



**CONTRACT DOCUMENTS**

**RESIDENTIAL AND COMMERCIAL  
REVENUE WATER METER  
REPLACEMENT PROJECT**

**CITY OF MARSHALL**

**JULY 2020**

Mayor: Joe Caron  
Ward 1: Scott Wolfersberger  
Ward 2: Nick Metzger  
Ward 3: Jacob Gates  
Ward 4: Michael McNeil  
Ward 5: Ryan Underhill  
At-Large: Ryan Traver

City Manager: Tom Tarkiewicz  
City Clerk: Trisha Nelson  
Director of  
Public Services: Marguerite Davenport  
Water  
Superintendent: Aaron Ambler

Prepared By:

Stantec Consulting Michigan Inc.  
3754 Rancho Drive  
Ann Arbor, Michigan 48108-2771

July 2020  
Stantec Project No.: 2075152400

**CONTRACT DOCUMENTS  
FOR THE  
RESIDENTIAL AND COMMERCIAL REVENUE WATER METER REPLACEMENT PROJECT  
FOR THE  
CITY OF MARSHALL, MICHIGAN**

Stantec Project No.: 2075152400

July 2020

**Stantec Consulting Michigan Inc.**

3754 Rancho Drive

Ann Arbor, Michigan 48108-2771

(734) 761-1010

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**PART I**  
**CONTRACT FORMS**

## ADVERTISEMENT FOR PROPOSALS

**PROJECT:** RESIDENTIAL AND COMMERCIAL REVENUE WATER REPLACEMENT PROJECT

**BIDS OPENING DATE:** August 10, 2020 at 2:00 p.m.

**OWNER:** City of Marshall, 323 W. Michigan Avenue, Marshall, Michigan 49068

**LOCATION/NAME:** 323 W. Michigan Avenue, Marshall, Michigan 49068

**BRIEF DESCRIPTION:** Bids are solicited on a unit price basis. The replacement of all residential and commercial revenue water meters that are operated, maintained and billed by the City of Marshall. Install necessary system to read the meters and transfer the readings to the City's existing billing system.

**LOCATION OF BID OPENING:** Bid opening will be in the City Council Chambers at City Hall, located at 323 W. Michigan Avenue, Marshall, Michigan, 49068

### **SPECIAL INSTRUCTIONS:**

**QUESTIONS:** Any questions regarding the project shall be brought to the attention of Greg Schofer at Stantec Consulting Michigan Inc., in writing by email at [greg.schofer@stantec.com](mailto:greg.schofer@stantec.com). Questions by telephone call are strictly prohibited. Questions will not be accepted if received less than seven (7) calendar days before the bids are due.

**PROPOSAL SUBMITTAL:** All bids shall be submitted in a sealed envelope and shall contain, as a minimum, all of the following: Bidder's Qualification and Experience Statement (QES-1-4), Proposal (P-1-6), Designation of Major Subcontractors and Suppliers (MS-1), Certification Regarding Debarment, Suspension and other Responsibility Matters (DS-1), Legal Status of Bidder (LS-1), Bid Certification (BC-1).

**BID SECURITY:** Each Proposal shall be accompanied by a cashier's check, certified check, money order or bid bond, payable to the OWNER, in an amount not less than five percent (5%) of the amount of the Proposal, as a Bid Security. The Bid Security of the Bidders under consideration will be returned after approval of the Contract by the OWNER. All others will be returned after the Proposal opening.

**CONTRACT SECURITY:** The successful Bidder will be required to furnish a satisfactory Performance Bond, Labor and Material Bond, and Maintenance Bond each in the amount of One Hundred Percent (100%) of the Contract.

**PROPOSAL WITHDRAWAL:** Withdrawal of any Proposal is prohibited for a period of 90 days after the actual date of the opening thereof.

**OWNER'S RIGHTS:** The OWNER reserves the right to accept any Proposal, to reject any or all Proposals, and to waive any irregularities in any Proposal, in the interest of the OWNER.

**NON-DISCRIMINATION:** Bidders shall not discriminate against any employees or firm due to origin, race, age or physical conditions. CONTRACTOR shall be an equal opportunity employer.

**HOW TO OBTAIN:**

In light of the current COVID-19 pandemic, the project bid documents can only be obtained electronically from the office of the ENGINEER, by emailing a request to Sheri Winkler at [Sheri.Winkler@stantec.com](mailto:Sheri.Winkler@stantec.com). A non-refundable payment of \$50.00, CHECK ONLY, payable to "Stantec Consulting Michigan Inc." will be required to obtain the electronic link. All checks should be mailed to: 3754 Ranchero Drive, Ann Arbor, MI 48108. Document requests shall indicate whether request is by: Prospective Bidder, Prospective Subcontractor, Prospective Supplier, or other.

**AVAILABLE AFTER:** July 23, 2020 at 1:00 p.m.

**DOCUMENT FEES:** Non-refundable Fee – \$50.00 for Electronic Copies. The Bidder must have purchased a set of Plans and Specifications from Stantec Consulting Michigan Inc. in order to submit a bid on this project.

**CONTACT NAME:** Greg Schofer, Project Manager

**CONTACT PHONE:** (734) 214-1852

**CONTACT EMAIL:** [greg.schofer@stantec.com](mailto:greg.schofer@stantec.com)

**PROPOSALS**

Each Proposal shall be made on a form prepared therefore by the ENGINEER and included as one of the Contract Documents and shall be submitted in a sealed envelope bound together with the other Contract Documents except the Plans, bearing the title of the Project and the name of the Bidder.

**DELIVERY OF PROPOSALS**

Proposals shall be delivered by the time and to the place stipulated in the Advertisement for Proposals. It is the sole responsibility of the Bidder to see that his Proposal is received in proper time. Any Proposal received after the bid date and time specified in the Advertisement shall be returned to the Bidder unopened.

**OPENING**

Proposals will be opened and publicly read aloud at the time and place set forth in the Advertisement.

**WITHDRAWAL BEFORE OPENING**

Any Bidder may withdraw his Proposal, either personally or by telegraph or written request, at any time prior to the scheduled time for Opening of Proposals.

**DISCREPANCIES**

In case of a difference between the stipulated amounts in the Proposal written in words and the stipulated amounts written in figures, the stipulated amounts written in words shall govern.

**MODIFICATIONS**

Proposals shall not contain any recapitulations of the work to be done. Alternate proposals will not be considered unless expressly requested. Oral proposals or modifications will not be considered. Conditional proposals or conditions attached to proposals shall have no force or effect.

**EXAMINATION OF CONTRACT DOCUMENTS**

Before submitting his Bid, each Bidder should:

- (a) examine the Contract Documents thoroughly;
- (b) visit the site to familiarize himself with local conditions that may in any manner affect performance of the work;
- (c) familiarize himself with Federal, State, and local laws, ordinances, rules, and regulations affecting performance of the work; and
- (d) carefully correlate his observations with the requirements of the Contract Documents.

Reference is made to the General Requirements (Division I) of the Specifications for the identification of those surveys and investigation reports of subsurface or latent physical conditions at the site or otherwise affecting performance of the work which have been relied upon by ENGINEER in preparing the Drawings and Specifications. OWNER will make copies of such surveys and reports available to any Bidder requesting them. Before submitting his Bid, each Bidder will at his own expense make such additional survey and investigations as he may deem necessary to determine his Bid Price for performance of the work within the terms of the Contract Documents.

The submission of a Bid will constitute an incontrovertible representation by the Bidder that he has complied with every requirement of this Article.



**COMPLETE WORK REQUIRED**

It is the intent of the Contract Documents to provide that the Product to be supplied under this Proposal shall be complete and ready for use in every respect. Any minor items not specifically called for in the Plans or Specifications, but which are clearly necessary, are to be included at no increase in the Contract Price.

The Proposal shall include a sum to cover the cost of all items of work to be performed such that the Product to be supplied under this Proposal shall be complete and ready for use in every respect.

**SUBCONTRACTORS: MATERIAL & EQUIPMENT QUOTATIONS**

The Bidder to whom an Award is made will not be entitled to additional compensation or extension of time by reason of his failure to fully understand all subproposals or quotations.

The Bidder is responsible for all coordination between subcontractors and suppliers during the bidding and construction so that a complete project is furnished for the Contract Price and within the Contract Time. The completed project includes the furnishing of all equipment, accessories, and appurtenances necessary for the proper operation and maintenance of the Project.

**AWARD OF CONTRACT**

OWNER reserves the right to reject any and all Bids and waive any and all informalities, and the right to disregard all nonconforming or conditional Bids or counter proposals.

In evaluating Bids, OWNER shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and alternates and unit prices if requested in the bid forms. He may consider the qualifications and experience of subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment) proposed for those portions of the work as to which the identity of subcontractors and other persons and organizations must be submitted as specified in the Supplementary Conditions or Specifications. He may conduct such investigations as he deems necessary to establish the responsibility, qualifications, and financial ability of the Bidders, proposed subcontractors and other persons and organizations to do the work in accordance with the Contract Documents to OWNER's satisfaction within the prescribed time. OWNER reserves the right to reject the Bid or any Bidder who does not pass any such evaluation to OWNER's satisfaction.

If a Contract is to be awarded, it will be awarded to the lowest responsible responsive Bidder. However, OWNER reserves the right to by-pass the low bidder and award a contract in the best interest of the OWNER.

If the Contract is to be awarded, OWNER will give the apparent successful Bidder a Notice of Award.

Simultaneous with delivery of the executed counterparts of the Agreement to OWNER, the CONTRACTOR shall deliver to OWNER the required Contract Security.

**INTERPRETATIONS**

All questions about the meaning or intent of the Contract Documents shall be submitted to ENGINEER in writing. Replies will be issued by Addenda mailed or delivered to all parties recorded by ENGINEER as having received the Bidding Documents. Questions received less than seven (7) days prior to the date of Opening of Bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

**ADDENDA**

Any Addenda issued during the time of bidding or forming a part of the Contract Documents shall be included in the Proposal and shall be made a part of the Contract Documents. Receipt of each Addendum shall be acknowledged in the Proposal.

**BID SECURITY**

The amount and type of Bid Security is stated in the Invitation to Bid. The required security must be in the form of a certified or bank cashier's check made payable to OWNER or a Bid bond issued by a surety licensed to conduct business in the state where the Project is located and named in the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Treasury Department. The Bid Security of the successful Bidder will be retained until he has executed the Agreement and furnished the required Contract Security, whereupon it will be returned; if he fails to execute and deliver the Agreement and furnish the required Contract Security within ten (10) days, Sundays and legal holidays excepted, of receipt of the Notice of Award, OWNER may annul the Notice of Award and the Bid Security of that Bidder will be forfeited. The Bid Security of any Bidder whom OWNER believes to have a reasonable chance of receiving the Award may be retained by OWNER until the earlier of the seventh day after the executed Agreement is delivered by OWNER to CONTRACTOR and the required Contract security is furnished. Bid Security of other Bidders will be returned within seven (7) days of the Bid Opening.

**CONTRACT TIME**

The number of days for the Delivery of Work (the Contract Time) is set forth in the Bid Forms and will be included in the executed Agreement. Any provisions for liquidated damages are set forth in the Contract Documents.

**REQUIREMENT FOR SIGNING PROPOSALS**

Proposals which are not signed by the individual making them shall have attached thereto a Power of Attorney evidencing authority to sign the Proposal in the name of the person for whom it is signed.

Proposals which are signed by a partnership shall be signed by all of the partners or by an Attorney-in-Fact. If signed by an Attorney-in-Fact, there shall be attached to the Proposal a Power of Attorney evidencing authority to sign the Proposal, executed by the partners.

Proposals which are signed for a corporation shall have the correct corporate name thereof and the signatures of the president or other authorized officers of the corporation manually written below the corporate name following the word "By". If such a Proposal is manually signed by an officer other than the president of the corporation, a certified copy of a resolution of the Board of Directors evidencing the authority of such official to sign the Proposal shall be attached to it. Such a Proposal shall also bear the attested signature of the secretary of the corporation and the impression of the corporate seal.

All Bidders shall complete the enclosed form entitled "Legal Status of Bidder".

**BIDDERS INTERESTED IN MORE THAN ONE PROPOSAL**

No person, firm, or corporation shall be allowed to make, file, or be interested in more than one (1) Proposal on this Project, unless Alternate Proposals are called for.

A person, firm, or corporation who has submitted a subproposal to a Bidder, or has quoted prices on materials and/or equipment to a Bidder, is not hereby disqualified from submitting a subproposal or quoting Prices to other Bidders.

**EXECUTION OF AGREEMENT**

The Bidder to whom an Award is made will be required to enter into a written Agreement in the form hereto annexed, within ten (10) days, Sundays and legal holidays excepted, after being notified of the acceptance of his Proposal and receipt by him of copies of the Contract Documents to be executed.

In case of failure to comply with this requirement, he shall be considered to have abandoned all rights and interest in the Award, his Proposal Guaranty may be declared forfeited to the OWNER and the Contract may be awarded to another.

**INSURANCE**

The successful Bidder will be required to carry insurance in the amounts and kinds specified in the General Conditions. Such insurance must be with companies and in a form satisfactory to the OWNER, and certificates of such insurance must be attached to each copy of the executed Contract Documents. These certificates shall contain a provision that coverages afforded under the policies will not be cancelled or materially changed unless at least thirty (30) days prior written notice has been given to the OWNER and ENGINEER, as evidenced by return receipt or registered or certified mail.

**BONDS**

The successful Bidder will be required to furnish for each set of the executed Contract Documents and conformed copies thereof, an original conformed Performance Bond, and Labor and Material Bond on the forms attached hereto with a surety acceptable to the OWNER, as follows:

- 1) Performance Bond in the amount of One Hundred Percent (100%) of the Contract Price to insure the completion of the entire Project according to the Contract Documents.
- 2) Labor and Material Bond in the amount of One Hundred Percent (100%) of the Contract Price for the protection of the OWNER and to secure payments of all labor, materials and subcontractors according to the statute of the state at that time in effect.
- 3) Maintenance Bond in the amount of One Hundred Percent (100%) of the Contract Price to replace or repair any deficiencies in Labor or Material which shall occur on or before the first anniversary of final acceptance by OWNER.

**COMPLIANCE WITH PERMITS**

The successful Bidder shall comply with all required State and local construction permits and shall comply with all local building codes and inspection requirements.

**NONDISCRIMINATION**

Contracts for work under this Proposal will obligate the Contractors and Subcontractors not to discriminate in employment practices.

Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the Award of Contract.

Successful Bidders must, if requested, submit a list of all subcontractors who will perform work on the Project and written signed statements from authorized agents of the labor pools with which they will or may deal for employees on the work, together with supporting information to the effect that said labor pools' practices and policies are in conformity with Executive Order No. 11246, as amended, and that said labor pools will

affirmatively cooperate in, or offer no hindrance to, the recruitment, employment, and equal treatment of employees seeking employment and performing work under the Contract, or a certification as to what efforts have been made to secure such statements when such agents or labor pools have failed or refused to furnish same prior to the Award of Contract.

Successful Bidders must be prepared to comply in all respects with the Labor Standards contract provisions regarding nondiscrimination.

**HEALTH AND SAFETY**

The successful Bidder shall comply with the Health and Safety Regulations, Chapter XVII of Title 29 CFR, Part 1926, as promulgated by the Department of Labor and/or applicable State and local safety and health regulations. All questions regarding compliance and enforcement, as well as requests for the regulations should be directed to the Department of Labor and/or local agencies.

**SOIL EROSION AND SEDIMENTATION**

The successful Bidder shall comply with the provisions of the "Soil Erosion and Sedimentation Control Act" of 1972 (Michigan P.A. 347, as amended), the "Inland Lakes and Streams Act" of 1972 (Michigan P.A. 346, as amended), and be in accordance with all applicable regulations, standards, and specifications as adopted by the local enforcing agencies.

END OF SECTION

**BIDDER'S QUALIFICATION AND EXPERIENCE STATEMENT**

The OWNER will require supporting evidence regarding Bidder's Qualifications and competency. The Bidder will be required to furnish all of the applicable information listed below and must be submitted with the sealed bid at the time of the Bid Opening. The Qualifications and Experience certificate must be type written and signed in ink.

**QUALIFICATIONS AND EXPERIENCE CERTIFICATE**

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

Submitted To: \_\_\_\_\_

Address: \_\_\_\_\_

Submitted By: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone No. \_\_\_\_\_ Fax No. \_\_\_\_\_

Principal Office: \_\_\_\_\_

Corporation: \_\_\_\_\_ Joint Venture: \_\_\_\_\_

Partnership: \_\_\_\_\_ Other: \_\_\_\_\_

Individual: \_\_\_\_\_

Name of Project: \_\_\_\_\_

Type of Work (File a separate form for each classification of work.)

General: \_\_\_\_\_ Plumbing: \_\_\_\_\_

HVAC: \_\_\_\_\_ Electrical: \_\_\_\_\_

Other: \_\_\_\_\_ (Please Specify)

**IF THIS INFORMATION IS NOT SUBMITTED WITH THE SEALED BID AT THE TIME OF BID, THE BID WILL BE CONSIDERED INCOMPLETE.**

ORGANIZATION

How many years has your organization been in business as a CONTRACTOR?

How many years has your organization been in business under its present business name?

Under what other or former names has your organization operated?

If your organization is a corporation, answer the following:

Date of Incorporation: \_\_\_\_\_

State of Incorporation: \_\_\_\_\_

President's Name: \_\_\_\_\_

Vice President's Name: \_\_\_\_\_

Secretary's Name: \_\_\_\_\_

Treasurer's Name: \_\_\_\_\_

If your organization is a partnership, answer the following:

Date of Organization: \_\_\_\_\_

Type of Partnership: \_\_\_\_\_

Name(s) of General Partner(s): \_\_\_\_\_

If your organization is individually owned, answer the following:

Date of Organization: \_\_\_\_\_

Name of OWNER: \_\_\_\_\_

If the form of your organization is other than those listed above describe it and name the principals:

**IF THIS INFORMATION IS NOT SUBMITTED WITH THE SEALED BID AT THE TIME OF BID, THE BID WILL BE CONSIDERED INCOMPLETE.**

## LICENSING

List jurisdiction and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable:

List jurisdiction in which your organization's partnership or trade name is filed:

## EXPERIENCE

List the categories of work that your organization normally performs with its own forces:

On a separate sheet, list major construction projects your organization has in progress, giving the name of project, OWNER, ARCHITECT/ENGINEER, Contract amount, percent complete, and scheduled completion date.

On a separate sheet, list the major construction projects your organization has completed in the past five (5) years, giving the name of the project, OWNER, ARCHITECT/ENGINEER, Contract amount, date of completion and percentage of the cost of the work performed with your own forces.

On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

CLAIMS AND SUITS (if the answer to any of the questions below is yes, please attach details)

Has your organization ever failed to complete any work awarded to it? \_\_\_\_\_

Are there any judgments, claims, arbitration proceedings or suite pending or outstanding against your organization or officers? \_\_\_\_\_

**IF THIS INFORMATION IS NOT SUBMITTED WITH THE SEALED BID AT THE TIME OF BID, THE BID WILL BE CONSIDERED INCOMPLETE.**

REFERENCES

Trade References: \_\_\_\_\_

Bank References: \_\_\_\_\_

Surety: \_\_\_\_\_

Name of Bonding Company:  
\_\_\_\_\_

Name and Address of Agent:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature: \_\_\_\_\_

Dated at: \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, 2020

Name of Organization: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Mr/Mrs/Ms \_\_\_\_\_ being duly deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this \_\_\_\_\_ day of \_\_\_\_\_, 2020

Notary Public: \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

**IF THIS INFORMATION IS NOT SUBMITTED WITH THE SEALED BID AT THE TIME OF BID, THE BID WILL BE CONSIDERED INCOMPLETE.**



PROPOSAL FOR THE  
RESIDENTIAL AND COMMERCIAL REVENUE WATER METER REPLACEMENT PROJECT  
TO THE CITY OF MARSHALL, MICHIGAN

The undersigned as Bidder hereby declares that this Proposal is made in good faith without fraud or collusion with any person or persons bidding on the same Contract; that he has read and examined the Advertisement, Information for Bidders, Proposal, General Conditions, Agreement, Forms of Bonds, Specifications and Plans, as prepared by the ENGINEERS, and understands all of the same; that he or his representative has made personal investigation at the site and has informed himself fully with regard to the conditions to be met in the execution of this Contract, and the undersigned proposes to furnish all labor, materials, tools, power, transportation, and construction equipment necessary for the construction of the Project and performing related work in full accordance with the aforesaid Contract Documents, including any and all addenda officially issued, the receipt of which is hereby acknowledged:

Addendum No./Dated	Date of Receipt	Signature

AWARD OF CONTRACT: The Contract(s) will be awarded to the lowest responsive, responsible Bidder based on unit price basis. The City may elect to select different contractors to award the **Small Form Factor Meter versus the Large Form Factor Meter** portions of this project based on each unit price. If a select discount is submitted, it will apply only if the City elects the same contractor to perform both portions of the Water Meter Replacement scope of work.

PROPOSAL PRICE: The Bidder agrees to complete the Project for the following unit prices:

**A. WATER METERS – SMALL FORM FACTOR**

Item No.	Item Description	Qty	Unit	Unit Price	Total Price
1.	5/8" X 3/4" Flow Meter (materials only)	2,000	EA	\$	\$
2.	5/8" X 3/4" Flow Installation	2,000	EA	\$	\$
3.	5/8" Flow Meter (materials only)	720	EA	\$	\$
4.	5/8" Flow Meter Installation	720	EA	\$	\$
5.	1" Flow Meter (materials only)	210	EA	\$	\$
6.	1" Flow Meter Installation	210	EA	\$	\$
<b>TOTAL WATER METERS – SMALL FORM FACTOR BASE BID (ITEM NOS. 1 THROUGH 6):</b>					\$

Dollars (\$ \_\_\_\_\_ )

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**B. WATER METERS – LARGE FORM FACTOR**

Item No.	Item Description	Qty	Unit	Unit Price	Total Price
1.	1 1/2" Flow Meter (materials only)	50	EA	\$	\$
2.	1 1/2" Flow Meter Installation	50	EA	\$	\$
3.	2" Flow Meter (materials only)	110	EA	\$	\$
4.	2" Flow Meter Installation	110	EA	\$	\$
5.	3" Flow Meter (materials only)	15	EA	\$	\$
6.	3" Flow Meter Installation	15	EA	\$	\$
7.	4" Flow Meter (materials only)	10	EA	\$	\$
8.	4" Flow Meter Installation	10	EA	\$	\$
9.	6" Flow Meter (materials only)	2	EA	\$	\$
10.	6" Flow Meter Installation	2	EA	\$	\$
11.	12" Flow Meter (materials only)	1	EA	\$	\$
12.	12" Flow Meter Installation	1	EA	\$	\$
13.	Pit Set Radio Transceiver	15	EA	\$	\$
<b>TOTAL WATER METER – LARGE FORM FACTOR BASE BID (ITEM NOS. 1 THROUGH 13):</b>					\$

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**C. SPARE WATER METERS**

Item No.	Item Description	Qty	Unit	Unit Price	Total Price
1.	5/8" x 5/8" Flow Meter	20	EA	\$	\$
2.	5/8" x 3/4" Flow Meter	20	EA	\$	\$
3.	1" Flow Meter	5	EA	\$	\$
4.	2" Flow Meter	3	EA	\$	\$
<b>TOTAL SPARE WATER METERS BID (ITEM NOS. 1 THROUGH 4):</b>					\$

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**D. SUPPORT HARDWARE AND SOFTWARE**

Item No.	Item Description	Qty	Unit	Unit Price	Total Price
1.	Handheld Readers	2	LS	\$	\$
2.	Sensus Logic Software (min. of 15,000 nodes) Including Installation / Workstation	1	LS	\$	\$
3.	Second Year of Annual Support	1	LS	\$	\$
4.	Network Connectivity	1	LS	\$	\$
<b>TOTAL SUPPORT HARDWARE AND SOFTWARE BID (ITEM NOS. 1 THROUGH 4):</b>					\$

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**E. RADIO SYSTEM**

Item No.	Item Description	Qty	Unit	Unit Price	Total Price
1.	Open Architecture Radio System <b>(REQUIRED FOR ALL BIDS)</b>	1	LS	\$	\$
<b>TOTAL RADIO SYSTEM BID:</b>					\$

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**F. GENERAL**

Item No.	Item Description	Qty	Unit	Unit Price	Total Price
1.	Insurance and Bonds	1	LS	\$	\$
2.	Permits	1	LS	\$	\$
3.	Training	1	LS	\$	\$
<b>TOTAL GENERAL BID (ITEM NOS. 1 THROUGH 3):</b>					\$

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**SUB TOTAL WATER METERS – SMALL FORM FACTOR PRICE A:**

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**SUB TOTAL WATER METERS – LARGE FORM FACTOR PRICE B:**

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**SUB TOTAL RADIO SYSTEM PRICE E:**

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**Discount of \$ \_\_\_\_\_ or \_\_\_\_\_ %, if one (1) bidder is awarded the entire project.**

**GRAND TOTAL BID PRICE A, B, C, D, E, and F:**

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

The undersigned has read the "Method of Measurement and Basis of Payment" and acknowledges that Pages MP-1 to MP-2 are part of his proposal.

The undersigned agrees that if the foregoing Proposal shall be accepted by the OWNER, he will, within ten (10) days (Sundays and legal holidays excepted) after receiving notice of such acceptance, enter into the attached form of Agreement and will complete the Project, ready for use, at the price and within the time stated in this Proposal, and that he will furnish the OWNER satisfactory Contract Bonds and certificates of insurance coverage.

The undersigned further agrees that if the foregoing Proposal shall be accepted, he will commence work immediately after the Contract has been awarded, the Agreement executed, and he has received a Notice to Proceed and he shall complete the entire work within **12** months.

The undersigned attaches hereto his Bid Security, as required by the Advertisement and Information for Bidders, and the undersigned agrees that in case he shall fail to fulfill his obligations under the foregoing Proposal and/or shall fail to furnish bonds, as specified, the OWNER may, at its option determine that the undersigned has abandoned his rights and interests in such Contract and that his Bid Security accompanying his Proposal has been forfeited to the said OWNER, but otherwise the Bid Security shall be returned to the undersigned upon the execution of the Contract and the acceptance of the bonds.

