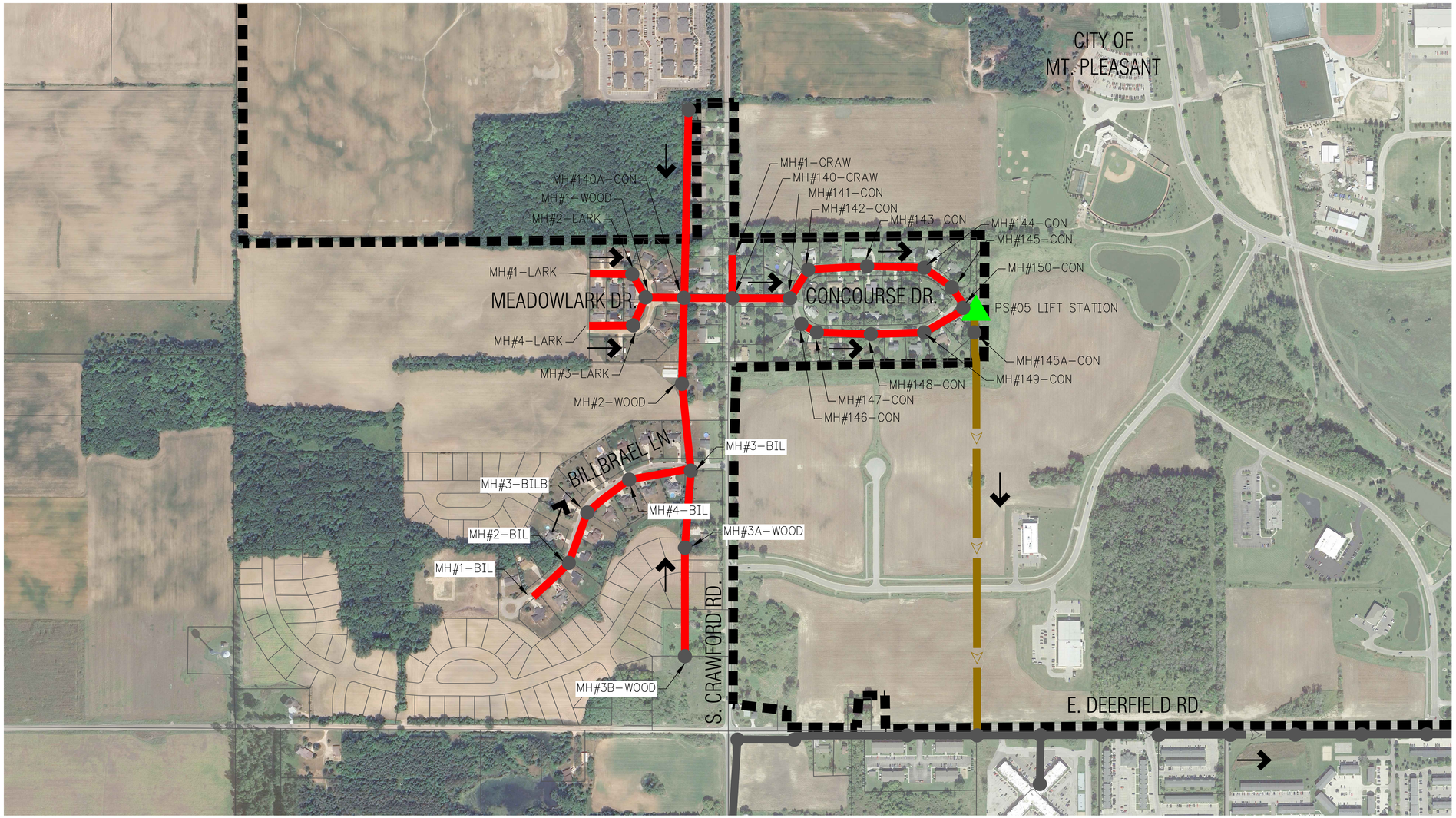
Inspection Reports Summary

Friday, October 13, 2017

		Location			Pipe				Manhole			Grade Count					
Setup	**Date**	**Street**	**Start MH**	**Finish MH**	**Direction**	**Size**	**Pre-Clean**	**Length (ft)**	**Struct**	**O&M**	**Overall**	**5**	**4**	**3**	**2**	**1**	**0**
1	9/5/2017	N Meadowlark Ln	MH#2-LARK	MH#1-LARK (Cleanout)	U	8	J	220.4	0	0	0	0	0	0	0	0	6
2	9/5/2017	N Meadowlark Ln	MH#2-LARK	MH#1-WOOD	D	8	J	163.5	4	0	4	0	0	0	2	0	4
3	9/5/2017	Meadowlark Ln	MH#1-WOOD	MH#140A-CON	D	8	J	183.9	2	0	2	0	0	0	1	0	3
4	9/5/2017	Meadowlark Ln	MH#140A-CON	MH#140-CRAW	D	8	J	262.4	20	5	25	0	0	1	11	0	4
5	9/5/2017	Concourse Dr	MH#140-CRAW	MH#141-CON	D	8	J	309.5	4	0	4	0	0	0	2	0	4
6	9/5/2017	S Meadowlark Ln	MH#3-LARK	MH#4-LARK (Cleanout)	U	8	J	228.6	0	0	0	0	0	0	0	0	6
7	9/5/2017	S Meadowlark Ln	MH#3-LARK	MH#1-WOOD	D	8	J	194.3	0	0	0	0	0	0	0	0	3
8	9/6/2017	N Concourse Dr	MH#141-CON	MH#142-CON	D	8	J	180.7	6	0	6	0	0	0	3	0	3
9	9/6/2017	N Concourse Dr	MH#142-CON	MH#143-CON	D	8	J	314.4	12	0	12	0	0	0	6	0	6
10	9/6/2017	N Concourse Dr	MH#143-CON	MH#144-CON	D	8	J	306.3	8	0	8	0	0	0	4	0	7
11	9/6/2017	N Concourse Dr	MH#144-CON	MH#145-CON	D	8	J	179.2	10	0	10	0	0	0	5	0	3
12	9/6/2017	S Concourse Dr	MH#146-CON	MH#147-CON	D	8	J	95.3	0	0	0	0	0	0	0	0	4
13	9/6/2017	S Concourse Dr	MH#147-CON	MH#148-CON	D	8	J	286.2	2	0	2	0	0	0	1	0	7
14	9/6/2017	S Concourse Dr	MH#148-CON	MH#149-CON	D	8	J	285.8	4	0	4	0	0	0	2	0	5
15	9/6/2017	S Concourse Dr	MH#149-CON	MH#150-CON	D	8	J	256.2	2	0	2	0	0	0	1	0	4
16	9/6/2017	N Concourse Dr	MH#145-CON	MH#150-CON	D	8	J	133.9	4	0	4	0	0	0	2	0	1
65	9/25/2017	Billbrael Ln	MH#3-BILB	MH#2-BIL	U	8	J	285.6	6	1	7	0	0	0	8	0	6
66	9/25/2017	Bilbrael Ln	MH#2-BIL	MH#1-BIL (Cleanout)	U	8	J	259.1	14	2	16	0	0	0	1	0	9
67	9/26/2017	Billbrael Ln	MH#3-BILB	MH#4-BIL	D	8	J	256.4	2	0	2	0	0	1	6	0	6
68	9/26/2017	Billbrael Ln	MH#4-BIL	MH#3-BIL	D	8	J	330.2	12	3	15	0	0	0	3	0	4
69	9/26/2017	Billbrael Ln Easement	MH#3B-WOOD	MH#3A-WOOD	D	8	J	497.7	6	0	6	0	0	0	7	0	5
70	9/26/2017	Billbrael Ln Easement	MH#3-BIL	MH#3A-WOOD	U	8	J	467.4	12	2	14	0	0	0	7	0	6
71	9/26/2017	Billbrael Ln	MH#3-BIL	MH#2-WOOD	D	8	J	474.3	38	0	38	0	0	0	19	0	5
72	9/26/2017	Billbrael Ln	MH#2-WOOD	MH#140A-CON	D	8	J	444.7	20	2	22	0	0	0	11	0	8
TOTAL MANHOLE COUNT			24	TOTAL INSPECTED LENGTH				6,616.0									

Pump Station #5 Service Area
Charter Township Of Union, Isabella County

Gourdie-Fraser



N

W E

NOT TO SCALE

LEGEND

- UNION TOWNSHIP LIMITS
- EXISTING 8" SANITARY SEWER
- SANITARY SEWER TO BE INSPECTED
- EXISTING SANITARY FORCEMAIN
- EXISTING SANITARY MANHOLE
- LIFT STATION
- FLOW ARROW