The undersigned also agrees that for each and every calendar day that he may be in default of substantial completion of the entire work, ready for use, within the time specified in this Proposal or within the time to which said time of completion may be extended for good cause shown, the

OWNER will suffer a damage of Eight Hundred Dollars (\$800.00) per day, and said OWNER shall be compensated therefore at the rate as liquidated damages in accordance with Article 1-B, Liquidated Damages, of the Agreement.

The Bidder shall acknowledge that he/she is an equal opportunity employer and that they do not discriminate against other firms due to race, age, gender or physical conditions.

In submitting this bid, it is understood that the right is reserved by the OWNER to accept any bid, to reject any or all bids, and to waive irregularities in bidding in the interest of the OWNER.

The Bidder has completed the accompanying "Legal Status" form.

Dated and Signed at \_\_\_\_\_  
this the \_\_\_\_\_ day of \_\_\_\_\_, 2020.

OFFICIAL ADDRESS

BIDDER'S NAME

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

By

Telephone

Title

**DESIGNATION OF MAJOR SUBCONTRACTORS AND SUPPLIERS**

Each bidder shall set forth below: (a) the name and the location of the place of business of each subcontractor who will perform work or labor or render service to the CONTRACTOR in or about the construction of the work in an amount in excess of two percent (2%) of the CONTRACTOR's total base bid; and (b) the portion of the work which will be done by each such subcontractor.

If the CONTRACTOR fails to specify a subcontractor for any portion of the work as above stated, he agrees to perform that work himself.

The CONTRACTOR shall not, without written consent of the OWNER, make any substitution, alterations, or additions to the following list of subcontractors that is made a part of this Bid.

The qualifications of each subcontractor/supplier will be presented to the ENGINEER for review and approval after a CONTRACTOR is selected. However, specific information may be requested from the Bidder prior to a CONTRACTOR being selected in order to aid in the evaluation of a responsive responsible Bidder.

Section of Work	Portion of Work to be Done	Name of Subcontractor / Supplier	Address of Shop, Mill or Office
15.0 Water Meter	Materials		
15.0 Water Meter	Installation		

Signed \_\_\_\_\_

CERTIFICATION REGARDING  
DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

The prospective participant certifies, to the best of its knowledge and belief, that it and its principals:

- (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in transactions under federal nonprocurement programs by any federal department or agency;
- (2) Have not, within the three-year period preceding the proposal, had one or more public transactions (federal, state or local) terminated for cause or default; and
- (3) Are not presently indicated or otherwise criminally or civilly charged by a government entity (federal, state or local) and have not, within the three-period preceding the proposal, been convicted of or had a civil judgment rendered against it:
  - a. For the commission of fraud or a criminal offence in connection with obtaining, attempting to obtain, or performing a public transaction (federal, state or local) or a procurement contract under such a public transaction;
  - b. For the violation of federal or state antitrust statutes, including those proscribing price fixing between competitors, the allocation of customers between competitors, or bid rigging; or
  - c. For the commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.

I understand that a false statement on this certification may be grounds for the rejection of this proposal or the termination of the award. In addition, under 18 U.S.C. § 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to five years, or both.

---

Name and Title of Authorized Representative

---

Name of Participant Agency or Firm

---

Signature of Authorized Representative

Date

I am unable to certify to the above statement. Attached is my explanation.

## METHOD OF MEASUREMENT AND BASIS OF PAYMENT

### A. GENERAL

The method of measurement and the basis of payment for each item in the Proposal will be as specified in the schedule attached. The items are generally grouped by the section of the Specifications under which the particular unit of work is detailed. There will be no payment allowed for any unit of work not specifically mentioned in the Proposal as a bid item, and any such unit of work not mentioned in the Proposal, but necessary for the completion of the Project, will be considered as incidental to the construction of the Project.

### B. MEASUREMENT

Quantities of work completed under the Contract will be measured by the ENGINEER according to the United States standard measures. When tons are specified, the unit shall be the ton of 2000 pounds. When measurements are stated in miles, stations, acres, they will be horizontal measurements unless specified otherwise. Where measurements are specified to be "in place," they will be taken along the actual surface of the completed item to obtain lineal, area, or volume measurements.

### C. PAYMENT

In each and every instance in the schedule attached, where a Basis of Payment is specified, it shall be understood to be prefaced by the following statement, "The Contract unit price bid in the Proposal will be payment in full for all labor, materials, and equipment necessary to do the following according to the Plans and Specifications". Payment shall be made on the basis of the actual quantity of the item completed and accepted at the unit price for such item named in the Proposal.



**MEASUREMENT AND PAYMENT SCHEDULE**

<u>ITEM IN PROPOSAL</u>	<u>METHOD OF MEASUREMENT</u>	<u>BASIS OF PAYMENT</u>
<b><u>SMALL FORM FACTOR</u></b>		
Flow Meter (materials only)	By the unit each (EA).	For the complete work of the installation of the new meter and confirmation information being processed by the City's BS&A software package. Meter will be fully operational and recording usage. Payment for installed and operation meters will be made on a thirty-day schedule.
Flow Meter Installation	By the unit each (EA).	For the complete work of removal of the existing meter and installation of the new meter. Meter will be fully operational and recording usage. Payment for installed and operation meters will be made on a thirty-day schedule.
<b><u>LARGE FORM FACTOR</u></b>		
Flow Meter (materials only)	By the unit each (EA).	For the complete work of the installation of the new meter and confirmation information being processed by the City's BS&A software package. Meter will be fully operational and recording usage. Payment for installed and operation meters will be made on a thirty-day schedule.
Flow Meter Installation	By the unit each (EA).	For the complete work of removal of the existing meter and installation of the new meter. Meter will be fully operational and recording usage. Payment for installed and operation meters will be made on a thirty-day schedule.
Spare Meters	By the unit each (EA).	For the delivery to the OWNER specified location within the City's service area. Once inspected after delivery by either the OWNER or ENGINEER.
Handheld Readers	By the unit lump sum (LS).	For the complete work, delivery and training to the OWNER specified location within the City's service area. Fully operational before the first meters are installed.
Second Year of Annual Support	By the unit lump sum (LS).	Second year of annual software support.
Network Connectivity	By the unit lump sum (LS).	Software connected to OWNER's network.
Training	By the unit lump sum (LS).	Software training.
Open Architectures Radio System		
Sensus Logic Software (min. of 10,000 nodes) Including Installation / Workstation	By the unit lump sum (LS).	For the complete work, delivery and training to the OWNER specified location within the City's service area. Fully operational within 90 days of first meters being installed. This will include all coordination necessary for use of City of Marshall Towers.

END OF SECTION

NAME, ADDRESS, LEGAL STATUS,  
AND SIGNATURE OF BIDDER

This Proposal is submitted in the name of:

(Print) \_\_\_\_\_

The undersigned hereby designates below his business address to which all notices, directions or other communications may be served or mailed:

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

The undersigned hereby declares that he has legal status checked below:

- INDIVIDUAL
- INDIVIDUAL DOING BUSINESS UNDER AN ASSUMED NAME
- CO-PARTNERSHIP

The Assumed Name of the Co-Partnership is registered in the County of \_\_\_\_\_, Michigan.

- CORPORATION INCORPORATED UNDER THE LAWS OF THE STATE OF \_\_\_\_\_. The Corporation is:
- LICENSED TO DO BUSINESS IN MICHIGAN
- NOT NOW LICENSED TO DO BUSINESS IN MICHIGAN

The name, titles and home addresses of all persons who are officers or Partners in the organization are as follows:

NAME AND TITLE	HOME ADDRESS
_____	_____
_____	_____
_____	_____

Signed and Sealed this \_\_\_\_\_ day of \_\_\_\_\_, 2020.

By \_\_\_\_\_ (Signature)

Printed Name of Signer \_\_\_\_\_

Title \_\_\_\_\_

BID CERTIFICATION

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a bid for the same materials, supplies, equipment, or service, that it meets or exceeds all the specifications contained herein, and is in all respects fair and without collusion or fraud. I understand collusive bidding is a violation of State and Federal law, and can result in fines, prison sentences, and civil damage awards. I agree to abide by all conditions of this bid, and certify that I am authorized to sign for the bidder.

---

Bidder

---

Signature

---

Title

---

Date Certified

AGREEMENT

THIS AGREEMENT, made as of the \_\_\_\_\_ day of \_\_\_\_\_, 2020, by and between

CITY OF MARSHALL, MICHIGAN

hereinafter called the OWNER, and \_\_\_\_\_

hereinafter called the CONTRACTOR.

WITNESSETH, That whereas the OWNER intends to construct

RESIDENTIAL AND COMMERCIAL REVENUE WATER METER REPLACEMENT PROJECT

hereinafter called the Project, in accordance with the Plans, Specifications and other Contract Documents prepared by STANTEC CONSULTING MICHIGAN INC., of Ann Arbor, Michigan, hereinafter called the ENGINEER.

NOW, THEREFORE, The OWNER and CONTRACTOR for the considerations hereinafter set forth, agree as follows:

1. THE CONTRACTOR AGREES to furnish all the necessary labor, materials, equipment, tools, and services necessary to perform and complete, in a workmanlike manner, all work required for the construction of the Project, in strict compliance with the Contract Documents herein mentioned, which are hereby made a part of the Contract, including the following Addenda:

ADDENDUM NO.

DATED

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

A. Contract Time: Work under this Agreement shall be commenced upon receipt of Notice to Proceed, and the entire work shall be completed within 12 months.

If the CONTRACTOR refuses or fails to prosecute the work, or any separate part thereof, with such diligence as will insure its completion, ready for use within the number of consecutive calendar days specified herein, or any extension thereof, or fails to complete said work within such time, the OWNER may, by written notice to the CONTRACTOR, terminate his right to proceed with the Project or such part of the Project as to which there has been delay. In such event the OWNER may take over the Project and prosecute the same to completion, by contract or otherwise, and the CONTRACTOR and his Sureties shall be liable to the OWNER for any excess cost occasioned the OWNER thereby. If the CONTRACTOR's right to proceed is so terminated, the OWNER may take possession of and utilize in completing the Project such materials, appliances, and plant as may be on the site of the Project and necessary therefore.

B. Liquidated Damages: If the OWNER does not terminate the right of the CONTRACTOR to proceed, the CONTRACTOR shall continue the Project, in which event the actual damages for the delay will be impossible to determine and in lieu thereof, the CONTRACTOR shall pay the OWNER the sum of Eight Hundred Dollars (\$800.00) per day, as fixed, agreed and liquidated damages for each consecutive calendar day of delay until the Project is completed, accepted, and the CONTRACTOR and his Sureties shall be liable for the amount thereof: Provided, however, that the right of the CONTRACTOR to proceed shall not be terminated or the CONTRACTOR charged with liquidated damages because of any delays in the completion of the Project due to unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including, but not restricted to acts of God or of the public enemy, acts of the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather, or delays of Subcontractors due to such causes, if the CONTRACTOR shall, within ten days from the beginning of any such delay (unless the OWNER shall grant a further period of time prior to the date of final settlement of the Contract) notify the OWNER in writing of the cause of delay who shall ascertain the facts and the extent of the delay and extend the time for completing the work, when in its judgment, the finds of fact justify such an extension and its findings of fact thereon shall be final and conclusive on the parties thereto.

C. Subcontractors: The CONTRACTOR agrees to bind every subcontractor by the terms of the Contract Documents. The Contract shall not be construed as creating any contractual relation between any Subcontractor and the OWNER.

II. THE OWNER AGREES to pay, and the CONTRACTOR agrees to accept, in full payment for the performance of this Contract, an amount to be determined by the actual constructed quantities and the Unit Prices and Lump Sums set forth in the attached Proposal. This amount is estimated to be:

**SUB TOTAL WATER METERS – SMALL FORM FACTOR PRICE A:**

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**SUB TOTAL WATER METERS – LARGE FORM FACTOR PRICE B:**

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**SUB TOTAL RADIO SYSTEM PRICE E:**

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

**Discount of \$ \_\_\_\_\_ or \_\_\_\_\_ %, if one (1) bidder is awarded the entire project.**

**GRAND TOTAL BID PRICE A, B, C, D, E, and F:**

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

in accordance with the provisions of the Contract Documents.

a. Progress Payments will be made in accordance with the General Conditions.

III. CONTRACT DOCUMENTS: The Contract comprises the Contract Documents listed in the General Conditions of the Contract. In the event that any provision of one Contract Document conflicts with the provision of another Contract Document, the provision in that Contract Document first listed below shall govern, except as otherwise specifically stated:

- a. Agreement (this instrument)
- b. Modifications
- c. Addenda to Contract Documents
- d. Supplementary Conditions
- e. Instructions to Bidders
- f. General Conditions
- g. Specifications
- h. Drawings

IV. AUTHORITY AND RESPONSIBILITY OF THE ENGINEER: All work shall be done under the observation of the ENGINEER. The ENGINEER shall decide any and all questions which may arise as to the quality and acceptability of materials furnished, work performed, rate of progress of work, interpretation of Plans and Specifications and all questions as to the acceptable fulfillment of the Contract on the part of the CONTRACTOR.

V. SUCCESSORS AND ASSIGNS: This Agreement and all of the covenants hereof shall inure to the benefit of and be binding upon the OWNER and the CONTRACTOR respectively and his partners, successors, assigns and legal representatives. Neither the OWNER nor the CONTRACTOR shall have the right to assign, transfer or sublet his interests or obligations hereunder without written consent of the other party.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed on the day and year first above written.

ATTEST

\_\_\_\_\_

\_\_\_\_\_  
CONTRACTOR

\_\_\_\_\_  
By

\_\_\_\_\_  
Title

BUSINESS ADDRESS

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Telephone

\_\_\_\_\_  
Fax

ATTEST

\_\_\_\_\_

\_\_\_\_\_  
OWNER

\_\_\_\_\_  
By

\_\_\_\_\_  
Title

APPROVED AS TO FORM

\_\_\_\_\_  
By the Attorney for

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS THAT \_\_\_\_\_

\_\_\_\_\_

as Principal, hereinafter called the CONTRACTOR, and \_\_\_\_\_

as Surety, hereinafter called Surety, are held and firmly bound unto

CITY OF MARSHALL, MICHIGAN

As obligee, hereinafter called the OWNER, in the amount of

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

for the payment whereof, the CONTRACTOR and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the CONTRACTOR has, by a written Agreement dated \_\_\_\_\_, entered into a Contract with the OWNER for the construction of

RESIDENTIAL AND COMMERCIAL REVENUE WATER METER REPLACEMENT PROJECT

in accordance with Plans and Specifications prepared by STANTEC CONSULTING MICHIGAN INC., which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the CONTRACTOR shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject to, however, to the following conditions.

A. The Surety hereby waives notice of any alteration or extension of time made by the OWNER.

B. Whenever the CONTRACTOR shall be, and declared by the OWNER to be, in default under the Contract, the OWNER having performed OWNER's obligations there under, the Surety may promptly remedy the default, or shall promptly:

1. Complete the Contract in accordance with its terms and conditions, or

2. Obtain a bid or bids for submission to the OWNER for completing the Contract in accordance with its terms and conditions, and upon determination by the OWNER and Surety of the lowest responsible Bidder, arrange for a Contract between such Bidder and the OWNER, and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "Balance of the Contract



Price," as used in this paragraph, shall mean the total amount payable by the OWNER to the CONTRACTOR under the Contract and any amendments thereto, less the amount properly paid by the OWNER to the CONTRACTOR.

C. Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

D. No right of action shall accrue on this bond to or for the use of any person or corporation other than the OWNER named herein or the heirs, executors, administrators or successors of the OWNER.

Signed and Sealed This \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

In the Presence of:

WITNESS

\_\_\_\_\_

Principal

\_\_\_\_\_

Title

WITNESS

\_\_\_\_\_

Surety

\_\_\_\_\_

Title

\_\_\_\_\_

Address of Surety

Bond No.

City

Zip Code

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS that \_\_\_\_\_

\_\_\_\_\_ as Principal, hereinafter called CONTRACTOR, and \_\_\_\_\_

as Surety, hereinafter called Surety, are held and firmly bound unto \_\_\_\_\_

CITY OF MARSHALL, MICHIGAN

as Obligee, hereinafter called the OWNER for the use and benefit of claimants herein below defined, in the amount of

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

for the Payment whereof, CONTRACTOR and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, CONTRACTOR has, by a written Agreement dated \_\_\_\_\_ entered into a Contract with the OWNER for

RESIDENTIAL AND COMMERCIAL REVENUE WATER METER REPLACEMENT PROJECT

in accordance with Plans and Specifications prepared by STANTEC CONSULTING MICHIGAN INC., which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the CONTRACTOR shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

A. A claimant is defined as one having a direct Contract with the CONTRACTOR or with a subcontractor of the CONTRACTOR for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental of equipment directly applicable to the Contract.

B. The above named CONTRACTOR and Surety hereby jointly and severally agree with the OWNER that every claimant as herein defined, who has not been Paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The OWNER shall not be liable for the payment of any costs or expenses of any such suit.

C. No suit or action shall be commenced hereunder by any claimant:

1. Unless claimant, other than one having a direct contract with the CONTRACTOR, shall have given written notice to any two of the following: The Principal, the OWNER, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim

is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the CONTRACTOR, OWNER, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid Project is located, save that such service need not be made by a public officer.

2. After the expiration of one (1) year following the date on which CONTRACTOR ceased work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof; such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law county or other political subdivision of the State in which the Project, or any part thereof, is situated; or in the United States District Court for the district in which the Project, or any part thereof, is situated; and not elsewhere.

D. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

Signed and Sealed This \_\_\_\_\_ day of \_\_\_\_\_, 2020.

In the Presence of:

WITNESS

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Title

WITNESS

\_\_\_\_\_  
Surety

\_\_\_\_\_  
Title

\_\_\_\_\_  
Address of Surety

\_\_\_\_\_  
Bond No. City Zip Code

MAINTENANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we \_\_\_\_\_

hereinafter called the "Principal," and \_\_\_\_\_  
hereinafter called the "Surety," are held and firmly bound unto

CITY OF MARSHALL, MICHIGAN

as Obligee, for the just and full sum of

\_\_\_\_\_ Dollars (\$\_\_\_\_\_)  
(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

to the payment whereof, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-named Principal was awarded a Contract by the OWNER

dated the \_\_\_\_\_ day of \_\_\_\_\_, 2020, for the construction of

RESIDENTIAL AND COMMERCIAL REVENUE WATER METER REPLACEMENT PROJECT

AND WHEREAS, this Contract was awarded upon the express condition that the Principal would furnish a one (1) year Maintenance Bond to repair or replace any deficiencies in Labor or Material.

NOW, THEREFORE, the condition of this obligation is such that if the above Principal shall replace such defective material and shall repair all defects due to defective workmanship which shall occur on or before the first anniversary of final acceptance by OWNER, then this obligation shall be void, otherwise to be and remain in full force, effect and virtue.

Signed and Sealed this \_\_\_\_\_ day of \_\_\_\_\_, 2020.

In the Presence of:

WITNESS

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Title

\_\_\_\_\_  
Surety

\_\_\_\_\_  
Title

\_\_\_\_\_  
Address of Surety

\_\_\_\_\_  
Bond No. City Zip Code

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## **ARTICLE 1 - DEFINITIONS**

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Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

Agreement: The written agreement between OWNER and CONTRACTOR covering the work to be performed; other Contract Documents are attached to the Agreement.

Application for Payment: The form furnished by ENGINEER which is to be used by CONTRACTOR in requesting progress payments and which is to include the schedule of values required by Paragraph 14.1 and an affidavit of CONTRACTOR that progress payments theretofore received on account of the work have been applied by CONTRACTOR to discharge in full all of CONTRACTOR's obligations reflected in prior Applications for Payment.

Bid: The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the work to be performed.

Bidder: Any person, firm, or corporation submitting a Bid for the work.

Bonds: Bid, performance and payment bonds, and other instruments of security, furnished by CONTRACTOR and his surety in accordance with the Contract Documents.

Change Order: A written order to CONTRACTOR signed by OWNER authorizing an addition, deletion, or revision in the work, or an adjustment in the Contract Price or the Contract Time issued after execution of the Agreement.

Contract Documents: The Agreement, Addenda (whether issued prior to the Opening of Bids or the execution of the Agreement), Instructions to Bidders, CONTRACTOR's bid, the bonds, the Notice of Award, these General Conditions, the Supplementary Conditions, the Specifications, Drawings, and Modifications.

Contract Price: The total monies payable to CONTRACTOR under the Contract Documents.

Contract Time: The number of days stated in the Agreement for the Completion of the Work, computed as provided in Paragraph 17.2.

CONTRACTOR: The person, firm, or corporation with whom OWNER has executed the Agreement.

Day: A calendar day of twenty-four (24) hours measured from midnight to the next midnight.

Drawings (Plans): The Drawings, also commonly known or referred to as Plans, which show the character and Scope of Work to be performed and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents.

ENGINEER: The person, firm, or corporation named as such in the Agreement.

Field Order: A written order issued by ENGINEER which clarifies or interprets the Contract Documents in accordance with Paragraph 9.3 or orders minor changes in the work in accordance with Paragraph 10.2.

Modification: (a) A written amendment of the Contract Documents signed by both parties; (b) A Change Order; (c) A written clarification or interpretation issued by ENGINEER in accordance with Paragraph 9.3; or (d) A written order for a minor change or alteration in the work issued by ENGINEER pursuant to Paragraph 10.2. A Modification may only be issued after execution of the Agreement.

Notice of Award: The written notice by OWNER to the apparent successful Bidder stating that upon compliance with the conditions precedent to be fulfilled by him within the time specified, OWNER will execute and deliver the Agreement to him.

Notice to Proceed: A written notice given by OWNER to CONTRACTOR (with a copy to ENGINEER) fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform his obligations under the Contract Documents.

OWNER: A public body or authority, corporation, association, partnership, or individual for whom the work is to be performed.

OWNER'S REPRESENTATIVE: The authorized representative of OWNER who is assigned to the project site or any part thereof.

Project: The entire construction to be performed as provided in the Contract Documents.

Resident Project Representative: The authorized representative of ENGINEER who is assigned to the Project site or any part thereof.

Shop Drawings: All Drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by CONTRACTOR, subcontractor, manufacturer, supplier, or distributor and which illustrate the equipment, material, or some portion of the work.

Specifications: Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the work. The Specifications are customarily organized in 18 divisions in accordance with the Uniform System for Construction Specifications endorsed by the Construction Specifications Institute.

Subcontractor: An individual, firm, or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the work at the site.

Substantial Completion: The date as certified by ENGINEER when the construction of the Project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Project or specified part can be utilized for the purposes for which it was intended; or if there be no such certification, the date when final payment is due in accordance with Paragraph 14.13.

Work: Any and all obligations, duties, and responsibilities necessary to the successful completion of the Project assigned to or undertaken by CONTRACTOR under the Contract Documents, including all labor, materials, equipment, and other incidentals, and the furnishing thereof.

## **ARTICLE 2 - PRELIMINARY MATTERS**

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### **Execution of Agreement**

**2.1.** At least three counterparts of the Agreement and such other Contract Documents as practicable will be executed and delivered by CONTRACTOR to OWNER within ten days of the Notice of Award and the OWNER will execute and deliver one counterpart to CONTRACTOR within ten days of receipt of the executed Agreement from CONTRACTOR. ENGINEER will identify those portions of the Contract Documents not so signed and such identification will be binding on all parties. OWNER, CONTRACTOR, and ENGINEER shall each receive an executed counterpart of the Contract Documents and additional conformed copies as required.

**Delivery of Bonds**

**2.2.** When he delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as he may be required to furnish in accordance with Paragraph 5.1.

**Copies of Documents**

**2.3.** OWNER shall furnish to CONTRACTOR up to ten copies (unless otherwise provided in the Supplementary Conditions) of the Contract Documents as are reasonably necessary for the execution of the work. Additional copies will be furnished, upon request, at the cost of reproduction.

**CONTRACTOR's Pre-Start Representations**

**2.4.** CONTRACTOR represents that he has familiarized himself with, and assumes full responsibility for having familiarized himself with the nature and extent of the Contract Documents, work, locality, and with all local conditions and Federal, State, and local laws, ordinances, rules, and regulations that may in any manner affect performance of the work, and represents that he has correlated his study and observations with the requirements of the Contract Documents. CONTRACTOR also represents that he has studied all surveys and investigation reports of subsurface and latent physical conditions referred to in the General Requirements (Division 1) of the Specifications and made such additional surveys and investigations as he deems necessary for the performance of the work at the Contract Price in accordance with the requirements of the Contract Documents and that he has correlated the results of all such data with the requirements of the Contract Documents.

**Commencement of Contract Time, Notice to Proceed**

**2.5.** The Contract Time will commence to run on the thirtieth day after the day on which the executed Agreement is delivered by OWNER to CONTRACTOR; or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed; but in no event shall the Contract Time commence to run later than the ninetieth day after the day of Bid Opening or the thirtieth day after the day on which OWNER delivers the executed Agreement to CONTRACTOR. A Notice to Proceed may be given at any time within thirty days after the day on which OWNER delivers the executed Agreement to CONTRACTOR.

**Starting the Project**

**2.6.** CONTRACTOR shall start to perform his obligations under the Contract Documents on the date when the Contract Time commences to run. No work shall be done at the site prior to the date on which the Contract Time commences to run.

**Before Starting Construction**

**2.7.** Before undertaking each part of the work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. He shall at once report in writing to ENGINEER any conflict, error, or discrepancy which he may discover; however, he shall not be liable to OWNER or ENGINEER for his failure to discover any conflict, error, or discrepancy in the Drawings or Specifications.

**2.8.** Within ten days after delivery of the executed Agreement by OWNER to CONTRACTOR, CONTRACTOR shall submit to ENGINEER for approval, an estimated progress schedule indicating the starting and completion dates of the various stages of the work, and a preliminary schedule of shop drawing submissions.