T:\PROJECTS\23069\DWG\ENG\PS5 SERVICE AREA MAP.DWG (02-27-25 8:48 AM) ABELANGER

Engineering
Surveying
Testing &
Operations

123 West Front Street
Traverse City, Michigan 49684
231.946.5874
231.946.3703

SERVICE AREA RECORD DRAWINGS FOR

PUMP STATION NO. 5 SERVICE AREA SANITARY SEWER INSPECTION

Charter Township of Union

GFA PROJECT NO.: 23069
DATE: FEBRUARY 2025

SEWER LEAD #	LOCATION FROM MANHOLE DISTANCE FROM M.H. #	DISTANCE FROM SEWER TO END OF LEAD	DEPTH AT ℄
134-000 004-00	114' West of MH# 141	17' to ℄ + 3' beyond	8'
134-000 022-00	210' West of MH# 141	52' to ℄ + 3' beyond	10½'
134-000 003-00	223' West of MH# 141	22' to ℄ + 4' beyond	8½'
148-000 003-00-A	192' West of MH# 140	15' to ℄	10'
148-000 003-00-B	194' West of MH# 140	15' to ℄	10'
148-000 022-00	196' West of MH# 140	51' to ℄ + 1' beyond	7'
134-000 001-00-A	190' North of MH# 140	6' to ℄ + 6' beyond	7'
134-000 001-00-B	219' North of MH# 140	6' to ℄ + 6' beyond	7'

UNION TOWNSHIP
SANITARY SEWER SYSTEM
ISABELLA COUNTY, MICHIGAN

A. A. S. C. 12770

GOURDIE · FRASER & ASSOCIATES INC
124 WEST STATE STREET · TRAVERSE CITY, MICHIGAN 49684
· ENGINEERING · SURVEYING · MAPPING

RP REFERENCE POINT
THESE SELECTED POINTS ARE PLOTTED WITH EXTREME CARE AND ARE RECOMMENDED AS BASIC TIES DURING CONSTRUCTION.
COMPILED BY PHOTOGRAMMETRIC METHODS BY
ABRAMS AERIAL SURVEY CORPORATION
LANSING, MICHIGAN

CRAWFORD RD.
BROOMFIELD TO 1,005' SOUTH
BROOMFIELD
CRAWFORD RD. TO DEMING DR.
CONCOURSE

DWN: WLK
CK'D: RRG
DATE: 2-27-73
REV: 11-13-73
REV 12-13-73
REV 11-11-77 KBL
REV 2-6-78 KBL
REV 10-17-78 JAM
SHEET 24
72714A