**2.9.** Before starting the work at the site, CONTRACTOR shall furnish OWNER and ENGINEER Certificates of Insurance as required by Article 5. Within twenty days after delivery of the executed Agreement by OWNER to CONTRACTOR, but before starting the work at the site, a conference will be held to review the above schedules, to establish procedures for handling Shop Drawings and other submissions and for processing Applications for Payment, and to establish a working understanding between the parties as to the Project. Present at the conference will be OWNER or his representative, ENGINEER, Resident Project Representatives, CONTRACTOR, and his Superintendent.

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**ARTICLE 3 - CORRELATION, INTERPRETATION, AND INTENT OF CONTRACT DOCUMENTS**

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**3.1.** It is the intent of the Specifications and Drawings to describe a complete Project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire Agreement between OWNER and CONTRACTOR. They may be altered only by a Modification.

**3.2.** The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, he shall call it to ENGINEER's attention in writing at once and before proceeding with the work affected thereby; however, he shall not be liable to OWNER or ENGINEER for his failure to discover any conflict, error, or discrepancy in the Specifications or Drawings. In resolving such conflicts, errors, and discrepancies, the Documents shall be given precedence in the following order: Agreement, Modifications, Addenda, Supplementary Conditions, Instructions to Bidders, General Conditions, Specifications, and Drawings. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over general Drawings. Any work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials, or equipment described in words which so applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards.

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**ARTICLE 4 - AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS**

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**Availability of Lands**

**4.1.** OWNER shall furnish, as indicated in the Contract Documents, and not later than the date when needed by CONTRACTOR, the lands upon which the work is to be done, rights-of-way for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise specified in the Contract Documents. If CONTRACTOR believes that any delay in OWNER's furnishing these lands or easements entitles him to an extension of the Contract Time, he may make a claim therefor as provided in Article 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

**Physical Conditions - Surveys and Reports**

**4.2.** Reference is made to the General Requirements (Division 1) of the Specifications for identification of those surveys and investigation reports of subsurface and latent physical conditions at the Project site or otherwise affecting performance of the work which have been relied upon by ENGINEER in preparation of the drawings and Specifications.

**Unforeseen Physical Conditions**

**4.3.** CONTRACTOR shall promptly notify OWNER and ENGINEER in writing of any subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents. ENGINEER will promptly investigate those conditions and advise OWNER in writing if further surveys or subsurface tests are necessary. Promptly thereafter, OWNER shall obtain the necessary additional surveys and tests and furnish copies to ENGINEER and CONTRACTOR. If ENGINEER finds that the results of such surveys or tests indicate that there are subsurface or latent physical conditions which differ materially from those intended in the Contract Documents, and which could not reasonably have been anticipated by CONTRACTOR, a Change Order shall be issued incorporating the necessary revisions.

**Reference Points**

**4.4.** OWNER shall provide engineering surveys for construction to establish reference points which in his judgment are necessary to enable CONTRACTOR to proceed with the work. CONTRACTOR shall be responsible for surveying and laying out the work (unless otherwise provided in the Supplementary Conditions), and shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. He shall report to ENGINEER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations. CONTRACTOR shall replace and accurately relocate all reference points so lost, destroyed or moved.

**4.5.** All elevations shown on the Plans or referred to herein are in feet above mean sea level datum as established by the United States Geological Survey, unless otherwise noted. The CONTRACTOR shall verify all the existing structure locations and elevations at points of connection or possible interference between his work and the existing structures and shall report at once to the ENGINEER any interferences or discrepancies discovered.

**4.6.** The CONTRACTOR shall cause to be replaced by a Registered Land Surveyor all survey monuments and/or property irons damaged or destroyed by his operations or the operations of his Subcontractor.

**ARTICLE 5 - BONDS AND INSURANCE**

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**Performance, Payment and Other Bonds**

**5.1.** CONTRACTOR shall furnish performance and payment bonds as security for the faithful performance and payment of all his obligations under the Contract Documents. These bonds shall be in amounts at least equal to the Contract Price, and (except as otherwise provided in the Supplementary Conditions) in such form and with such sureties as are licensed to conduct business in the state where the Project is located and are named in the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Treasury Department.

**5.2.** If the surety on any bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located, CONTRACTOR shall within five days thereafter substitute another bond and surety, both of which shall be acceptable to OWNER.

**Insurance Required of the CONTRACTOR**

**5.3.** Prior to commencement of the work, the CONTRACTOR shall purchase and maintain during the term of the Project such insurance as will protect him, the OWNER(s), OWNER'S REPRESENTATIVE and the

ENGINEER(s) from claims arising out of the work described in this Contract and performed by the CONTRACTOR, Subcontractor(s), or Sub-subcontractor(s) consisting of:

**5.3.1.** Worker's Compensation Insurance including Employer's Liability to cover employee injuries or disease compensable under the Worker's Compensation Statutes of the states in which work is conducted under this Contract; disability benefit laws, if any; or Federal Compensation Acts such as U.S. Longshoremen or Harbor Workers, Maritime Employment, or Railroad Compensation Act(s), if applicable. Self-insurance plans approved by the regulatory authorities in the state in which work on this Project is performed are acceptable.

**5.3.2.** A Comprehensive General Liability policy to cover bodily injury to persons other than employees and for damage to tangible property, including loss of use thereof, including the following exposures:

- (a) all premises and operations;
- (b) explosion, collapse, and underground damage;
- (c) CONTRACTOR's Protective Coverage for independent CONTRACTORS and subcontractors employed by him;
- (d) Contractual Liability for the obligation assumed in the indemnification or hold harmless agreement found in the General Conditions section of this Contract;
- (e) the usual Personal Injury Liability endorsement with no exclusions pertaining to employment;
- (f) products and completed operations coverage -- this coverage shall extend through the Contract Guarantee period.

**5.3.3.** A Comprehensive Automobile Liability policy to cover bodily injury and property damage arising out of the ownership, maintenance, or use of any motor vehicle, including owned, non-owned, and hired vehicles. In light of standard policy provisions concerning:

- (a) loading and unloading; and
- (b) definitions pertaining to motor vehicles licensed for road use vs. unlicensed or self-propelled construction equipment, it is strongly recommended that the Comprehensive General Liability and the Comprehensive Auto Liability be written by the same insurance carrier, though not necessarily in one policy.

**5.3.4.** The CONTRACTOR will purchase for the OWNER an OWNER's Protective Liability policy to protect the OWNER, the ENGINEER, their consultants, agents, employees, and such public corporations in whose jurisdiction the work is located for their contingent liability for work performed by the CONTRACTOR, the Subcontractor(s), and the Sub-subcontractor(s) under this Contract.

**5.3.5.** The CONTRACTOR shall purchase a Builder's Risk-Installation Floater in a form acceptable to the OWNER covering property of the Project for the full cost of replacement as of the time of any loss which shall include as named insureds:

- (a) the CONTRACTOR;
- (b) all Subcontractors;
- (c) all Sub-subcontractors;
- (d) the OWNER, the ENGINEER(s) or Architect(s);

as their respective interests may prove to be at the time of loss, covering insurable property which is the subject of this Contract, whether in place, stored at the job site, stored elsewhere, or in transit at the risk of the insured(s). Coverage shall be effected on an "All Risk" form including, but not limited to, the perils of fire, wind, vandalism, collapse, theft, and earthquake, with exclusions normal to the coverage. The CONTRACTOR may arrange for such deductibles as he deems to be within his ability of self-assume, but he will be held solely responsible for the amount of such deductible and for any non-insurance penalties. Any insured loss shall be adjusted with the OWNER and the CONTRACTOR and paid to the OWNER and CONTRACTOR as trustee for the other insureds.

**5.3.6. Umbrella or Excess Liability:** The OWNER or its representative may, for certain projects, require limits higher than those stated in Paragraph 5.4. which follows. The CONTRACTOR is granted the option of arranging coverage under a single policy for the full limit required or by a combination of underlying policies with the balance provided by an Excess or Umbrella Liability policy equal to the total limit(s) requested. Umbrella or Excess policy wording shall be at least as broad as the primary or underlying policy(ies) and shall apply both to the CONTRACTOR's general liability and to his automobile liability insurance.

**5.3.7. Railroad Protective Liability:** Where such an exposure exists, the CONTRACTOR will provide coverage in the name of each railroad company having jurisdiction over rights-of-way across which work under the Contract is to be performed. The form of policy and the limits of liability shall be determined by the railroad company(ies) involved. See Supplemental General Conditions for limits and coverage requested.

**Limits of Liability**

**5.4.** The required limits of liability for insurance coverages requested in Paragraph 5.3 shall be NOT LESS than the following:

**5.4.1. Worker's Compensation:**

Coverage A - Compensation	Statutory
Coverage B - Employer's Liability	\$500,000

**5.4.2. Comprehensive General Liability:**

Bodily Injury - Each Occurrence	\$1,000,000
Bodily Injury - Aggregate (Completed Operations)	\$1,000,000
Property Damage - Each Occurrence	\$500,000
Property Damage - Aggregate or Combined Single Limit	\$1,000,000 \$2,000,000

**5.4.3. Comprehensive Automobile Liability:**

Bodily Injury	\$500,000
Property Damage or Combined Single Limit	\$200,000 \$1,000,000

**5.4.4. OWNER's Protective:**

Bodily Injury - Each Occurrence	\$1,500,000
Property Damage - Each Occurrence	\$500,000
Property Damage - Aggregate or Combined Single Limit	\$1,000,000 \$2,000,000

**5.4.5. Builder's Risk-Installation Floater:** Replacement Cost at Time of Loss

**5.4.6. Umbrella or Excess Liability:** \$3,000,000

**Insurance - Other Requirements**

**5.5.** The following conditions shall also be required in regard to insurance coverage.

**5.5.1.** Notice of Cancellation or Intent Not to Renew: Policies will be endorsed to provide that at least 30 days written notice of cancellation or of intent not to renew shall be given to the OWNER and to the ENGINEER.

**5.5.2.** Evidence of Coverage: Prior to commencement of the work, the CONTRACTOR shall furnish to the OWNER, Certificates of Insurance in force on the OWNER's form of certificate provided. Other forms of certificate are acceptable only if:

- (a) they include all of the items prescribed in the OWNER's form of certificate, including agreement to cancellation provisions outlined in Paragraph 5.5.1. above; and
- (b) they have written approval of the OWNER and the ENGINEER. The OWNER reserves the right to request complete copies of policies if deemed necessary to ascertain details of coverage not provided by the certificates. Such policy copies shall be "originally signed copies," and so designated.

**5.5.3.** Evidence of Insurance Required for the CONTRACTOR:

- (1) Worker's Compensation and Employer's Liability Comprehensive General Liability including:
  - (a) all premises and operations;
  - (b) explosion, collapse, and underground damage;
  - (c) CONTRACTOR's Protective;
  - (d) Contractual Liability for obligations assumed in the Indemnification-Hold Harmless Agreement of this Contract;
  - (e) Personal Injury Liability;
  - (f) products and completed operations;
- (2) Comprehensive Automobile Liability including owned, non-owned, and hired vehicles
- (3) Umbrella or Excess Liability

**5.5.4.** Evidence of Insurance Required for the OWNER:

- (a) OWNER's Protective Liability which names as insured(s) the OWNER, OWNER'S REPRESENTATIVE the ENGINEER(s), their consultants, agents, employees, and such public corporations in whose jurisdiction the work is located.

**5.5.5.** Evidence of Insurance Required for the CONTRACTOR and the OWNER:

- (a) Builder's Risk-Installation Floater which names as insured(s) the OWNER; OWNER'S REPRESENTATIVE; the ENGINEER(s); their consultants, agents, and employees; the CONTRACTOR and all Subcontractors.

**5.5.6.** Qualification of Insurers: In order to determine financial strength and reputation of insurance carriers, all companies providing the coverages required shall be licensed or approved by the Insurance Bureau of the State of Michigan and shall have a financial rating not lower than XI and a Policyholder's service rating no lower than B+ as listed in A.M. Best's Key Rating Guide, current edition. Companies with ratings lower than B+:XI will be acceptable only upon written consent of the OWNER.

**Additional Bonds and Insurance**

**5.6.** Prior to delivery of the executed Agreement by OWNER to CONTRACTOR, OWNER may require CONTRACTOR to furnish such other bonds and such additional insurance, in such form and with such

sureties or insurers as OWNER may require. If such other bonds or such other insurance is specified by written instructions given prior to Opening of Bids, the premiums shall be paid by CONTRACTOR; if subsequent thereto, they shall be paid by OWNER (except as otherwise provided in Article 11).

## **ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES**

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### **Supervision and Superintendence**

**6.1.** CONTRACTOR shall supervise and direct the work efficiently and with his best skill and attention. He shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but he shall not be solely responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence, or procedure of construction which is indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished work complies accurately with the Contract Documents.

**6.2.** CONTRACTOR shall keep on the work site at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the site and shall have authority to act on behalf of the CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

### **Labor, Materials, and Equipment**

**6.3.** CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the work and perform construction as required by the Contract Documents. He shall at all times maintain good discipline and order at the site.

**6.4.** CONTRACTOR shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities and all other facilities and incidentals necessary for the execution, testing, initial operation, and completion of the work.

**6.5.** All materials and equipment shall be new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

**6.6.** All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, or processors, except as otherwise provided in the Contract Documents.

### **Substitute Materials or Equipment**

**6.7.** Whenever a material, article, or piece of equipment is identified on the Drawings or Specifications by reference to brand name or catalog number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality, and function may be considered.

The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or

catalog number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the Contract Price and the Contract Documents shall be appropriately modified by Change Order. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the Contract Price or Contract Time.

**Concerning Subcontractors**

**6.8.** CONTRACTOR shall not employ any Subcontractor or other person or organization (including those who are to furnish the principal items of materials or equipment), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. A Subcontractor or other person or organization identified in writing to OWNER and ENGINEER prior to the Notice of Award will be deemed acceptable to OWNER and ENGINEER. Acceptance of any Subcontractor, other person, or organization by OWNER or ENGINEER shall not constitute a waiver of any right of OWNER or ENGINEER to reject defective work or work not in conformance with the Contract Documents. If OWNER or ENGINEER after due investigation has reasonable objection to any Subcontractor, other person or organization proposed by CONTRACTOR after the Notice of Award, CONTRACTOR shall submit an acceptable substitute and the Contract Price shall be increased or decreased by the difference in cost occasioned by such substitution, and an appropriate Change Order shall be issued. CONTRACTOR shall not be required to employ any Subcontractor, other person or organization against whom he has reasonable objection. CONTRACTOR shall not without the consent of OWNER and ENGINEER make any substitution for any CONTRACTOR, other person, or organization who has been accepted by OWNER and ENGINEER unless ENGINEER determines that there is good cause for doing so.

Nothing contained in these Contract Documents shall create any contractual relationship between the OWNER or ENGINEER and any Subcontractor or Sub-Subcontractor.

**6.9.** CONTRACTOR shall be fully responsible for all acts and omissions of his Subcontractors and of persons and organizations directly or indirectly employed by them and of persons and organizations for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between OWNER or ENGINEER and any Subcontractor or other person or organization having a direct contract with CONTRACTOR, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any monies due any Subcontractor or other person or organization, except as may otherwise be required by law. OWNER or ENGINEER may furnish to any Subcontractor or other person or organization, to the extent practicable, evidence of amounts paid to CONTRACTOR on account of specific work done in accordance with the Schedule of Values.

**6.10.** The divisions and sections of the Specifications and the identifications of any drawings shall not control CONTRACTOR in dividing the work among Subcontractors or delineating the work to be performed by any specific trade.

**6.11.** CONTRACTOR agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER.

**6.12.** All work performed for CONTRACTOR by a Subcontractor shall be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which shall contain provisions that waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by insurance provided in accordance with Article 5 of these General Conditions, except such rights as they may have to the proceeds of such insurance held by OWNER as trustee under Paragraph 5.3.5.

**Patent Fees and Royalties**

**6.13.** CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorney's fees) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the work or resulting from the incorporation in the work of any invention, design, process, product or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.

**Permits**

**6.14.** CONTRACTOR shall obtain and pay for all construction permits and licenses and shall pay all governmental charges and inspection fees necessary for the prosecution of the work, which are applicable at the time of his Bid. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall also pay all public utility charges.

**Laws and Regulations**

**6.15.** CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the work. If CONTRACTOR observes that the Specifications or Drawings are at variance therewith, he shall give ENGINEER prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If CONTRACTOR performs any work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without such notice to ENGINEER, he shall bear all costs arising therefrom; however, it shall not be his primary responsibility to make certain that the Specifications and Drawings are in accordance with such laws, ordinances, rules and regulations.

**Taxes**

**6.16.** CONTRACTOR shall pay all sales, consumer use, and other Federal, State and Local taxes required to be paid by him in accordance with the law of the place where the work is to be performed.

**Use of Premises**

**6.17.** CONTRACTOR shall confine his equipment, the storage of materials and equipment, and the operations of his workmen to areas permitted by law, ordinances, permits, or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with materials or equipment. CONTRACTOR shall restore the areas to their original condition.

**6.18.** CONTRACTOR shall not load nor permit any part of any structure to be loaded with weights that will endanger the structure, nor shall he subject any part of the work to stresses or pressures that will endanger it.

**Record Drawings**

**6.19.** CONTRACTOR shall keep one record copy of all Specifications, Drawings, Addenda, Modifications, and Shop Drawings at the site in good order and annotated to show all changes made during the construction



process. These shall be available to ENGINEER and shall be delivered to him for OWNER upon completion of the Project. (Note: Further provisions in respect of such record Drawings may be included in the General Requirements (Division 1).)

**Safety and Protection**

**6.20.** CONTRACTOR shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. He shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

- (a) all employees on the work and other persons who may be affected thereby;
- (b) all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site;
- (c) other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

CONTRACTOR shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. He shall erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for its safety and protection. He shall notify owners of adjacent utilities when prosecution of the work may affect them. All damage, injury or loss to any property referred to in Paragraph 6.20(b) or 6.20(c) caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR; except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR. CONTRACTOR's duties and responsibilities for the safety and protection of the work shall continue until such time as all the work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with Paragraph 14.13 that work is acceptable.

**6.21.** CONTRACTOR shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be CONTRACTOR's superintendent unless otherwise designated in writing by CONTRACTOR to OWNER.

**6.22.** Neither OWNER nor ENGINEER shall be responsible for safety on the job. It is the CONTRACTOR's sole responsibility to comply with the rules and regulations of the Occupational Safety and Health Act (OSHA).

**Emergencies**

**6.23.** In emergencies affecting the safety of persons or the work or property at the site or adjacent thereto, CONTRACTOR without special instruction or authorization from ENGINEER or OWNER, is obligated to act, at his discretion, to prevent threatened damage, injury, or loss. He shall give ENGINEER prompt written notice of any significant changes in the work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved. If CONTRACTOR believes that additional work done by him in an emergency which arose from causes beyond his control entitles him to an increase in the Contract Price or an extension of the Contract Time, he may make a claim therefor as provided in Articles 11 and 12.

**Shop Drawings and Samples**

**6.24.** After checking and verifying all field measurements, CONTRACTOR shall submit to ENGINEER for approval, in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.8) five copies (or at ENGINEER's option, one reproducible copy) of all Shop Drawings, which shall have been checked by and stamped with the approval of CONTRACTOR and identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to dimensions, design criteria, materials of construction, and the like to enable ENGINEER to review the information as required.

**6.25.** CONTRACTOR shall also submit to ENGINEER for approval with such promptness as to cause no delay in work, all samples required by the Contract Documents. All samples will have been checked by and stamped with the approval of CONTRACTOR, identified clearly as to material, manufacturer, any pertinent catalog numbers, and the use for which intended.

**6.26.** At the time of each submission, CONTRACTOR shall in writing call ENGINEER's attention to any deviations that the Shop Drawing or sample may have from the requirements of the Contract Documents.

**6.27.** ENGINEER will review and approve with reasonable promptness Shop Drawings and samples, but his review and approval shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make any corrections required by ENGINEER and shall return the required number of correct copies of Shop Drawings and resubmit new samples, until approved. CONTRACTOR shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections called for by ENGINEER on previous submissions. CONTRACTOR's stamp of approval on any Shop Drawing or sample shall constitute a representation to OWNER and ENGINEER that CONTRACTOR has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or he assumes full responsibility for doing so, and that he has reviewed or coordinated each Shop Drawing or sample with the requirements of the work and the Contract Documents.

**6.28.** Where a Shop Drawing or sample submission is required by the Specifications, no related work shall be commenced until the submission has been approved by ENGINEER. A copy of each approved Shop Drawing and each approved sample shall be kept in good order by CONTRACTOR at the site and shall be available to ENGINEER.

**6.29.** ENGINEER's approval of Shop Drawings or samples shall not relieve CONTRACTOR from his responsibility for any deviations from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to such deviation at the time of submission and ENGINEER has given written approval to the specific deviation, nor shall any approval by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings.

(Note: Further provisions in respect to Shop Drawings and samples may be included in the General Requirements (Division 1).)

**Cleaning**

**6.30.** CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the work, and at the completion of the work he shall remove all waste materials, rubbish, and debris from and about the premises as well as all tools, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents. (Note: Further provisions in respect of cleaning may be included in the General Requirements (Division 1).)

**Indemnification**

**6.31.** CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and their agents, directors, officers, and employees from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from the performance of the work, provided that any such claim, damage, loss or expense is:

- (a) attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom; and
- (b) caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

**6.32.** In any and all claims against OWNER or ENGINEER or any of their agents or directors, officers, and employees by any employee of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.31 shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR, or any Subcontractor under Worker's Compensation Acts, disability benefit acts, or other employee benefit acts.

**6.33.** The obligations of CONTRACTOR under Paragraph 6.30 shall not extend to the liability of ENGINEER, his agents or directors, officers, and employees arising out of:

- (a) the preparation of approval of maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
- (b) the giving of or the failure to give directions or instructions by ENGINEER, his agents or directors, officers and employees provided such giving or failure to give is the primary cause of injury or damage.

**ARTICLE 7 - WORK BY OTHERS**

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**7.1.** OWNER may perform additional work related to the Project by himself, or he may let other direct contracts therefor which shall contain General Conditions similar to these. CONTRACTOR shall afford the other CONTRACTORS who are parties to such direct contracts (or OWNER, if he is performing the additional work himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of work, and shall properly connect and coordinate his work with theirs.

**7.2.** If any part of CONTRACTOR's work depends for proper execution or results upon the work of any such other CONTRACTOR (or OWNER), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any defects or deficiencies in such work that render it unsuitable for such proper execution and results. His failure so to report shall constitute an acceptance of the other work as fit and proper for the relationship of his work except as to defects and deficiencies which may appear in the other work after the execution of his work.

**7.3.** CONTRACTOR shall do all cutting, fitting, and patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and of the other CONTRACTORS whose work will be affected.

7.4. If the performance of additional work by other CONTRACTORS or OWNER is not noted in the Contract Documents prior to the execution of the contract, written notice thereof shall be given to CONTRACTOR prior to starting any such additional work. If CONTRACTOR believes that the performance of such additional work by OWNER or others involves him in additional expense or entitles him to an extension of the Contract Time, he may make a claim therefor as provided in Articles 11 and 12.

## **ARTICLE 8 - OWNER'S RESPONSIBILITIES**

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8.1. OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.2. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer against whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER. Any dispute in connection with such appointment shall be subject to arbitration.

8.3. OWNER shall furnish the data required of him under the Contract Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in Paragraphs 14.4 and 14.13.

8.4. OWNER's duties in respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.1 and 4.4. Paragraph 4.2 refers to OWNER's identifying and making available to CONTRACTOR copies of surveys and investigation reports of subsurface and latent physical conditions at the site or otherwise affecting performance of the work which have been relied upon by ENGINEER in preparing the Drawings and Specifications.

8.5. OWNER's responsibilities in respect of liability and property insurance are set forth in Article 5.

8.6. In addition to his rights to request changes in the work in accordance with Article 10, OWNER (especially in certain instances as provided in Paragraph 10.4) shall be obligated to execute Change Orders.

8.7. OWNER's responsibility in respect of certain inspections, tests, and approvals is set forth in Paragraph 13.2.

8.8. In connection with OWNER's right to stop work or suspend work, see Paragraphs 13.8 and 15.1. Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR under certain circumstances.

## **ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION**

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### **OWNER's Representative**

9.1. ENGINEER will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER's representative during construction are set forth in Articles 1 through 17 of these General Conditions and shall not be extended without written consent of OWNER and ENGINEER.

### **Visits to Site**

9.2. ENGINEER will make periodic visits to the site to observe the progress and quality of the executed work and to determine, in general, if the work is proceeding in accordance with the Contract Documents. He will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the work. His efforts will be directed toward providing assurance for OWNER that the completed Project will

conform to the requirements of the Contract Documents. On the basis of his on-site observations as an experienced and qualified design professional, he will keep OWNER informed of the progress of the work and will endeavor to guard OWNER against defects and deficiencies in the work of CONTRACTORS.

### **Clarifications and Interpretations**

**9.3.** ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the Contract Documents (in the form of drawings or otherwise) as he may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If CONTRACTOR believes that a written clarification and interpretation entitles him to an increase in the Contract Price, he may make a claim therefor as provided in Article 11.

### **Rejecting Defective Work**

**9.4.** ENGINEER will have authority to disapprove or reject work which is "defective" (which term is hereinafter used to describe work that is unsatisfactory, faulty, or defective, or does not conform to the requirements of the Contract Documents or does not meet the requirements of the inspection, test, or approval referred to in Paragraph 13.2 or has been damaged prior to approval of final payment). He will also have authority to require special inspection or testing of the work as provided in Paragraph 13.7, whether or not the work is fabricated, installed, or completed.

### **Shop Drawings, Change Orders, and Payments**

**9.5.** In connection with ENGINEER's responsibility for Shop Drawings and samples, see Paragraphs 6.23 through 6.28 inclusive.

**9.6.** In connection with ENGINEER's responsibility for Change Orders, see Articles 10, 11, and 12.

**9.7.** In connection with ENGINEER's responsibilities in respect of Applications for Payment, etc., see Article 14.

### **Resident Project Representatives**

**9.8.** If the OWNER authorizes the ENGINEER, the ENGINEER shall provide one or more full-time resident project representatives to assist the ENGINEER in carrying out his responsibilities at the site. The duties, responsibilities, and limitation of authority of any such resident project representative shall be to endeavor to further protect the OWNER against defects and deficiencies in the work. But the furnishing of such resident project representatives shall not make the ENGINEER responsible for construction means, methods, techniques, sequences, or procedures or for any safety precautions or programs in connection with the work.

### **Decisions on Disagreements**

**9.9.** ENGINEER will be the interpreter of the requirements of the Contract Documents and the judge of the performance thereunder. In his capacity as interpreter and judge he will exercise his best efforts to insure faithful performance by both OWNER and CONTRACTOR. He will not show partiality to either and will not be liable for the result of any interpretation or decision rendered in good faith. Claims, disputes, and other matters relating to the execution and progress of the work or the interpretation of or performance under the Contract Documents shall be referred to ENGINEER for decision, which he will render in writing within a reasonable time.

**Limitations on Engineer's Responsibilities**

**9.10.** Neither ENGINEER's authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by him in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of ENGINEER to CONTRACTOR, any Subcontractor, any materialman, fabricator, supplier, or any of their agents or employees or any other person performing any of the work.

**9.11.** ENGINEER will not be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, and he will not be responsible for CONTRACTOR's failure to perform the work in accordance with the Contract Documents.

**9.12.** ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or any Subcontractors, or any of his or their agents or employees, or any other persons at the site or otherwise performing any of the work.

**ARTICLE 10 - CHANGES IN THE WORK**

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**10.1.** Without invalidating the Agreement, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the work; these will be authorized by Change Orders. Upon receipt of a Change Order, CONTRACTOR shall proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made as provided in Article 11 or Article 12 on the basis of a claim made by either party.

**10.2.** ENGINEER may authorize minor changes or alterations in the work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order. If CONTRACTOR believes that any minor change or alteration authorized by ENGINEER entitles him to an increase in the Contract Price, he may make a claim therefor as provided in Article 11.

**10.3.** Additional work performed by CONTRACTOR without authorization of a Change Order will not entitle him to an increase in the Contract Price or an extension of the Contract Time, except in the case of an emergency and as provided in Paragraphs 10.2 and 13.7.

**10.4.** OWNER shall execute appropriate Change Orders prepared by ENGINEER covering changes in the work to be performed as provided in Paragraph 4.3, and work performed in an emergency as provided in Paragraph 6.23 and any other claim of CONTRACTOR for a change in the Contract Time or the Contract Price which is approved by ENGINEER.

**10.5.** It is CONTRACTOR's responsibility to notify his Surety of any changes affecting the general Scope of Work or change in the Contract Price and the amount of the applicable bonds shall be adjusted accordingly. CONTRACTOR shall furnish proof of such adjustment to OWNER.

**ARTICLE 11 - CHANGE OF CONTRACT PRICE**

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**11.1.** The Contract Price constitutes the total compensation payable to CONTRACTOR for performing the work. All duties, responsibilities, and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.

**11.2.** The Contract Price may only be changed by a Change Order. Any claim for an increase in the Contract Price shall be based on written notice delivered to OWNER and ENGINEER within fifteen days of the occurrence of the event giving rise to the claim. Notice of the amount of the claim with supporting data

shall be delivered within forty-five days of such occurrence unless ENGINEER allows an additional period of time to ascertain accurate cost data. Any claims, not delivered to OWNER or ENGINEER within forty-five days or within any additional period allowed by ENGINEER in writing, shall be forfeited by the CONTRACTOR and shall not be honored by the OWNER. All claims for adjustments in the Contract Price shall be determined by ENGINEER if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. Any change in the Contract Price resulting from any such claim shall be incorporated in a Change Order.

**11.3.** The value of any work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

- (a) where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved;
- (b) by mutual acceptance of a lump sum;
- (c) on the basis of the Cost of the Work (determined as provided in Paragraph 11.4.).

### **Cost of the Work**

**11.4.** The term Cost of the Work means the sum of all costs necessarily incurred and paid by the CONTRACTOR in the proper performance of the work. Except as may be otherwise agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in Paragraph 11.5.

**11.4.1.** Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the work under schedules of job classifications agreed upon by OWNER and CONTRACTOR: Payroll costs for employees not employed full time on the work shall be apportioned on the basis of their time spent on the work. Payroll costs shall include, but not be limited to salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, worker's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing work after regular working hours, on Sunday or legal holidays shall be included in the above to the extent authorized by the OWNER.

**11.4.2.** Cost of all materials and equipment furnished and incorporated in the work, including costs of transportation and storage thereof, and manufacturers' field services required in connection therewith: All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds, and all returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

**11.4.3.** Payments made by CONTRACTOR to the Subcontractors for work performed by Subcontractors: If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to him and shall deliver such bids to OWNER who will then determine with the advice of ENGINEER, which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Cost of the Work shall be determined in accordance with Paragraphs 11.4 and 11.5. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

**11.4.4.** Costs of special consultants (including, but not limited to, ENGINEERS, architects, testing laboratories, surveyors, lawyers, and accountants) employed for services specifically related to the work.

**11.4.5.**Supplemental costs including the following:

- (a)The proportion of necessary transportation, traveling and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the work;
- (b)Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workmen, which are consumed in the performance of the work, and cost less market value of such items used but not consumed which remain the property of CONTRACTOR;
- (c)Sales, use or similar taxes related to the work, and for which CONTRACTOR is liable, imposed by any governmental authority;
- (d)Deposits lost for causes other than CONTRACTOR's negligence, royalty payments and fees for permits and licenses;
- (e)Losses, damages and expenses, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the execution of and to the work, provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's Fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, he shall be paid for his services a fee proportionate to that stated in Paragraph 11.6.2;
- (f) The cost of utilities, fuel and sanitary facilities at the site;
- (g) Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the work;
- (h) Cost of premiums for bonds and insurance which OWNER is required to pay.

**11.5.** The term Cost of the Work shall not include any of the following:

**11.5.1.**Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, ENGINEERS, architects, estimators, lawyers, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in his principal or a branch office for general administration of the work and not specifically included in the schedule referred to in Subparagraph 11.4.1. -- all of which are to be considered administrative costs covered by the CONTRACTOR's Fee.

**11.5.2.**Expenses of CONTRACTOR's principal and branch offices other than his office at the site.

**11.5.3.**Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the work and charges against CONTRACTOR for delinquent payments.

**11.5.4.**Cost of premiums for all bonds and for all insurance policies whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except as otherwise provided in Subparagraph 11.4.5(h)).

**11.5.5.**Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective work, disposal of materials or equipment wrongly supplied, and making good any damage to property.



**11.5.6.** Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 11.4.

**11.5.7.** Temporary shut down of work due to unknown existing condition. CONTRACTOR shall not charge OWNER for equipment of labor for idled operations due to unforeseen condition at the work site.

**CONTRACTOR's Fee**

**11.6.** The CONTRACTOR's Fee which shall be allowed to CONTRACTOR for his overhead and profit shall be determined as follows:

**11.6.1.** A fixed mutually acceptable. If no mutually acceptable fixed fee can be agreed upon, then,

**11.6.2.** A fee based on the following percentages of the various portions of the Cost of the Work:

(a) for costs incurred under Paragraphs 11.4.1. and 11.4.2.; the CONTRACTOR's Fee shall be ten (10) percent;

(b) for costs incurred under Paragraph 11.4.3., the CONTRACTOR's Fee shall be five (5) percent; and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to the Subcontractor as a fee for overhead and profit shall be ten (10) percent; and

(c) no fee shall be payable on the basis of costs itemized under Paragraphs 11.4.4., 11.4.5., and 11.5.

**11.7.** The amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost, will be the amount of the actual net decrease. When both additions and credits are involved in any one change, the combined overhead and profit shall be figured on the basis of the net increase, if any.

**11.8.** Whenever the cost of any work is to be determined pursuant to Paragraphs 11.4 and 11.5, CONTRACTOR will submit in form prescribed by ENGINEER an itemized cost breakdown together with supporting data.

**Cash Allowances**

**11.9.** It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the work so covered to be done by such materialmen, suppliers, or Subcontractors and for such sums within the limit of the allowances as ENGINEER may approve. Upon final payment, the Contract Price shall be adjusted as required and an appropriate Change Order issued. CONTRACTOR agrees that the original Contract Price includes such sums as he deems proper for costs and profit on account of cash allowances. No demand for additional cost or profit in connection therewith will be allowed.

**ARTICLE 12 - CHANGE OF THE CONTRACT TIME**

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**12.1.** The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to OWNER and ENGINEER within fifteen days of the occurrence of the event giving rise to the claim. Notice of the extent of the claim with supporting data shall be delivered within forty-five days of such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data. All claims for adjustment in the Contract Time shall be determined by

ENGINEER if OWNER and CONTRACTOR cannot otherwise agree. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

**12.2.** The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if he makes a claim therefor as provided in Paragraph 12.1. Such delays shall include, but not be restricted to, acts or neglect by any separate CONTRACTOR employed by OWNER, fires, floods, labor disputes, epidemics, abnormal weather conditions, or Acts of God.

**12.3.** All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 12 shall not exclude recovery for damages (including compensation for additional professional services) for delay by either party.

**ARTICLE 13 - WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK**

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**Warranty and Guarantee**

**13.1.** CONTRACTOR warrants and guarantees to OWNER and ENGINEER that all materials and equipment will be new unless otherwise specified and that all work will be of good quality and free from faults or defects and in accordance with the requirements of the Contract Documents and of any inspections, tests, or approvals referred to in Paragraph 13.2. All unsatisfactory work, all faulty or defective work, and all work not conforming to the requirements of the Contract Documents at the time of acceptance thereof or of such inspections, tests, or approvals, shall be considered defective. Prompt notice of all defects shall be given to CONTRACTOR. All defective work, whether or not in place, may be rejected, corrected, or accepted as provided in this Article 13.

**Tests and Inspections**

**13.2.** If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by some public body, CONTRACTOR shall assume full responsibility therefor, pay all costs in connection therewith and furnish ENGINEER the required certificates of inspection, testing, or approval. All other inspections, tests and approvals required by the Contract Documents shall be performed by organizations acceptable to OWNER and CONTRACTOR and the costs thereof shall be borne by CONTRACTOR unless otherwise specified.

**13.3.** CONTRACTOR shall give ENGINEER timely notice of readiness of the work for all inspections, tests, or approvals. If any such work required so to be inspected, tested, or approved is covered without written approval of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation, and such uncovering shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of his intention to cover such work and ENGINEER has not acted with reasonable promptness in response to such notice.

**13.4.** Neither observations by ENGINEER, nor inspections, tests, or approvals by persons other than CONTRACTOR shall relieve CONTRACTOR from his obligations to perform the work in accordance with the requirements of the Contract Documents.

**Access to Work**

**13.5** ENGINEER and his representatives and other representatives of OWNER will at reasonable times have access to the work. CONTRACTOR shall provide proper and safe facilities for such access and observation of the work and also for any inspection or testing thereof by others.

**Uncovering Work**

**13.6.** If any work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for his observation and replaced at CONTRACTOR's expense.

**13.7.** If any work has been covered which ENGINEER has not specifically requested to observe prior to its being covered, or if ENGINEER considered it necessary or advisable that covered work be inspected or tested by others, CONTRACTOR at ENGINEER's request shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the work in question, furnishing all necessary labor, material, and equipment. If it is found that such work is defective, CONTRACTOR shall bear all the expenses of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate deductive Change Order shall be issued. If, however, such work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction if he makes a claim therefor as provided in Articles 11 and 12.

**OWNER May Stop the Work**

**13.8.** If the work is defective, or CONTRACTOR fails to supply sufficient skilled workmen or suitable materials or equipment, or if CONTRACTOR fails to make prompt payments to Subcontractors or for labor, materials, or equipment, OWNER may order CONTRACTOR to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party.

**Correction or Removal of Defective Work**

**13.9.** If required by ENGINEER prior to approval of final payment, CONTRACTOR shall promptly, without cost to OWNER and as specified by ENGINEER, either correct any defective work, whether or not fabricated, installed or completed, or, if the work has been rejected by ENGINEER, remove it from the site and replace it with nondefective work. If CONTRACTOR does not correct such defective work or remove and replace such rejected work within a reasonable time, all as specified in a written notice from ENGINEER, OWNER may have the deficiency corrected or the rejected work removed and replaced. All direct and indirect costs of such correction or removal and replacement, including compensation for additional professional services, shall be paid by CONTRACTOR, and an appropriate deductive Change Order shall be issued. CONTRACTOR shall also bear the expenses of making good all work of others destroyed or damaged by his correction, removal or replacement of his defective work.

**One-Year Correction Period**

**13.10.** If, after the approval of final payment and prior to the expiration of one year after the date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions, either correct such defective work, or, if it has been rejected by OWNER, remove it from the site and replace it with nondefective work. If CONTRACTOR does not promptly comply with the terms of such instructions, OWNER may have the defective work corrected or the rejected work removed and replaced, and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, shall be paid by CONTRACTOR.

### Acceptance of Defective Work

**13.11.** If, instead of requiring correction or removal and replacement of defective work, OWNER (and, prior to approval and final payment, also ENGINEER) prefers to accept it, he may do so. In such case, if acceptance occurs prior to approval of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including appropriate reduction in the Contract Price; or, if the acceptance occurs after approval of final payment, an appropriate amount shall be paid by CONTRACTOR to OWNER.

### Neglected Work by CONTRACTOR

**13.12.** If CONTRACTOR should fail to prosecute the work in accordance with the Contract Documents, including any requirements of the progress schedule, OWNER, after seven days written notice to CONTRACTOR may, without prejudice to any other remedy he may have, make good such deficiencies and the cost thereof (including compensation for additional professional services) shall be charged against CONTRACTOR if ENGINEER approves such action, in which case a Change Order shall be issued incorporating the necessary revisions in the Contract Documents including an appropriate reduction in the Contract Price. If the payments then or thereafter due CONTRACTOR are not sufficient to cover such amount, CONTRACTOR shall pay the difference to OWNER.

## ARTICLE 14 - PAYMENTS AND COMPLETION

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### Schedules

**14.1.** At least ten days prior to submitting the first application for a progress payment, CONTRACTOR shall submit a progress schedule, a final schedule of Shop Drawing submissions and a schedule of values of the work. These schedules shall be satisfactory in form and substance to ENGINEER. The schedule of values shall include quantities and unit prices aggregating the Contract Price, and shall subdivide the work into component parts in sufficient detail to serve as the basis for progress payments during construction. Upon approval of the schedules of values by ENGINEER, it shall be incorporated into the form of Application for Payment furnished by ENGINEER.

### Application for Progress Payment

**14.2.** At least ten days before each progress payment falls due (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the work completed as of the date of the application and accompanied by such data and schedules as ENGINEER may reasonably require. If payment is requested on the basis of material and equipment not incorporated in the work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by such data, satisfactory to OWNER, as will establish OWNER's title to the material and equipment and protect his interest therein, including applicable insurance. Each subsequent Application for Payment shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the work have been applied to discharge in full all of CONTRACTOR's obligations reflected in prior Applications for Payment. Except where greater retention is necessary pursuant to definite circumstances specifically provided for in the construction contract, the following schedule of retained amounts from progress payments shall be followed:

- (a) Not more than 10% of the dollar value of all work in place until work is 50% in place.

- (b) After the work is 50% in place, additional retainage shall not be withheld unless the OWNER determines that the CONTRACTOR is not making satisfactory progress, or for other specific cause relating to the CONTRACTOR's performance under the Contract. If the OWNER so determines, the OWNER may retain not more than 10% of the dollar value of work more than 50% in place.
- (c) The retained funds shall not exceed the pro rata share of the OWNER's matching requirement under the construction contract and shall not be co-mingled with other funds of the OWNER and shall be deposited in an interest bearing account in a regulated financial institution in this state wherein all such retained funds are kept by the OWNER which shall account for both retainage and interest on each construction contract separately. An OWNER is not required to deposit retained funds in an interest bearing account if the retained funds are to be provided under a state or federal grant and the retained funds have not been paid to the OWNER.
- (d) Except as provided in 14.2.6 and 14.2.7, retainage and interest earned on retainage shall be released to the CONTRACTOR together with the final progress payment.
- (e) At any time after 94% of work under the Contract is in place and at the request of the original CONTRACTOR, the OWNER shall release the retainage plus interest to the original CONTRACTOR only if the original CONTRACTOR provides to the OWNER an irrevocable letter of credit in the amount of the retainage plus interest, issued by a bank authorized to do business in this state, containing terms mutually acceptable to the CONTRACTOR and the OWNER.

**14.2.1.** If a dispute regarding a matter described in 14.2.2. arises, the CONTRACTOR and the OWNER shall designate an agent who has background, training, and experience in the construction of facilities similar to that which is the subject of the Contract, as follows:

- (a) in an agreement reached within 10 days after a dispute arises;
- (b) if an agreement cannot be reached within 10 days after a dispute arises, the OWNER shall designate an agent who has background, training, and experience in the construction of facilities similar to that which is the subject of the Contract and who is not an employee of the OWNER.

**14.2.2.** The OWNER may request dispute resolution by the agent regarding the following:

- (a) at any time during the term of the Contract, to determine whether there has been a delay for reasons that were within the control of the CONTRACTOR, and the period of time that delay has been caused, continued, or aggravated by actions of the CONTRACTOR.
- (b) at any time after 94% of work under the Contract is in place, whether there has been an unacceptable delay by the CONTRACTOR in performance of the remaining 6% of work under the Contract. The agent shall consider the terms of the Contract and the procedures normally followed in the industry and shall determine whether the delay was for failure to follow reasonable and prudent practices in the industry for completion of the project.

**14.2.3.** This dispute resolution process shall be used only for the purpose of determining the rights of the parties to retained funds and interest earned on retained funds and is not intended to alter, abrogate, or limit any rights with respect to remedies that are available to enforce or compel performance of the terms of the Contract by either party.

**14.2.4.** The agent may request and shall receive all pertinent information from the parties and shall provide an opportunity for an informal meeting to receive comments, documents, and other relevant information in order to resolve the dispute. The agent shall determine the time, place, and procedure for the informal meeting. A written decision and reasons for the decision shall be given to the parties within 14 days after the meeting.

**14.2.5.**The decision of the agent shall be final and binding upon all parties. Upon application of either party, the decision of the agent may be vacated by order of the circuit court only upon a finding by the court that the decision was procured by fraud, duress, or other illegal means.

**14.2.6.**If the dispute resolution results in a decision:

- (a) that there has been a delay as described in 14.2.2.(a), all interest earned on retained funds during the period of delay shall become the property of the OWNER;
- (b) that there has been unacceptable delay as described in 14.2.2.(b), the OWNER may contract with a subsequent contractor to complete the remaining 6% of the work under the Contract, and interest earned on retained funds shall become the property of the OWNER. A subsequent CONTRACTOR under this subdivision shall be paid by the OWNER from the following sources until each source is depleted, in the order listed below:
  - (1) the dollar value of the original Contract, less the dollar value of funds already paid to the original CONTRACTOR and the dollar value of work in place for which the original CONTRACTOR has not received payment;
  - (2) Retainage from the original CONTRACTOR, or funds made available under a letter of credit provided under 14.1.(e);
  - (3) interest earned on retainage from the original CONTRACTOR, of funds made available under a letter of credit provided under 14.1.(e).

**14.2.7.**If the OWNER contracts with a subsequent CONTRACTOR as provided in 14.2.6.(b), the final progress payment shall be payable to the original CONTRACTOR within the time period specified in 14.4.1. The amount of the final progress payment to the original CONTRACTOR shall not include interest earned on retained funds. The OWNER may deduct from the final progress payment all expenses of contracting with the subsequent CONTRACTOR. This act shall not impair the right of the OWNER to bring an action or to otherwise enforce a performance bond to complete work under a construction contract.

### **CONTRACTOR's Warranty of Title**

**14.3.** CONTRACTOR warrants and guarantees that title to all work, material and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereafter in these General Conditions referred to as "Liens").

### **Approval of Payments**

**14.4.** ENGINEER will, within ten days after receipt of each Application for Payment, either indicate in writing his approval of payment and present the application to OWNER, or return the application to CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the application. OWNER shall, after presentation to him of an approved Application for Payment, pay CONTRACTOR the amount approved by ENGINEER as provided under 14.4.1.

**14.4.1.**Each progress payment requested, including reasonable interest if requested under 14.4.2. shall be paid within thirty (30) days after receipt by the OWNER of the Application for Payment.

**14.4.2.** Upon failure of the OWNER to make a timely progress payment pursuant to this section, the person designated to submit requests for progress payments may include reasonable interest on amounts past due in the next request for payment.

**14.5.** ENGINEER's approval of any payment requested in an Application for Payment will constitute a representation by him to OWNER, based on ENGINEER's on-site observations of the work in progress as an experienced and qualified design professional and on his review of the Application for Payment and the accompanying data and schedules that the work has progressed to the point indicated; that, to the best of his knowledge, information and belief, the quality of the work is in accordance with the Contract Documents (subject to an evaluation of the work as a functioning Project upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents and any qualifications stated in his approval); and that CONTRACTOR is entitled to payment of the amount approved. However, by approving any such payment ENGINEER will not thereby be deemed to have represented that he made exhaustive or continuous on-site inspections to check the quality or the quantity of the work, or that he has reviewed the means, methods, techniques, sequences, and procedures of construction, or that he has made any examination to ascertain how or for what purpose CONTRACTOR has used the monies paid or to be paid to him on account of the Contract Price, or that title to any work, materials, or equipment has passed to OWNER free and clear of any liens.

**14.6.** ENGINEER's approval of final payment will constitute an additional representation by him to OWNER that the conditions precedent to CONTRACTOR's being entitled to final payment as set forth in Paragraph 14.13 have been fulfilled.

**14.7.** ENGINEER may refuse to approve the whole or any part of any payment if, in his opinion, it would be incorrect to make such representations to OWNER. He may also refuse to approve any such payment, or, because of subsequently discovered evidence of the results of subsequent inspections or tests, nullify any such payment previously approved, to such extent as may be necessary in his opinion to protect OWNER from loss because:

- (a) The work is defective, or completed work has been damaged requiring correction or replacement;
- (b) Claims or liens have been filed or there is reasonable cause to believe such may be filed;
- (c) The Contract Price has been reduced because of Modifications;
- (d) OWNER has been required to correct defective work or complete the work in accordance with Paragraph 13.11; or
- (e) Of unsatisfactory prosecution of the work, including failure to furnish acceptable submittals or to clean up.

**Substantial Completion**

**14.8.** Prior to final payment, CONTRACTOR may, in writing to OWNER and ENGINEER, certify that the entire Project is substantially complete and request that ENGINEER issue a Certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, CONTRACTOR and ENGINEER shall make an inspection of the Project to determine the status of completion. If ENGINEER does not consider the Project substantially complete, he will notify CONTRACTOR in writing giving his reasons therefor. If ENGINEER considers the Project substantially complete, he will prepare and deliver to OWNER a tentative Certificate of Substantial Completion which shall fix the date of Substantial Completion and the responsibilities between OWNER and CONTRACTOR for maintenance, heat, and utilities. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment, and the certificate shall fix the time within which such items shall be completed or corrected, said time to be within the Contract Time. OWNER shall have seven days after receipt of the tentative certificate during which he may make written objection to

ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Project is not substantially complete, he will within fourteen days after submission of the tentative certificate to OWNER notify CONTRACTOR consideration of OWNER's objections, ENGINEER considers the Project substantially complete, he will within said fourteen days execute and deliver to OWNER and CONTRACTOR a definitive Certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as he believes justified after consideration of any objections from OWNER.

**14.9.** OWNER shall have the right to exclude CONTRACTOR from the Project after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

### **Partial Utilization**

**14.10.** Prior to final payment, OWNER may request CONTRACTOR in writing to permit him to use a specified part of the Project which he believes he may use without significant interference with construction of the other parts of the Project. If CONTRACTOR agrees, he will certify to OWNER and ENGINEER that said part of the Project is substantially complete and request ENGINEER to issue a Certificate of Substantial Completion for that part of the Project which is substantially complete. Within a reasonable time thereafter OWNER, CONTRACTOR and ENGINEER shall make an inspection of that Part of the Project to determine its status of completion. If ENGINEER does not consider that it is substantially complete, he will notify OWNER and CONTRACTOR in writing giving his reasons therefor. If ENGINEER considers that part of the Project to be substantially complete, he will execute and deliver to OWNER and CONTRACTOR a certificate to that effect, fixing the date of Substantial Completion as to that part of the Project, attaching thereto a tentative list of items to be completed or corrected before final payment and fixing the responsibility between OWNER and CONTRACTOR for maintenance, heat and utilities as to that part of the Project. OWNER shall have the right to exclude CONTRACTOR from any part of the Project which ENGINEER has so certified to be substantially complete, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

### **Final Inspection**

**14.11.** Upon written notice from CONTRACTOR that the Project is complete, ENGINEER will make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies.

### **Final Application for Payment**

**14.12.** After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, and other documents -- all as required by the Contract Documents -- he may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by such data and schedules as ENGINEER may reasonably require, together with complete and legally effective releases or waivers (satisfactory to OWNER) of all liens arising out of the Contract Documents and the labor and services performed and the materials and equipment furnished thereunder. In lieu thereof and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material, and equipment for which a lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the work for which OWNER or his property might in anyway be responsible, have been paid or otherwise satisfied; and consent of the Surety, if any, to final payment. If any Subcontractor, materialman, fabricator, or



supplier fails to furnish a release or receipt in full, CONTRACTOR may furnish a bond or other collateral satisfactory to OWNER to indemnify him against any lien.

**Approval of Final Payment**

**14.13.** If, on the basis of his observation and review of the work during construction, his final inspection and his review of the final Application for Payment -- all as required by the Contract Documents -- ENGINEER is satisfied that the work has been completed and CONTRACTOR has fulfilled all of his obligations under the Contract Documents, he will, within ten days after receipt of the final Application for Payment, indicate in writing his approval of payment and present the application to OWNER for payment. Thereupon ENGINEER will give written notice to OWNER and CONTRACTOR that the work is acceptable subject to the provisions of Paragraph 14.16. Otherwise, he will return the application to CONTRACTOR, indicating in writing his reasons for refusing to approve final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the application. OWNER shall within ten days of presentation to him of an approved final Application for Payment, pay CONTRACTOR the amount approved by ENGINEER.