AS BUILT DONE 11-1-79 BGS
AS-BLT CKD. JLS 1-27-81 REV 7-11-78 KBL

PLATE 2 - PLAN - PROFILE - F.A.S.
CLEARPRINT PAPER CO., S. F. CAL.
NO. 1000H-2

DIVISION B 79036

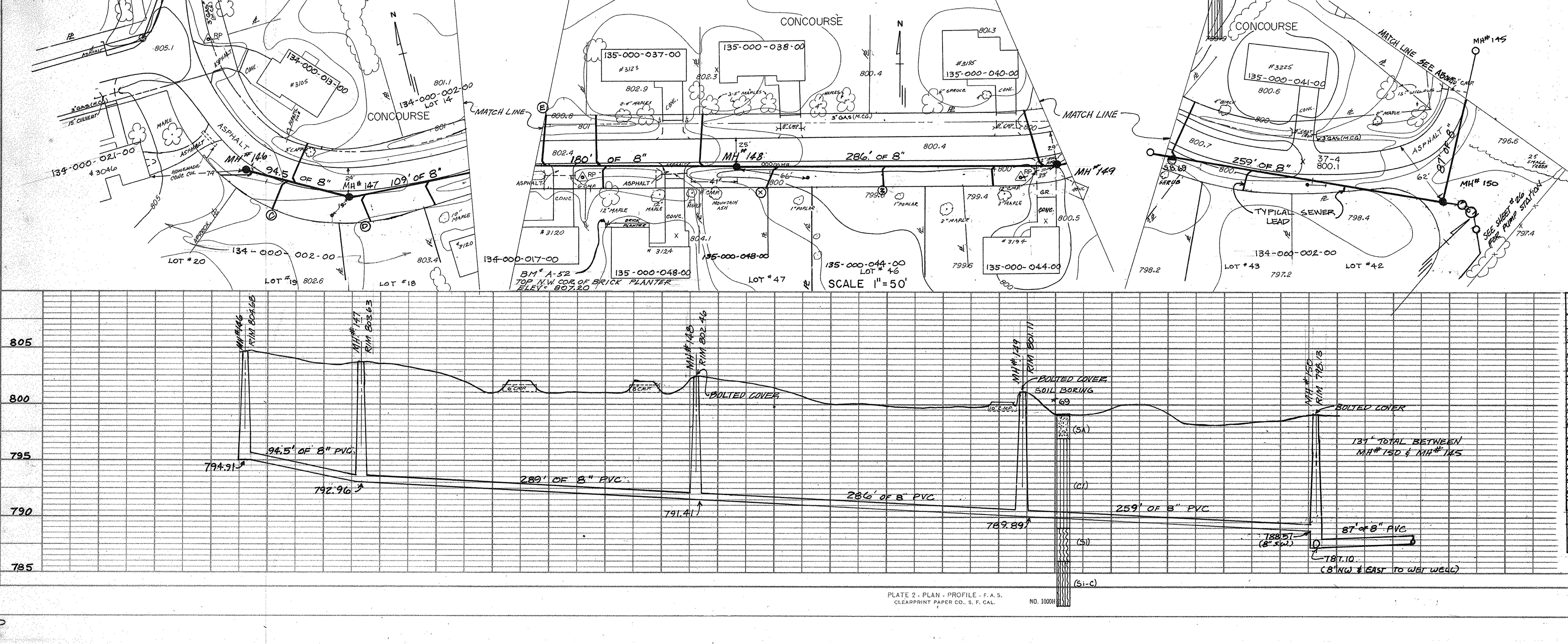
REV 9-11-79 EM
ADDED SEWER ON CRAWFORD

#33

#2

NOTE: DEPTH IS MEASURED FROM TOP OF 4"×4" POST

SEWER LEAD #	LOCATION FROM MANHOLE DISTANCE FROM M.H. #	DISTANCE FROM SEWER TO END OF LEAD	DEPTH AT ℄
134-000-006-00	14' S.W. OF MH#142	25' TO ℄ + 4' BEYOND	9'
134-000-005-00	100' S.W. OF MH#142	22' TO ℄ + 4' BEYOND	9'
134-000-002-00A	59' WEST OF MH#143	47' TO ℄ + 3' BEYOND	8'
135-000-025-00	86' WEST OF MH#143	25' TO ℄ + 3' BEYOND	8'
134-000-011-00	216' WEST OF MH#143	40' TO ℄ + 3' BEYOND	8'
134-000-008-00	220' WEST OF MH#143	29' TO ℄ + 3' BEYOND	8'
134-000-012-00	227' WEST OF MH#143	40' TO ℄ + 3' BEYOND	8'
135-000-029-00	15' WEST OF MH#144	22' TO ℄ + 3' BEYOND	8½'
135-000-033-00	29' WEST OF MH#144	43' TO ℄ + 3' BEYOND	10½'
135-000-028-00	116' WEST OF MH#144	26' TO ℄ + 5' BEYOND	10'
137-000-027-00	120' WEST OF MH#144	26' TO ℄ + 3' BEYOND	8'
135-000-034-00	215' WEST OF MH#144	44' TO ℄ + 3' BEYOND	8'
134-000-002-00B	268' WEST OF MH#144	46' TO ℄ + 3' BEYOND	8'
135-000-031-00	159' WEST OF MH#145	40' TO ℄ + 3' BEYOND	10½'



SEWER LEAD #	LOCATION FROM MANHOLE DISTANCE FROM M.H. #	DISTANCE FROM SEWER TO END OF LEAD	DEPTH AT ℄
135-000-031-00	6' N.W. OF MH#145	24' TO ℄ + 3' BEYOND	8'
134-000-013-00	60' WEST OF MH#147	44' TO ℄ + 1' BEYOND	5'
134-000-002-00-C	62' WEST OF MH#147	29' TO ℄ + 1' BEYOND	6½'
134-000-021-00	91' WEST OF MH#147	23' TO ℄	4'
135-000-038-00	33' WEST OF MH#148	49' TO ℄	5'
135-000-048-00	119' WEST OF MH#148	21' TO ℄	5'
135-000-037-00	123' WEST OF MH#148	49' TO ℄	5'
134-000-002-00E	171' WEST OF MH#148	49' TO ℄	5'
134-000-017-00	222' WEST OF MH#148	25' TO ℄	5'
134-000-002-00-D	280' WEST OF MH#148	30' TO ℄ + 1' BEYOND	6.5'
135-000-040-00	15' WEST OF MH#149	49' TO ℄	5'
135-000-044-00	59' WEST OF MH#149	26' TO ℄	5'
135-000-048-00-X	155' WEST OF MH#149	26' TO ℄	5'
135-000-044-00-Z	264' WEST OF MH#149	26' TO ℄	5'
134-000-002-00	90' WEST OF MH#150	20' TO ℄	5'
134-000-002-00	176' WEST OF MH#150	50 TO ℄	5'
135-000-041-00	244' WEST OF MH#150	49' TO ℄	5'

AS-BUILT DONE 10-29-79 BGS
REV 7-27-79 EMM
AS-BUILT CKD. JLG 1-29-81

PLATE 2 - PLAN - PROFILE - F.A.S.
CLEARPRINT PAPER CO., S. F. CAL.
NO. 1000H

DIVISION B

UNION TOWNSHIP
SANITARY SEWER SYSTEM
ISABELLA COUNTY, MICHIGAN
A. A. S. C. 12770

GOURDIE · FRASER & ASSOCIATES INC
124 WEST STATE STREET · TRAVERSE CITY, MICHIGAN 49684
· ENGINEERING · SURVEYING · MAPPING

RP REFERENCE POINT
THESE SELECTED POINTS ARE PLOTTED WITH EXTREME CARE AND ARE RECOMMENDED AS BASIC TIES DURING CONSTRUCTION.
COMPILED BY PHOTOGRAMMETRIC METHODS BY
ABRAMS AERIAL SURVEY CORPORATION
LANSING, MICHIGAN

CONCOURSE ST.

DWN: WLK
CK'D: RKG
DATE: 2-27-73
REV: 11-13-73
REV 11-11-77
REV 2-6-78
REV 6-6-78
REV 10-17-78
SHEET 25
72714A

79036 #35


BENCH MARK #A-53
SE CORNER OF BRICK LIGHT BASE IN
FRONT OF HSE #3145 N. CONCOURSE ELEV. = 801.85
027-11-959-00 (C.M.U.)
10' PERMANENT EASEMENT
1370' OF 6" FORCEMAIN
45° BEND
MH#145A FORCEMAIN BY-PASS
CONC. MONUMENT
12' OF 8" DUCTILE IRON
PUMP STATION #5
SEE SHEET #39
027-11-958-00 (C.M.U.)
027-11-960-00 (C.M.U.)
MATCH LINE SEE SHEET 27
CONCOURSE
SCALE: 1"=50'
400' OF FORCEMAIN
205' OF FORCEMAIN
6'-0" MIN. COVER
410' OF FORCEMAIN
6" FORCE MAIN
355' OF FORCEMAIN
MH#150
PUMP STA. #5
FORCE MAIN BY-PASS MH #145A
12' OF 8" D.I. @ 1.00%
I.E. 790.32
8"NW. & E
INV. = 587.10
787.12
780.50
SEWER CONTRACT (DIVISION "B")
PUMP STATION CONTRACT (DIVISION "C")
DIVISION CONTRACT LIMITS
SEWER CONTRACTOR SHALL INSTALL M.H.# 150 WITH A HOLE AND WATER-STOP FOR CONNECTION BY PUMP STATION CONTRACTOR.
PUMP STATION CONTRACTOR SHALL INSTALL BY-PASS M.H. # 145-A WITH A HOLE AND WATERSTOP FOR CONNECTION BY SEWER CONTRACTOR.
AS BUILT DONE 11-2-79
AS BUILT CKD. 1-29-81 JLS

DIVISION B

UNION TOWNSHIP
SANITARY SEWER SYSTEM
ISABELLA COUNTY, MICHIGAN

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124 WEST STATE STREET · TRAVERSE CITY, MICHIGAN 49684
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RP REFERENCE POINT
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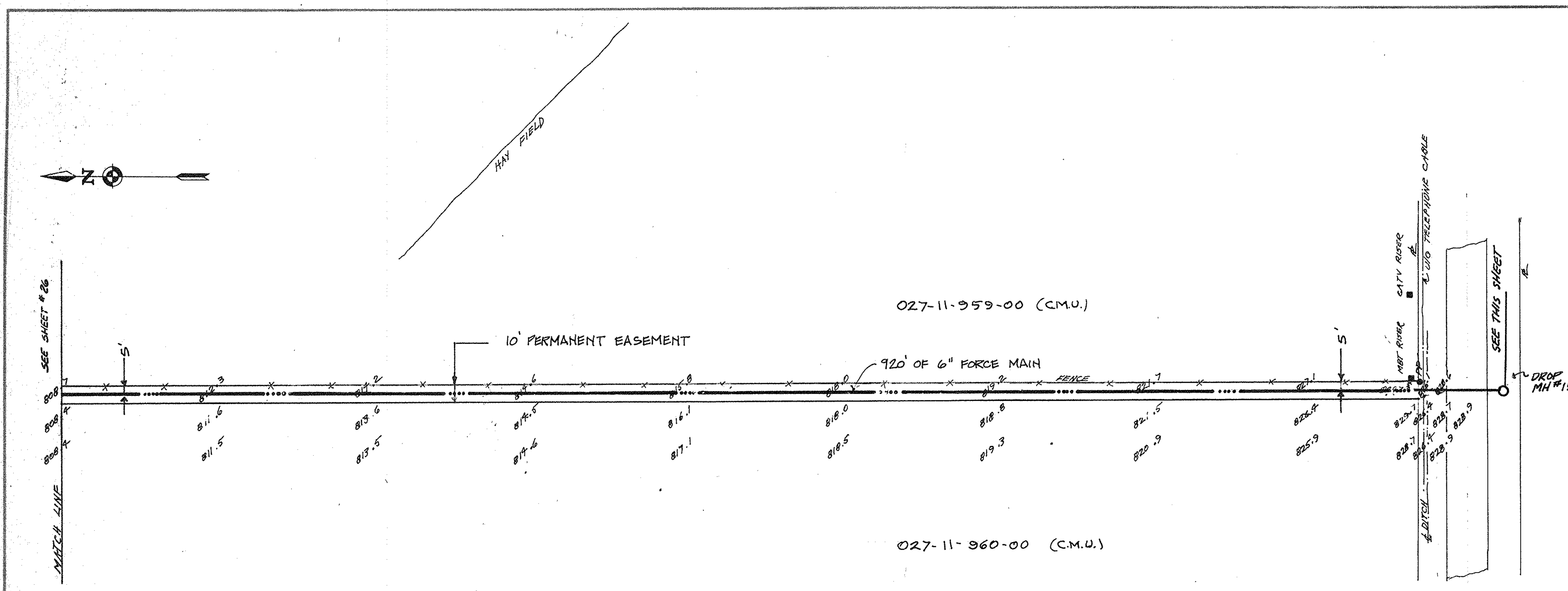
ABRAMS AERIAL SURVEY CORPORATION
LANSING, MICHIGAN