**14.14.** If after Substantial Completion of the work, final completion thereof is materially delayed through no fault of CONTRACTOR, and ENGINEER so confirms, OWNER shall upon certification by ENGINEER and without terminating the Agreement make payment of the balance due for that portion of the work fully completed and accepted. If the remaining balance for work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.1, the written consent of the Surety to the payment of the balance due for that portion of the work fully completed and accepted shall be submitted by the CONTRACTOR to the ENGINEER prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment except that it shall not constitute a waiver of claims.

**CONTRACTOR's Continuing Obligation**

**14.15.** CONTRACTOR's obligation to perform the work and complete the Project in accordance with the Contract Documents shall be absolute. Neither approval of any progress or final payment by ENGINEER, nor the issuance of a Certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Project or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor any correction of defective work by OWNER shall constitute an acceptance of work not in accordance with the Contract Documents.

**Waiver of Claims**

**14.16.** The making and acceptance of final payment shall constitute:

- (a) A waiver of all claims by OWNER against CONTRACTOR other than those arising from unsettled liens, from defective work appearing after final inspection pursuant to Paragraph 14.11, or from failure to comply with the requirements of the Contract Documents or the terms of any special guarantees specified therein; and
- (b) A waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

**ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION**

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**OWNER May Suspend Work**

**15.1.** OWNER may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and ENGINEER which shall fix the date on which work shall be resumed. CONTRACTOR shall resume the work on the date so fixed. CONTRACTOR will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if he makes a claim therefor as provided in Articles 11 and 12.

**OWNER May Terminate**

**15.2.** If CONTRACTOR is adjudged bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or similar laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable material or equipment, or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction, or if he disregards the authority of ENGINEER, or if he otherwise violates any provision of the Contract Documents, then OWNER may, without prejudice to any other right or remedy and after giving CONTRACTOR and his Surety seven days' written notice, terminate the services of CONTRACTOR and take possession of the Project and of all materials, equipment, tools, construction equipment and machinery thereon owned by CONTRACTOR, and finish the work by whatever method he may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project, including compensation for additional professional services, such excess shall be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER shall be determined by ENGINEER and incorporated in a Change Order.

**15.3.** Where CONTRACTOR's services have been so terminated by OWNER, said terminations shall not affect any rights of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by OWNER due CONTRACTOR will not release CONTRACTOR from liability.

**15.4.** Upon seven days' written notice to CONTRACTOR and ENGINEER, OWNER may without cause and without prejudice to any other right or remedy elect to abandon the Project and terminate the Agreement. In such case, CONTRACTOR shall be paid for all work executed and any expense sustained plus a reasonable profit.

**CONTRACTOR May Stop Work or Terminate**

**15.5.** If, through no act or fault of CONTRACTOR, the work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within thirty days after it is submitted, or OWNER fails to pay CONTRACTOR any sum approved by ENGINEER within thirty days of its approval and presentation, then CONTRACTOR may, upon seven days' written notice to OWNER and ENGINEER, terminate the Agreement and recover from OWNER payment for all work executed and any expense sustained plus a reasonable profit. In addition and in lieu of terminating the Agreement, if ENGINEER has failed to act on an Application for Payment or OWNER has failed to make any payment as aforesaid, CONTRACTOR may upon seven days' notice to OWNER and ENGINEER stop the work until he has been paid all amounts then due.

**ARTICLE 16 - OFFICE SPACE**

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**16.1.** The CONTRACTOR shall establish and maintain, at his own expense, office headquarters at the site of the Project. Telephone and fax service shall be provided. At the office headquarters shall be kept a complete set of the Contract Documents and Shop Drawings.

**16.2.** The CONTRACTOR shall arrange office space for the ENGINEER in a separate building or in a room completely partitioned off from the CONTRACTOR's office, if in the same building. The CONTRACTOR shall provide adequate heating and lighting telephone and fax service within the ENGINEER's office.

**ARTICLE 17 - MISCELLANEOUS**

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**Giving Notice**

**17.1.** Whenever any provision of the Contract Documents requires the giving of written notice it shall be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to him who gives the notice.

**Computation of Time**

**17.2.** When any period of time is referred to in the Contract Documents by days, it shall be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day shall be omitted from the computation.

**General**

**17.3.** All monies not paid when due hereunder shall bear interest at the maximum rate allowed by law at the place of the Project.

**17.4.** All Specifications, Drawings and copies thereof furnished by ENGINEER shall remain his property. They shall not be used on another Project, and, with the exception of those sets which have been signed in connection with the execution of the Agreement, shall be returned to him on request upon completion of the Project.

**17.5.** The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR by Paragraphs 6.30, 13.1, 13.10, and 14.3 and the rights and remedies available to OWNER and ENGINEER thereunder, shall be in addition to and shall not be construed in any way as a limitation of any rights and remedies available to them which are otherwise imposed or available by law, by special guarantee, or by other Provisions of the Contract Documents.

**17.6.** Should OWNER or CONTRACTOR suffer injury or damage to his person or property because of any error, omission, or act of the other or of any of his employees or agents or others for whose acts he is legally liable, claim shall be made in writing to the other party within a reasonable time of the first observance of such injury or damage.

**17.7.** The Contract Documents shall be governed by the law of the place of the Project.

END OF SECTION

02/27/04

**PART II**  
**DETAILED SPECIFICATIONS**

**1.00 GENERAL****1.01 DESCRIPTION OF WORK**

- A. Work under this Contract consists of the replacement of existing residential and commercial revenue water meters within the City of Marshall.

**1.02 WORK SCHEDULE**

- A. The CONTRACTOR shall provide a work schedule. The schedule shall be complete and shall show in detail the manner in which he proposes to complete the work under this Contract and approximately monthly billing of the Contract. The purpose of the schedule is to assist the OWNER in notifying the public of inconveniences and to anticipate cash-flow on the job, and to determine if the CONTRACTOR is reasonably proceeding with the work to assure completion within the specified time.

**1.03 NOTIFICATION OF PUBLIC**

- A. The CONTRACTOR shall work with OWNER to notify the public of the replacement of water and electric meters.
- B. Door hangers to private residences will be required. These door hangers will be hung by CONTRACTOR 72 hours before any work is to be performed.
- C. Letters two (2) weeks in advance shall be required to be sent to all commercial and/or industrial facilities. These letters will be sent by CONTRACTOR. One (1) week before the actual work the CONTRACTOR will visit the facilities in person to coordinate work.
- D. In addition to these notifications the OWNER will make formal public announcements.

**1.04 MAINTAINING EXISTING SERVICE**

- A. The CONTRACTOR shall schedule and arrange the work so that the interruptions to the facility are coordinated and kept to a minimum.

**1.05 CONSTRUCTION PERMITS**

- A. CONTRACTOR is responsible for application and associated costs for all necessary permits. Coordinate with ENGINEER prior to permit applications.

**1.06 PROJECT PROGRESS MEETING**

- A. It shall be the responsibility of the CONTRACTOR to have a representative present at each meeting. The meetings shall be held at least once a month as directed by the ENGINEER.

**1.07 METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

A. General

1. The method of measurement and the basis of payment for each item in the Proposal will be as specified in the schedule attached. The items are generally grouped by the section of the Specifications under which the particular unit of work is detailed. There will be no payment allowed for any unit of work not specifically mentioned in the Proposal as a bid item, and any such unit of work not mentioned in the Proposal, but necessary for the completion of the Project, will be considered as incidental to the construction of the Project.

**B. Measurement**

1. Quantities of work completed under the Contract will be measured by the ENGINEER according to the United States standard measures. When tons are specified, the unit shall be the ton of 2000 pounds. When measurements are stated in miles, stations, acres, they will be horizontal measurements unless specified otherwise. Where measurements are specified to be "in place," they will be taken along the actual surface of the completed item to obtain lineal, area, or volume measurements.

**C. Payment**

1. In each and every instance in the schedule attached, where a Basis of Payment is specified, it shall be understood to be prefaced by the following statement, "The Contract Unit Price bid in the Proposal will be payment in full for all labor, materials, and equipment necessary to do the following according to the Plans and Specifications." Payment shall be made on the basis of the actual quantity of the item completed and accepted at the unit price for such item named in the Proposal.

END OF SECTION

**1.00 GENERAL****1.01 DESCRIPTION**

- A. The CONTRACTOR shall provide all labor, materials, tools and equipment necessary for the preparation and completion of the project.

**1.02 PROTECTION OF AMENITIES**

- A. Protection and Restoration of Property: The CONTRACTOR shall restore at his own expense, any public or private property damaged or injured in consequence of any act or omission on his part or on the part of his employees or agents, to a condition equal or better than that existing before such injury or damage was done. If the CONTRACTOR neglects to restore or make good such damage or injury, the OWNER may upon 48 hours notice proceed to restore or make good such damage or injury and to order the cost thereof deducted from any monies that are due or may become due the CONTRACTOR for his work.

**1.03 WORK AREA AND STORAGE OF MATERIALS**

- A. The working area shall be organized in an orderly manner with storage and tool sheds, offices and sanitary facilities, parking areas for employees, and all other necessary facilities developed and maintained by the CONTRACTOR. The CONTRACTOR shall keep the site and all haul roads reasonably clean and dust free.
- B. Cleanliness of the Work: The CONTRACTOR shall at all times keep the street or highway and any public or private premises temporarily occupied by him for purposes of work under this Contract free from accumulations of waste material or rubbish caused by his employees or work. This requirement shall also apply to any areas in the vicinity of the work which are affected by the CONTRACTOR's construction or hauling operations.
- C. The CONTRACTOR shall periodically or as directed during the progress of work, remove and legally dispose of all surplus excavated material and debris and keep the project area and public rights-of-way reasonably clear. Upon completion of the work, he shall remove all temporary construction facilities, debris and unused materials provided for the work and put the whole site of the work and public rights-of-way in a neat and clean condition. Trash burning on the site of the work by open fire method will not be allowed.
- D. Trucks hauling recycled materials (meters) or other loose materials from or to the site, shall be tight so that no spillage will occur on adjacent streets. Before trucks start away from the site, their loads shall be carefully trimmed, by hand, if necessary.
- E. All materials, supplies and equipment, whether furnished by the CONTRACTOR or by the OWNER, shall be delivered, stored and handled as to prevent the inclusion of foreign materials and/or damage by water, freezing, breakage or other causes. The ENGINEER may require the CONTRACTOR to provide an enclosed storage shed for the storage of the above-mentioned materials, supplies and equipment. Packaged materials shall be delivered in the original unopened containers and shall be stored until ready for use. All materials which have been stored shall meet the requirements of the Specifications at the time they are used in the project.
- F. The CONTRACTOR shall begin work and operate at such points as the ENGINEER may deem necessary and shall thereafter prosecute the work in such order as may be prescribed by the ENGINEER.

- G. In case of a dispute arising between two or more CONTRACTORS or others as to the respective rights of each under these specifications, the ENGINEER shall determine the matters at issue and shall define the respective rights of the various interests involved in order to secure the completion of all parts of the work in general harmony and with satisfactory results, and his decision shall be final and binding on all parties concerned and shall not in any way be cause for claim for extra compensation by any of the parties.
- H. Where the CONTRACTOR is required to do work within the rights-of-way under the jurisdiction of governmental bodies, he shall meet the requirements of said governmental bodies for the work and storage within their jurisdiction. Such requirements must be met as a minimum requirement, and if the specifications given herein impose further limitations on the work, they shall also be met as the required work standard.
- I. The CONTRACTOR shall at all times be aware of inconveniences caused to the property OWNERS and general public. Where undue inconveniences are not remedied by the CONTRACTOR, the OWNER, upon four hours notice, reserves the right to perform the necessary work and to deduct the cost thereof from the money due the CONTRACTOR.
- J. When it is apparent that construction operations may endanger the foundations of any facilities, utility conduit, or the support of any structure, the CONTRACTOR shall notify the utility OWNER of this possibility and he shall take steps as may be required to provide temporary bracing or support of conduit or structures.

**1.04 EXISTING PUBLIC UTILITIES**

- A. The CONTRACTOR shall conduct his operations so as not to damage any existing utilities regardless of the location. The CONTRACTOR shall correct, at his own expense, any injury caused during his operations or the operations of his subcontractors or suppliers.
- B. If the CONTRACTOR desires, or is required by the utility companies, to relocate any power or telephone poles to facilitate his work, any expense encountered from such relocation shall be borne by the CONTRACTOR.
- C. The CONTRACTOR shall pay the cost of all fees for permits, insurance, inspectors, and flagmen required and furnished by the railroad company during the construction operations.
- D. In all cases where permits or inspection fees are required by utilities in connection with changes to or temporary support of their conduits, the CONTRACTOR shall secure such permits and pay all inspection fees.
- E. Where it is the policy of any utility OWNER to make his own repairs to damaged conduit and/or piping or other structures, the CONTRACTOR shall cooperate to the fullest extent with the utility and he shall see that his operations interfere as little as possible with those operations. The CONTRACTOR shall pay any charges for these repairs.
- F. Individual gas, water, and sanitary sewer services to residential and commercial buildings may be encountered in the course of replacement of the meters. It shall be the CONTRACTOR's responsibility to repair any such service damaged due to his operation and to bear all costs.

**1.05 NOTIFICATION TO UTILITIES**

- A. MISS DIG - The Detroit Edison Co., Consumers Energy Co., Michigan Consolidated Gas Co., AT&T, WOW and City of Marshall Utilities are members of a utility communication system called "MISS DIG" that provides service to participating utilities. The CONTRACTORS shall contact



"MISS DIG" not less than 72 hours before starting construction for assistance in locating utilities or for any work to be done on utilities. The toll-free phone number 800-482-7171.

**1.06 UTILITIES**

- A. The CONTRACTOR shall make all necessary arrangements for the provisions of all utility services, temporary or permanent, required under this Contract. The CONTRACTOR shall pay all costs for such connections and services.
- B. All utility services shall be inspected by and shall meet the requirements of the applicable codes and governmental bodies.

**1.07 WINTER CONSTRUCTION**

- A. The ENGINEER shall have permissive authority over the work which is proposed to be done during the winter months. The CONTRACTOR shall provide adequate weather protection, temporary heating and take any other measures which are necessary to ensure that the work performed during the winter months is properly installed and protected against damage from freezing at his own expenses.

**2.00 PRODUCTS**

Not Applicable

**3.00 EXECUTION**

**3.01 SUNDAY AND NIGHT WORK**

- A. The CONTRACTOR is required to prosecute work done under this Contract during the hours of daylight. There shall be no work done on Sunday without the written permission of the City of Marshall Water Superintendent. No work will be permitted before 7:30 a.m. or after 7:00 p.m., Monday thru Friday or before 9:00 a.m. or after 7:00 p.m. on Saturday without the written permission of the City of Marshall Water Superintendent.

**3.02 FLOODING AND PROTECTION OF WORK**

- A. The CONTRACTOR shall protect his work from flooding and be responsible for repair of any work damaged by flooding including dewatering necessary to continue work. Time extensions due to flooding down time shall be in accordance with the General Conditions.

**3.03 BURNING OF WASTE MATERIAL**

- A. Burning of any shrubs, tree, wreckage, rubbing or other waste material by the open fire method will not be allowed at the construction site. All rubbish and waste material shall be removed from the construction site by the CONTRACTOR and he shall provide his own dump site.

END OF SECTION



**1.00 GENERAL**

**1.01 DESCRIPTION**

- A. Furnish all labor, materials, tools, and equipment necessary to install, repair and replace the items specified herein. This work shall include removal of such items include the revenue meters.

**2.00 PRODUCTS**

Not Applicable

**3.00 EXECUTION**

**3.02 METER DISPOSAL**

- A. The CONTRACTOR shall properly return all removed meters to the OWNER. Documentation showing that the meters have been properly returned shall be provided to the OWNER and ENGINEER.

END OF SECTION



**1.00 GENERAL****1.01 DESCRIPTION**

- A. This Section specifies the general interrelationship of mechanical work with the general work provisions and specifies certain mechanical requirements which are common to general work containing mechanical components.

**1.02 RELATED DOCUMENTS**

- A. General and Supplementary Conditions and requirements of Division 1 apply to Work of this Section.
- B. The provisions of this section shall apply to other work specified in this Division 15 - Mechanical.

**1.03 INTENT**

- A. The intent of this division is to call for finished work, tested and ready for operation.
- B. Furnish all materials, supplies, equipment, tools, transportation and facilities, and perform all labor and services necessary for the complete installation of the mechanical systems as shown as specified, and as required to make complete and operating systems.
- C. The work shall also include the completion of such details of mechanical work not mentioned or specifically shown, but which are necessary for the successful operation of all mechanical systems.

**1.04 CODES**

- A. Where Standards or Codes are mentioned, the latest edition or revision in force shall be followed.
- B. The Contract Documents shall take precedence when they are more stringent than codes, ordinances, standards, and statutes. Codes, ordinances, standards and statutes shall take precedence when they are more stringent or conflict with the Drawings and Specifications.
- C. Should any change be required to conform to the codes, ordinances and rules, the CONTRACTOR shall notify the ENGINEER and shall include the costs involved in his work. CONTRACTOR shall be held to complete all work necessary to meet these local code requirements without additional compensation after award of the Contract.

**1.05 PERMITS AND INSPECTIONS**

- A. Secure and pay for all permits, inspections, certificates, licenses, tests and fees required for the work to be performed.
- B. Upon completion of the work, furnish Inspection Certificates as normally issued in connection with the work.

**1.06 SUBMITTALS**

- A. Shop Drawings:
  - 1. Prior to delivery of any material to the job site, the CONTRACTOR shall submit seven (7) copies of Shop Drawings for review by the ENGINEER.

2. Shop Drawings shall be complete and concise. Partial Shop Drawings shall be returned unreviewed. Manufacturer, model, capacities and all related accessories shall be clearly marked.
  3. Provide certified performance curves for each pump, fan and major piece of equipment, including design points, efficiency and sound levels.
- B. Substitutions:
1. No approval for substitutions of equipment, materials or processes other than those manufacturers specified herein and other Division 15 sections will be considered. THERE WILL BE NO EXCEPTIONS.
- C. Operating and Maintenance Instructions:
1. Upon completion of all work and tests, instruct the OWNER in the operation and maintenance of all components.
  2. O & M's shall include the following:
    - a. Submit operating and maintenance instructions covering all units of mechanical equipment herein specified, shall be submitted to ENGINEER for approval, together with parts list. All literature shall be furnished in triplicate for the OWNER and shall be suitably bound in book form and provided in a PDF format on a USB flash-drive.
    - b. The operating and maintenance instructions shall have a brief, general description for all mechanical systems and shall include:
      - 1) Routine maintenance procedures.
      - 2) Lubrication chart listing all types of oil to be used for each piece of equipment and the recommended frequency of lubrication. This chart shall be located where directed by the OWNER.
      - 3) Trouble-shooting procedures.
      - 4) CONTRACTOR's telephone numbers for warranty repair service
      - 5) Shop Drawings.
      - 6) Recommended spare parts list.
      - 7) Names and telephone numbers of major material suppliers and subcontractors.

**1.07 CONTRACTOR RESPONSIBILITY**

- A. Each CONTRACTOR shall be responsible for the safety and good condition of all work and materials in his Contract until its completion.
- B. Assume entire responsibility for all the materials, workmanship and satisfactory performance of the systems installed. It is not intended to limit or restrict the CONTRACTOR to the use of materials and manner of shop fabrication or erection that is not in accord with his best standard practice.

- C. It is also not intended that this Specification indicate or specify each item or material which is required to complete a satisfactory installation. Where such items are required, and they are considered to be the accepted trade practice to provide same, they shall be considered to be both specified and indicated.
  
- D. The design and construction of all equipment and materials specified herein shall conform in all details with the latest revised codes:
  - 1. Michigan State Fire Marshall, "Fire Damper Clarification."
  - 2. Michigan Construction Code Michigan Department of Labor.
  - 3. NFPA 101, "Safety to Life from Fire in Buildings and Structures."
  - 4. NFPA 90A, Installation of Air Conditioning and Ventilating Systems.
  - 5. SMACNA HVAC Duct Construction Standards - Metal and Flexible.
  - 6. Factory Mutual Loss Prevention Data Sheets.
  - 7. NFPA 13" Installation of Sprinkler Systems.
  - 8. ASTM American Society for Testing and Materials.
  - 9. AABC National Standards for Total System Balance.
  - 10. ACGIH Industrial Ventilation.
  - 11. ASHRAE Handbook - Fundamentals, Equipment, HVAC Systems and Applications, Refrigeration.
  - 12. SMACNA - HVAC Testing, Adjusting and Balancing.
  - 13. NEBB - Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems.
  - 14. ASHRAE Standard 62-1999, Ventilation for Acceptable Indoor Air Quality.
  - 15. AMCA - Standards, Definitions, Terms and Test Codes for Louvers, Dampers and Shutters.
  - 16. NFPA 14 - Standpipe and Hose Systems.
  - 17. Michigan Occupational Safety and Health Act.
  - 18. Michigan Department of Consumer and Industry Services - 1998 Edition.
  - 19. Centers for Disease Control (CDC) Ventilation Guidelines.
  - 20. N.F.P.A. 99, Standard for Health Care Facilities - 1999 Edition.
  - 21. The State of Michigan Basic Building Code.
  - 22. ANSI/ASHRAE/IES 90A and 100.5 Energy Standards.
  - 23. The State of Michigan Mechanical and Plumbing Code.

**1.08 DELIVERY, STORAGE AND HANDLING**

- A. Protect all materials and equipment during delivery and during storage on site. Store materials and equipment on suitable blocking to maintain parts clear of the ground and to insure drainage of all rainwater.

**1.09 COORDINATION AND COOPERATION**

- A. Submit to and obtain from trades concerned, copies of Shop Drawings and catalog data of work which connects with or affects his work.
  
- B. Make arrangements with other trades as required to properly correlate installation into the overall project. When other trades are required to assist in the installation of Division 15 equipment, the CONTRACTOR shall include all costs for completing the work.
  
- C. Each CONTRACTOR shall be responsible for establishing his elevations and routing of piping and to correlate the work with other trades.
  
- D. Coordinate location and arrangement of equipment, piping, etc. In case of interferences between various items, or if simplified construction procedures are possible by relocation or changes in arrangement, change may be made if approved by ENGINEER in writing.

**1.10 WARRANTY**

- A. Warranty all labor, materials, and workmanship for a period of one (1) year from date of final acceptance or what is specified in specification section 15.07, whichever is greater.
- B. Alterations, repairs, or replacement in defects of materials, equipment, and labor shall be borne by the CONTRACTOR at his expense.

**1.11 MAINTENANCE AND SERVICE ACCESSIBILITY**

- A. Install equipment and piping to permit service and maintenance to all parts of the systems installed.
- B. Provide hinged access doors not less than 18" x 18" to access all maintainable equipment located behind walls.

**2.00 PRODUCTS**

**2.01 GENERAL**

- A. Reference applicable technical sections in this Division for specific systems.

**2.02 MATERIALS, EQUIPMENT AND WORKMANSHIP**

- A. All materials shall be new and shall be prepared, fabricated and installed with skill and workmanship as is commonly considered to be the best in the trade involved. Work shall be performed at such times as will be best for the proper conduct of the entire project.
- B. The ENGINEER shall notify the CONTRACTOR of rejected or faulty work upon discovery, but this failure to detect omissions or violations of the Contract will not act as a waiver of the right to demand correction of defects in materials or workmanship.
- C. Materials and equipment are specified by manufacturer or trade name and catalog or model number. Products of other manufacturers other than listed WILL NOT BE ALLOWED.
- D. If the CONTRACTOR provides equipment or materials other than that upon which the design is based, it shall be his responsibility to pay for any changes caused to other trades as a result of the substitution and replace the equipment with that specified and designed at no cost to the OWNER.

**2.03 EQUIPMENT SUPPORTS**

- A. Provide the supports and hangers for equipment installed under this work. Where equipment is to be suspended from the roof steel, provide intermediate support members such that the load is carried at the panel joints of the joints or trusses.

**2.04 COMPONENTS AND REVISIONS**

- A. Components normally furnished with equipment shall be considered as part of the specification whether specifically mentioned or not. Any revision necessary due to substitution shall be the responsibility of the CONTRACTOR without extra cost to the project.



**3.00 EXECUTION**

**3.01 EXAMINATION OF PREMISES**

- A. Verify site conditions under which this work must be conducted prior to commencing. CONTRACTOR shall be held to have examined the premises and satisfied himself and is to be fully conversant with all conditions. No claim for additional compensation due to his failure to make this evaluation are allowed.
- B. Examine all spaces, surfaces, and areas to receive the work. Do not proceed until corrections, if any required, have been made.
- C. Verify dimensions, elevations, grades and obtain all measurements required for proper execution of the work.
- D. Verify points of connections to utilities prior to start of construction and report any inconsistency before commencing work.

**3.02 INSTALLATION REQUIREMENTS**

- A. Each sub-contractor shall have in charge of his work a competent superintendent whose experience shall qualify him for the work to be performed.
- B. Coordinate and schedule the work with other trades to properly expedite the completion of the project. Consult with other trades so that they are informed for coordination of all services.
- C. Equipment shall be set in place when necessary prior to enclosing the spaces. Any equipment which will not enter the normal openings provided or which will not fit into the designated areas will not be acceptable.
- D. Equipment shall be cleaned, aligned and lubricated prior to start-up. Flush piping, valves, strainers, and similar devices. Adjust systems for proper operation.
- E. Perform system adjustments and place all equipment in operating condition. Obtain the services of approved factory trained technicians where specified in this Division to start the equipment in accordance with factory recommendations.

**3.03 CLEARANCES**

- A. Mechanical equipment shall be installed so that maintenance and replacement can be performed without the removal of other equipment.
- B. Clearance around pumps, coils, fans, air conditioners, etc. shall be provided for operation, maintenance, replacement, repair and removal.
- C. Piping connections to equipment shall be made with valves, unions, or victaulic fittings to permit their repair or removal without causing damage to piping or equipment.
- D. Install all ducts, piping, conduit, wiring, switches, panels, fixtures, etc. to accommodate any obstacles anticipated or encountered during construction. Determine exact route and location of ductwork, piping or raceway prior to fabrication.
- E. Prior to shop fabrication of ductwork, piping, conduit, etc., make field measurements and make Shop Drawings to check for clearances and interferences.