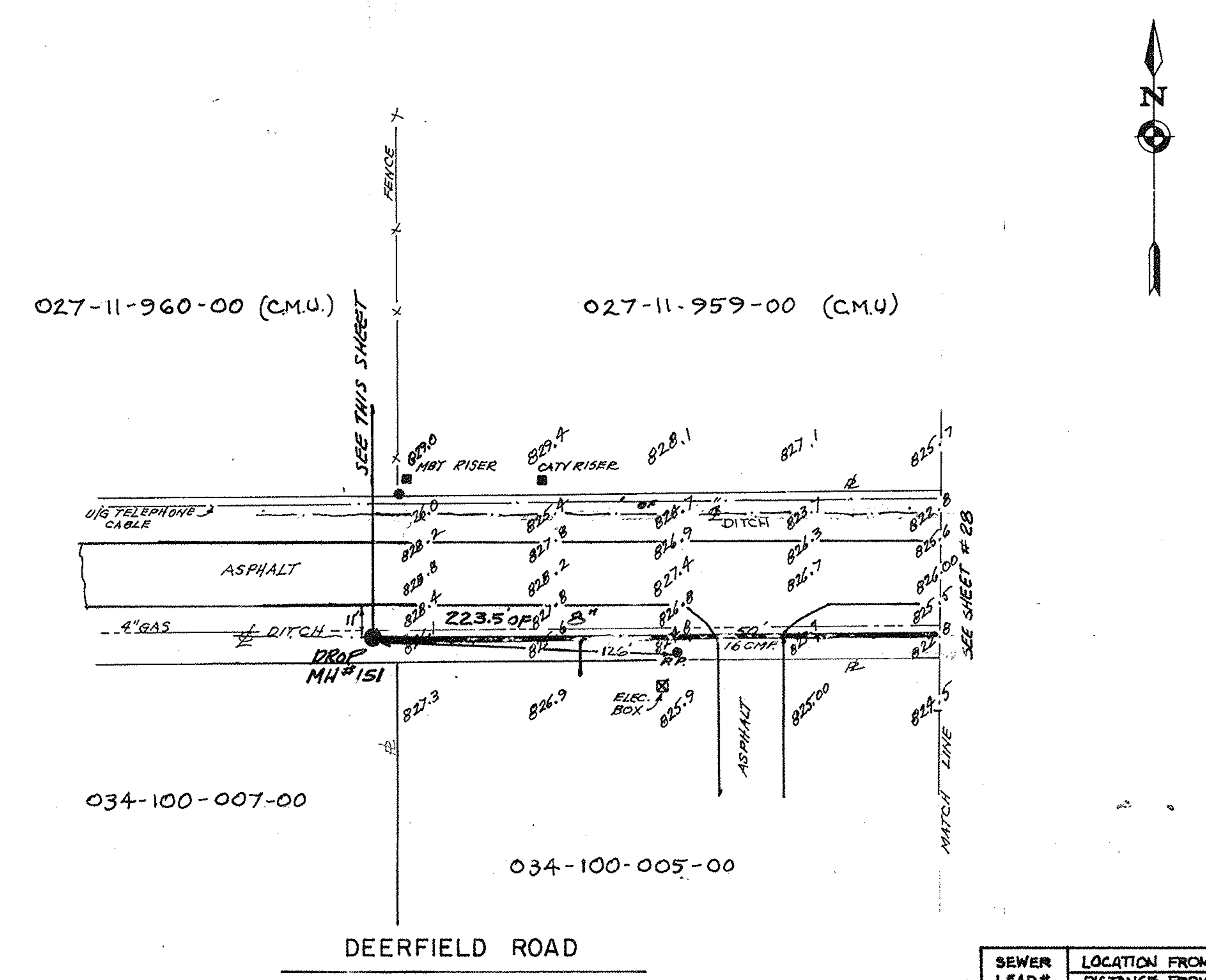
FORCE MAIN FROM
CONCOURSE ST. TO
DEERFIELD ROAD

DWN KGY
CK'D
DATE 5-2-78
REV 6-6-78
REV 6-11-78
REV 7-27-79
REV 8-31-79

SHEET 26
72714A
79036

A.A.S.C. 11681





SEWER LEAD#	LOCATION FROM MANHOLE DISTANCE FROM M.H.#	DISTANCE FROM SEWER TO END OF LEAD	DEPTH AT ℄
034-100-005-00	25T' WEST OF MH#152	8' TO POST + 8' BEYOND	12'

SCALE: 1"=50'

AS-BUILT DONE 10-31-79 BGS
AS-BUILT CKD. 1-29-81 JLS

DIVISION B

UNION TOWNSHIP
SANITARY SEWER SYSTEM
ISABELLA COUNTY, MICHIGAN

A.A.S.C. 11681

GOURDIE · FRASER & ASSOCIATES INC
124 WEST STATE STREET · TRAVERSE CITY, MICHIGAN 49684
· ENGINEERING · SURVEYING · MAPPING

RP REFERENCE POINT
THESE SELECTED POINTS ARE PLOTTED WITH EXTREME CARE AND ARE RECOMMENDED AS BASIC TIES DURING CONSTRUCTION.
COMPILED BY PHOTOGRAMMETRIC METHODS BY
ABRAMS AERIAL SURVEY CORPORATION
LANSING, MICHIGAN

DEERFIELD ROAD & FORCE MAIN NORTH TOWARDS CONCOURSE STREET

DWN
CKD
DATE
REV 6-6-78
REV. 8-31-79

SHEET 27
72714A

79036

SEWER LEAD #	LOCATION FROM MANHOLE DISTANCE FROM M.H. #	DISTANCE FROM SEWER TO END OF LEAD	DEPTH AT R.
034-200 004-00-N	12' WEST OF MH# 156	11' TO POST + 5' BEYOND	9'
034-200 004-00-O	110' WEST OF MH# 156	10' TO POST + 6' BEYOND	10'
034-200 004-00-P	206' WEST OF MH# 156	8' TO POST + 8' BEYOND	12'
034-200 004-00-Q	311' WEST OF MH# 156	8' TO POST + 7' BEYOND	12'
034-100 005-00	174' WEST OF MH# 155	8' TO POST + 7' BEYOND	11'
034-100 001-00-A	334' WEST OF MH# 155	8' TO POST + 7' BEYOND	12'
034-100 001-00-B	112' WEST OF MH# 154	8' TO POST + 7' BEYOND	12'
034-100 001-00-C	237' WEST OF MH# 154	8' TO POST + 7' BEYOND	12'

SCALE 1" = 50'

SCALE 1" = 50'

PLATE 2 - PLAN - PROFILE - F. A. S.
CLEARPRINT PAPER CO., S. F. CAL. NO. 1000H-2

AS BUILT DONE 10-31-79 BGS
AS BUILT CKD. 1-29-81 JLS

DIVISION B

UNION TOWNSHIP
SANITARY SEWER SYSTEM
ISABELLA COUNTY, MICHIGAN

GOURDIE · FRASER & ASSOCIATES INC
124 WEST STATE STREET · TRAVERSE CITY, MICHIGAN 49684
· ENGINEERING · SURVEYING · MAPPING

ABRAMS AERIAL SURVEY CORPORATION
LANSING, MICHIGAN

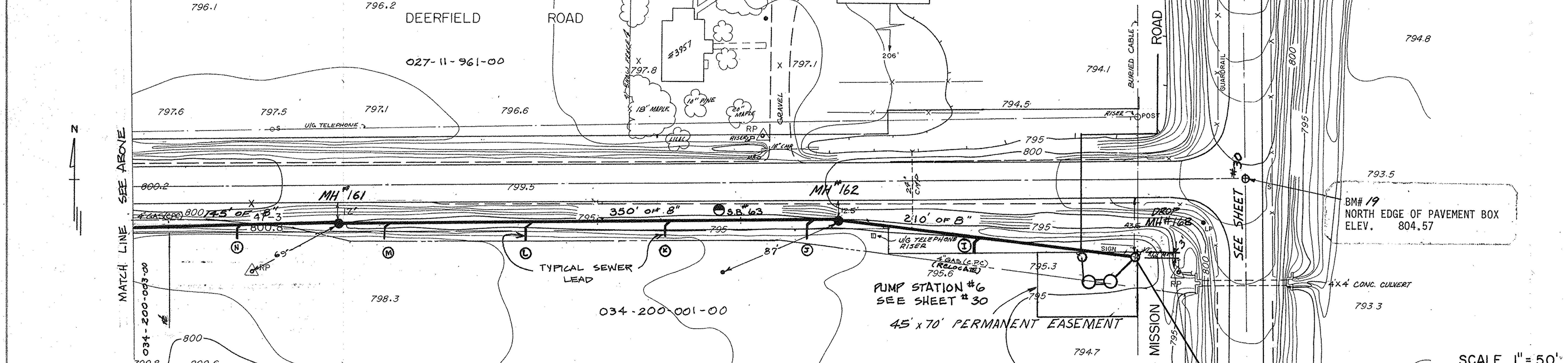
RP REFERENCE POINT
THESE SELECTED POINTS ARE PLOTTED WITH EXTREME CARE AND ARE CONSIDERED ACCURATE FOR TIES DURING CONSTRUCTION. CONSIDERED BY PROCEEDING PERSONS BY