- F. Due to the scale of drawings, all required fittings, offsets, elevation changes, and routing are not shown. The intent of these drawings and specifications is that these shall be installed without additional cost.
- G. Maintain proper headroom and pitch of lines.

**3.04 OPENINGS**

- A. Provide openings in walls, ceilings, floors or roofing which are part of the existing construction as required for the installation of the work. All opening shall be fully coordinated with existing field conditions, architectural and structural drawings and all other contracting trades.
- B. The location and size of all openings shall be the responsibility of each sub-contractor for the trade involved.
- C. Install and provide sleeves, inserts, panels, raceways, boxes, curbs, etc. ahead of the work to be performed.
- D. Openings shall be neatly patched after installation of the work.
- E. Flash and counter flash where mechanical equipment passes through waterproofed walls, floors, and roofs.

**3.05 CUTTING AND PATCHING**

- A. Cutting shall be avoided whenever possible, but any cutting required in the new construction shall be performed by the CONTRACTOR under the direction of the ENGINEER.
- B. Where piping, ductwork, conduit, etc. must pass through walls, floors or other building components, the CONTRACTOR shall provide reinforcement or support adjacent to the opening to compensate for the removal of any support material.

**3.06 GENERAL CLEANING**

- A. Upon completion of the work leave all surfaces broom clean and vacuum all ductwork, piping, conduit external surfaces on a daily basis.
- B. The entire installation shall be thoroughly free from oil and grease, dust and dirt, and any other foreign matter.
- C. Special cleaning methods shall be described in individual sections of this specification.

**3.07 REMOVAL OF RUBBISH**

- A. Remove on a daily basis all rubbish, debris, dirt, cartons, materials, etc. resulting from the work. Remove during construction to keep dirt accumulation to a minimum.

**3.08 PROTECTION**

- A. Protect all work from damage and protect the OWNER's property from injury or loss during the performance of the work.

- B. Properly protect adjacent property as provided by law and the Contract Documents. Provide and maintain all passageways, guard fences, lights and other facilities for protections required by local conditions.
- C. Any damage to existing equipment, piping, accessories or structures shall be repaired to original condition and acceptable to the OWNER.

**3.09 LEAK DAMAGE**

- A. Damage caused by leaks in any of the equipment or piping installed by the CONTRACTOR to the building or to the work of other CONTRACTORS, or to the contents, etc. shall be repaired by the CONTRACTOR who caused such damage at his own expense.

END OF SECTION



**1.00 GENERAL****1.01 DESCRIPTION**

- A. Basic materials and methods and related items for heating, ventilating, air conditioning systems and plumbing systems.

**1.02 RELATED DOCUMENTS**

- A. General and Supplementary Conditions and requirements of Division 1 apply to Work of this Section.
- B. Related work specified in other Division 15 Sections:
  - 1. 15.01 - Mechanical General Provisions
  - 2. 15.07 – Residential / Commercial Water Revenue Meters

**1.03 SUBMITTALS**

- A. Submit under provision of Section 15.01 - Mechanical General Provisions.
- B. Product data for the following:
  - 1. Piping and Fittings
  - 2. Valves

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. Deliver new, unused materials to the job site in original, unbroken factory packaging.

**2.00 PRODUCTS****2.01 MECHANICAL PIPING & FITTINGS**

- A. Provide mechanical piping and fittings as required to facilitate the replacement of the meters.
- B. Mechanically formed tee connections in copper piping.
  - 1. CONTRACTOR may use mechanically formed Tee connections in copper piping in lieu of tee fitting only where main piping is 2 1/2" or larger and where branch connection is 3/4" or smaller. Joint must be brazed. Tool manufacturer: T-Drill.

**2.02 UNIONS AND COUPLINGS**

- A. Size 2 inch and under: 300 psi malleable iron, bronze to iron ground joint unions for threaded ferrous piping. Provide wrought copper or brass couplings for copper piping. Provide brass unions for all ferrous to copper piping connections.
- B. Size 2-1/2 inch and over: 150 psi forged steel slip-on flanges for ferrous piping and 150 psi bronze flanges for copper piping. Gaskets: 1/8-inch-thick, preformed synthetic rubber with impregnate cloth suitable for service intended, high temperature type, 286°F.

- C. Use grooved mechanical couplings to engage and lock grooved, or shouldered pipe ends and to allow for some annular deflection, contraction and expansion. Couplings consist of malleable iron housing-clamps, C-shaped composition sealing gasket and steel bolts. Use galvanized couplings for galvanized pipe. For di-electric connection in grooved piping, use manufacturer's di-electric nipple. Manufacturers: Grinnell/Gruvlok Di-Lok Nipple, Victaulic Style 47 Di-electric Waterway.
- D. Unions shall be installed preceding and after each control valve, strainer, steam trap, heat exchanger, pump, coil & any other piece of equipment to enable removal.
- E. Di-electric unions are not allowed, unless noted otherwise.

**2.03 BOLTS, STUDS AND NUTS**

- A. Steel bolts, studs, and nuts: Comply with the current ASTM A-307, Grade B, or equal.
- B. Threads: American National form right hand machine cut threads complying with the current American Standard for Screw Threads ANSI B1-1, Coarse Thread Series, Class 2 fit.
- C. Provide galvanized or cadmium plated carbon steel bolts and nuts for flanged pipe joints.
- D. Provide stainless steel Type 304 bolts and nuts for underground pipe joints.
- E. Bolt heads and nuts: Semi-finished, hexagonal, complying with the dimensions for the current American Standard for Wrench Head Bolts and Nuts and Wrench Openings, ANSI B18.2, Heavy Series.

**2.04 PIPE SLEEVE**

- A. Provide pipe sleeve for all new piping thru existing or new building construction.
- B. Material: Seamless pipe, galvanized, ASTM A120 for penetrations through outside walls and floors. Provide seamless, black steel ASTM A53 elsewhere.
- C. Sleeve Size: Large enough to accommodate the pipe and its covering, wall sleeves to be flush on both sides, and floor sleeves to be extended 2 inch above floor level. Where escutcheon plates are required, extend the sleeves 1/4 inch above the floor.
- D. Modular mechanical type seal: Use for the annular space between pipes and sleeves to seal against water or earth, consisting of interlocking synthetic rubber links compressed to positive seal by through bolts bearing on delrin plastic pressure plates. Provide 316 stainless steel bolts.

**2.05 VALVES**

- A. General
  - 1. All valves shall comply with the applicable Manufacturers Standardization Society of the Valves and Fittings Industry.
  - 2. All valves shall have fullport openings and be of the serviceable type.
  - 3. Manually operated valves used in fuel systems shall have levers with locking devices.
  - 4. Manually operated valves 10 feet A.F.F. or higher shall have chain wheel operators with chains reaching to within 7'-0" A.F.F.

5. Unless otherwise noted, valves shall be rated for a minimum of 125 psi W.S.P/250 psi (cold water, oil, gas).
6. All valves on chilled water, heating and hot water systems shall be selected for use with ethylene glycol.
7. Valves through 2" shall have screwed connections for steel piping and sweat connections for copper piping. Valves 2-1/2" and larger shall be flanged. Grooved connections are permitted where specified.
8. Gate valves shall be repackable under pressure whether open or closed.
9. Provide extended valve stems for insulated piping.
10. Where valves are installed outdoors, all components including the gear wheel operators shall be weatherproofed.
11. Unless noted otherwise, all butterfly valves shall be full lug construction, suitable for bi-directional dead-end service, and have open position memory stop. Manually operated butterfly valves 4" and larger shall have enclosed worm gear operators with position indicators.
12. Unless noted otherwise, valves shall be same size as piping.

B. Shut-Off Valve and Check Valve Application Schedule (unless noted otherwise on drawings)

System	Shut-Off Valve and Check Valve Type and Size		
	2" and Less	2 1/2" - 4"	6" and Larger
Hot and Cold Water	A, E	B, F	B, F
Chilled Water	A, E	B, F	B, F
Condenser Water	A, E	B, F	B, F
Heating Hot Water	A, E	B, F	B, F
Steam and Steam Condensate	A or D, E	B, F	B, F
Natural Gas	A	G	G
Compressed Air	A, E	B, F	B, F

C. Shut-Off Valve and Check Valve Types

1. Type A: Ball Valves, provide 2-piece, full port, bronze body, stainless steel ball and stem with PTFE seats. Valves for natural gas shall be AGA approved.
2. Type B: High Performance Butterfly Valves, provide iron body, PTFE seat, one-piece stainless steel shaft and bearing, 316 stainless steel disk, Teflon stem packing, memory stop and lug pattern rated for 150 psi, 450 degrees F., ANSI class.
3. Type C: Standard Butterfly Valve, full lug, carbon steel body, stainless steel disc, shaft and bearing, EPDM seat, Teflon stem packing. Rated for 125 psi, 250 degrees F.
4. Type D: Gate Valve, bronze body and trim, screwed, rising stem, double wedge or disc. Deep stuffing box with gland and back seating capacity.

5. Type E: Swing Check Valve, bronze body and trim.
  6. Type F: Silent Check Valve, proved stainless steel spring loaded, resilient disc, silent type, bronze body.
  7. Type G: Lubricated Plug Valve, semi-steel body, single gland, wrench operated, flanged ends, MSS SP-78, 175 psi.
- D. Drain Valve
1. Ball valve with 3/4" hose thread and cap.
- E. Automatic Balancing Valve:
1. Automatic flow control, pressure independent type, +/- 5 percent accuracy. 304 stainless steel cartridge, two P/T ports for flow reading. Valve size shall match pipe size. Refer to drawing for flow and pressure range.
- F. Manual Balancing Valves
1. General Manual Balancing Valve Requirements: ports for measuring flow, memory stop, bubble tight shut-off, valve Cv characteristics suitable for throttling. Size valve to produce readable design flow and maximum full open pressure drop of 3 feet.
  2. 2" and less: bronze body, brass ball, calibrated.
  3. 2-1/2" and larger: cast iron body, brass ball or bronze disc, TFE seat rings, bronze seat, and stainless-steel stem.
  4. Provide gauge kit for projects requiring over 20 balancing valves. Gauge kits shall be capable of directly reading GPM or shall include conversion chart from Cv pressure.
- G. Combination Shut-off, Check and Balancing Valves (Triple-Duty Valves):
1. 2-1/2" and larger-cast iron or semi-steel body, flanged, stainless steel stem and spring, replaceable bronze disc with EPDM seat insert, calibrated balancing adjustment with memory bank, backs eating valve stem, maximum working pressure of 175 psi at 250°F, Bell and Gossett, Thrush-Amtrol or Taco.
  2. Valve design to be straight pattern unless otherwise indicated and constructed to permit repacking under full line pressure.
  3. Valves to be equipped with brass readout valves with integral check valve for taking differential pressure readings across orifice.
- H. Control Valves
1. See 15.17 "HVAC Controls and Sequence of Operation".
- I. Water Pressure Regulating Valve
1. Bronze valve body, renewable stainless-steel seat. Adjustable reduced pressure range, built-in bypass, diaphragm type with spring cage and orifice. Pressure to be adjustable from a top screw on the valve. Valve to comply with ASSE Standard 1003.



J. Water Pressure Relief Valves

1. ASME rated, sized for the full installed capacity of the low-pressure side of the regulating station. Factory set valve at not more than 20% above low side pressure. Furnish seat material suited for the service.

**3.00 EXECUTION**

**3.01 INSTALLATION**

- A. For soldered joints, use non-acidic and lead-free flux on cleaned pipe and fittings. Cut pipe square and ream ends before assembly. Fill joints with solder by capillary action, with solder covering joint periphery. Wipe joints clean. Apply heat carefully to prevent overheating and damage to pipe, fittings, and valves. Strict adherence to manufacturer's installation recommendations when heating and soldering valves is mandatory.
- B. Terminal units shall be properly supported to wall studs by use of backing plate spanning stud-to-stud.
- C. Cut copper tube square and ream before assembly. Keep piping capped during construction to prevent intrusion of construction debris.
- D. Support piping drops through finished ceiling from structure above to prevent any lateral or up/down movement. Other outlet drops shall be supported from walls, columns, or work benches using appropriate hangers, anchors, or unistrut.
- E. CONTRACTOR shall provide his own survey to locate pipes, elevations, ducts, conduits, etc. and prepare his own Shop Drawings. Variations to suit existing conditions, structural features or mechanical equipment shall be his responsibility.
- F. Cut pipe accurately and install without springing or forcing. All burrs shall be removed after cutting.
- G. Install plumbing to applicable code requirements.
- H. Install all domestic supply piping for fixtures through the sidewalls unless otherwise noted on the Plans.
- I. Install shock absorbers on the water supply at flush valves or self-closing valves and at equipment with solenoid valves.
- J. Install above ground water piping so as to be completely drainable with accessible drain valves installed at the low points of the system.
- K. Lubricate domestic clean out plugs with mixture of graphite and linseed oil.
- L. Install chrome-plated compression stops for all fixtures.
- M. Make screwed joints with full cut standard taper pipe threads.
- N. Install piping to permit complete draining. Provide capped hose end ball drain valves at all low points.

- O. Installed piping shall be free from sagging. Provide for expansion and contraction of piping in an approved and safe manner by means of loops or offsets, where mechanical expansion joints are not specifically called for.
- P. Branch connections for steam and condensate and gaseous systems shall be taken off mains on top, up at a 45° angle, or off the side.
- Q. Branch piping shall be valved at the branch connection points.
- R. Provide fittings and specialties necessary to properly interconnect all items and specialties whether or not shown in detail.
- S. Clean and swab-out all piping before installation. Piping left open for extended periods shall be capped.
- T. Lay out pipelines straight, plumb and in true alignment. Offset as required to avoid interference with other work, to conceal piping, to allow maximum headroom and to avoid interference with windows and doors. Lay out all pipes and establish their levels from benchmarks, existing floors or finished grades.
- U. Piping shall be concealed unless indicated otherwise on drawings. Do not conceal piping until it has been inspected, tested, flushed and approved.
- V. Use eccentric reducing fittings to increase or decrease pipe sizes. Bushings are not acceptable. Orient reducers to prevent trapping of water.
- W. Pipe extending into finished areas shall have chrome plated escutcheons large enough to cover pipe sleeves and shall fit snugly over pipe or insulation.

**3.02 INSTALLATION OF WELDED PIPING**

**A. CONTRACTOR Qualification:**

- 1. CONTRACTOR shall submit with his bid the welding procedure and the welder qualification per ASME - Boiler and Pressure Vessel Code, Section IX, in order to perform welding in accordance with the ASME - Boiler and Pressure Vessel Code and the ASME B31 Code for Pressure Piping.

**B. Preparation:**

- 1. The edge of surface or part to be joined by welding shall be prepared by flame cutting or machining and shall be cleaned of oil or grease and excessive amount of scale, rust or other foreign material.
- 2. The work area shall be kept clean at all times.
- 3. Tie-ins to existing pipes shall be done after emptying the pipe and blowing the pipe with nitrogen.
- 4. The following precautions must be followed when welding or torch cutting is required in area which contains flammable liquids processing equipment in services:
  - a. All open-ended lines and valves shall be blind flanged prior to commencing of the job.
  - b. As much piping as practical shall be prefabricated.
  - c. Tie-ins to existing pipes shall be cold cut, stople and flange procedure.

5. No welding allowed on materials to be joined when their temperature is below 40°F. The material must be preheated to 65°F.

C. Welding Criteria:

1. Carbon steel piping:

- a. In sizes 1-1/2 inches and smaller, the welding shall be performed by means of the gas welding (oxyacetylene) process.
- b. In sizes 2 inches and larger, the welding shall be performed by the metallic arc process with coated electrodes.
- c. In sizes 1 inches and larger the welding may be done by wire welding process (gas metal arc welding).

2. Stainless steel piping, type 304 SS or 316 SS.

- a. The welding shall be done by gas tungsten arc welding process using a non-consumable electrode of thoriated tungsten.
- b. Filler metal shall be 316 ELC (extra low carbon).
- c. Shielding gas and internal purge gas shall be welding grade argon.
- d. Post weld heat treatment: Annealed min. 1925 degrees F and rapidly cooled if corrosion resistance is required.

D. Weld Quality and Repairs:

1. 100 percent penetration is required on the entire length of the welded joints. Welds shall be free of defects, (undercoating, lack of penetration, cracks, etc.) Inside and outside of welds shall be smooth as possible. Add filler rod as necessary. The outside of all welds shall be cleaned by brushing.
2. All welds should be made with one pass if necessary.
3. The OWNER will be invoiced directly and will pay only all primary (initial) X-rays required by codes. CONTRACTOR will pay for repairs of any defective welds, including the labor costs to repair or replace the defective weld and the cost of the x-ray of any such welds, until the welds pass inspection.
4. Weld repairs failing three attempts shall be cut out and replaced with new spool piece at CONTRACTOR'S expense. Quality procedures shall then apply as new weld.

### 3.03 VALVES

A. General:

1. Provide valves of same manufacturer throughout where possible.
2. Provide valves with manufacturer's name and pressure rating clearly marked on outside of body.
3. Install valves with stems upright or horizontal, not inverted.
4. Install ball valves for shut-off and isolating service, to isolate equipment, part of systems or vertical risers.

**3.04 CLEANING OF DOMESTIC PIPING SYSTEMS**

A. Domestic water: Flush with chlorine solution-AWWA C6-168 Disinfecting Water Mains.

END OF SECTION

**1.00 GENERAL**

**1.01 DESCRIPTION**

- A. Under this Section the CONTRACTOR shall provide at his own expense all labor, materials, tools and equipment required to replace existing meters with new units.
- B. Appended to this Section are meter size and quantities.
- C. The exact location of the meters will need to be field determined by CONTRACTOR. Assistance from City personnel will be given if a meter can't be located. After contract award, addresses of all meter locations will be given to the CONTRACTOR.

**1.02 CODES, PLANS AND SPECIFICATIONS**

- A. Meter installations shall conform to:
  - 1. All applicable Federal, State and local codes.
  - 2. Applicable industry codes:
    - a. ANSI - American National Standards Institute Code
    - b. American Water Works Standard C-700 and C-710
    - c. NSF – National Sanitation Foundation
    - d. ANSI/NSF Standard Annex F and G
  - 3. City of Marshall Ordinances

**1.03 MATERIAL ACCEPTANCE**

- A. Prior to fabrication and/or installation, all piping, fittings, valves and equipment shall be inspected as required. Any materials not meeting the specifications, or obviously faulty material, shall be rejected by the ENGINEER and removed from the job site by the CONTRACTOR.

**1.04 MATERIAL PREPARATION**

- A. All pipe, fittings and accessories shall be free of all foreign matter. Any accumulations of dirt, rust, scale, mud, etc., shall be removed prior to installation. All pipe ends shall be reamed and de-burred to prevent loose particles from getting into the pipeline.

**2.00 PRODUCTS**

**2.01 5/8" TO 1" FLOW METER – SMALL FORM FACTOR**

- A. Eternal Housing
  - 1. The meter and measuring element will be an integrated unit housed within a thermal plastic external casing. The integrated unit will not be removable from the external housing. The system shall have the size and direction of water through the system imprinted on the external housing. Flow direction marking will be cast into the housing (non-removable).

## B. Measuring Element

1. The measuring element shall be made of a noncorrosive, lead-free glass fiber reinforced, composite alloy material. A battery powered non-contact flow sensor utilizing silver/silver chloride electrodes will be utilized to measure the velocity of the water and develop a linearly proportional value of the water volume. The measuring will have no moving parts.

## C. Capabilities / Features

1. The units shall operate up to a working pressure of 200 psi without leakage or damage to the units. Accuracy shall not be affected by variations in pressure.
2. The register/display shall be an electronic device encapsulated in glass with 9 programmable digits utilizing a liquid crystal display. The unit must be hermetically sealed with a heat tempered glass cover and shall be tamper resistant. The register/display shall not be removable from the measuring sensor. The register/display shall utilize non-contact coupling technology to connect to a touch, radio or fixed based meter reading system.
3. The assembly shall be a solid-state battery-operated electromagnetic flow measurement system with a hermetically sealed, glass covered and electronic register/display.

Determination of the lay length of the meters will be the responsibility of the CONTRACTOR. Any adaption or spool pieces will need to be provided at no cost to the OWNER.

## D. Warranty

1. The unit shall have a guarantee accuracy of 98.5% to 101.5% with flow rates of .11 to 35 gpm for  $\frac{3}{4}$ " and .4 to 55 gpm for 1". The warranty period shall be 20 years from shipment from factory. The complete meter assembly will be replaced if the unit fails.
2. The meter batteries will be warrantied for 10 years at 0% cost to OWNER for replacement of the complete meter. The warranty on the batteries will be extended to 20 years on proration scale. The 11<sup>th</sup> year will be 30% replacement cost and extend to 20 years at 5% increments.
3. If the meter fails during the first year for any reason it will be replaced including replacement and re-installation cost by the CONTRACTOR.
4. After the first-year replacement and re-installation will be the responsibility of the OWNER.

## E. Manufacturers

1. Manufacturers must be pre-approved by the ENGINEER. Additional manufacturers will be approved and notified via an addendum.
2. Manufacturers that are pre-approved for  $\frac{3}{4}$ " to 1" non-contact Flow Meter are Sensus IPERL electromagnetic flow meter, or Kamstrup Ultrasonic Flow Meter.

**2.03 2" to 12" FLOW METER – LARGE FORM FACTOR**

## A. Measuring Assembly

1. The meter shall be constructed of two components: the measuring tube and the liner. The measuring tube will be polyurethane coated steel housing and a non-magnetic alloy tube with an obstruction-less cross section a homogenous magnetic field.

- 2. The line of the measuring tube shall be Polyamide 11/Nylon 11 – also known as standard commercial name of Rilsan.

B. Measuring Element

- 1. The unit shall be rated for a temperature range of 33°F – 149°F.

C. Capabilities / Features

- 1. The units shall operate up to a working pressure of 200 psi without leakage or damage to the units. Accuracy shall not be affected by variations in pressure.
- 2. The unit shall be rated for a temperature range of 33°F – 149°F.
- 3. The unit will be provided with a grounding ring and grounded to structural steel of the facility per manufacturer requirements.
- 4. The register/display shall be an electronic device hermetically sealed with an electronic pick-up containing no mechanical gearing. The register/display shall utilize magnetic coupling technology to connect to a touch, radio or fixed based meter reading system.
- 5. The battery shall be field replaceable.

Determination of the lay length of the meters will be the responsibility of the CONTRACTOR. Any adaption or spool pieces will need to be provided at no cost to the OWNER. Maximum meter lay length (flange to flange) to be 15 inches.

D. Warranty

- 1. The unit shall have a guarantee accuracy of 98.5% to 101.5% within the following rates:

<u>Size</u>	<u>Low Flow</u>	<u>High Flow</u>
1½"	0.7 gpm	180 gpm
2"	1.2 gpm	320 gpm
3"	2.8 gpm	720 gpm
4"	5 gpm	1,250 gpm
6"	11 gpm	2,850 gpm
12"	44.5 gpm	11,500 gpm

- 2. The meter batteries will be warrantied for 10 years at 0% cost to OWNER for replacement of the meter register.
- 3. If the meter fails during the first year for any reason it will be replaced including replacement and re-installation cost by the CONTRACTOR.
- 4. After the first-year replacement and re-installation will be the responsibility of the OWNER.

E. Manufacturers

1. Manufacturers must be pre-approved by the ENGINEER. Additional manufacturers will be approved and notified via an addendum.
2. Manufacturers that are preapproved for 2" to 12" non-contact flow meters are Sensus accuMag flow meter or Kamstrup Ultrasonic flow meter.

**2.04 FLOW METER RADIO READ – METER TRANSCIEVER UNIT (MXU)**

- A. Wall mount (non-pit, non-submersible) installation interfacing the IPERL and accuMAG flow meters.
- B. Unit must be rated to be mounted either indoors or outdoors.
- C. Each flow meter will be provided with MXU that will be installed by the CONTRACTOR.
- D. The batteries will be warrantied for 20 years at 0% cost to Owner for replacement.
- E. If the units fail during the first year for any reason it will be replaced including replacement and re-installation cost by the CONTRACTOR.
- F. After the first-year replacement and re-installation will be the responsibility of the OWNER.
- G. All communication wiring between the meter and transceiver will be provided by CONTRACTOR.
- H. Manufacturers
  1. Manufacturers must be pre-approved by the ENGINEER. Additional manufacturers will be approved and notified via an addendum.
  2. Manufacturers that are pre-approved for MXU units are the RadioRead AMR Model 510R by Sensus.

**2.05 AUTOREAD HANDHELD PROGRAMMER / METER READER**

- A. Hand-held electronic meter reading collection and data storage device for manual, TouchRead System and RadioRead meter reading.
- B. Additional option including Sensus SmartPoints and ICE registers.
- C. Manufacturers
  1. Manufacturers must be pre-approved by the ENGINEER. Additional manufacturers will be approved and notified via an addendum.
  2. Manufacturers that are pre-approved for Autoread Handheld Programmer / Meter Reader are TouchRead Model AR5502 by Sensus.
  3. A total of two (2) complete units are to be provided.



**2.06 FIX RADIO GATEWAY BASESTATION**

- A. Radio based fix utility meter reading system to be installed by the CONTRACTOR onto the existing two (2) elevated tanks located with the City of Marshall. All hardware and connections to connect the system to the OWNER's system will be provided by the CONTRACTOR.
- B. Unit will communicate on the 900-950 or 400-450 mite Mhz frequency range.
- C. The unit will be based on 277 VAC single phase and will have a battery back-up system.
- D. The antenna system will be approximately 80 feet high from ground elevation and the antenna array will need to be pointed towards the City of Marshall.
- E. Manufacturers
  - 1. Manufacturers must be pre-approved by the ENGINEER. Additional manufacturers will be approved and notified via an addendum.
  - 2. Manufacturers that are pre-approved for Radio Fixed Gateway Basestation are FlexNet VGB by Sensus.