ENTRANCE TO DEERFIELD APT'S
420' W. OF ENTRANCE TO 1480' E. OF ENTRANCE

DWN: WLK
CK'D: REG
DATE: 8-23-78
REV: 11-17-78
REV 12-7-78
REV 2-8-78
REV 10-17-78 JAM

SHEET 28
72714A

790310



SEWER LEAD #	LOCATION FROM MANHOLE DISTANCE FROM M.H. #	DISTANCE FROM SEWER TO END OF LEAD	DEPTH AT ℄
034-200 004-00-H	114' WEST OF MH# 158	13' TO POST + 5' BEYOND	10'
034-200 004-00-I	214' WEST OF MH# 158	13' TO POST + 5' BEYOND	10'
034-200 004-00-J	314' WEST OF MH# 158	13' TO POST + 5' BEYOND	10'
034-200 004-00-K	65' WEST OF MH# 157	12' TO POST + 6' BEYOND	10'
034-200 004-00-L	164' WEST OF MH# 157	10' TO POST + 6' BEYOND	10'
034-200 004-00-M	263' WEST OF MH# 157	10' TO POST + 6' BEYOND	10'

SEWER LEAD #	LOCATION FROM MANHOLE DISTANCE FROM M.H. #	DISTANCE FROM SEWER TO END OF LEAD	DEPTH AT ℄
034-200 001-00-I	113' WEST OF MH# 168	12' TO ℄ + 2' BEYOND	12'
034-200 001-00-J	19' WEST OF MH# 162	8' TO ℄ + 7' BEYOND	12'
034-200 001-00-K	122' WEST OF MH# 162	8' TO ℄ + 9' BEYOND	11'
034-200 001-00-L	219' WEST OF MH# 162	8' TO ℄ + 10' BEYOND	11'
034-200 001-00-M	318' WEST OF MH# 162	8' TO ℄ + 8' BEYOND	11'
034-200 001-00-N	70' WEST OF MH# 161	8' TO ℄ + 10' BEYOND	11'
034-200 003-00	173' WEST OF MH# 161	12' TO POST + 4' BEYOND	11'
034-200 004-00-A	88' WEST OF MH# 160	14' TO POST + 4' BEYOND	11'
034-200 004-00-B	189' WEST OF MH# 160	13' TO POST + 4' BEYOND	
034-200 004-00-C	286' WEST OF MH# 160	13' TO POST + 5' BEYOND	12'
034-200 004-00-D	40' WEST OF MH# 159	14' TO POST + 5' BEYOND	12'
034-200 004-00-E	139' WEST OF MH# 159	14' TO POST + 4' BEYOND	11'
034-200 004-00-F	251' WEST OF MH# 159	14' TO POST + 4' BEYOND	11'
034-200 004-00-G	14' WEST OF MH# 158	13' TO POST + 5' BEYOND	11'

NOTE: APPROXIMATE DEPTH AT ℄ IS MEASURED FROM THE TOP OF THE 4" x 4" WOOD POST.

AS-BUILT DONE 10-30-79 BGS
AS-BUILT CKD. 1-29-81 JLS

PLATE 2 - PLAN - PROFILE - F.A.S.
CLEARPRINT PAPER CO., S. F. CAL. NO. 1000H-2

DIVISION B

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COMPILED BY PHOTOGRAMMETRIC METHODS BY
ABRAMS AERIAL SURVEY CORPORATION
LANSING, MICHIGAN

DEERFIELD RD.

FROM MISSION ROAD WEST
2,280'

DWN: WCK
CK'D: RRG
DATE: 2-27-73
REV: 11-13-73
REV 11-11-77
REV 2-6-78
REV 7-18-78
REV 10-17-78 JAM
SHEET 29
72714A
REV. 7-27-79
79036

#8