**2.07 METER READING SOFTWARE**

- A. All software systems must be compatible to support no less than 10,000 meters. This includes any and all licensing and node counts requirements/modules.
- B. All software that is required to receive and transfer readings from the hand-held reader and/or vehicle readers to the OWNER's existing BS&A billing system shall be provided. Any and all custom programming/setting/scripts to convert to OWNER's BS&A billing system will be provided.
- C. A minimum of 32 hours of software training shall be provided. The first 16 hours training will be provided at the OWNER's location in a formal classroom setting. The balance of training will be provided in four (4) – four (4) hour one-on-one work sessions that occur during the first six (6) months of meter operations. All training will occur at OWNER's facilities.
- D. All software updates will be included free of charge for the first (2) years of operation. These updates will be installed by CONTRACTOR onsite with no fees/charges to the OWNER.
- E. The CONTRACTOR will document all software upgrades and support costs for five (5) years. This document will be provided as a formal submittal.
- F. The CONTRACTOR will provide all necessary communication cables to connect the computer/workstation, BS&A billing system and meter reading systems.
- G. Manufacturers
  - 1. Manufacturers must be pre-approved by the ENGINEER. Additional manufacturers will be approved and notified via an addendum.
  - 2. Manufacturers that are pre-approved for Meter Reading Software are AutoRead for Windows by Sensus.

**2.08 PIT SET RADIO TRANSCEIVER FOR SUBMERSIBLE APPLICATIONS**

- A. Pit set for interfacing the utility meter to a radio based automatic meter system. Unit incorporates a 1.75" diameter hole in pit lid and fits pit lid thicknesses up to 1.75".
- B. Physical Characters: Width: 4.43" x Height: 5.09" x 3" Depth
- C. Frequency Range: 900 – 950 MHz, 8000 channels with 6.25 kHz steps, narrow band modulation.
- D. Non-Volatile Memory
- E. Battery Powered with Lithium Thionyl Chloride batteries with 20-year warranty – Based on six (6) transmissions per day.
- F. Approvals: US: FCC CFR 47: Part 24D, Part 101C, Part 15 Licensed operation
- G. Operating Temperature/Environment: 22°F to +185°F, 100% condensing, water submersible.
- H. Compatibility: Sensus Encoder Registers and Badger ADE water registers, Master Meter, AccuLinx, Elster, Neptune ARB VI (ProRead) and Hersey Translator.
- I. Unit shall be a Model 520M – Pit Set by Sensus or ENGINEER pre-approved alternative.

**3.00 EXECUTION**

**3.01 EQUIPMENT/METER RECEIVING, HANDLING AND STORING**

- A. Cleanliness in all meter systems is of paramount importance and procedures used in receiving, handling and storing shall be directed toward assuring that all lines are clean and free of rust, scale, dirt, and all foreign material that can damage equipment or contaminate potable systems or processes. Similar precautions must be taken in handling and storing of fittings, valves and other equipment to insure a clean assembly. NSF and Health Department disinfection practices will be enforced at all times.
- B. Any equipment damage or contamination during transport or handling shall be rejected and removed from the job site by the CONTRACTOR.
- C. Care shall be taken not to injure any pipe or pipe coating and no damaged or imperfect pipe shall be used in the work except that minor damage which may be repaired subject to the review of the ENGINEER or OWNER.

**3.02 INSTALLATION**

**A. General**

- 1. Only personnel competent at installing the various types of meters shall be employed on this project and complete suitable equipment necessary for the execution of same is required. Any incompetency observed by the ENGINEER must be removed at his request, and where improper equipment or lack of same appears to be impairing the quality or speed of the work, such adjustments in same shall be made to the ENGINEER's satisfaction.

2. Piping and meters shall be installed straight and true, with approved offsets around obstructions for a satisfactory installation and operation. Horizontal piping shall be sloped to permit drainage. All vertical pipe shall be installed plumb and parallel with the building lines.
3. Piping shall be run in an orderly manner consistent with good operation, neatness of appearance and safety of facility/homeowner, tenant and City personnel. Wherever possible interior piping will be grouped in banks with a change in elevation when a change in direction occurs. Provisions shall be made in establishing piping runs to allow for maximum accessibility for servicing. Space allowance shall be made for possible future changes or additions. Pockets which will prevent complete drainage of a line shall be avoided. Meters and transceivers shall be conveniently located for operating and servicing.
4. Piping and meter installation shall not be run in such a manner as to interfere with the operation, adjustment or maintenance of equipment. Meters shall not be located directly over equipment so as to impede their removal.
5. All cutting of the pipe shall be done in a neat workmanlike manner with the least amount of waste and without damage to existing or new lines. A fine tooth saw, tubing or pipe cutter or similar tool shall be used to cut the pipe. Cuts must be square and ragged edges removed with a burring tool and/or file.
6. All meters, unless clearance and code compliance cannot be satisfied, shall be installed in the exact location of the meter that is being replaced.

B. Cleaning and Flushing

1. Unless special cleaning procedures are noted in the respective meter manufacturers requirements, these general methods shall apply for cleaning lines before start-up. Installations of all piping shall be done with extreme care to insure clean pipelines free of scale, rust, weld splatter or beads, sand, dirt, grease and all other impurities or foreign matter. All piping shall be installed to permit cleaning by flushing through all portions of the piping system with provisions made to open the lines at all low points to permit release of any accumulation of foreign material and to drain off the flushing fluid. Where this flushing operation may be detrimental to specialties and/or equipment, provisions must be made for isolation or removing these components from the system. When feasible, this flushing operation shall be done with the same medium that will normally be conveyed in the line, i.e., air for air or gas lines, water for water lines and liquids, oil for oil piping, etc. All equipment shall be disinfected per NSF/Heath Department guidelines

C. Piping Inventory

1. Contractor shall document the material of construction of the water service lead coming into the building and the service lead after where the meter has been installed.

END OF SECTION



**1.00 GENERAL****1.01 REFERENCE TO GENERAL CONDITIONS**

- A. The requirements of the General Conditions shall be reviewed for their application to the work within the Electrical Division.

**1.02 WORK INCLUDED**

- A. The work included in this Division consists of providing all labor and material required for the installation of the complete electrical system, ready for operation.
- B. The work shall include the following:
  - 1. All wiring and equipment for the Meter, Radio Transceiver and Radio Tower;
  - 2. All items incidental to and/or required to complete the installation;
  - 3. Equipment and metering grounding;
  - 4. Meter ground jumper;

**1.03 CHARACTER OF WORK**

- A. The work shall be done in a first-class and workmanlike manner by skilled tradesmen and shall be complete in all details. It shall be executed so that the installation conforms and accommodates itself to the building structure, facilities, equipment and usage.

**1.04 MATERIALS**

- A. All materials and equipment shall be new and, to the extent possible, standard products of the same manufacturer for similar equipment. Equipment or material not specifically identified shall conform to the general standard of quality established herein.
- B. Factory assemble control panels and component assemblies.
- C. All materials and equipment shall be listed and labeled by a nationally recognized testing laboratory.
- D. All mounting hardware installed outdoors, in wet locations, or in contact with concrete shall be stainless steel.
- E. Equipment and materials must be UL certified. Where there is no alternative to supplying equipment that is UL certified, obtain special approval from the Engineer then the Authority Having Jurisdiction (AHJ). CONTRACTOR to pay all associated fees including any additional testing or observation by an alternative testing laboratory.

**1.05 PERMITS**

- A. The CONTRACTOR shall obtain and pay for all permits and certificates of inspection for work herein specified. The cost of such permits and certificates shall be included in the CONTRACTOR's bid price.

- B. CONTRACTOR to submit necessary interim and final certificates of inspection and approval required by Inspection Authorities as evidence that the work installed complies with laws and regulations of governing authorities.
- C. Notify the Inspection Authorities in sufficient time for them to arrange to inspect work.
- D. Furnish the final unconditional Certificates of Acceptance from Inspection Authorities having jurisdiction on completion of work to the client and the Project Manager / Administrator.

**1.06 LAWS, ORDINANCES, REGULATIONS**

- A. The CONTRACTOR shall comply with, and all work and materials shall conform to, the requirements of all applicable federal, state and local laws, ordinances, regulations, as well as the rules and standards of the National Board of Fire Underwriters.

**1.07 RECEIPT OF PORTABLE AND DETACHABLE PARTS**

- A. All portable and detachable portions of the installation, such as keys, etc., shall be retained. At the completion of the work, they shall be turned over to the OWNER and itemized receipts obtained.

**1.08 COORDINATION WITH OTHER DIVISIONS**

- A. Follow the Contract Drawings to become familiar with all conditions affecting the work and verify spaces in which the work will be installed.
- B. Examine the drawings and specifications of all divisions and become fully familiar with the work. Before commencing work, obtain a ruling from the ENGINEER on any conflicting issues between divisions. No compensation will be made for any costs arising from conflict not identified before work has commenced.
- C. Coordinate the work to be performed under this Section of the specification with all divisions installing equipment to ensure that there are no conflicts.
- D. Install anchors, bolts, pipe sleeves, hanger inserts, etc. required in ample time to prevent delays to other division's installation work.
- E. Lay out the work and equipment with due regard to architectural, structural and mechanical features. Architectural and structural drawings take precedence over electrical Drawings regarding locations of walls, doors and equipment.
- F. Structural members shall not be cut without prior approval of the ENGINEER.
- G. Examine previously constructed work and notify the ENGINEER of any conditions that prejudice the proper completion of this work.

**1.09 SHOP DRAWINGS**

- A. Shop Drawings shall be prepared as defined in the General Conditions for all equipment supplied under Division 16, Electrical.
- B. Submit data (Drawings) for review prior to commencement of manufacturing or installing with the exception of conduit, standard conduit fittings and low voltage wiring.
- C. Assume responsibility for accuracy of equipment dimensions related to available space and accessibility for maintenance and service, and compliance with codes and inspection authorities.
- D. Show all details of construction, dimensions, capacities, weights, and electrical performance characteristics of equipment or material.
- E. Obtain manufacturer's installation directions to aid in properly executing the work. Submit two (2) copies of such directions to the Contract Administrator prior to installation, for use in inspecting the work.
- F. Prepare composite construction Drawings, fully dimensioned of cables, conduit, cable tray, bus duct, sleeves, clearances, pipes, ducts, etc., and equipment in mechanical and electrical equipment rooms, ceiling spaces and all other critical locations to avoid a conflict of trades. Base Drawings on manufacturer's Shop Drawings. Drawings should be developed from consultation with and agreement of all trades involved. Prepare Drawings of equipment bases, anchors, slabs, floor and roof curbs, if needed, for the electrical work.
- G. CONTRACTOR is responsible for providing Shop Drawings showing the integration between supplied control panels and control panels supplied with equipment. These Drawings are to be a single Drawing for each specific device, showing interconnection between the device and all associated panels and terminal blocks. Contract Administrator reserves the right to request more detailed Drawings if those provided are deemed insufficient.
- H. Submit samples of material and equipment where specified or as may reasonably requested by the Contract Administrator for review before ordering same in accordance with Division 1. The Contract Administrator may retain the samples until the completion of the contract.
- I. Complete all work in accordance with reviewed Shop Drawings.
- J. Bind one complete set of construction/Shop Drawings showing "as built" conditions in each operating and maintenance instruction manual.
- K. In addition to the requirements of the General Provisions, provide working shop drawings with, but not necessarily limit to, the following additional information:
  - 1. Manufacturer's and Supplier's name.
  - 2. Manufacturer's bulletins, leaflets and specifications of major electrical equipment.
  - 3. Catalogue model number.
  - 4. Number identifying item on the Drawings and/or in the specifications such as equipment, item number, panel identification letters, etc.
  - 5. Indicate details of construction, dimensions, capacities, weights and electrical performance characteristics of equipment or material.

6. Where applicable, include wiring, single line and schematic diagrams.
7. Include wiring diagrams or diagrams showing interconnections with work of other sections.
8. Lighting fixtures, including photometric data.

**1.10 RECORD DRAWINGS**

- A. Shop drawings shall be prepared as defined in the General Conditions for all equipment supplied under Division 16, Electrical.
- B. Before commencing work, obtain two (2) sets of electrical drawings for showing "As Built" conditions. As job progresses, mark on field set of prints to indicate accurately all installed work. At completion stage, transfer all information onto master set of Drawings and indicate "CONTRACTORS Certified Approval of Accuracy" before submitting to Contract Administrator for review and record use.
- C. Indicate on record Drawings "As Built" stamp.
- D. Show on the record Drawings as-built, all outlets and equipment such as runs of conduit, locations of pull boxes, outlets, motors, panels, etc., as well as all services entering the building and on the property.
- E. Dimension underground services and concealed main and sub-feeder conduits at key points of every run-in relation to structure and building. Record all elevations for underground services in relation to the ground floor level of the building. Indicate on record Drawings, location of all buried services. This information is to be certified correct by Contract Administrator before backfilling commences.
- F. Indicate exact location of all services left for future work.

**1.11 OPERATIONS AND MAINTENANCE MANUALS**

- A. The CONTRACTOR shall supply five (5) copies of Installation, Operation and Maintenance Manuals for all equipment supplied under Division 16, Electrical.
- B. In addition to the requirements of General Provisions – Submittals, include in the Operations and Maintenance Manuals:
  1. Details of design elements, construction features, component function and maintenance requirements, to permit effective start-up, operation, maintenance, repair, modification, extension and expansion of any portion or feature of installation.
  2. Technical data, product data, supplemented by bulletins, component illustrations, exploded views, technical descriptions of items and parts lists. Advertising or sales literature not acceptable.
  3. Wiring and schematic diagrams and performance curves.
  4. Names and addresses of local suppliers for items included in Maintenance Manuals.
  5. Copy of test data.
  6. Recommended spare parts list.



**1.12 OPERATION INSTRUCTIONS**

- A. Comply with the requirements of the General Provisions of the Contract – Clean-up, Start-up and Commissioning.
- B. Upon completion of testing, provide on-site operating instructions by certified and experienced personnel to the operating/maintenance personnel at their convenience. As a minimum, this shall include:  
  
Main Electrical Distribution System  
Motor Control Equipment  
Local Control Panels
- C. Provide these services as necessary to put equipment in operation. Ensure that plant staff, operating/maintenance are conversant with its care and operation.

**2.00 INSTALLATION**

**2.01 COORDINATION OF WORK**

- A. The CONTRACTOR shall coordinate his work with that of subcontractors on the job.
- B. The CONTRACTOR shall check with the ENGINEER before placing any panels, flush devices or other equipment installed in masonry walls and partitions.
- C. The CONTRACTOR shall install all motor starters, disconnect switches and other items or material used in connection with equipment in accordance with supplier's requirements and diagrams.

**2.02 DEMOLITION**

- A. The CONTRACTOR shall remove and/or relocate all electrical equipment, devices, conduit and wiring work as called for on the Drawings and as necessary whether such items are actually indicated on the Drawings or not in order to accomplish the installation of the specified new work.
- B. Equipment, materials and devices removed shall remain the property of the OWNER and shall be stored at locations as directed by the ENGINEER. Such items shall only be reused if specifically designated on the Drawings.
- C. Demolition may require staging for main power supplies. CONTRACTOR to coordinate with all scheduling and maintain power at site for all equipment deemed necessary.

**2.03 POWER INTERRUPTIONS**

- A. The CONTRACTOR shall coordinate with the ENGINEER any interruptions to power in the existing building. Every effort shall be made to give enough advance notice to allow proper scheduling of the affected work activities.
- B. The CONTRACTOR shall provide temporary wiring or power generation to minimize the duration of electrical interruptions and to keep critical load energized.

**2.04 CONCRETE WORK**

- A. Concrete work for foundations, manholes, concrete encased conduit, etc., shall be provided by the CONTRACTOR and performed as shown on the Plans and shall conform to the Concrete Work Section of these Specifications.

**2.05 LEGEND PLATES**

- A. Electrical equipment shall be equipped with laminated plastic legend plates with black lettering engraved on white background. The legend plates shall be 1¼-inches high and 3½-inches wide and shall be attached to the equipment by means of stainless-steel machine screws. The plates shall be approximately 3/32-inch thick and shall have letter sizes and legends as reviewed by the ENGINEER.
- B. Legend plates shall be installed on the doors or covers of all enclosed electrical equipment.
- C. Non-corroding, visible and legible after equipment is installed.
- D. Provide "Asbestos Free" labels on switchgear.
- E. Wording on nameplates to be approved by Client and/or Project Manager / Administrator prior to manufacture.
- F. Identification to be in English.

**2.06 MOUNTING HEIGHTS**

- A. Devices shall be installed at heights as listed below unless otherwise shown on the Drawings or directed in the field. Dimensions given are from the finished floor to the centerline of the device unless otherwise noted:

Push button stations	4'-0"
Hand-off-auto selector switches	4'-0"
Receptacles	1'-6"
Lighting switches	4'-0"
Telephone outlets (for desk phones)	1'-6"
Telephone outlets (for wall phones)	4'-10"
Outdoor receptacles	3 0" above ground
Lighting panelboards	6'-6" to top of panel
Power panelboards	6'-6" to highest starters, disconnect switches, actuating handle

**2.07 ENCLOSURES and AMBIENT ENVIRONMENTS**

- A. Unless noted otherwise, enclosures shall be NEMA 12 for interior locations; NEMA 4X for outdoor locations and for units indicated weatherproof on the Plans. Supply classified rated equipment where areas are deemed hazardous areas. Where CONTRACTOR is unsure what to provide, obtain ENGINEER confirmation. Installation of improperly rated equipment shall result in complete replacement at the CONTRACTOR's expense.
- B. Unless otherwise indicated, supply equipment enclosures, boxes, electrical materials and products suitable for ambient environments of the following areas:

AREA	GEN CLASSIFICATION	EQUIPMENT ENCLOSURE TYPE
Electrical Rooms	Dry, clean	NEMA 12
Control Rooms	Dry, clean	NEMA 12
Other rooms / areas	Dry, clean	NEMA 12
Outdoor areas	Wet	4X (stainless steel)

**2.08 CUTTING AND PATCHING**

- A. The CONTRACTOR shall be responsible for the proper location of all chases, recesses and openings required for the electrical work and shall advise other trades of the sizes and locations of those required for his work.
- B. The CONTRACTOR shall provide all sleeves, etc., required for the introduction and placement of his work and shall be responsible for their correct location.
- C. Cutting, coring, and patching required as a result of the omission or opening of sleeve shall be done by the CONTRACTOR at his own expense.
- D. All cutting, coring, and patching shall be done by workers skilled in that trade.

**2.09 ACCESS DOORS**

- A. The CONTRACTOR shall provide access doors for concealed pull boxes and other work items that require accessibility for operation and maintenance.

**2.10 EQUIPMENT SUPPORTS, FOUNDATIONS AND STANDS**

- A. The CONTRACTOR shall provide supports, foundations, stands, and platforms for electrical equipment when specified or required for proper installation.
- B. Supporting structures shall be designed and constructed of a strength to withstand stresses and to distribute the load over building areas.

**2.11 PROTECTION**

- A. Protect the work of others from damage resulting from the work of this project.
- B. Protect the work of the project from that others, make good any damage, remove all debris and rubbish and leave the project site in a clean and tidy condition to the approval of the Project Manager / Administrator.
- C. Protect exposed line equipment during construction for personnel safety. Shield and make live parts "Live 120-Volts", or with appropriate voltage.

**2.12 CLEANING**

- A. Clean during construction and make final cleaning in accordance with Division 1.
- B. Before energizing and systems, inspect and clean all the inside of power panel boards and cabinets to ensure that they are completely free from dust and debris.
- C. Clean all polished, painted and plated work brightly. Clean all lighting fixtures and replace all burned out lamps.
- D. Remove all debris, surplus materials and tools.

- E. At time of final cleaning, clean lighting reflectors, lenses, and other lighting surfaces that have been exposed to construction dust and dirt.

**2.13 EXCAVATION, TRENCHING AND BACKFILLING**

- A. The CONTRACTOR shall perform all excavation and backfilling required for the complete installation of the electrical systems.
- B. Excavations and backfilling shall be made at such time as will permit the uninterrupted progress of the work.
- C. Trenches for conduit may be excavated manually or with mechanical trenching equipment. Where underground utilities are encountered, the trenching shall be done by hand. Trenches shall be opened the complete length and depth before conduit is placed so that if any obstructions are encountered proper provisions can be made to avoid them. The CONTRACTOR shall sheet and brace the trenches, where necessary, and shall furnish and keep in place such bridges and crossing as may be required.
- D. All conduits shall be securely fastened in place during construction and shall be plugged or capped to prevent entrance of grout, water or dirt. Any conduit having a defective joint shall not be installed.
- E. No conduit shall come into contact with tunnels, or gas, water or sewer pipes. The conduit where crossing gas, water or sewage pipes shall be separated therefrom by at least 6-inches of soil. Conduits laid parallel to tunnels or gas or water mains or sewers must be separated therefrom by at least 12-inches of soil.
- F. Where it is necessary to cut existing paving, the CONTRACTOR shall restore the paving to its original condition.
- G. Restore any disturbed grading or seeded areas to their original conditions.
- H. The appropriate sections of Division 2.00, Sitework, shall be referred to for additional requirements of the listed work.

**2.14 ELECTRIC SERVICE**

- A. The electric service from the power company shall be coordinated by the CONTRACTOR and all cost for obtaining the service shall be paid by the CONTRACTOR. The CONTRACTOR shall make connection to the power company equipment and conform to the power company requirements. Coordinate with local utility standards as deemed necessary.
- B. Scheduling with the local utility company shall also be the responsibility of the CONTRACTOR. No downtime shall be regarded as an extra in the event of delaying the contract.

**2.15 LOAD BALANCE**

- A. Measure phase current to panel boards with normal loads (lighting) operating at time of acceptance. Adjust branch circuit connections as required to obtain best balance of current between phases and record changes. Maintain accurate record of changes made and provide circuit directory that lists final circuit arrangement.

- B. Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment. Balance electrical load between phases as nearly as possible on switchboards, panel boards, motor control centres and other equipment where balancing is required.
- C. Submit, at completion of work, report listing phase and neutral currents on panelboards, dry-core transformers, oil-filled transformers, and switchgear operating under normal load. State hour and date on which each load was measured, and voltage at time of test.

**2.16 CONDUIT AND CABLE INSTALLATION**

- A. Install conduit and sleeves prior to pouring of concrete. Sleeves through concrete: schedule 40 rigid PVC, sized for free passage of conduit, and protruding 50 mm.
- B. Install cables, conduits and fittings to be embedded or plastered over, neatly and close to building structure so furring can be kept to minimum.
- C. Arrange for holes through exterior walls and roof to be flashed and made weatherproof. Coordinate with appropriate division.

**2.17 INSERT, SLEEVES, FASTENINGS AND SUPPORTS**

- A. Provide all necessary inserts, hangers, fastenings, sleeves and curbs for electrical equipment, suspended from or passing through structural walls or floors, to suit the specific location, and as approved by the Contract Administrator. Sleeves: allow 12 mm clearance over the O.D. of all cables and conduits, 25 mm horizontally and vertically for rectangular openings.
- B. Finish sleeves flush with wall finish (each side) or the ceiling to curb top.
- C. Secure equipment to solid masonry, tile and plaster surfaces with lead anchors or nylon shields, properly sized for the load to be carried.
- D. Secure equipment to poured concrete with expandable inserts, properly sized for the load to be carried.
- E. Secure equipment to hollow masonry walls or suspended ceilings with factory made threaded or toggle type inserts, properly sized for the load to be carried.

**2.18 FIREPROOFING**

- A. Where sleeves or openings are installed in walls, floors or partitions to accommodate raceways, cables or bus duct, provide all necessary seals, fittings, barriers and fire-resistant materials to restore the installation to its original fire rating to the satisfaction of the governing authorities and the OWNER's insurance underwriters. Minimum of 2-hour fire rating.

**3.00 TESTS****3.01 GENERAL**

- A. Following installation but not more than 120-hrs before energization, the CONTRACTOR shall test the electrical system and components in the manner described below. All test results shall be recorded in writing. If requested, the CONTRACTOR shall use test documents supplied by the ENGINEER to record data. A certified copy of all test results shall be submitted to the ENGINEER immediately after completion.

- B. All necessary test instruments and equipment shall be furnished by the CONTRACTOR.
- C. Tests shall be performed, and the system reviewed by the ENGINEER for acceptability before any work is covered up or concealed. If such work is concealed, it shall be re-opened so that the test may be performed.
- D. The ENGINEER shall be given ample notification of tests to permit him or the OWNER to be present. If tests are conducted without notification, they shall be required to be redone.
- E. A representative of the CONTRACTOR shall accompany the ENGINEER during the final inspection and checking out of the electrical system.

**3.02 TESTS REQUIRED**

- A. All work shall be given a visual inspection for good workmanship and conformance with standard practice.
- B. The CONTRACTOR shall make any tests or adjustments required or recommended in the manufacturer's installation instructions.
- C. The direction of rotation of all motors shall be checked. The motor shall be mechanically uncoupled from the driven load where reverse rotation could damage equipment.
- D. All motor control circuits shall be checked for correct operation, as well as all control functions, all actuating mechanisms and sensors. All adjustable circuit breakers and overload protection devices for motor circuits shall be adjusted to allow the motors to start and run. Furnish and install the proper size heaters if required.
- E. All lighting circuits and associated control shall be checked, and any burned out lamps shall be replaced.
- F. All 480-volt distribution systems, including cabling for correct phasing, voltage, grounding and load balancing.
- G. Communication, control and instrumentation, fire alarm and emergency power systems.
- H. Test and check electrical instrumentation systems for correct operation and compliance with regulatory authorities.
- I. After the ground system is completed, the CONTRACTOR shall test the resistance of the mat to earth. The test shall be conducted in the presence of the ENGINEER or OWNER. Testing shall be performed during normal dry weather conditions with at least five (5) consecutive non-rain days prior to the test. The resistance to ground shall not exceed 5 ohms. All ground paths shall be tested for continuity and all connection points inspected. The ENGINEER shall be notified after installation of the grounding system but before backfilling in order to have an opportunity to inspect all connection points.
- J. All 480-volt motors shall be tested with a 500-volt insulation megohm tester. The test shall be held for a period of one (1) minute or until a constant reading of 15 seconds after one minute.
- K. Supply instruments, meters, consumable parts (such as fuses) and equipment. Arrange for qualified personnel to conduct tests.

- L. Check electrical voltage after facility has been in operation for 60 days. Adjust transformer tap settings as required. Tabulate, make adjustments and record data in Maintenance and Operating manuals.
- M. Obtain the services from an approved testing agency for major electrical equipment such as switchgear, switchboards, motor control centers, and 480-volt panel boards. The approved testing agency will conduct power system study and acceptance tests on the installed equipment complete with a report certified by a licensed ENGINEER. The rest report shall include a summary of the project, description of the equipment tested, methodology of the test, test results and analysis of results.
- N. The tests will be in accordance with the relevant latest NETA – Acceptance Testing Standards for the following equipment: switchgear, metal enclosed busway, secondary grounding, ground fault protection systems, motor control centers, and capacitors.

**3.03 CHECKOUT AND STARTUP****A. Voltage Field Test:**

- 1. Check voltage at point of termination of power company supply system to project when installation is essentially complete and is in operation.
- 2. Check voltage amplitude and balance between phases for loaded and unloaded conditions.
- 3. Record supply voltage (all three (3) phases simultaneously on same graph) for 24-hours during normal working day. Submit Voltage Field Test Report within five (5) days of test.

**B. Equipment Line Current Tests**

- 1. Check line current in each phase for each piece of equipment.
- 2. Make line current check after supply utility has made final adjustments to supply voltage magnitude or balance.
- 3. If any phase current for any piece of equipment is above rated nameplate current, prepare Equipment Line Phase Current Report that identifies cause of problem and corrective action taken.

**C. Conduits and Ducts**

- 1. Conduits or ducts which are required to be installed but left empty shall be tested for clear bore using a ball mandrel of approximately 85% of the conduit or duct inside diameter. Any conduit or duct which rejects the ball mandrel shall be cleared at no additional cost to the OWNER. These tests shall be witnessed by the Contract Administrator. Three (3) days' notice shall be given prior to testing.

**D. Grounding System**

- 1. Test the ground system efficacy for compliance with CSA Standard C22.1 and Supply Authority requirements. Verify that the ohmic resistance values specified therein are not exceeded.
- 2. If ohmic value of the grounding system is not satisfactory to the Contract Administrator or Supply Authority, install additional ground rods and ground conductor to rectify.

3. Notify inspection Authorities that they may be present to witness CONTRACTOR testing and provide any assistance required by these Authorities for their own testing procedures.

**3.04 COORDINATION OF PROTECTIVE DEVICES**

- A. Ensure circuit protective devices such as over-current trips, relays and fuses, are installed to correct values and settings.
- B. Ensure all protective devices ratings and settings are set to the coordination study settings.
- C. Record and submit to Contract Administrator all protective devices settings as left.
- D. Provide tests for all relays and provide full and complete data sheets on as found settings, as tested settings, and as left settings.
- E. Provide full data sheets for all settings of multifunction relays within the scope of this contract:  
Full data sheets to include:
  1. All protective settings
  2. All relay input settings
  3. All relay output settings
  4. All communications settings

**3.05 FINAL INSPECTION**

- A. Make request, in writing, to the Contract Administrator to arrange for a final inspection of all electrical systems with a schedule of inspections.
- B. Do not issue this written request until.
- C. All deficiencies noted during the job inspection have been completed.
- D. All systems have been balanced and tested and are ready for operation.
- E. Operating and maintenance instructions have been submitted and approved.
- F. Identification of equipment and raceways is complete.
- G. Certificates have been submitted.
- H. Record Drawings are completed and approved.
- I. OWNER's operating personnel have been instructed.

END OF SECTION



**APPENDIX A**  
**SERVICE MAPS**

# Electric Meters

## FlexNet Design Propagation Analysis

8203 – MARSHALL, CITY OF  
Marshall, MI

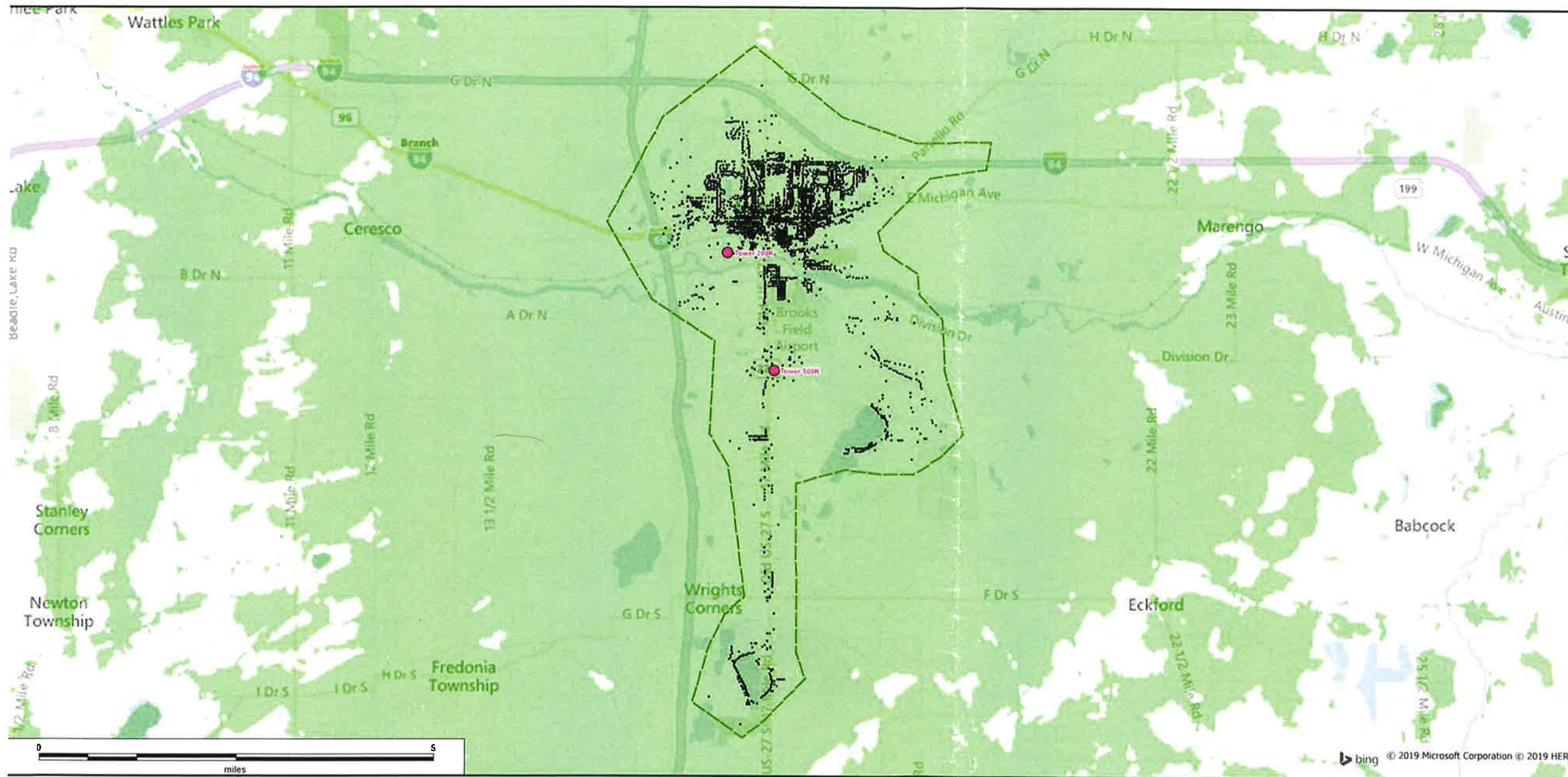
RF Engineer: Cameron Sisson  
Date: 10/17/2019

### Existing Site Details

Total Site Locations: 2  
Total Base Station Counts: 2  
M400B2 = 2

### Design Factors

Flex Net Version: V2  
Endpoint Type: Electric  
Smart point Location: Outdoor  
Attenuation: 0dB



	Count	%
Total Endpoints Covered	5,291	100.00%
Total Endpoints Analyzed	5,291	

### LEGEND

- Coverage
- Site Location
- Endpoint Location
- Service Boundary



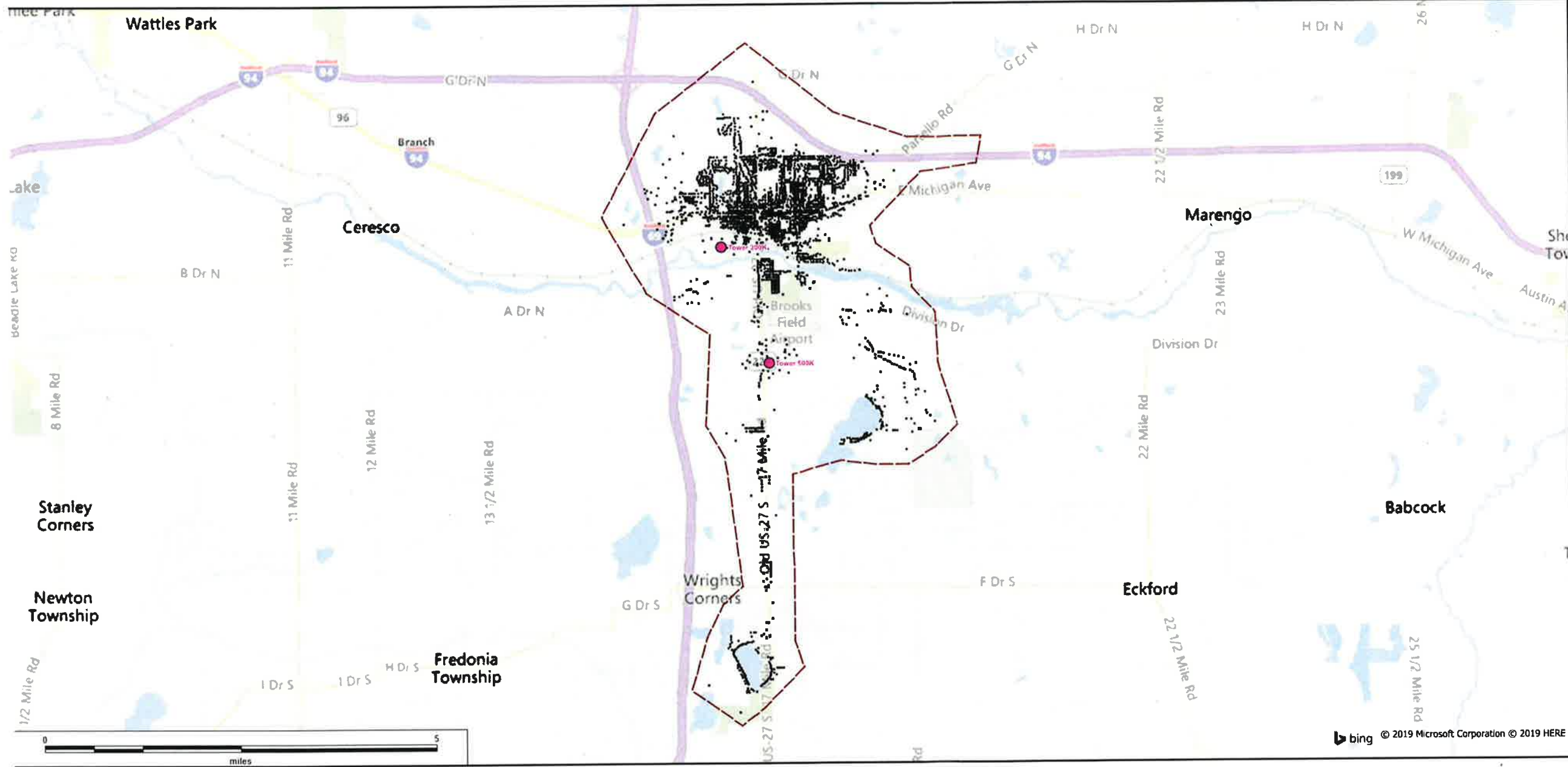
This propagation study is based on actual information provided by the utility pertaining to meter type, Smart point Location, potential antennae height on structure, structure height, and structure location. Any changes, deletions and/or additions that are not provided to the design engineers during the creation of this design may result in a study that does not correlate to actual field conditions.

# Electric Meters

## FlexNet Design Base station and Meter Locations

8203 – MARSHALL, CITY OF  
Marshall, MI

RF Engineer: Cameron Sisson  
Date: 10/17/2019



### LEGEND

- Site Location
- Endpoint Location
- Service Boundary



This propagation study is based on actual information provided by the utility pertaining to meter type, Smart point Location, potential antennae height on structure, structure height, and structure location. Any changes, deletions and/or additions that are not provided to the design engineers during the creation of this design may result in a study that does not correlate to actual field conditions.



# Water Meters

## FlexNet Design Propagation Analysis

8203 – MARSHALL, CITY OF  
Marshall, MI

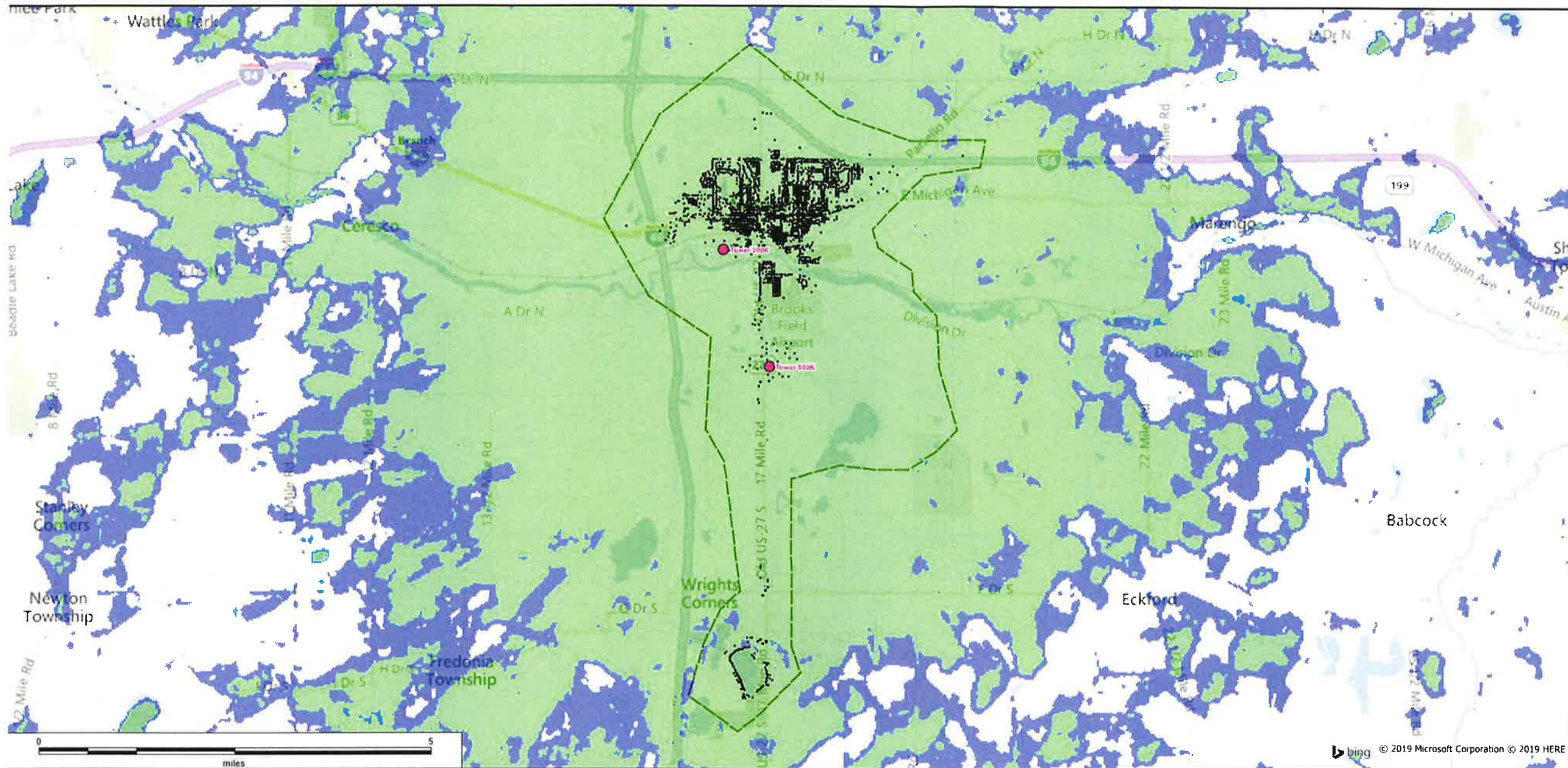
RF Engineer: Cameron Sisson  
Date: 10/17/2019

### Existing Site Details

Total Site Locations: 2  
Total Base Station Counts: 2  
M400B2 = 2

### Design Factors

Flex Net Version: V1  
Endpoint Type: Water  
Smart point Location: Indoor  
Attenuation: 10dB



	Count	%
Total Endpoints Covered	3,547	100.00%
2 Way Coverage	3,542	99.86%
1 Way Coverage	5	0.14%
Total Endpoints Analyzed	3,547	

### LEGEND

- 2-Way Coverage
- 1-Way Coverage
- Site Location
- Endpoint Location
- Service Boundary



This propagation study is based on actual information provided by the utility pertaining to meter type, Smart point Location, potential antennae height on structure, structure height, and structure location. Any changes, deletions and/or additions that are not provided to the design engineers during the creation of this design may result in a study that does not correlate to actual field conditions.

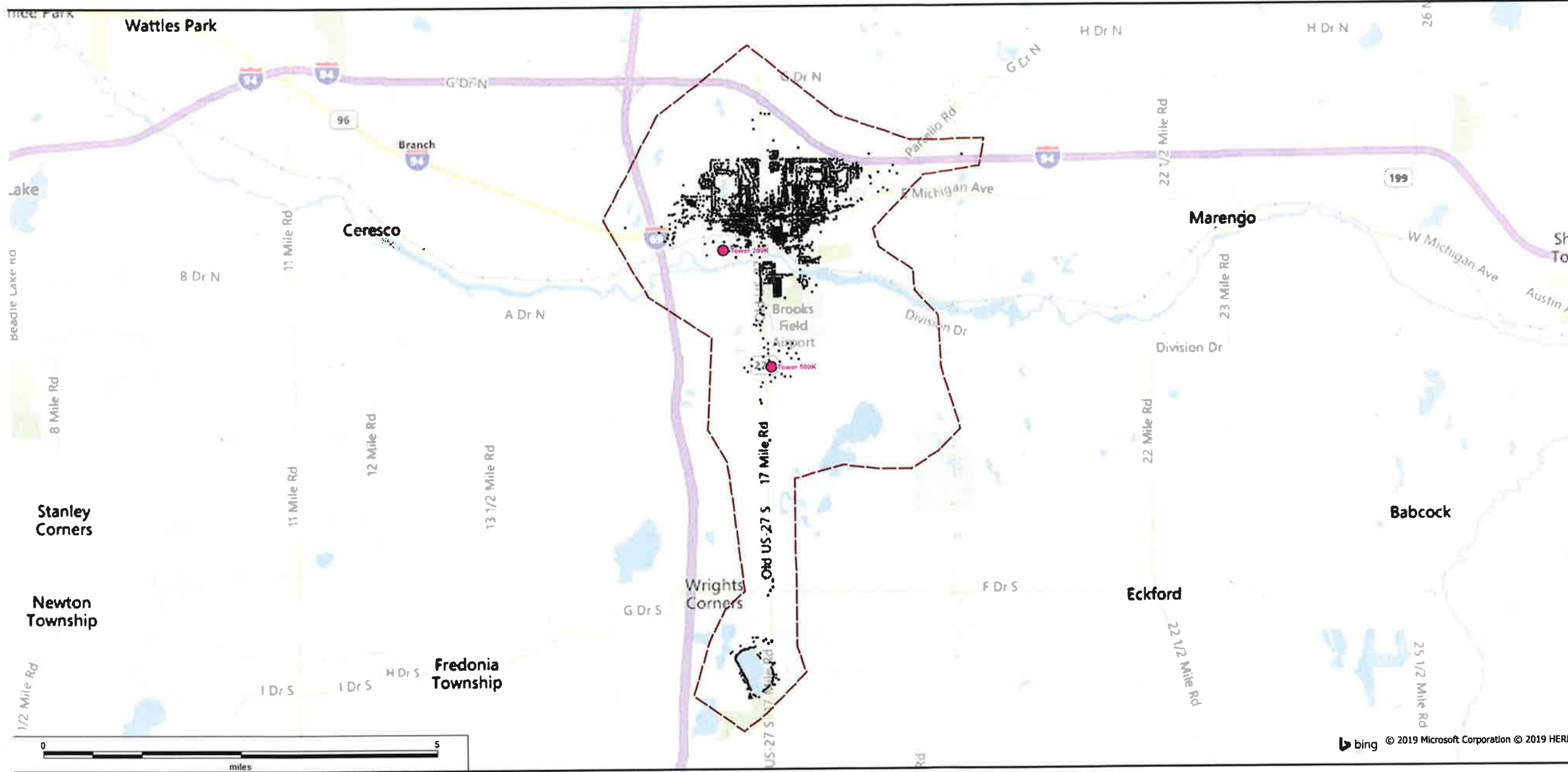


# Water Meters

**FlexNet Design**  
Base station and Meter Locations

**8203 – MARSHALL, CITY OF**  
Marshall, MI

RF Engineer: Cameron Sisson  
Date: 10/17/2019



## LEGEND

- Site Location
- Endpoint Location
- Service Boundary



This propagation study is based on actual information provided by the utility pertaining to meter type, Smart point Location, potential antennae height on structure, structure height, and structure location. Any changes, deletions and/or additions that are not provided to the design engineers during the creation of this design may result in a study that does not correlate to actual field conditions.

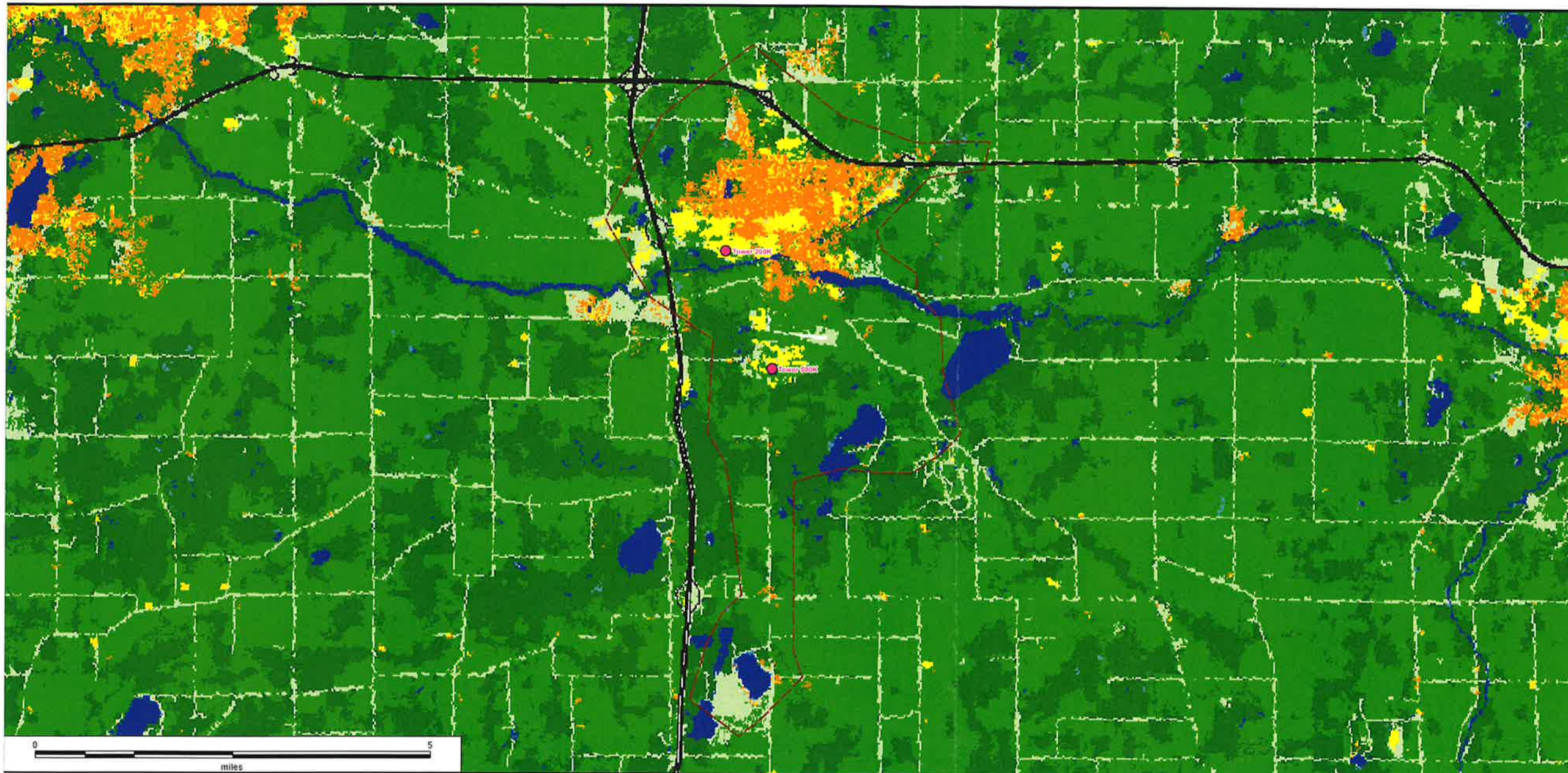


# FlexNet Design

Base station and Clutter

8203 – MARSHALL, CITY OF  
Marshall, MI

RF Engineer: Cameron Sisson  
Date: 10/17/2019



## LEGEND

- Site Location
- - - Service Boundary
- High Density Urban
- Commercial - Industrial
- Suburban Few Trees
- Suburban With Trees
- Airports
- Major Transportation
- Open
- Grass - Agriculture
- Forest
- Wetland
- Inland Water
- Sea Water

This propagation study is based on actual information provided by the utility pertaining to meter type, Smart point Location, potential antennae height on structure, structure height, and structure location. Any changes, deletions and/or additions that are not provided to the design engineers during the creation of this design may result in a study that does not correlate to actual field conditions.



